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CAN COMMUNICATION SYSTEM

PRECAUTION

1. **IGNITION SWITCH EXPRESSIONS**

   HINT:

   The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

SWITCH REFERENCE CHART

Expression	Ignition Switch (position)	Engine Switch (condition)
Ignition Switch off	LOCK	Off
Ignition Switch on (IG)	ON	On (IG)
Ignition Switch on (ACC)	ACC	On (ACC)
Engine Start	START	Start

2. **STEERING SYSTEM HANDLING PRECAUTIONS**
   a. Care must be taken when replacing parts. Incorrect replacement could affect the performance of the steering system and result in hazardous driving.
3. **SRS AIRBAG SYSTEM HANDLING PRECAUTIONS**
   a. This vehicle is equipped with an SRS (Supplemental Restraint System) which includes parts such as the driver airbag and front passenger airbag. Failure to carry out service operations in the correct sequence could cause unexpected SRS deployment during servicing and may lead to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notice for the SRS (See **AIRBAG SYSTEM**).
4. **BUS WIRE REPAIR**
   a. After repairing a bus wire with solder, wrap the repaired part with electrical tape.



N F045104

Fig. 1: Identifying Repairing Wire Bus Line With Solder, Wrap
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- **The CANL bus wire and CANH bus wire must be installed**

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together at all times.

- **When installing, make sure that they are twisted.**
- **CAN bus wires are likely to be influenced by electrical noise if the bus wires are not twisted.**
- **The difference in length between the CANL bus wire and CANH bus wire should be 100 mm (3.937 in.) or less.**
- **Leave approximately 80 mm (3.150 in.) loose in the twisted wires around the connector.**

b. Do not use bypass wiring between the connectors.

NOTE: The ability of the twisted bus wires to resist interference will be lost if bypass wiring is used.

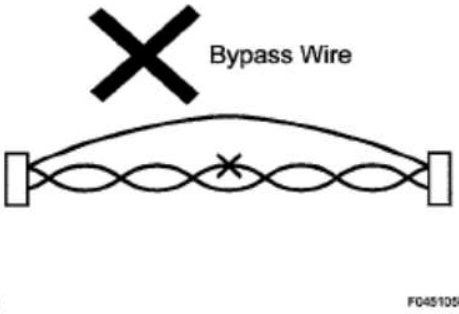


Fig. 2: Precaution For Bypass Wire
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **CONNECTOR HANDLING**
   a. When checking resistance with a tester, insert the tester probes from the backside (harness side) of the connector.

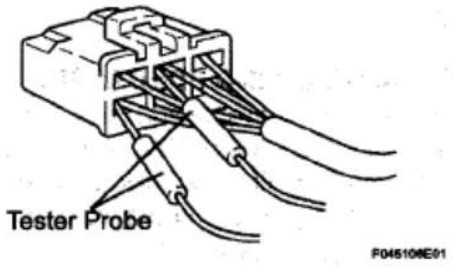


Fig. 3: Inserting Tester Probes From Backside (Harness Side) Of Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   b. Use service wires to check the connector if it is impossible to check continuity from the rear of the connector.

6. **PRECAUTIONS FOR INSPECTING OR REPLACING CAN JUNCTION CONNECTOR**

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a. If the CAN junction connector is removed from the vehicle for inspection or replacement, make sure to install the CAN junction connector and all wire harnesses to their original locations with tape and the clamps.

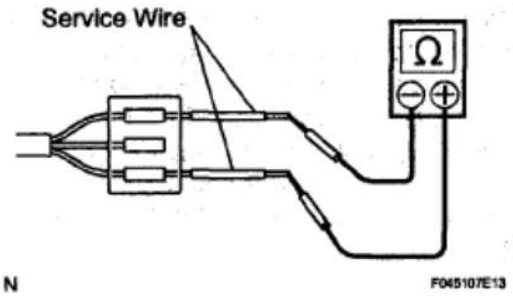


Fig. 4: Checking Continuity From Rear Of Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PARTS LOCATION

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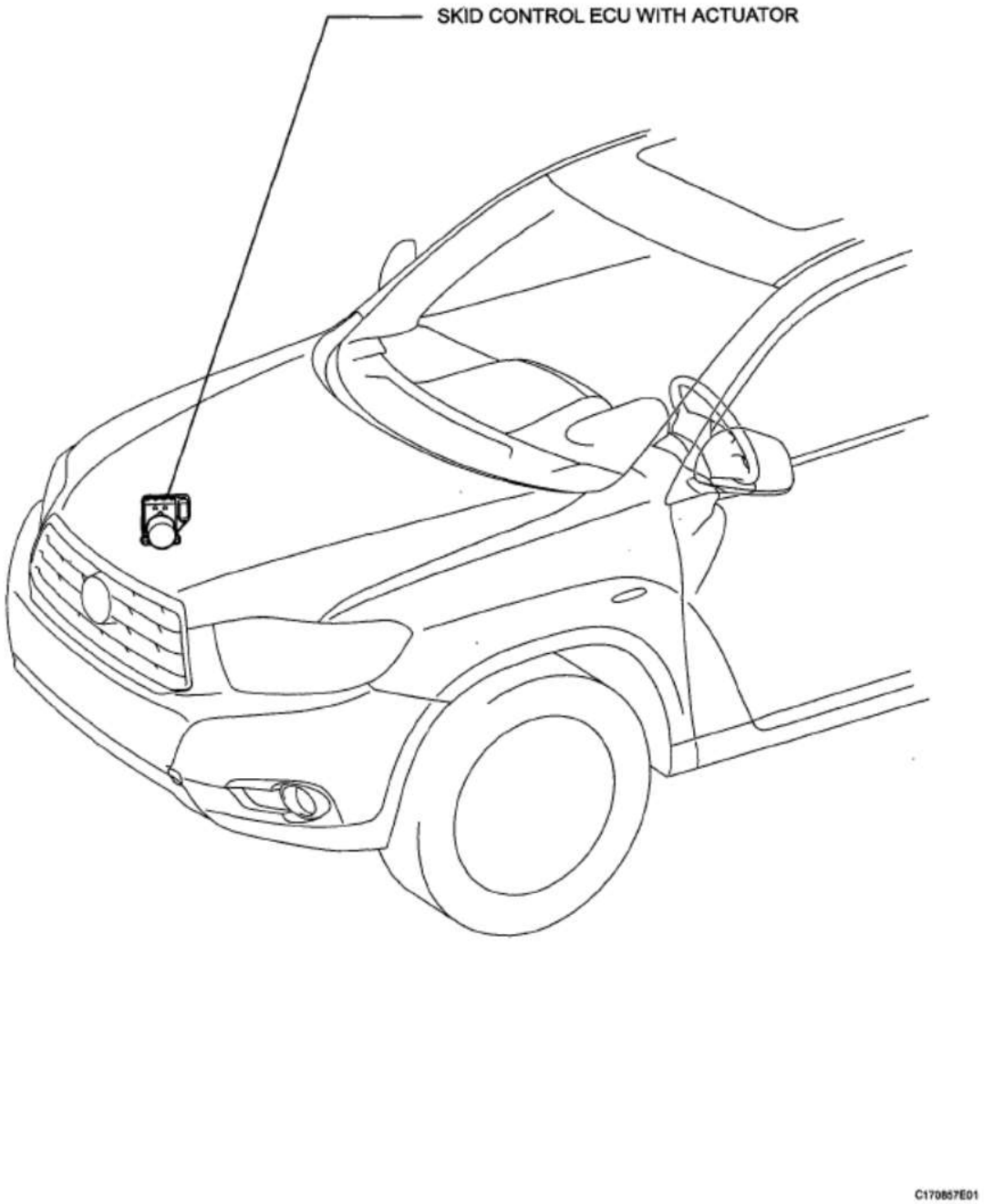


Fig. 5: Identifying CAN Communication System Parts Location (1 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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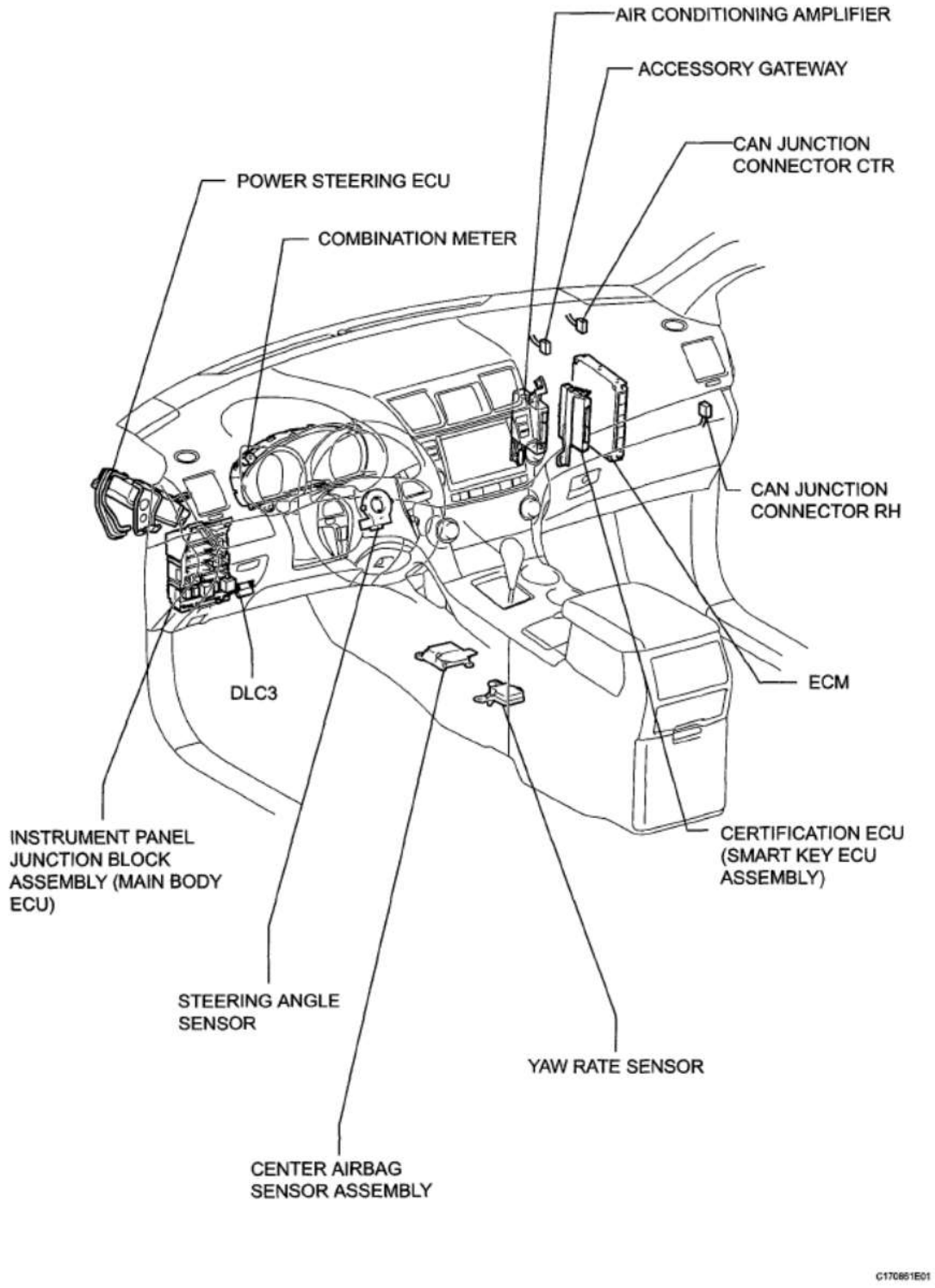


Fig. 6: Identifying CAN Communication System Parts Location (2 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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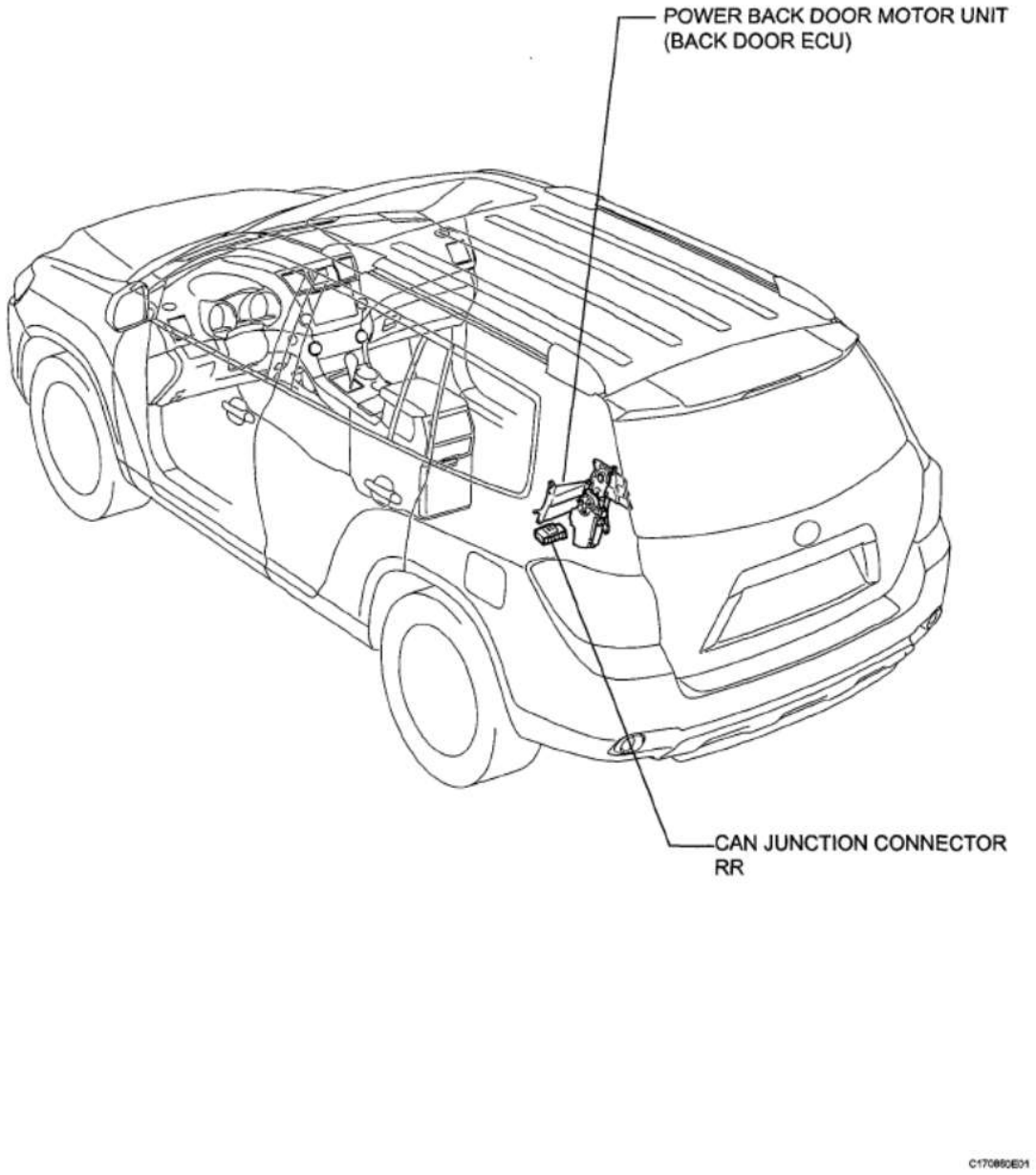


Fig. 7: Identifying CAN Communication System Parts Location (3 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

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CAN No. 1 Bus:

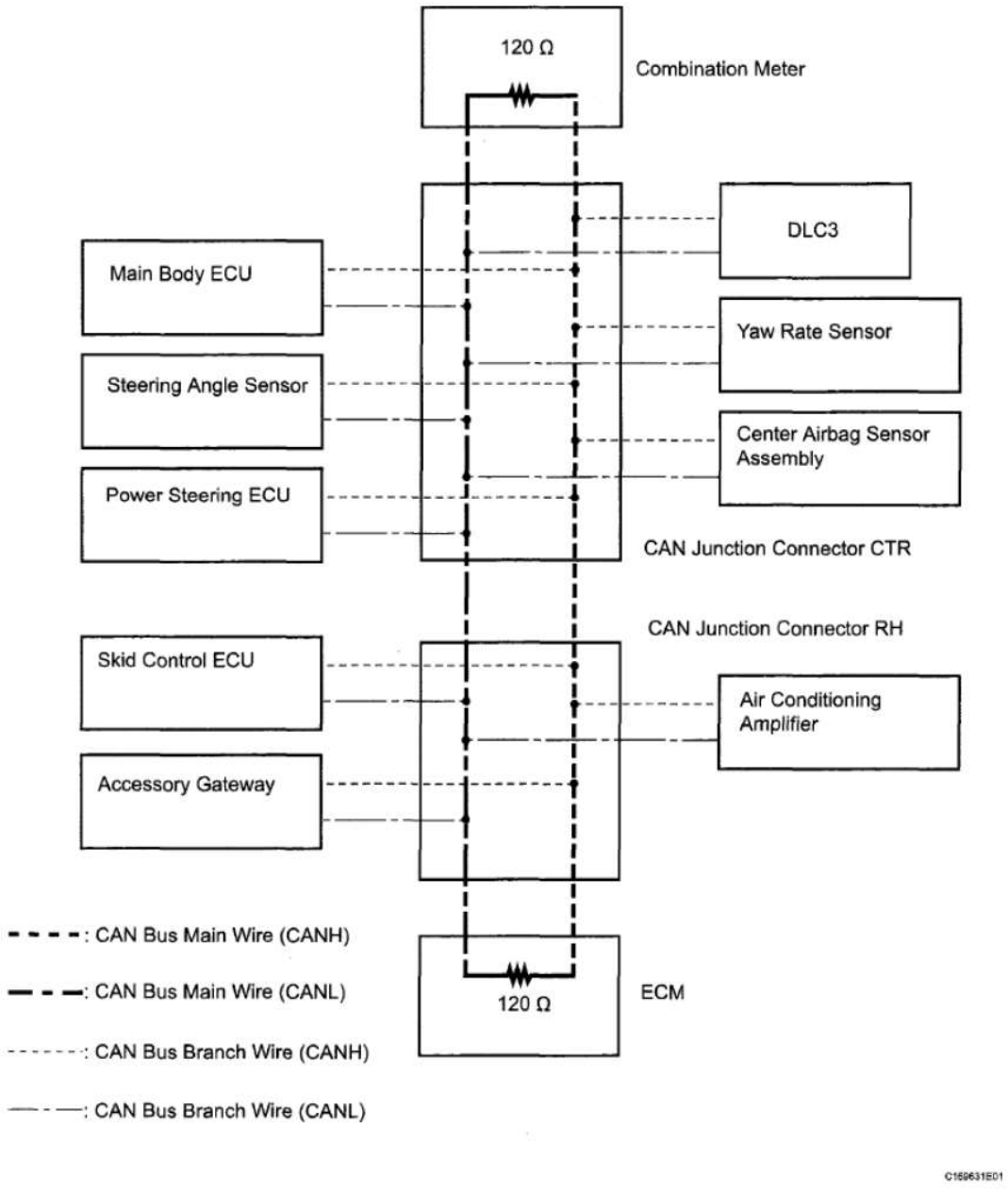


Fig. 8: CAN Communication System Diagram (1 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

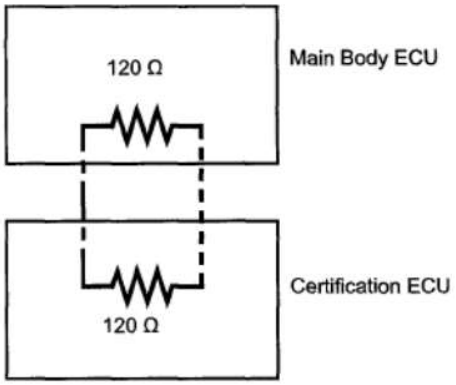
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CAN MS Bus:

w/ Smart Key System and w/o Power Back Door System:



w/o Smart Key System and w/ Power Back Door System:

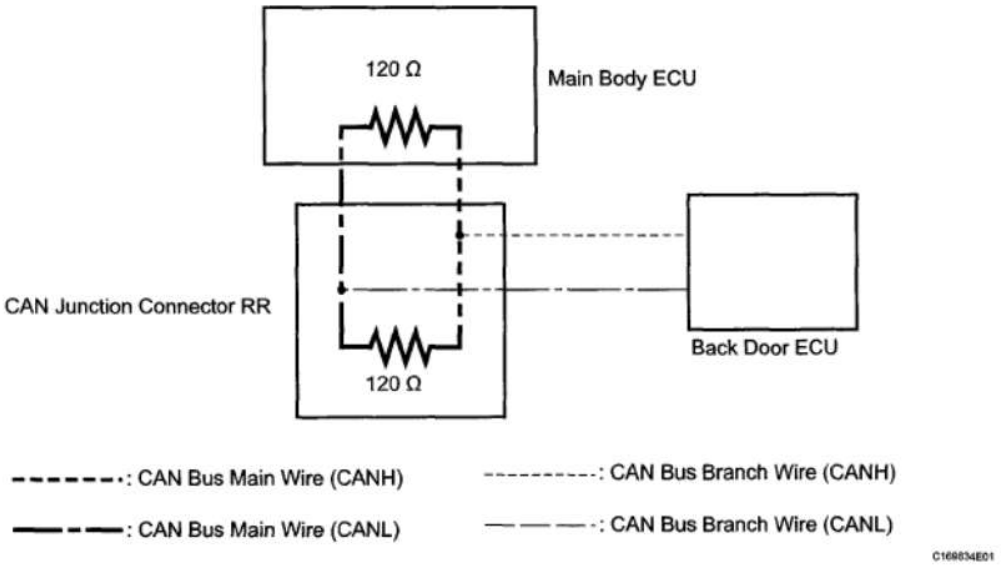


Fig. 9: CAN Communication System Diagram (2 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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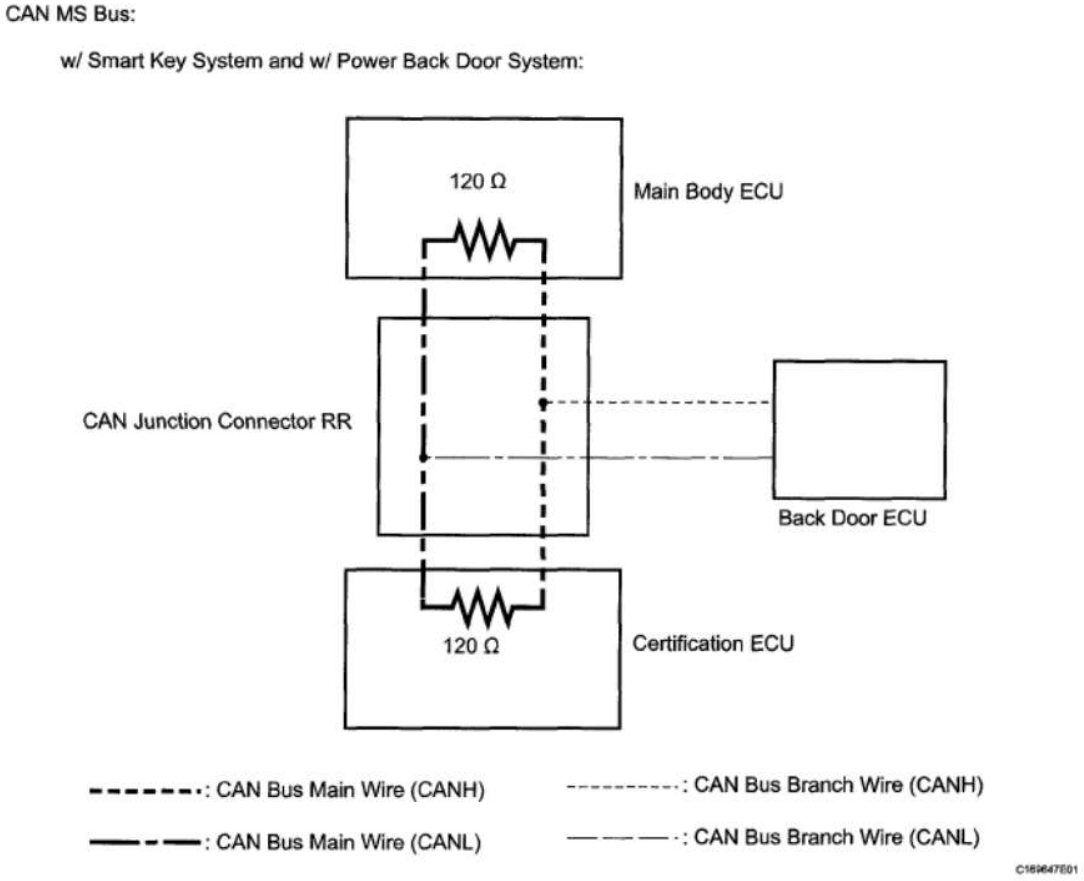


Fig. 10: CAN Communication System Diagram (3 Of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DESCRIPTION

1. BRIEF DESCRIPTION

a. Two different types of CAN buses are used. The CAN buses are classified into two types based on typical communication speed. The HS-CAN bus is a high speed communication bus that is used for powertrain, chassis, and some body electrical communication. The HS-CAN bus is referred to as "CAN No. 1 bus". It operates at speeds of approximately 500 kbps. Terminating resistors for the CAN No. 1 bus are located in the combination meter and ECM. The resistance of the CAN No. 2 bus cannot be measured from the DLC3 connector. The MS-CAN bus is a medium speed communication bus that is used for body electrical communication. The MS-CAN bus is referred to as "MS bus" and it operates at speeds of approximately 250 kbps. Terminating resistors for the MS-CAN bus are located in the main body ECU and the certification ECU (or the CAN junction connector RR). The resistance of the MS-CAN bus cannot be measured from the DLC3 connector. Communication between these networks is handled via the main body ECU (for the CAN MS bus), which acts as a gateway.

b. By pairing the CANH and CANL bus wires, the CAN performs communication based on differential voltage.

c. Many ECUs (sensors) installed on the vehicle operate by sharing information and communicating

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with each other.

d. The CAN has two resistors of 120 ohms which are necessary to communicate with the main bus wire.

2. **DEFINITION OF TERMS**

a. Main bus wire

1. The main bus wire is a wire harness between the two terminating resistors on the bus (communication wire). This is the main bus in the CAN communication system.

b. Branch wire

1. The branch wire is a wire harness which diverges from the main bus wire to an ECU or sensor.

c. Terminating resistors

1. Two resistors of 120 ohms are installed in parallel across the ends of the CAN main bus wire. They are called terminating resistors. These resistors allow the changes of the voltage differential between the CAN bus wires to be accurately judged. To allow proper function of CAN communication, it is necessary to have both terminating resistors installed. Since the two resistors are installed in parallel, a measurement of resistance between the two CAN bus wires should produce a reading of approximately 60 ohms.

3. **ECUS OR SENSORS WHICH COMMUNICATE THROUGH CAN COMMUNICATION SYSTEM**

a. ECM
b. Combination meter
c. Skid control ECU
d. Yaw rate sensor
e. Steering angle sensor
f. Air conditioning amplifier
g. Power steering ECU
h. Center airbag sensor assembly
i. Main body ECU
j. Certification ECU (w/ Smart key system)
k. Back door ECU (w/ Power back door system)
l. Accessory gateway

4. **DIAGNOSTIC CODE FOR CAN COMMUNICATION SYSTEM**

a. DTCs for the CAN communication system are as follows: U0073, U0100, U0123, U0124, U0126, U0129, U0230*2 , U0327*1 , U1002*1*2 and B1499.

*1: w/ Smart key system

*2: w/ Power back door system

5. **TROUBLESHOOTING REMARKS**

a. DTCs for the CAN communication system can be checked using Techstream. The DLC3 is

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connected to the CAN communication system, but no DTCs exist regarding problems in the DLC3 or the DLC3 branch wires. If there is trouble in the DLC3 or the DLC3 branch wires, ECUs on the CAN network cannot output codes to Techstream.

b. Trouble in the CAN buses (communication wires) can be checked by measuring the resistance between terminals of the DLC3. However, an open circuit in a branch wire other than the DLC3 branch wires cannot be checked from the DLC3.

NOTE: Do not insert the tester probes directly into the DLC3. Be sure to use service wires.

6. **HOW TO DISTINGUISH THE CAN JUNCTION CONNECTOR**

a. In the CAN communication system, the shape of all connectors connected to the CAN junction connector is the same. The connectors connected to the CAN Junction connector can be distinguished by the colors of the bus wire and the connecting side of the junction connector.

HINT:

See "**TERMINALS OF ECU**" for bus wire color or the type of connecting surface.

HOW TO PROCEED WITH TROUBLESHOOTING

NOTE:

- **DTCs for the CAN communication system are as follows: U0073, U0100, U0123, U0124, U0126, U0129, U0230*2 , U0327*1 , U1002*1*2 and B1499.**

  ***1 : w/ Smart key system**

  ***2 : w/ Power back door system**

- **Refer to troubleshooting of each system if DTCs regarding the CAN communication system are not output.**

1. **INSPECT BATTERY VOLTAGE**

Standard voltage:

11 to 14 V

HINT:

If the voltage is below 11 V, recharge or replace the battery before proceeding.

2. **CHECK AND CLEAR DTCS**

HINT:

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- CAN communication DTCs are output when there is an open or short in any of the communication wires. Any problems with the power source of a corresponding ECU or sensor, or problems in the ECU, the sensor itself also cause these DTCs to be output.
- If a CAN communication wire connector is disconnected with the ignition switch on (IG), the ECUs of the corresponding system and related systems record a DTC.

3. **CHECK INSTALLED SYSTEMS (ECU AND SENSOR) THAT USE CAN COMMUNICATION**
   a. Based on the vehicle equipment and specifications, confirm the systems that use CAN communication (See **DIAGNOSIS SYSTEM**).
4. **CHECK DLC3 BRANCH WIRE AND CAN NO. 1 BUS CIRCUIT MAIN WIRE (CANH - CANL)**

NOTE:

- **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 and light reminder warning system are 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 the doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.

a. Turn the ignition switch off.
b. Measure the resistance according to the value(s) in the table below.

Standard resistance

TESTER CONNECTION CONDITION CHART

Tester Connection	Condition	Result	Proceed to
D47-6 (CANH) - D47-14 (CANL)	Ignition switch off	54 to 69 ohms	A
D47-6 (CANH) - D47-14 (CANL)	Ignition switch off	70 ohms or higher	B
D47-6 (CANH) - D47-14 (CANL)	Ignition switch off	Below 54 ohms	C

B: GO TO CAN MAIN WIRE FOR DISCONNECTION (See **OPEN IN CAN MAIN BUS LINE**)

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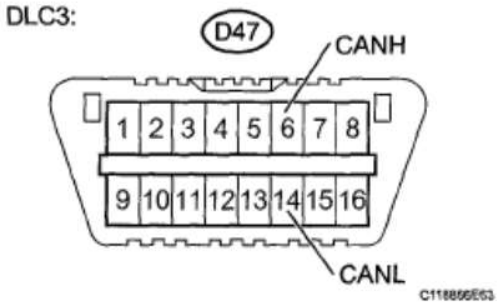


Fig. 11: Identifying D47 DLC3 Connector Terminals (CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

C: GO TO **CHECK CAN BUS LINES FOR SHORT CIRCUIT**

A: Go to next step

5. **CHECK FOR SHORT TO GND IN CAN NO. 1 BUS (CANH, CANL - CG)**
   a. Turn the ignition switch off.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D47-6 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D47-14 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: GO TO **CHECK CAN BUS LINE FOR SHORT TO GND**

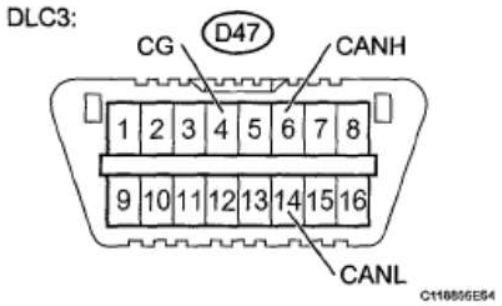


Fig. 12: Identifying D47 DLC3 Connector Terminals (CG, CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

6. **CHECK FOR SHORT TO +B IN CAN NO. 1 BUS (CANH, CANL - BAT)**
   a. Disconnect the negative battery terminal.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D47-6 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D47-14 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: GO TO **CHECK CAN BUS LINE FOR SHORT TO +B**

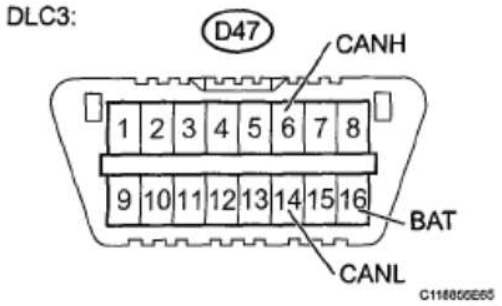


Fig. 13: Identifying D47 DLC3 Connector Terminals (BAT, CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

7. **CHECK TECHSTREAM**
   a. Using Techstream, display the "Communication Bus Check" screen (See **DIAGNOSIS SYSTEM**).
   b. Observe the screen for approximately 1 minute to check the ECUs and sensors displayed on the screen.

Result

RESULT CHART

Result	Proceed to
All ECUs and sensors connected to the CAN communication system are displayed on the screen. (CAN bus circuit is currently normal)	A
One of the ECUs and sensors connected to the CAN communication system is not displayed on the screen. (Open in ECU or sensor branch wires, or	B(*1)

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communication interrupted)	
Some ECUs and sensors repeatedly appear and disappear from the screen, during this check. (Open in one side of ECU or sensor branch wires)	C
• All ECUs and sensors except the main body ECU connected to the CAN MS bus are not displayed on the screen. • The main body ECU outputs DTC U1002. (Open in CAN MS bus main wire or short in CAN MS bus wire)	D
All ECUs and sensors connected to the CAN MS bus are not displayed on the screen. (Open in main body ECU branch wire or main body ECU malfunction)	E
HINT: • (*1): See the "DTC CHART" instead of the "COMMUNICATION STOP MODE TABLE" when some of the ECUs connected to the CAN MS bus are not displayed on the screen (See **DIAGNOSIS SYSTEM**). • The ECUs connected to the CAN MS bus are displayed on the screen by the main body ECU.	

NOTE:

- **The systems (ECUs, sensors) that adopt CAN communication vary depending on the vehicle and optional equipment. Check which systems (ECUs, sensors) are installed on the vehicle (See DIAGNOSIS SYSTEM).**
- **Non-installed ECUs or sensors will not be displayed. Do not mistake them for being in the communication stop mode.**
- **The ECUs and sensors that repeatedly appear and disappear from the screen during this check are considered normal. (The response to Techstream and the tester display are affected by signals output from other ECUs which have an open circuit in either of their CAN branch wires.)**

B: GO TO "**COMMUNICATION STOP MODE TABLE**"

C: GO TO "**OPEN IN ONE SIDE OF CAN BRANCH WIRE**"

D: GO TO "**U1002 (CAN MS BUS)**"

E: GO TO "**MAIN BODY ECU COMMUNICATION STOP MODE**"

A: Go to next step

8. **RECHECK DTC**

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HINT:

- Sometimes CAN communication system DTCs are output, but all the ECUs and sensors connected to the CAN communication system are displayed on Techstream. In this case, previous or history DTCs may indicate the cause of the problem.
- ECUs related to a problem in the CAN bus will store DTCs to indicate communication malfunctions. The communication stop mode in the CAN bus can be determined by comparing the combination of DTCs that have been set. Refer to the DTC combination table for the CAN bus.
- The main body ECU will store communication error DTCs when the ECUs connected to the CAN MS bus cannot communicate, or if a network malfunction occurs.

Result

RESULT CHART

Result	Proceed to
Communication error DTCs other than the codes output from the main body ECU is output. (A malfunction occurred in the CAN No. 1 bus)	A
The main body ECU outputs DTC U1002. (A malfunction occurred in the CAN MS bus)	B
The main body ECU outputs DTCs other than DTC U1002. (A malfunction occurred in an ECU branch wire connected to the CAN MS bus)	C

B: GO TO "**U1002 (CAN MS BUS)**"

C: GO TO "**DTC CHART**"

A: Go to next step

9. **DTC COMBINATION TABLE**
   a. Confirm trouble according to the combination of output DTCs regarding the CAN communication system (See **DIAGNOSIS SYSTEM**).

      HINT:

      Previous CAN communication system DTCs may be the cause if CAN communication system DTCs are output and all ECUs and sensors connected to the CAN communication system are displayed on Techstream's "Communication Bus Check" screen.

10. **CIRCUIT INSPECTION**
11. **IDENTIFICATION OF PROBLEM**
12. **REPAIR OR REPLACE**
13. **CONFIRMATION TEST**

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NEXT: END

PROBLEM SYMPTOMS TABLE

RESULT LIST OF CAN BUS WIRE CHECK:

RESULT LIST OF CAN BUS WIRE

Symptom	Suspected Area	Refer to
The result of "CAN BUS WIRE CHECK" is "Open in CAN Main Bus Line".	Open in CAN Main Bus Line	**OPEN IN CAN MAIN BUS LINE**
The result of "CAN BUS WIRE CHECK" is "Short in CAN Bus Lines".	Short in CAN Bus Lines	**CHECK CAN BUS LINES FOR SHORT CIRCUIT**
The result of "CAN BUS WIRE CHECK" is "Short to B+ in CAN Bus Line".	Short to B+ in CAN Bus Line	**CHECK CAN BUS LINE FOR SHORT TO +B**
The result of "CAN BUS WIRE CHECK" is "Short to GND in CAN Bus Line".	Short to GND in CAN Bus Line	**CHECK CAN BUS LINE FOR SHORT TO GND**
The result of "CAN BUS WIRE CHECK" is "Open in One Side of CAN Branch Line".	Open in One Side of CAN Branch Line	**OPEN IN ONE SIDE OF CAN BRANCH LINE**

COMMUNICATION STOP MODE TABLE:

COMMUNICATION STOP MODE SYMPTOM CHART

Symptom	Suspected Area	Refer to
"Engine" is not displayed on Techstream.	ECM Communication Stop Mode	**ECM COMMUNICATION STOP MODE**
"ABS/VSC/TRAC" is not displayed on Techstream.	Skid Control ECU Communication Stop Mode	**SKID CONTROL ECU COMMUNICATION STOP MODE**
"Steering Angle Sensor" is not displayed on Techstream.	Steering Angle Sensor Communication Stop Mode	**STEERING ANGLE SENSOR COMMUNICATION STOP MODE**
"Yaw Rate/Decelerate Sensor" is not displayed on Techstream.	Yaw Rate Sensor Communication Stop Mode	**YAW RATE SENSOR COMMUNICATION STOP MODE**
"EPS" is not displayed on Techstream.	Power Steering ECU Communication Stop Mode	**POWER STEERING ECU COMMUNICATION STOP MODE**
"Air Conditioner" is not displayed on Techstream.	Air Conditioning Amplifier Communication Stop Mode	**AIR CONDITIONING AMPLIFIER COMMUNICATION STOP**

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		MODE
"SRS Airbag" is not displayed on Techstream.	Center Airbag Sensor Communication Stop Mode	CENTER AIRBAG SENSOR COMMUNICATION STOP MODE
"Main Body" is not displayed on Techstream.	Main Body ECU Communication Stop Mode	MAIN BODY ECU COMMUNICATION STOP MODE
"Combination Meter" is not displayed on Techstream.	Combination Meter ECU Communication Stop Mode	COMBINATION METER ECU COMMUNICATION STOP MODE

TERMINALS OF ECU

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light remainder warning system are not operating.**
- **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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

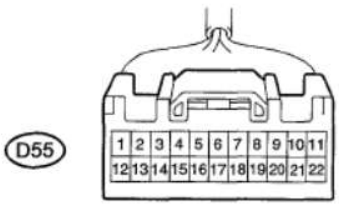
HINT:

Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.

NOTE: This section describes the standard CAN values for all CAN related components.

1. **JUNCTION CONNECTOR FOR CAN BUS**
   a. CAN junction connector CTR

Front view of wire harness connector:



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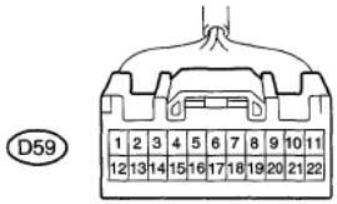
Fig. 14: Identifying CAN Junction CTR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CAN JUNCTION CONNECTOR REFERENCE CHART

CAN Junction Connector CTR	Wiring Color	Connect to
D55-1 (CANH)	SB	CAN junction connector RH
D55-12 (CANL)	W	CAN junction connector RH
D55-2 (CANH)	V	Yaw rate sensor
D55-13 (CANL)	W	Yaw rate sensor
D55-3 (CANH)	Y	Center airbag sensor assembly
D55-14 (CANL)	W	Center airbag sensor assembly
D55-4 (CANH)	L	DLC3
D55-15 (CANL)	W	DLC3
D55-5 (CANH)	R	Steering angle sensor
D55-16 (CANL)	W	Steering angle sensor
D55-6 (CANH)	P	Combination meter
D55-17 (CANL)	W	Combination meter
CAN Junction Connector CTR	Wiring Color	Connect to
D55-7 (CANH)	BR	Power steering ECU
D55-18 (CANL)	W	Power steering ECU
D55-8 (CANH)	GR	Main body ECU
D55-19 (CANL)	W	Main body ECU

b. CAN junction connector RH

Front view of wire harness connector:



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Fig. 15: Identifying CAN Junction Connector RH Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CAN JUNCTION CONNECTOR REFERENCE CHART

CAN Junction Connector RH	Wiring Color	Connect to
D59-1 (CANH)	R	ECM

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D59-12 (CANL)	W	ECM
D59-2 (CANH)	BR	Accessory gateway
D59-13 (CANL)	W	Accessory gateway
D59-3 (CANH)	LG	Air conditioning amplifier
D59-14 (CANL)	W	Air conditioning amplifier
D59-4 (CANH)	B	Skid control ECU
D59-15 (CANL)	W	Skid control ECU
D59-5 (CANH)	SB	CAN junction connector CTR
D59-16 (CANL)	W	CAN junction connector CTR

c. The connection diagram of the components which are connected to the CAN junction connector.

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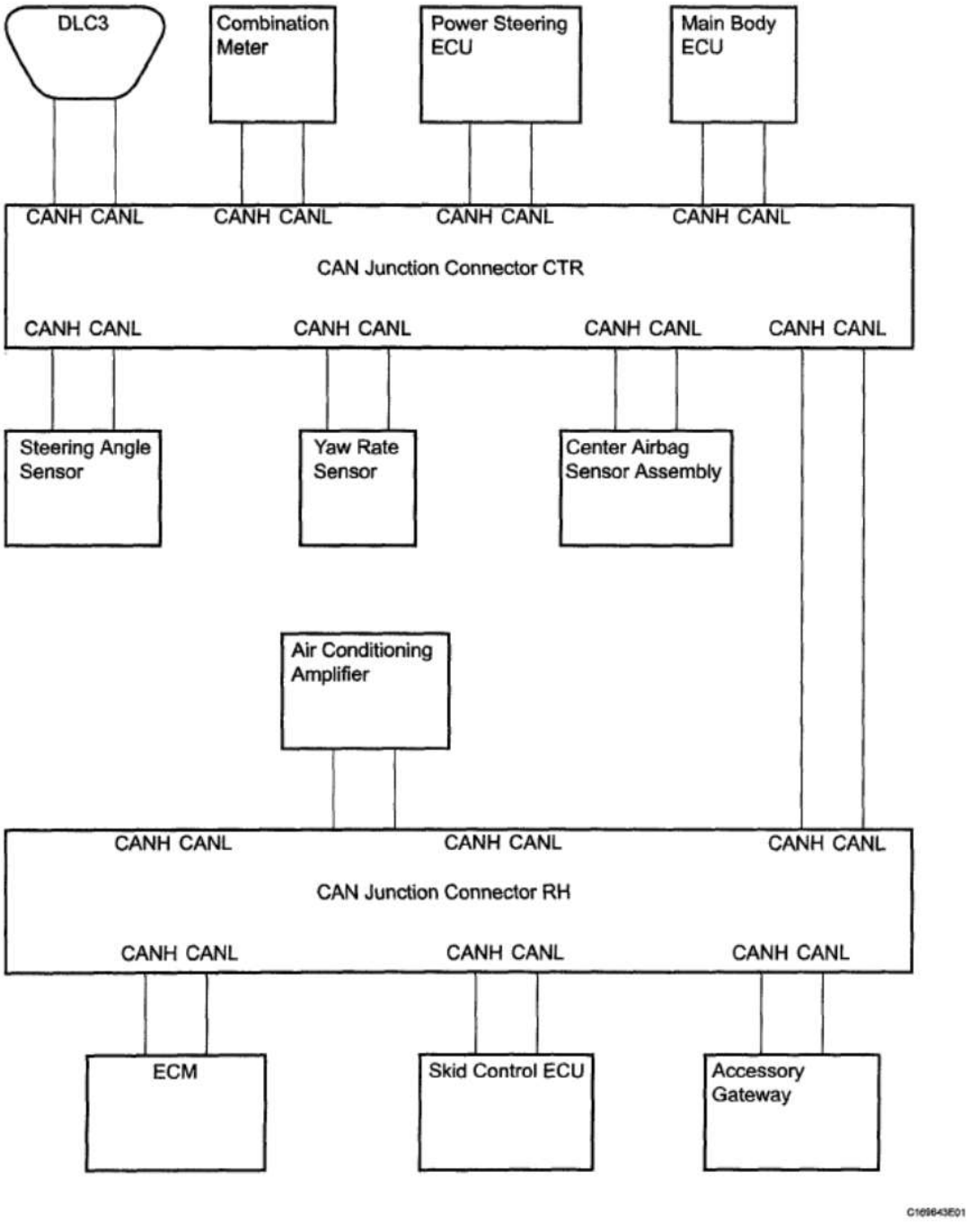


Fig. 16: CAN Junction Connector Connection Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **JUNCTION CONNECTOR FOR CAN MS BUS (w7 POWER BACK DOOR SYSTEM)**
   a. CAN junction connector RR

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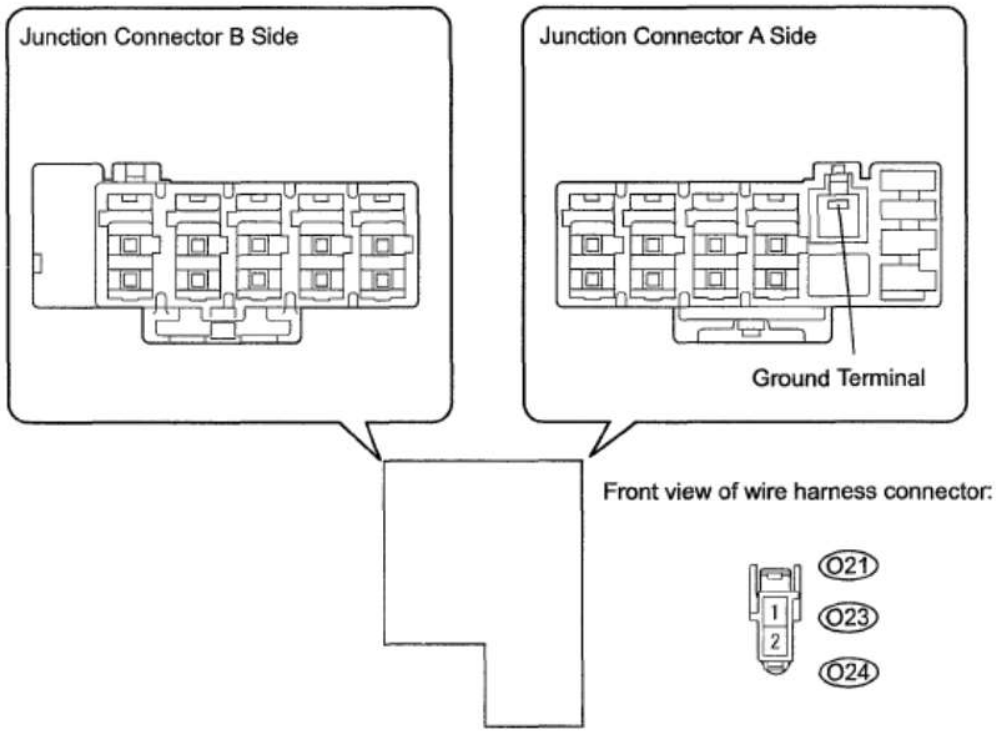


Fig. 17: Identifying CAN Junction RR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CAN JUNCTION CONNECTOR REFERENCE CHART

CAN Junction Connector RR	Wiring Color	Connect to
O21-1 (CANH)	B	Back door ECU*2
O21-2 (CANL)	W	Back door ECU*2
O23-1 (CANH)	GR	Certification ECU*1
O23-2 (CANL)	W	Certification ECU*1
O24-1 (CANH)	Y	Main body ECU*2
O24-2 (CANL)	W	Main body ECU*2
HINT: • *1: w/ Smart key system and power back door system. • *2: w/ Power back door system.		

b. The connection diagram of the components which are connected to the CAN junction connector.

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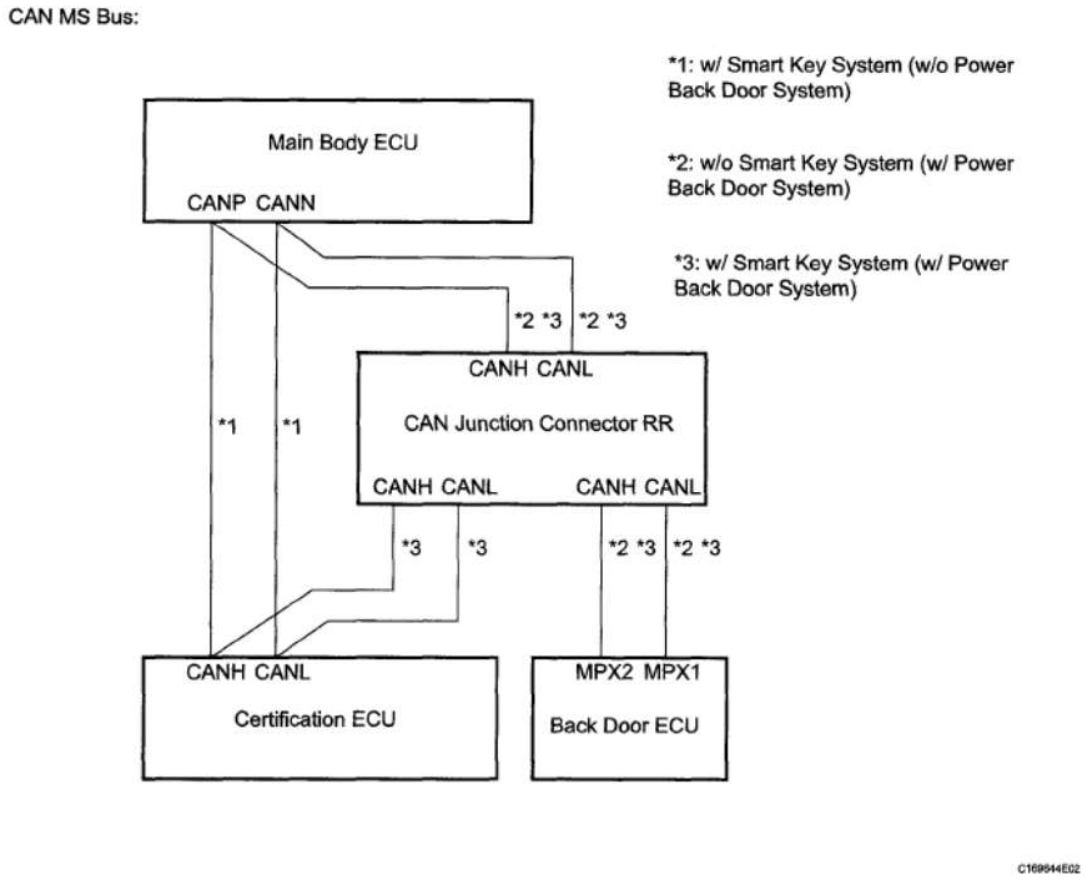


Fig. 18: CAN Junction Connector RR Connection Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **DLC3**
   a. Measure the resistance according to the value (s) in the table below.

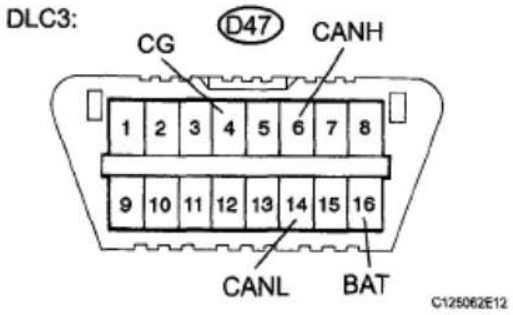


Fig. 19: Identifying D47 DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

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Terminals	Wiring Color	Condition	Specified Condition
D47-6 (CANH) - D47-14 (CANL)	L-W	Ignition switch off	54 to 69 ohms
D47-6 (CANH) - D47-4 (CG)	L-B	Ignition switch off	200 ohms or higher
D47-14 (CANL) - D47-4 (CG)	W-B	Ignition switch off	200 ohms or higher
D47-6 (CANH) - D47-16 (BAT)	L - LG	Negative battery terminal disconnected	6 kohms or higher
D47-14 (CANL) - D47-16 (BAT)	W - LG	Negative battery terminal disconnected	6 kohms or higher

4. **SKID CONTROL ECU WITH ACTUATOR**
   a. Disconnect the connector from the skid control ECU.
   b. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(to Skid Control ECU)

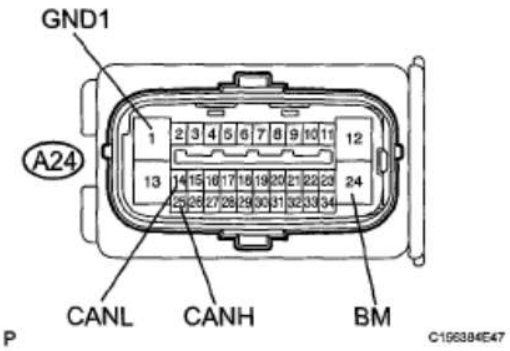


Fig. 20: Identifying Skid Control ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
A24-25 (CANH) - A24-14 (CANL)	B - W	Ignition switch off	54 to 69 ohms
A24-25 (CANH) - A24-1 (GND1)	B - W-B	Ignition switch off	200 ohms or higher
A24-14 (CANL) - A24-1 (GND1)	W - W-B	Ignition switch off	200 ohms or higher
A24-25 (CANH) - A24-	B - B	Negative battery	6 kohms or higher

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24 (BM)		terminal disconnected	
A24-14 (CANL) - A24-24 (BM)	W - B	Negative battery terminal disconnected	6 kohms or higher

5. **STEERING ANGLE SENSOR**
   a. Disconnect the connector from the steering angle sensor.
   b. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(to Steering Angle Sensor)

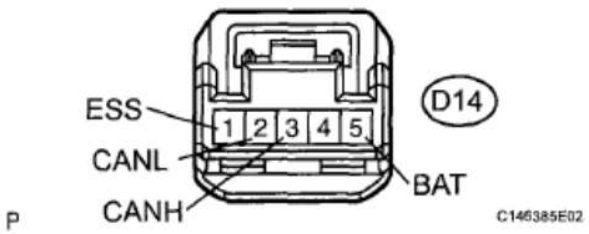


Fig. 21: Identifying Steering Angle Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
D14-3 (CANH) - D14-2 (CANL)	R-W	Ignition switch off	54 to 69 ohms
D14-3 (CANH) - D14-1 (ESS)	R-GR	Ignition switch off	200 ohms or higher
D14-2 (CANL) - D14-1 (ESS)	W-GR	Ignition switch off	200 ohms or higher
D14-3 (CANH) - D14-5 (BAT)	R-BR	Negative battery terminal disconnected	6 kohms or higher
D14-2 (CANL) - D14-5 (BAT)	W-BR	Negative battery terminal disconnected	6 kohms or higher

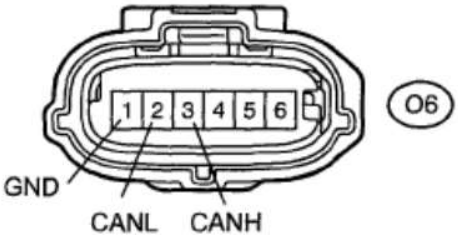
6. **YAW RATE SENSOR**
   a. Disconnect the connector from the yaw rate sensor.
   b. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(to Yaw Rate Sensor)



DLC3:

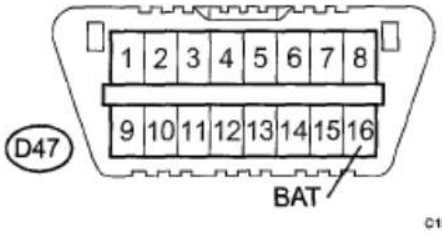


Fig. 22: Identifying Yaw Rate Sensor And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
O6-3 (CANH) - O6-2 (CANL)	V-W	Ignition switch off	54 to 69 ohms
O6-3 (CANH) - O6-1 (GND)	V - W-B	Ignition switch off	200 ohms or higher
O6-2 (CANL) - O6-1 (GND)	W - W-B	Ignition switch off	200 ohms or higher
O6-3 (CANH) - D47-16 (BAT)	V - LG	Negative battery terminal disconnected	6 kohms or higher
O6-2 (CANL) - D47-16 (BAT)	W - LG	Negative battery terminal disconnected	6 kohms or higher

7. **CENTER AIRBAG SENSOR ASSEMBLY**
   a. Disconnect the connector from the center airbag sensor assembly.

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Front view of wire harness connector:
(to Center Airbag Sensor Assembly)

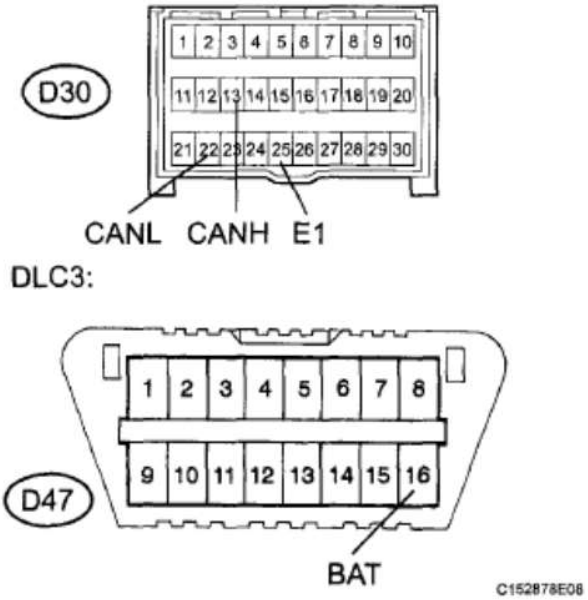


Fig. 23: Identifying Center Airbag Sensor Assembly And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
D30-13 (CANH) - D30-22 (CANL)	Y-W	Ignition switch off	54 to 69 ohms
D30-13 (CANH) - D30-25 (E1)	Y-B	Ignition switch off	200 ohms or higher
D30-22 (CANL) - D30-25 (E1)	W-B	Ignition switch off	200 ohms or higher
D30-13 (CANH) - D47-16 (BAT)	Y - LG	Negative battery terminal disconnected	6 kohms or higher
D30-22 (CANL) - D47-16 (BAT)	W - LG	Negative battery terminal disconnected	6 kohms or higher

8. **ECM (2GR-FE)**

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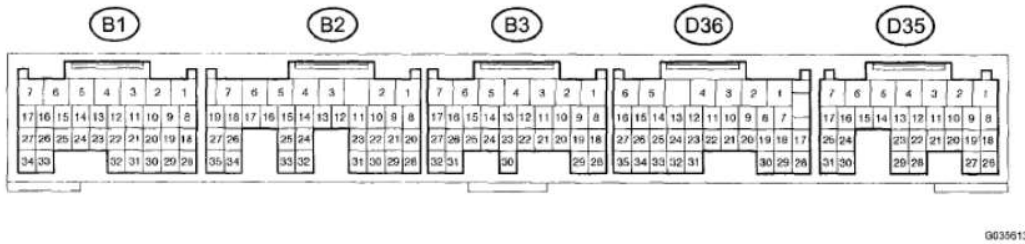


Fig. 24: Identifying ECM (2GR-FE) Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Rear view of wire harness connector:
(to ECM)

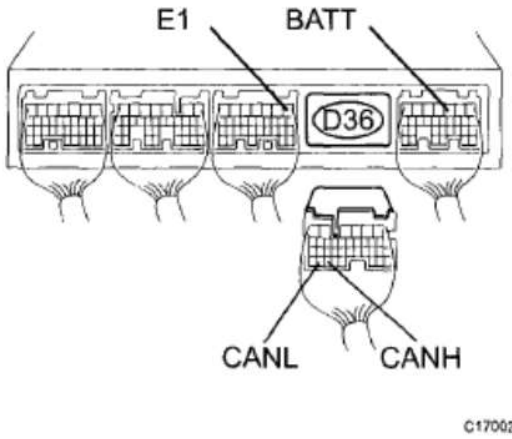


Fig. 25: Identifying ECM Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
D36-33 (CANH) - D36-34 (CANL)	R-W	Ignition switch off	108 to 132 ohms.
D36-33 (CANH) - B3-1 (E1)	R - W-B	Ignition switch off	200 ohms or higher
D36-34 (CANL) - B3-1 (E1)	W - W-B	Ignition switch off	200 ohms or higher
D36-33 (CANH) - D35-3 (BATT)	R-R	Negative battery terminal disconnected	6 kohms or higher

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D36-34 (CANL) - D35-3 (BATT)	W-R	Negative battery terminal disconnected	6 kohms or higher

9. **ECM (1AR-FE)**

Component without harness connected:
(ECM)

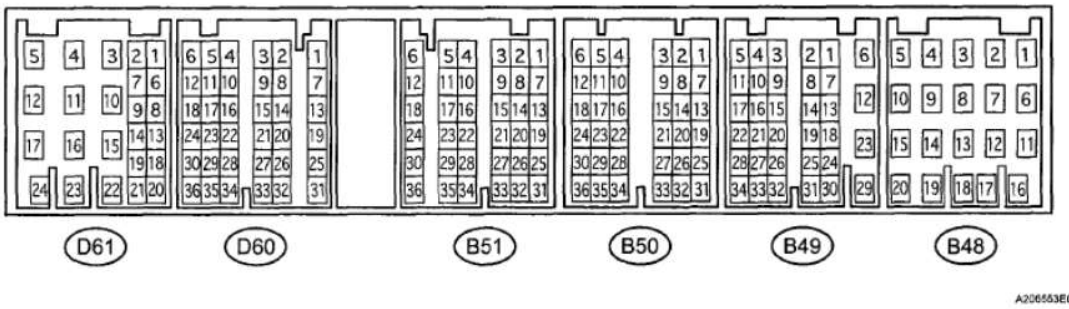


Fig. 26: Identifying ECM (1AR-FE) Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Rear view of wire harness connector:
(to ECM

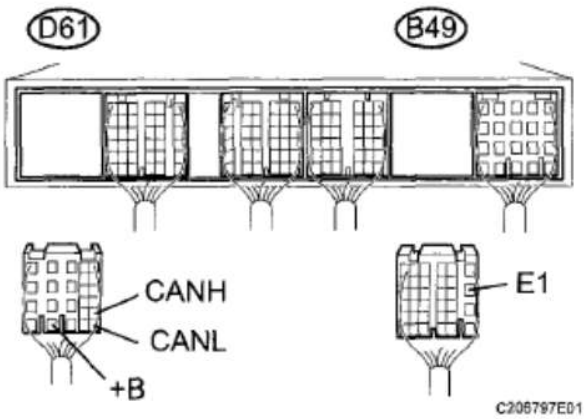


Fig. 27: Identifying ECM Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

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Terminals	Wiring Color	Condition	Specified Condition
D61-18 (CANH) - D61-20 (CANL)	R-W	Ignition switch off	108 to 132 ohms.
D61-18 (CANH) - B49-6 (E1)	R - W-B	Ignition switch off	200 ohms or higher
D61-20 (CANL) - B49-6 (E1)	W - W-B	Ignition switch off	200 ohms or higher
D61-18 (CANH) - D61-23 (+B)	R-SB	Negative battery terminal disconnected	6 kohms or higher
D61-20 (CANL) - D61-23 (+B)	W-SB	Negative battery terminal disconnected	6 kohms or higher

10. **AIR CONDITIONING AMPLIFIER**
    a. Disconnect the amplifier connector from air conditioning amplifier.
    b. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(to Air Conditioning Amplifier)

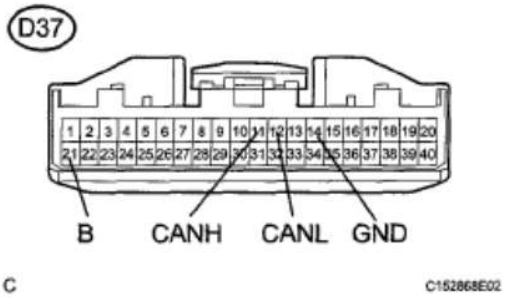


Fig. 28: Identifying Air Conditioning Amplifier Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
D37-11 (CANH) - D37-12 (CANL)	LG-W	Ignition switch off	54 to 69 ohms
D37-11 (CANH) - D37-14 (GND)	LG - W-B	Ignition switch off	200 ohms or higher
D37-12 (CANL) - D37-14 (GND)	W - W-B	Ignition switch off	200 ohms or higher
D37-11 (CANH) - D37-	LG - LG	Negative battery	6 kohms or higher

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21 (B)		terminal disconnected	
D37-12 (CANL) - D37-21 (B)	W - LG	Negative battery terminal disconnected	6 kohms or higher

11. **COMBINATION METER**
    a. Disconnect the connector from the combination meter.
    b. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(to Combination Meter)

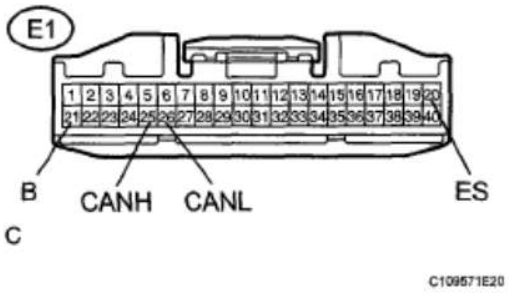


Fig. 29: Identifying Combination Meter Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
E1-25 (CANH) - E1-26 (CANL)	P-W	Ignition switch off	108 to 132 ohms
E1-25 (CANH) - E1-20 (ES)	P-R	Ignition switch off	200 ohms or higher
E1-26 (CANL) - E1-20 (ES)	W-R	Ignition switch off	200 ohms or higher
E1-25 (CANH) - E1-21 (B)	P-SB	Negative battery terminal disconnected	6 kohms or higher
E1-26 (CANL) - E1-21 (B)	W-SB	Negative battery terminal disconnected	6 kohms or higher

12. **CERTIFICATION ECU (w/ Smart Key System)**
    a. Disconnect the connector from the certification ECU.
    b. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(to Certification ECU)

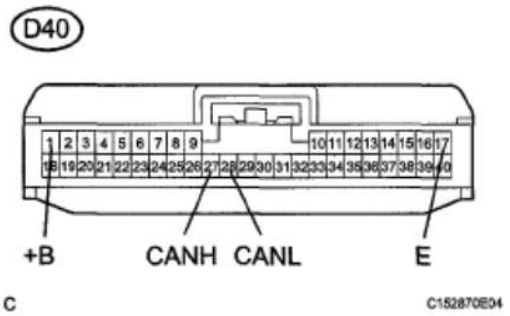


Fig. 30: Identifying Certification ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
D40-27 (CANH) - D40-28 (CANL)	GR-W	Ignition switch off	54 to 69 ohms
D40-27 (CANH) - D40-17 (E)	GR-B	Ignition switch off	200 ohms or higher
D40-28 (CANL) - D40-17 (E)	W-B	Ignition switch off	200 ohms or higher
D40-27 (CANH) - D40-1 (+B)	GR-B	Negative battery terminal disconnected	6 kohms or higher
D40-28 (CANL) - D40-1 (+B)	W-B	Negative battery terminal disconnected	6 kohms or higher

13. **MAIN BODY ECU**
    a. Disconnect the connector from the main body ECU.
    b. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(to Main Body ECU)

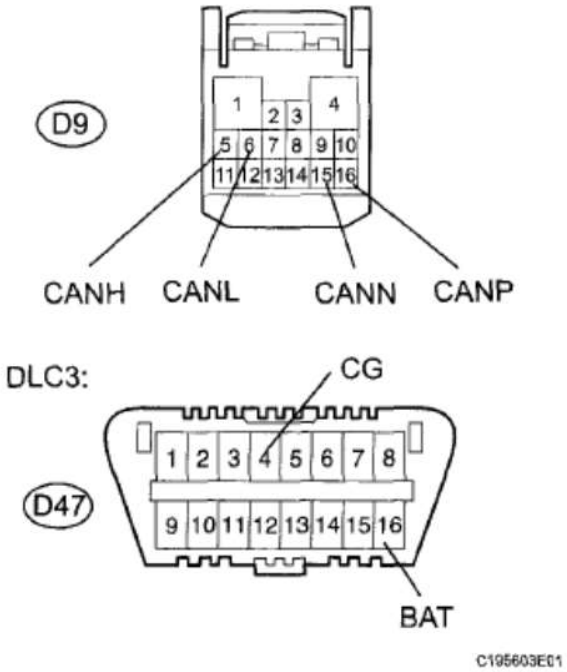


Fig. 31: Identifying Main Body ECU And Dlc3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
D9-5 (CANH) - D9-6 (CANL)	GR-W	Ignition switch off	54 to 69 ohms
D9-5 (CANH) - D47-4 (CG)	GR-B	Ignition switch off	200 ohms or higher
D9-6 (CANL) - D47-4 (CG)	W-B	Ignition switch off	200 ohms or higher
D9-6 (CANH) - D47-16 (BAT)	GR - LG	Negative battery terminal disconnected	6 kohms or higher
D9-6 (CANL) - D47-16 (BAT)	W - LG	Negative battery terminal disconnected	6 kohms or higher
D9-16 (CANP) - D9-15 (CANN)	Y-W	Ignition switch off	108 to 132 ohms
D9-16 (CANP) - D47-4 (CG)	Y-B	Ignition switch off	200 ohms or higher
D9-15 (CANN) - D47-4 (CG)	W-B	Ignition switch off	200 ohms or higher

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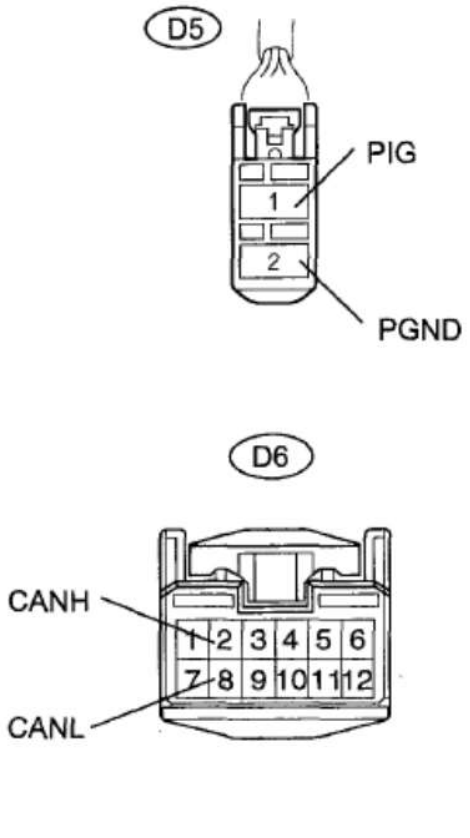
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D9-16 (CANP) - D47-16 (BAT)	Y - LG	Negative battery terminal disconnected	6 kohms or higher
D9-15 (CANN) - D47-16 (BAT)	W - LG	Negative battery terminal disconnected	6 kohms or higher

14. **POWER STEERING ECU**
    a. Disconnect the power steering ECU connectors.
    b. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(to Power Steering ECU)



C160514E16

Fig. 32: Identifying Power Steering ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
D6-2 (CANH) - D6-8	BR-W	Ignition switch off	54 to 69 ohms

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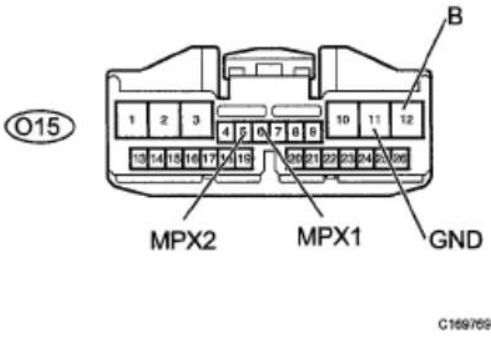
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(CANL)			
D6-2 (CANH) - D5-2 (PGND)	BR-W	Ignition switch off	200 ohms or higher
D6-8 (CANL) - D5-2 (PGND)	W-W	Ignition switch off	200 ohms or higher
D6-2 (CANH) - D5-1 (PIG)	BR-B	Negative battery terminal disconnected	6 kohms or higher
D6-8 (CANL) - D5-1 (PIG)	W-B	Negative battery terminal disconnected	6 kohms or higher

15. **BACK DOOR ECU**
    a. Disconnect the back door ECU connector.
    b. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(to Back Door ECU)



C169769E01

Fig. 33: Identifying Back Door ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

TERMINALS SPECIFIED CONDITION CHART

Terminals	Wiring Color	Condition	Specified Condition
O15-6 (MPX1) - O15-5 (MPX2)	B - W	Ignition switch off	54 to 69 ohms
O15-6 (MPX1) - O15-11 (GND)	B - W-B	Ignition switch off	200 ohms or higher
O15-5 (MPX2) - O15-11 (GND)	W - W-B	Ignition switch off	200 ohms or higher
O15-6 (MPX1) - O15-12 (B)	B - B	Negative battery terminal disconnected	6 kohms or higher
O15-5 (MPX2) - O15-	W - B	Negative battery	6 kohms or higher

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12 (B)		terminal disconnected	

16. **ACCESSORY GATEWAY**

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

Front view of wire harness connector:

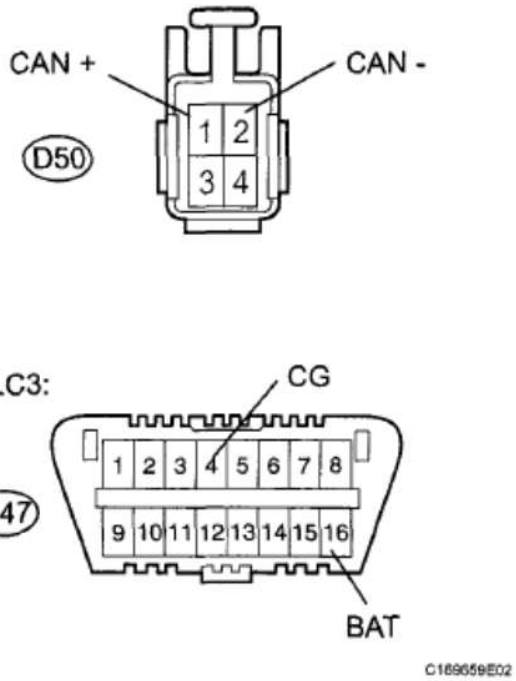


Fig. 34: Identifying Accessory Gateway And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

ECU/SENSOR REFERENCE CHART

Terminals	Wiring Color	Condition	Specified Condition
D50-1 (CAN+) - D50-2 (CAN-)	BR-W	Ignition switch off	54 to 69 ohms
D50-1 (CAN+) - D47-4 (CG)	BR-B	Ignition switch off	200 ohms or higher
D50-2 (CAN-) - D47-4 (CG)	W-B	Ignition switch off	200 ohms or higher
D50-1 (CAN+) - D47-16 (BAT)	BR - LG	Negative battery terminal disconnected	6 kohms or higher
D50-2 (CAN-) - D47-16 (BAT)	W - LG	Negative battery terminal disconnected	6 kohms or higher

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DIAGNOSIS SYSTEM

1. **BUS CHECK**
   a. Using Techstream, select "CAN Bus Check" from the "System Select".
2. **CHECK FOR INSTALLED SYSTEMS (ECUS AND SENSORS) THAT ADOPT CAN COMMUNICATION**
   a. Systems (ECUs, sensors) that adopt CAN communication vary depending on the vehicle's optional settings. Check which systems (ECUs, sensors) are installed on the vehicle.

   HINT:

   ECUs and sensors that are connected to the LIN communication system and the local CAN system are also displayed.

   DTC DETECTION ITEM REFERENCE CHART

ECU/Sensor name	Check method
ECM	Installed on all vehicles
Combination meter	Installed on all vehicles
Skid control ECU	Installed on all vehicles
Steering angle sensor	Installed on all vehicles
Yaw rate sensor	Installed on all vehicles
Power steering ECU	Installed on all vehicles
Center airbag sensor assembly	Installed on all vehicles
Air conditioning amplifier	Installed on all vehicles
Main body ECU	Installed on all vehicles
Certification ECU	w/ Smart key system
Back door ECU	w/ Power back door system
Accessory gateway	w/ Remote engine start (car dealer option)

3. **DTC TABLE BY ECU**

   HINT:

   - In the CAN communication system, CAN communication system DTCs can be displayed by the ECU using Techstream.
   - If CAN communication system DTCs are output, trouble cannot be determined only by the DTCs. Perform troubleshooting according to "**HOW TO PROCEED WITH TROUBLESHOOTING**" .

   a. ECM (2GR-FE)

   HINT:

   The ECM is connected to the CAN communication system, but CAN communication DTCs are not output.

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b. ECM (1AR-FE)

DTC DETECTION ITEM REFERENCE CHART

DTC No.	Detection Item
U0101*1	Lost Communication with Transfer Case Control Module
HINT: • DTC communication uses the CAN communication system. • *1: The ECM is malfunctioning if only U0101 is output. Refer to SFI system (See **DTC U0101 LOST COMMUNICATION WITH TCM**).	

c. TCM (U760E/1AR-FE)

DTC DETECTION ITEM REFERENCE CHART

DTC No.	Detection Item
U0100*2	Lost Communication with ECM/PCM "A"
HINT: • DTC communication uses the CAN communication system. • *2: The TCM is malfunctioning if only U0100 is output. Refer to Automatic Transaxle system (See **INSTALLATION**).	

d. SKID CONTROL ECU

HINT:

DTC communication uses the CAN communication system.

DTC DETECTION ITEM REFERENCE CHART

DTC No.	Detection Item
U0073	Control Module Communication Bus Off
U0100	Lost Communication with ECM/PCM "A"
U0123	Lost Communication with Yaw Rate Sensor Module
U0124	Lost Communication with Lateral Acceleration Sensor Module
U0126	Lost Communication with Steering Angle Sensor Module

e. AIR CONDITIONING AMPLIFIER

HINT:

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- DTC communication uses the CAN communication system.
- The following DTC is output only for current malfunctions.

DTC DETECTION ITEM REFERENCE CHART

DTC No.	Detection Item
B1499	Multiplex Communication Circuit

f. COMBINATION METER

HINT:

DTC communication uses the CAN communication system.

DTC DETECTION ITEM REFERENCE CHART

DTC No.	Detection Item
U0100	Lost Communication with ECM/PCM "A"
U0129	Lost Communication with Brake System Control Module

g. POWER STEERING ECU

HINT:

DTC communication uses the CAN system.

DTC DETECTION ITEM REFERENCE CHART

DTC No.	Detection Item
U0073	Control Module Communication Bus Off
U0100	Lost Communication with ECM
U0129	Lost Communication with Anti-lock Brake System (ABS) Control Module

h. MAIN BODY ECU

HINT:

DTC communication uses the CAN system.

DTC COMBINATION CHART

DTC No.	Detection Item
U0327	Software Incompatibility with Vehicle Security Control Module
U1002	Lost Communication with Gateway Module

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i. CENTER AIRBAG SENSOR

HINT:

The center airbag sensor is connected to the CAN communication system, but CAN communication DTCs are not output.

j. STEERING ANGLE SENSOR

HINT:

The steering angle sensor is connected to the CAN communication system, but CAN communication DTCs are not output.

k. YAW RATE SENSOR

HINT:

The yaw rate sensor is connected to the CAN communication system, but CAN communication DTCs are not output.

l. CERTIFICATION ECU (w/ Smart key system)

HINT:

The certification ECU is connected to the CAN communication system, but CAN communication DTCs are not output.

m. BACK DOOR ECU (w/ Power back door system)

HINT:

The certification ECU is connected to the CAN communication system, but CAN communication DTCs are not output.

4. **DTC COMBINATION TABLE**

a. CAN No. 1 Bus

DTC TROUBLE MODE CHART

DTC		Trouble Mode				
Output from	Output DTC	ECM Communication Stop Mode	Skid Control ECU Communication Stop Mode	Steering Angle Sensor Communication Stop Mode	Yaw Rate Sensor Communication Stop Mode	Comb Mete Comm Stop
	U0073	X	o*1	X	X	
	U0100	o	o*1	X	X	

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Skid Control ECU	U0123	X	o*1	X	o	
	U0124	X	o*1	X	o	
	U0126	X	o*1	o	X	
Combination Meter	U0100	o	X	X	X	
	U0129	X	o	X	X	
Power Steering ECU	U0100	o	X	X	X	
	U0129	X	o	X	X	

HINT:

- o: Set
- X: Not set or may be set according to the malfunctioning part when one side of the CAN bus opens
- *1: Does not output it during communication error

FAIL-SAFE CHART

DTC		Trouble Mode			
Output from	Output DTC	Air Conditioning Amplifier Communication Stop Mode	Center Airbag Sensor Communication Stop Mode	Power Steering ECU Communication Stop Mode	Main Body ECU Communication Stop Mode
Skid Control ECU	U0073	X	X	X	X
	U0100	X	X	X	X
	U0123	X	X	X	X
	U0124	X	X	X	X
	U0126	X	X	X	X
Combination Meter	U0100	X	X	X	X
	U0129	X	X	X	X
Power Steering ECU	U0100	X	X	o*1	X
	U0129	X	X	o*1	X

HINT:

- o: Set
- X: Not set or may be set according to the malfunctioning part when one side of the CAN bus wire opens
- *1: Does not output it during communication error
- ECM Communication Stop Mode (See **ECM COMMUNICATION STOP MODE**)
- Skid Control ECU Communication Stop Mode (See **SKID CONTROL ECU COMMUNICATION STOP MODE**)
- Steering Angle Sensor Communication Stop Mode (See **STEERING ANGLE SENSOR COMMUNICATION STOP MODE**)

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- Yaw Rate Sensor Communication Stop Mode (See **YAW RATE SENSOR COMMUNICATION STOP MODE**)
- Air Conditioning Amplifier Communication Stop Mode (See **AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE**)
- Combination Meter Communication Stop Mode (See **COMBINATION METER ECU COMMUNICATION STOP MODE**)
- Power Steering ECU Communication Stop Mode (See **POWER STEERING ECU COMMUNICATION STOP MODE**)
- Main Body ECU Communication Stop Mode (See **MAIN BODY ECU COMMUNICATION STOP MODE**)
- Center Airbag Sensor Communication Stop Mode (See **CENTER AIRBAG SENSOR COMMUNICATION STOP MODE**)

FAIL-SAFE CHART

1. **FAIL-SAFE FUNCTION**
   a. When communication fails in any of the CAN bus wires (communication wires) due to a short circuit or other causes, the fail-safe function, which is specified for each system, operates to prevent the system from malfunctioning.
   b. The following chart shows the relationships between components, system functions, and effects of communication failure on these functions. (For further details, see the pages for each system.)

DIAGNOSTIC TROUBLE CODE CHART - CAN MS BUS (MAIN BODY ECU OUTPUT CODE)

Function (Function Description)	Control Master	System Related	Fail-safe Operation	DTC (Driver Detectable)
VSC control (Controls driving force while VSC in operation)	Skid Control ECU	• ECM • Steering Angle Sensor • Yaw Rate Sensor	VSC control is inoperative (VSC control gradually stops)	U0073, U0100, U0123, U0124, U0126 (Warning light comes on)
VSC control (Engine power control by VSC/TRC)	Skid Control ECU	• ECM • Steering Angle Sensor • Yaw Rate Sensor	VSC control is inoperative (VSC control gradually stops)	U0073, U0100, U0123, U0124, U0126 (Warning light comes on)
Electric power steering (Speed of		• ECM	Depression of EPS	U0100, U0129 (VSC failure: warning light comes on, and decrease of assistance power

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vehicle induction type torque control)	Power Steering ECU	• Skid Control ECU	assist (Deterioration of steering)	at vehicle speed 120km/h [74mph]) (ECM failure : Warning light comes on [only before assist beginning])
Meter display (Displays operation condition and DTCs)	Combination Meter	• ECM • Skid Control ECU • Center Airbag Sensor Assembly • Certification ECU • Main Body ECU • Power steering ECU	Light does not come on, illuminates abnormally, or blinks abnormally	U0100, U0129 (Abnormal light illuminates)
Meter buzzer (Combination meter)	Combination Meter	• ECM • Skid Control ECU • Center Airbag Sensor Assembly • Certification ECU • Main Body ECU	Meter buzzer does not ring	U0100, U0129
Air conditioning control	Air Conditioning Amplifier	• ECM • Combination Meter • Main Body ECU	Air conditioning function and PTC heater function stop	B1499 (Air Conditioning is inoperative)
Smart entry function/Power door lock control (1)	Certification ECU	• Combination Meter • Main Body ECU	Unlock permitted	U0327, U1002 (Wireless door lock cannot operate)
(1) w/ Smart key system				

DIAGNOSTIC TROUBLE CODE CHART

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CAN MS bus (Main body ECU output code)

DTC TROUBLE AREA CHART

DTC Code	Detection Item	Trouble Area
U0230	Lost Communication with Rear Gate Module	• Back door ECU branch wire or connector • Back door ECU power source circuit • Back door ECU
U0327	Software Incompatibility with Vehicle Security Control Module	• Certification ECU branch wire or connector • Certification ECU power source circuit • Certification ECU
U1002 (CAN MS BUS)	Lost Communication with Gateway Module (Main body ECU)	• Open or short in CAN MS bus main wire or connector • Open or short in CAN MS bus branch wire or connector • Certification ECU • Back door ECU • Main body ECU • CAN junction connector RR

DTC U0230 LOST COMMUNICATION WITH REAR GATE MODULE

DESCRIPTION

RESULT CHART

DTC No.	Symptom	Trouble Area
U0230	No communication from back door ECU continues	• Power source circuit of back door ECU • Back door ECU branch wire and connector • Back door ECU

HINT:

For vehicles with power back door system only.

WIRING DIAGRAM

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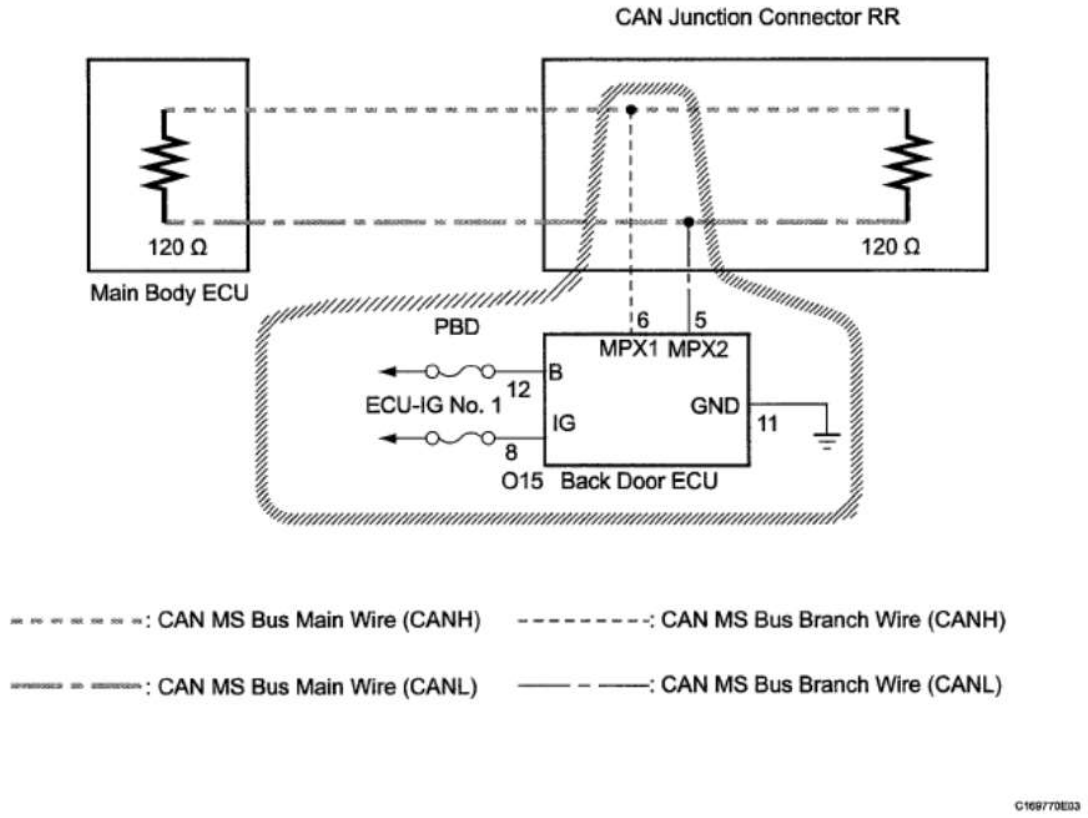


Fig. 35: Lost Communication With Rear Gate Module - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are 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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

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1. **CHECK FOR DTC**
   a. Connect Techstream to the DLC3.
   b. Turn the ignition switch on (IG).
   c. Check for DTC.

   HINT:

   If the CAN MS bus communication error DTC U1002 is output, troubleshooting for U1002 and check for malfunctions in the CAN MS bus.

   Result

   TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
DTC U1002 is not output	A
DTC U1002 is output	B

   B: GO TO GO TO DTC CHART (U1002) (See **DTC U1002 (CAN MS BUS) LOST COMMUNICATION WITH GATEWAY MODULE (MAIN BODY ECU)**)

   A: Go to next step

2. **CHECK CAN BUS LINE FOR DISCONNECTION (BACK DOOR ECU BRANCH WIRE)**
   a. Disconnect the back door ECU connector.
   b. Measure the resistance according to the value (s) in the table below.

   Standard resistance

   TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
O15-6 (MPX1) - O15-5 (MPX2)	Ignition switch off	108 to 132 ohms

   NG: REPAIR OR REPLACE CAN BRANCH WIRE CONNECTED TO POWER SLIDE DOOR ECU RH (MPX1, MPX2)

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Front view of wire harness connector:
(to Back Door ECU)

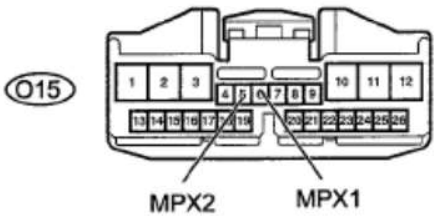


Fig. 36: Identifying Back Door ECU Connector Terminals (MPX2 And MPX1)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

3. **CHECK WIRE HARNESS**
   a. Disconnect the back door ECU connector.
   b. Measure the resistance of the wire harness side connector.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
O15-11 (GND) - Body ground	Always	Below 1 ohms

   c. Measure the voltage of the wire harness side connector.

Standard voltage

DTC DETECTION CONDITION CHART

Tester Connection	Condition	Specified Condition
O15-12 (B) - Body ground	Always	10 to 14 V
O15-8 (IG) - Body ground	Ignition switch on (IG)	10 to 14 V

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

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Front view of wire harness connector:
(to Back Door ECU)

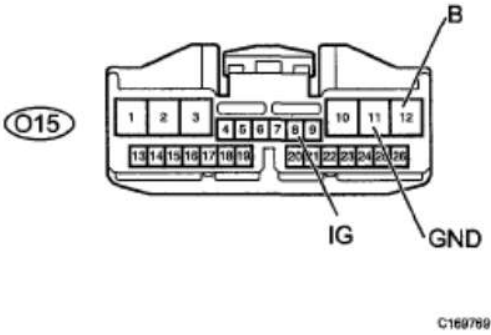


Fig. 37: Identifying Back Door ECU Connector Terminals (B, IG And GND)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE BACK DOOR MOTOR UNIT (BACK DOOR ECU) (See **REMOVAL**)

DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE

DESCRIPTION

The main body ECU will store this DTC when no signals can be received from the certification ECU while the CAN MS main bus is normal.

RESULT CHART

DTC No.	DTC Detection Condition	Trouble Area
U0327	No communication from certification ECU continues	• Certification ECU power source circuit • Certification ECU • Certification ECU branch wire or connector

WIRING DIAGRAM

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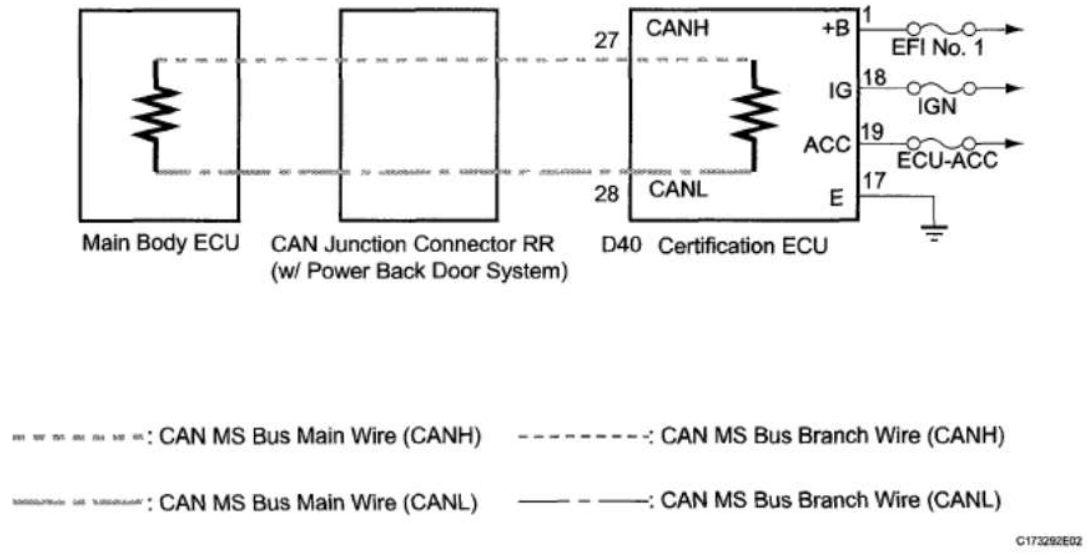


Fig. 38: Software Incompatibility With Vehicle Security Control Module - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are 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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK THE VEHICLE TYPE**

Result

RESULT CHART

Result	Proceed to
w/ Power back door system	A

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w/o Power back door system	B

B: GO TO DTC CHART (U1002) (See **DTC U1002 (CAN MS BUS) LOST COMMUNICATION WITH GATEWAY MODULE (MAIN BODY ECU)**)

A: Go to next step

2. **CHECK FOR DTC**
   a. Check for DTC.

      HINT:

      If the CAN MS bus communication error DTC U1002 is output, troubleshoot for U1002 and check for malfunctions in the CAN MS main bus circuit (See **DTC U1002 (CAN MS BUS) LOST COMMUNICATION WITH GATEWAY MODULE (MAIN BODY ECU)**).

      Result

      TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
U1002 is not output	A
U1002 is output	B

      B: GO TO DTC CHART (U1002) (See **DTC U1002 (CAN MS BUS) LOST COMMUNICATION WITH GATEWAY MODULE (MAIN BODY ECU)**)

      A: Go to next step

3. **CHECK CAN MS BUS WIRE (CERTIFICATION ECU)**
   a. Turn the ignition switch off.
   b. Disconnect the connector from the certification ECU.
   c. Measure the resistance according to the value (s) in the table below.

      Standard resistance

      TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D40-27 (CANH) - D40-28 (CANL)	Ignition switch off	108 to 132 ohms

      NG: REPAIR OR REPLACE CAN MS BUS BRANCH WIRE OR CONNECTOR (CERTIFICATION ECU)

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Front view of wire harness connector:
(to Certification ECU)

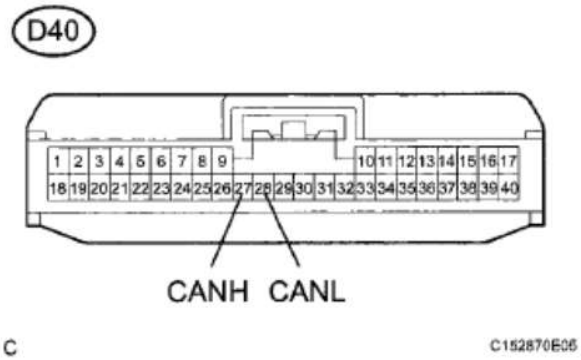


Fig. 39: Identifying Certification ECU Connector Terminals (CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

4. **CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)**
   a. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D40-17 (E) - Body ground	Always	Below 1 ohms

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

Standard voltage

DTC DETECTION CONDITION CHART

Tester Connection	Condition	Specified Condition
D40-18 (IG) - Body ground	Ignition switch on (IG)	10 to 14 V
D40-1 (+B) - Body ground	Always	10 to 14 V
D40-19 (ACC) - Body ground	Ignition switch on (ACC)	10 to 14 V

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Front view of wire harness connector:
(to Certification ECU)

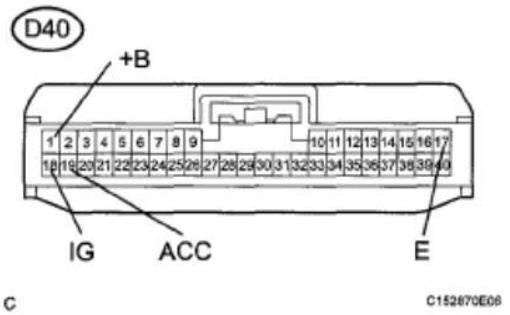


Fig. 40: Identifying Certification ECU Connector Terminals (+B, IG And ACC)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: REPLACE CERTIFICATION ECU

DTC U1002 (CAN MS BUS) LOST COMMUNICATION WITH GATEWAY MODULE (MAIN BODY ECU)

DESCRIPTION

The main body ECU will store this DTC when no signals can be received from the ECUs that have been memorized as those that are connected to the CAN MS bus.

When the main body ECU receives a response signal from the ECUs connected to the CAN MS bus, the main body ECU recognizes and memorizes that the ECU is connected to the CAN MS bus. Based on this memorized data, the main body ECU monitors for malfunctions in the ECUs connected to the CAN MS bus when communicating with those ECUs. If the main body ECU cannot receive response signals from the ECUs that have been memorized as those connected to the CAN MS bus, the main body ECU determines that a malfunction exists.

RESULT CHART

DTC No.	DTC Detection Condition	Trouble Area
U1002	Main body ECU cannot receive signals from all ECUs that have been memorized as those connected to the CAN MS bus.	• Open or short in CAN MS bus main wire or connector • Open or short in CAN MS bus branch wire or connector • Main body ECU • Certification ECU • Back door ECU

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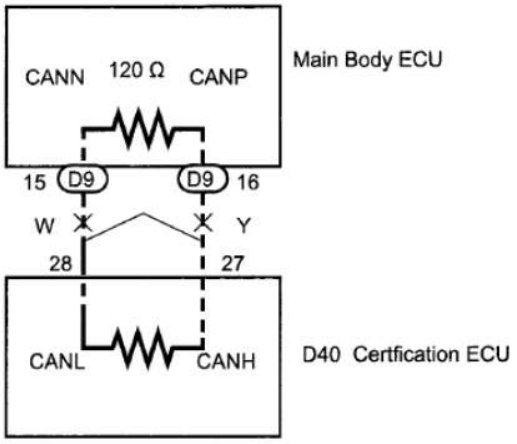
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		• CAN junction connector RR

WIRING DIAGRAM

w/ Smart Key System and w/o Power Back Door System:



W/o Smart Key System and w/ Power Back Door System:

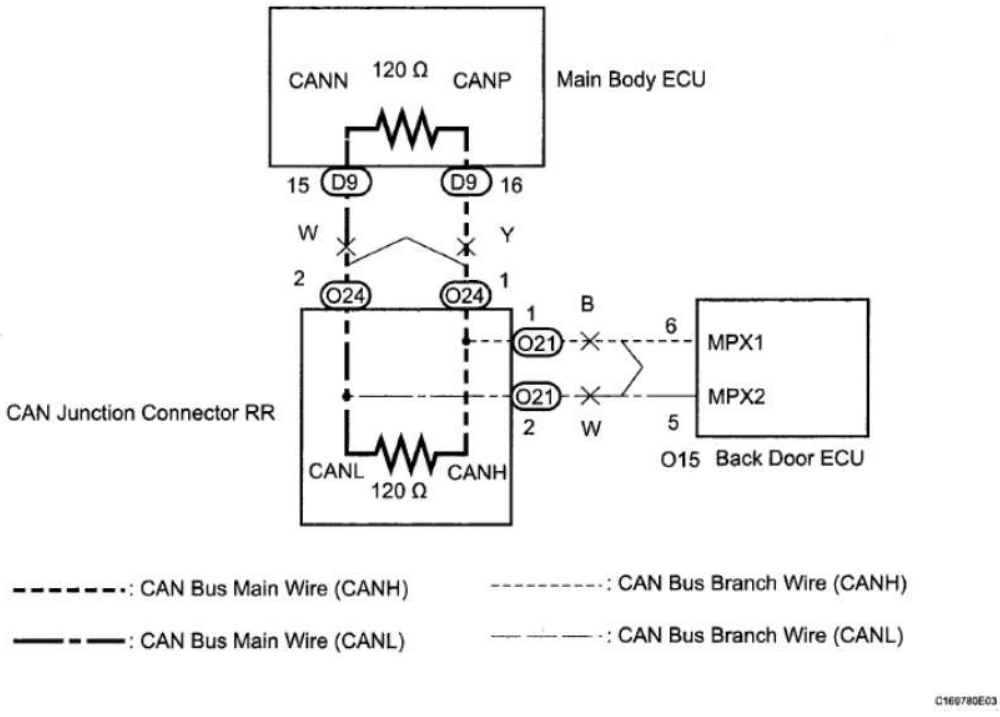


Fig. 41: Lost Communication With Gateway Module (Main Body ECU) - Wiring Diagram (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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w/ Smart Key System and w/ Power Back Door system:

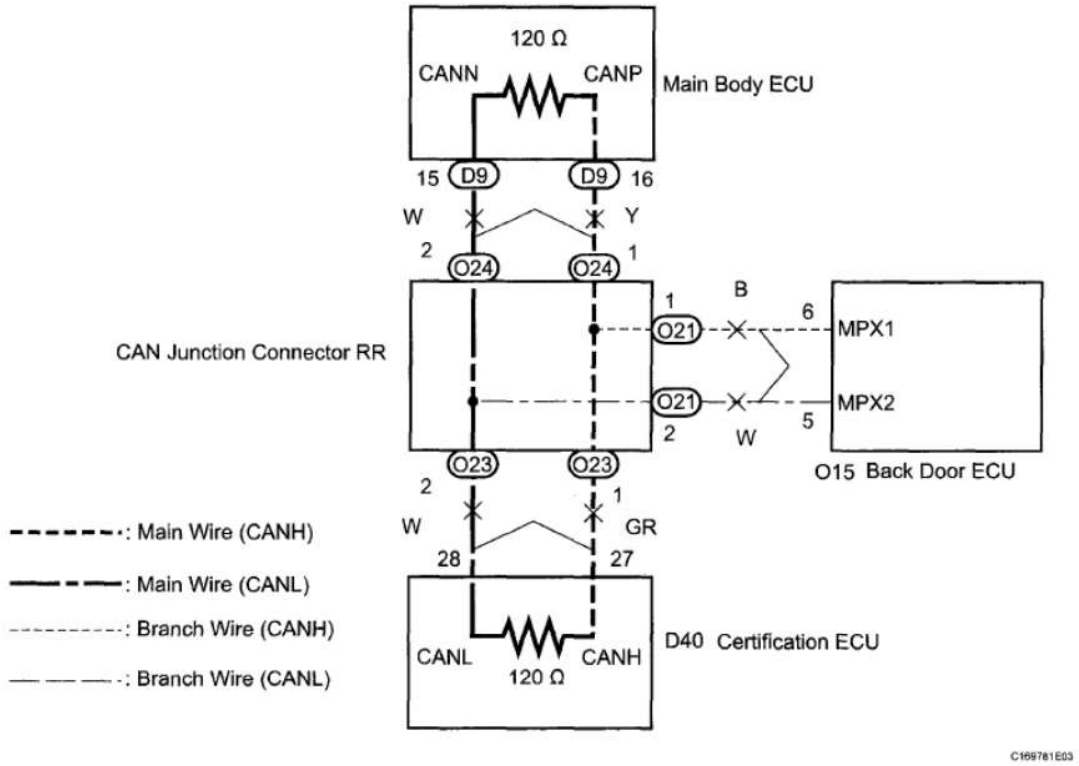


Fig. 42: Lost Communication With Gateway Module (Main Body ECU) - Wiring Diagram (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are 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 any doors need to be opened in order to check connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

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1. **CHECK VEHICLE TYPE**

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
w/o Power back door	A
w/ Power back door	B

B: Go to step 6

A: Go to next step

2. **CHECK CAN MS BUS WIRE**
   a. Turn the ignition switch off.
   b. Disconnect the certification ECU connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition	Result
D40-27 (CANH) - D40-28 (CANL)	Ignition switch off	108 to 132 ohms	Below 107 ohms: Short in line
			133 ohms or more: Open in CAN main bus line
D40-27 (CANH) - D40-17 (E)	Ignition switch off	200 ohms or higher	Below 200 ohms: Ground short
D40-28 (CANL) - D40-17 (E)			
D40-27 (CANH) - D40-1 (+B)	Negative battery terminal disconnected	6 kohms or higher	Below 6 kohms: +B short
D40-28 (CANL) - D40-1 (BAT)			

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Front view of wire harness connector:
(to Certification ECU)

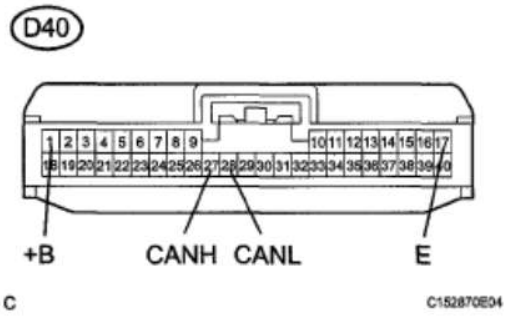


Fig. 43: Identifying Certification ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
Open in CAN main wire	B
Short in line, Ground short, +B short	C

B: Go to step 4

C: Go to step 5

A: Go to next step

3. **CHECK CAN MS BUS WIRE**
   a. Reconnect the certification ECU connector.
   b. Disconnect the main body ECU connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D9-16 (CANP) - D9-15 (CANN)	Ignition switch off	108 to 132 ohms
D9-16 (CANP) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D9-15 (CANN) - D47-4 (CG)		

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D9-16 (CANP) - D47-16 (BAT) D9-15 (CANN) - D47-16 (BAT)	Negative battery terminal disconnected	6 kohms or higher

NG: REPLACE CERTIFICATION ECU

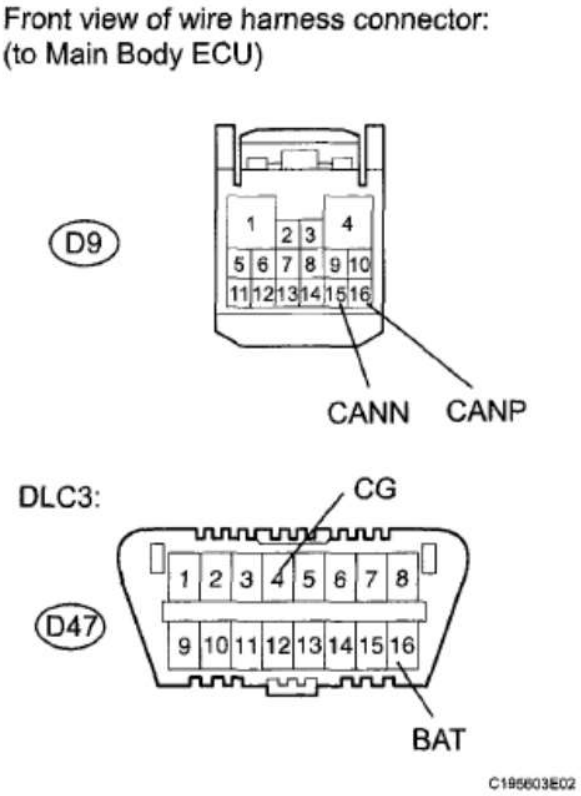


Fig. 44: Identifying Main Body ECU And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (MAIN BODY ECU)

4. **CHECK FOR OPEN IN CAN MS BUS MAIN WIRE**
   a. Reconnect the certification ECU connector.
   b. Disconnect the main body ECU connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D9-16 (CANP) - D9-15 (CANN)	Ignition switch off	108 to 132 ohms

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NG: REPAIR OR REPLACE CAN MS BUS MAIN WIRE OR CONNECTOR (MAIN BODY ECU - CERTIFICATION ECU)

Front view of wire harness connector:
(to Main Body ECU)

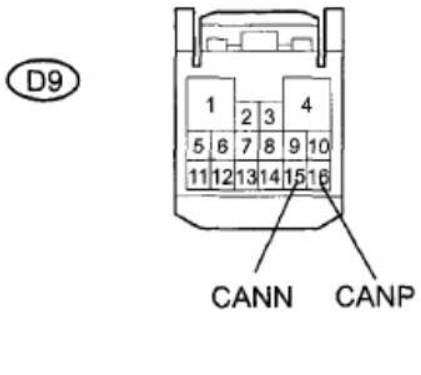


Fig. 45: Identifying Main Body ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (MAIN BODY ECU)

5. **CHECK FOR SHORT IN CAN MS BUS WIRES**
   a. Disconnect the main body ECU connector (D9).
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D9-16 (CANP) - D9-15 (CANN)	Ignition switch off	108 to 132 ohms
D9-16 (CANP) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D9-15 (CANN) - D47-4 (CG)		
D9-16 (CANP) - D47-16 (BAT)	Negative battery terminal disconnected	6 kohms or higher
D9-15 (CANN) - D47-16 (BAT)		

NG: REPAIR OR REPLACE CAN MS BUS MAIN WIRE OR CONNECTOR (MAIN BODY ECU - CERTIFICATION ECU)

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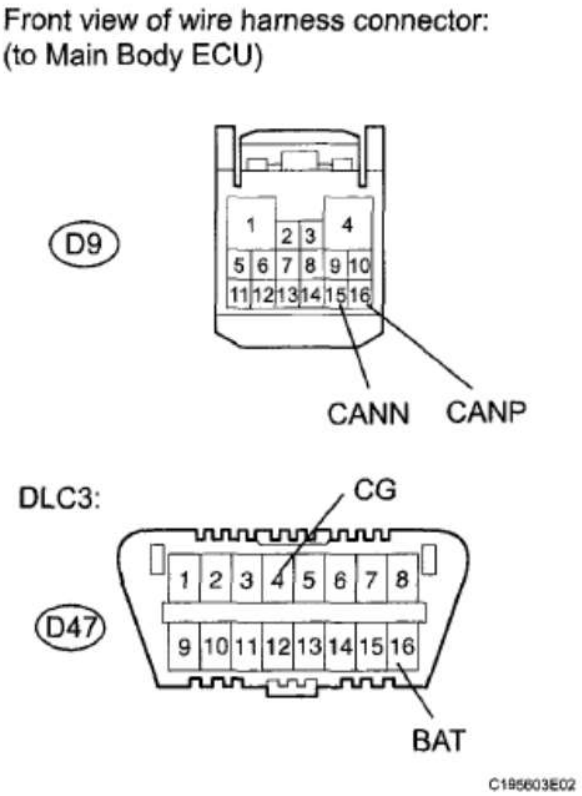


Fig. 46: Identifying Main Body ECU And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (MAIN BODY ECU)

6. **CHECK CAN MS BUS WIRE**
   a. Turn the ignition switch off.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition	Result
O15-6 (MPX1) - O15-5 (MPX2)	Ignition switch off	54 to 69 ohms	Below 54 ohms: Short in line
			70 ohms or more: Open in CAN main bus line
O15-6 (MPX1) - O15-11 (GND)	Ignition switch off	200 ohms or higher	Below 200 ohms: Ground short
O15-5 (MPX2) - O15-11 (GND)			

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O15-6 (MPX1) - O15-12 (B) O15-5 (MPX2) - O15-12 (B)	Negative battery terminal disconnected	6 kohms or higher	Below 6 kohms: +B short

Component with harness connected:
(Back Door ECU)

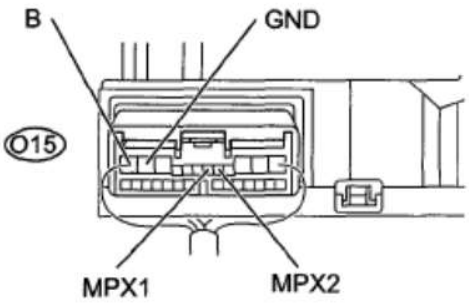


Fig. 47: Identifying Back Door ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
Open in CAN main wire	B
Short in line, Ground short, +B short	C

B: Go to step 7

C: Go to step 10

A: REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (MAIN BODY ECU)

7. **CHECK FOR OPEN IN CAN MS BUS MAIN WIRE**
   a. Disconnect the main body ECU junction connector from the CAN junction connector RR.

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Wire harness side: (CAN Junction Connector RR)

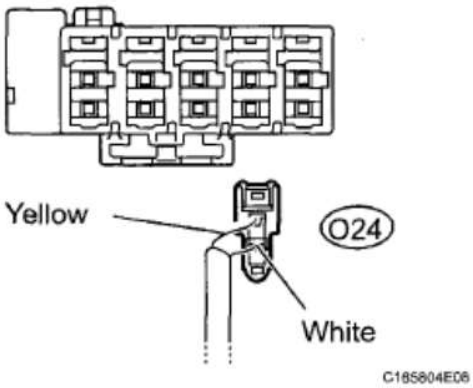


Fig. 48: Identifying CAN Junction RR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition
O15-6 (MPX1) - O15-5 (MPX2)	Ignition switch off	108 to 132 ohms

Front view of wire harness connector: (to Back Door ECU)

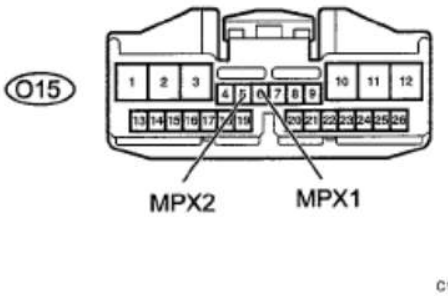


Fig. 49: Identifying Back Door ECU Connector Terminals (MPX2 And MPX1)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Result

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TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (w/o Smart key system)	B
NG (w/ Smart key system)	C

B: REPLACE CAN JUNCTION CONNECTOR RR

C: Go to step 9

A: Go to next step

8. **CHECK FOR OPEN IN CAN MS BUS MAIN WIRE**
   a. Reconnect the main body ECU junction connector to the CAN junction connector RR.
   b. Disconnect the main body ECU connector (D9) from the main body ECU.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D9-16 (CANP) - D9-15 (CANN)	Ignition switch off	108 to 132 ohms

NG: REPAIR OR REPLACE CAN MS BUS MAIN WIRE OR CONNECTOR (MAIN BODY ECU MAIN WIRE)

Front view of wire harness connector:
(to Main Body ECU)

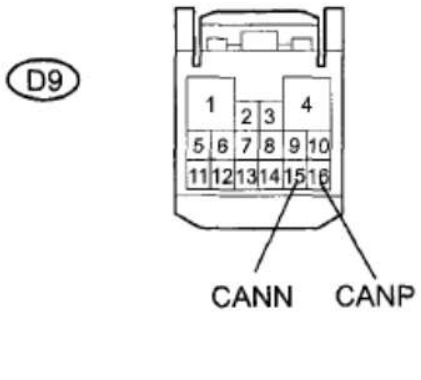


Fig. 50: Identifying Main Body ECU Connector Terminals

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Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (MAIN BODY ECU)

9. **CHECK FOR OPEN IN CAN MS BUS MAIN WIRE**
   a. Reconnect the main body ECU junction connector to the CAN junction connector RR.
   b. Disconnect the certification ECU connector from the certification ECU.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D40-27 (CANH) - D40-28 (CANL)	Ignition switch off	108 to 132 ohms

NG: REPAIR OR REPLACE CAN MS BUS MAIN WIRE OR CONNECTOR (CERTIFICATION ECU BRANCH WIRE)

Front view of wire harness connector:
(to Certification ECU)

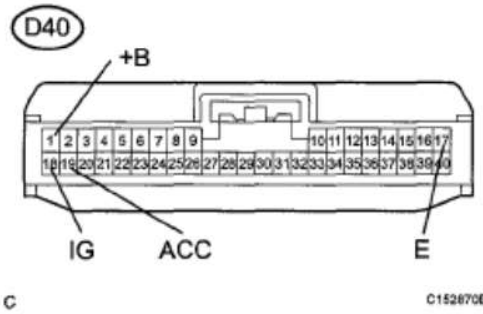


Fig. 51: Identifying Certification ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE CERTIFICATION ECU

10. **CHECK FOR SHORT IN CAN MS BUS WIRES**
    a. Disconnect the back door ECU connector.
    b. Measure the resistance according to the value (s) in the table below.

Standard resistance

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TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
O15-6 (MPX1) - O15-5 (MPX2)	Ignition switch off	54 to 69 ohms
O15-6 (MPX1) - O15-11 (GND)	Ignition switch off	200 ohms or higher
O15-5 (MPX2) - O15-11 (GND)		
O15-8 (MPX1) - O15-12 (B)	Negative battery terminal disconnected	6 kohms or higher
O15-5 (MPX2) - O15-12 (B)		

NG: Go to step 11

Front view of wire harness connector:
(to Back Door ECU)

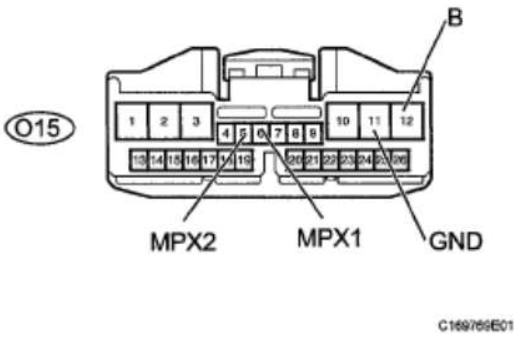


Fig. 52: Identifying Back Door ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE BACK DOOR MOTOR UNIT (BACK DOOR ECU) (See **REMOVAL**)

11. **CHECK FOR SHORT IN CAN MS BUS WIRES**
    a. Disconnect the back door ECU junction connector from the CAN junction connector RR.

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Wire harness side: (CAN Junction Connector RR)

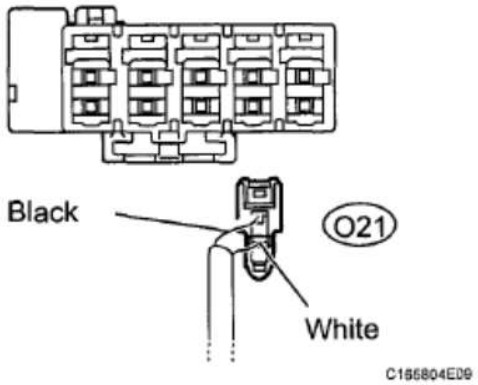


Fig. 53: Identifying CAN Junction RR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
O15-6 (MPX1) - O15-5 (MPX2)	Ignition switch off	1 Mohms or higher
O15-6 (MPX1) - O15-11 (GND)	Ignition switch off	200 ohms or higher
O15-5 (MPX2) - O15-11 (GND)		
O15-6 (MPX1) - O15-12 (B)	Negative battery terminal disconnected	6 kohms or higher
O15-5 (MPX2) - O15-12 (B)		

NG: REPAIR OR REPLACE CAN MS BUS BRANCH WIRE OR CONNECTOR (BACK DOOR ECU)

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Front view of wire harness connector:
(to Back Door ECU)

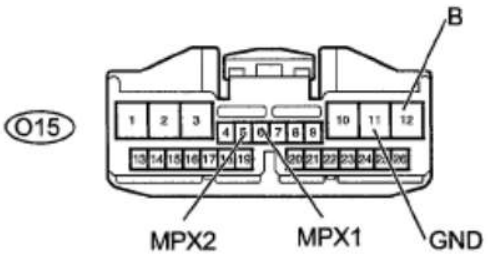


Fig. 54: Identifying Back Door ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

12. **CHECK FOR SHORT IN CAN MS BUS WIRES**
    a. Reconnect the back door ECU junction connector to the CAN junction connector RR.
    b. Disconnect the main body ECU junction connector from the CAN junction connector RR.

Wire harness side: (CAN Junction
Connector RR)

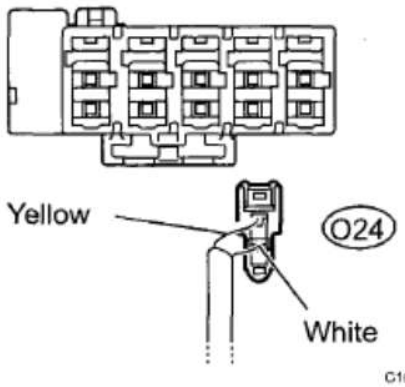


Fig. 55: Identifying CAN Junction RR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

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RESULT CHART

Tester Connection	Condition	Specified Condition
O15-6 (MPX1) - O15-5 (MPX2)	Ignition switch off	108 to 132 ohms
O15-6 (MPX1) - O15-11 (GND)	Ignition switch off	200 ohms or higher
O15-5 (MPX2) - O15-11 (GND)		
O15-6 (MPX1) - O15-12 (B)	Negative battery terminal disconnected	6 kohms or higher
O15-5 (MPX2) - O15-12 (B)		

Front view of wire harness connector:
(to Back Door ECU)

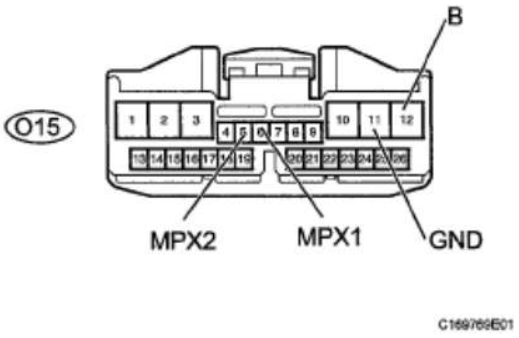


Fig. 56: Identifying Back Door ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (w/o Smart key system)	B
NG (w/ Smart key system)	C

B: REPLACE CAN JUNCTION CONNECTOR RR

C: Go to step 14

A: Go to next step

13. **CHECK FOR SHORT IN CAN BUS MAIN WIRE**
    a. Reconnect the main body ECU junction connector to the CAN junction connector RR.
    b. Disconnect the main body ECU connector (D9) from the main body ECU.
    c. Measure the resistance according to the value (s) in the table below.

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Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D9-16 (CANP) - D9-15 (CANN)	Ignition switch off	108 to 132 ohms
D9-16 (CANP) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D9-15 (CANN) - D47-4 (CG)		
D9-16 (CANP) - D47-16 (BAT)	Negative battery terminal disconnected	6 kohms or higher
D9-15 (CANN) - D47-16 (+B)		

NG: REPAIR OR REPLACE CAN MS BUS MAIN WIRE OR CONNECTOR (MAIN BODY ECU MAIN WIRE)

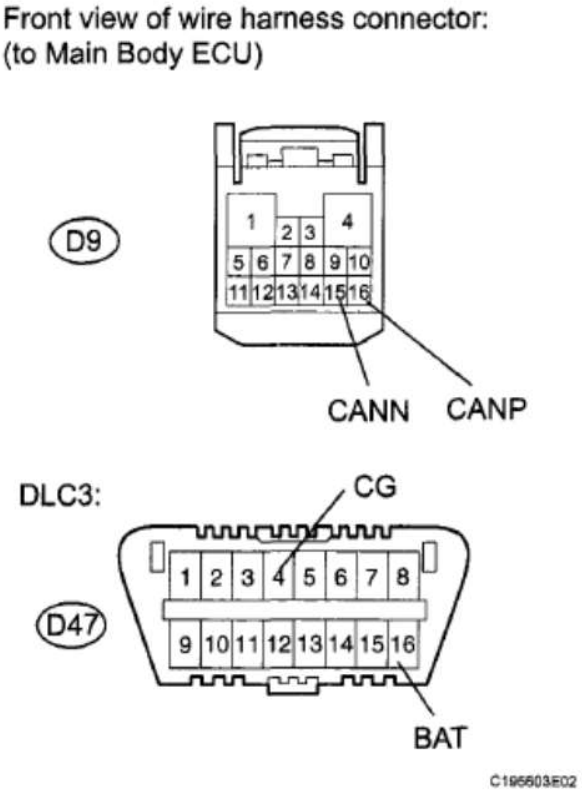


Fig. 57: Identifying Main Body ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (MAIN BODY ECU)

14. **CHECK FOR SHORT IN CAN MS BUS WIRES**
    a. Reconnect the main body ECU junction connector to the CAN junction connector RR.

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b. Disconnect the certification ECU junction connector from the CAN junction connector RR.

Wire harness side: (CAN Junction Connector RR)

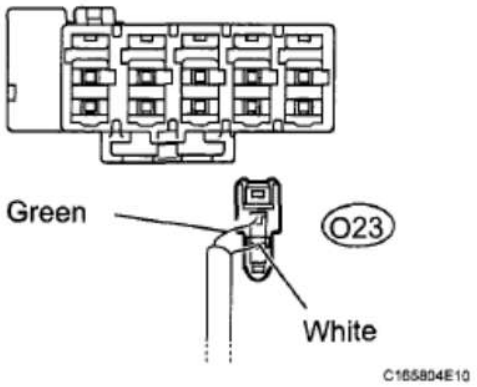


Fig. 58: Identifying CAN Junction RR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

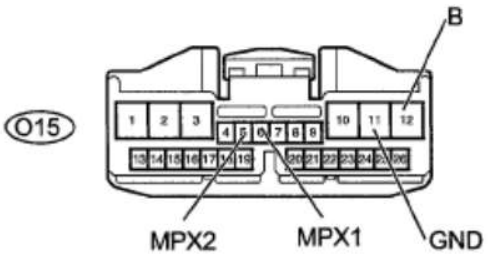
TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
O15-6 (MPX1) - O15-5 (MPX2)	Ignition switch off	108 to 132 ohms
O15-6 (MPX1) - O15-11 (GND)	Ignition switch off	200 ohms or higher
O15-5 (MPX2) - O15-11 (GND)		
O15-6 (MPX1) - O15-12 (B)	Negative battery terminal disconnected	6 kohms or higher
O15-5 (MPX2) - O15-12 (B)		

NG: REPLACE CAN JUNCTION CONNECTOR RR

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Front view of wire harness connector:
(to Back Door ECU)



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Fig. 59: Identifying Back Door ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

15. **CHECK FOR SHORT IN CAN MS BUS WIRES**
    a. Reconnect the certification ECU junction connector to the CAN junction connector RR.
    b. Disconnect the certification ECU connector from the certification ECU.
    c. Measure the resistance according to the value (s) in the table below.

Standard resistance

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
D40-27 (CANH) - D40-28 (CANL)	Ignition switch off	108 to 132 ohms
D40-27 (CANH) - D40-17 (E)	Ignition switch off	200 ohms or higher
D40-28 (CANL) - D40-17 (E)		
D40-27 (CANH) - D40-1 (+B)	Negative battery terminal disconnected	6 kohms or higher
D40-28 (CANL) - D40-1 (+B)		

NG: REPAIR OR REPLACE CAN MS BUS MAIN WIRE OR CONNECTOR (CERTIFICATION ECU BRANCH WIRE)

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Front view of wire harness connector:
(to Certification ECU)

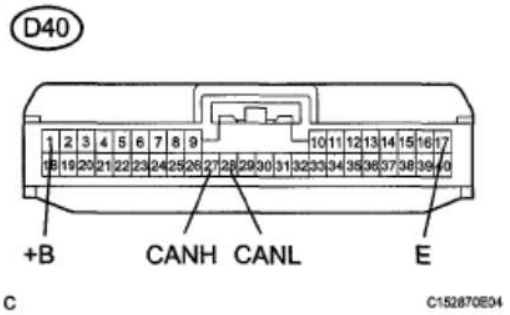


Fig. 60: Identifying Certification ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE CERTIFICATION ECU

SKID CONTROL ECU COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
Skid Control ECU Communication Stop Mode	• "ABS/VSC/TRC" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "Skid Control ECU Communication Stop Mode" in "DTC COMBINATION TABLE"	• Power source circuit of skid control ECU • Skid control ECU branch wire or connector • Skid control ECU

WIRING DIAGRAM

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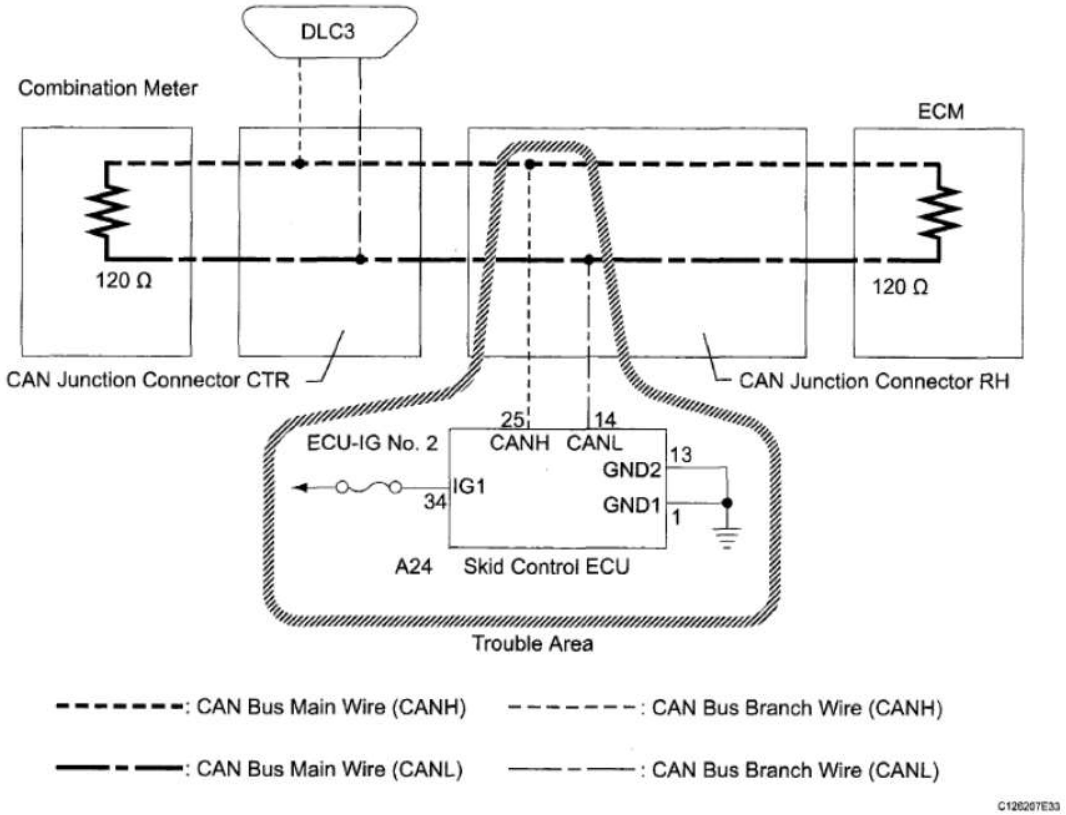


Fig. 61: Skid Control ECU Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **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 and light reminder warning system are 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 the doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

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1. **CHECK CAN BUS WIRE FOR DISCONNECTION (SKID CONTROL ECU BRANCH WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the skid control ECU connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
A24-25 (CANH) - A24-14 (CANL)	Ignition switch off	54 to 69 ohms

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (SKID CONTROL ECU BRANCH WIRE)

Front view of wire harness connector:
(to Skid Control ECU)

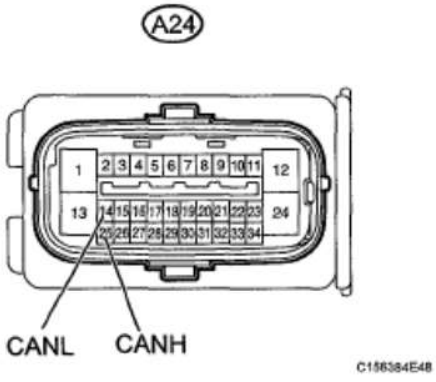


Fig. 62: Identifying Skid Control ECU Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **CHECK HARNESS AND CONNECTOR (IG1, GND1)**
   a. Disconnect the skid control ECU connector.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
A24-1 (GND1) - Body ground	Always	Below 1 ohms

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

Standard voltage

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
A24-34 (IG1) - Body ground	Ignition switch on (IG)	10 to 14 V

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Skid Control ECU)

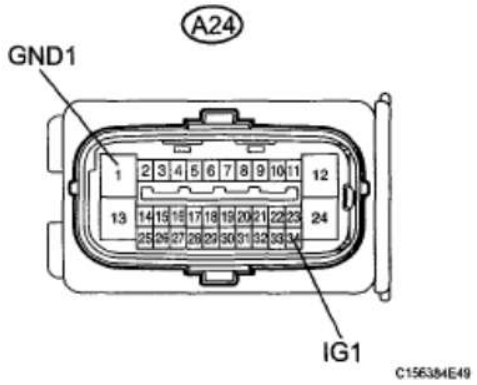


Fig. 63: Identifying Skid Control ECU Connector Terminals (GND1 And IG1)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

3. **CHECK DTC OUTPUT**
   a. Check the skid control ECU output DTC (See **DTC CHECK/CLEAR**).
   b. Read the DTC.

OK:

C1241 is not stored.

NG: GO TO DTC CHART (C1241) (See **DTC C1417 HIGH POWER SUPPLY VOLTAGE MALFUNCTION**)

OK: REPLACE BRAKE ACTUATOR ASSEMBLY (See **REMOVAL**)

AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE

DESCRIPTION

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TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
Air Conditioning Amplifier Communication Stop Mode	• "Air Conditioner" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "Air Conditioning Amplifier Communication Stop Mode" in "DTC combination table"	• Power source circuit of the air conditioning amplifier • Air conditioning amplifier branch wire or connector • Air conditioning amplifier

WIRING DIAGRAM

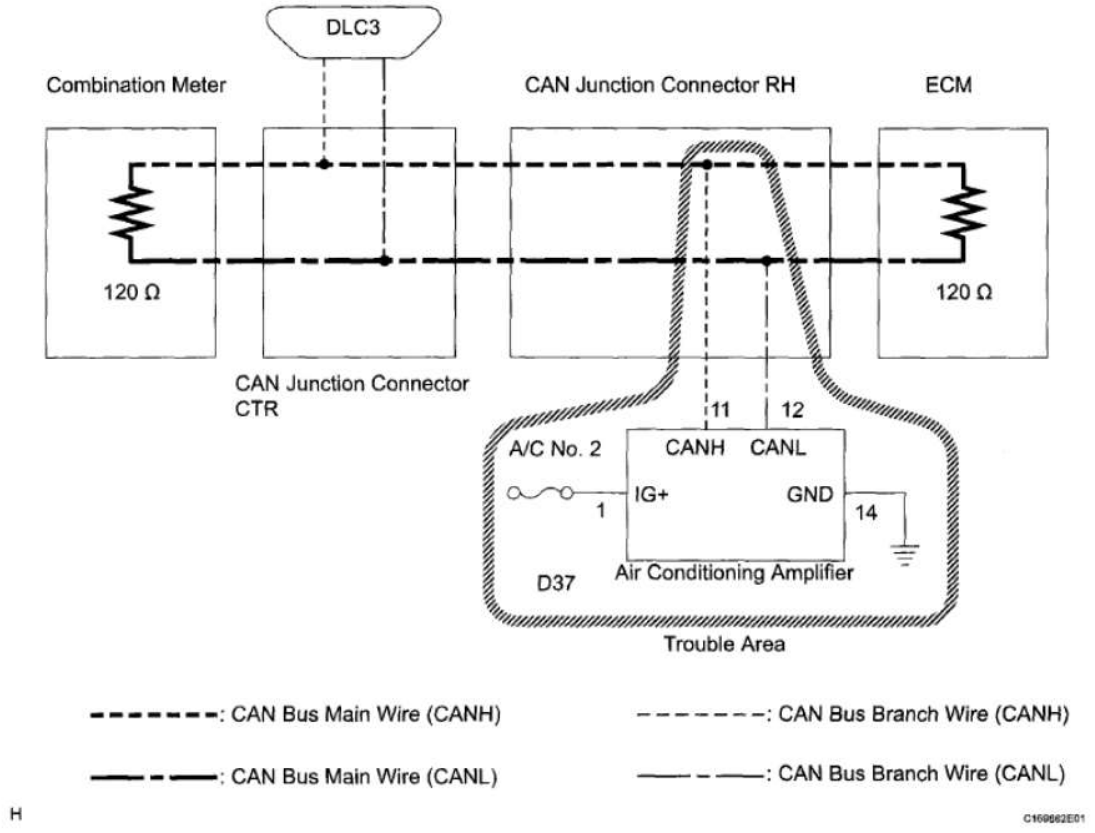


Fig. 64: Air Conditioning Amplifier Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **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 and light reminder warning system are not in operation.**

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- **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 the doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK CAN BUS LINE FOR DISCONNECTION (AIR CONDITIONING AMPLIFIER BRANCH WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the air conditioning amplifier connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D37-11 (CANH) - D37-12 (CANL)	Ignition switch off	54 to 69 ohms

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (AIR CONDITIONING AMPLIFIER BRANCH WIRE)

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Front view of wire harness connector:
(to Air Conditioning Amplifier)

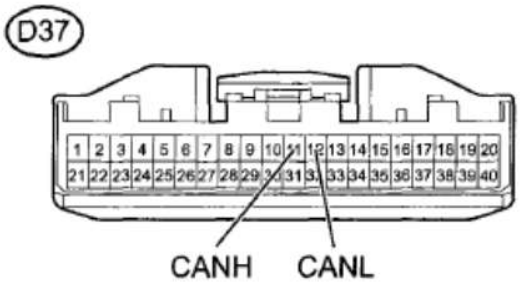


Fig. 65: Identifying Air Conditioning Amplifier Connector Terminals (CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **CHECK HARNESS AND CONNECTOR (IG+, GND)**
   a. Disconnect the air conditioning amplifier connector.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D37-14 (GND) - Body ground	Always	Below 1 ohms

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

Standard voltage

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
D37-1 (IG+) - Body ground	Ignition switch on (IG)	10 to 14 V

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

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Front view of wire harness connector:
(to Air Conditioning Amplifier)

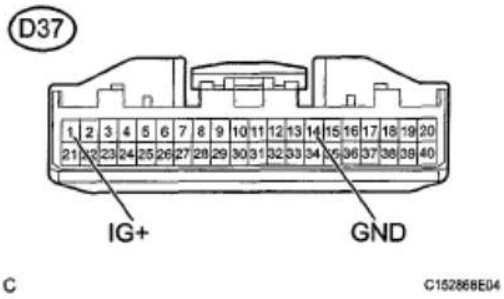


Fig. 66: Identifying Air Conditioning Amplifier Connector Terminals (IG+ And GND)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE AIR CONDITIONING AMPLIFIER ASSEMBLY (See **REMOVAL**)

POWER STEERING ECU COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
Power Steering ECU Communication Stop Mode	• EPS is not displayed on "BUS CHECK" screen of Techstream • Applies to "POWER STEERING ECU COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE"	• Power source circuit of the power steering ECU • Power steering ECU branch wire or connector • Power steering ECU

WIRING DIAGRAM

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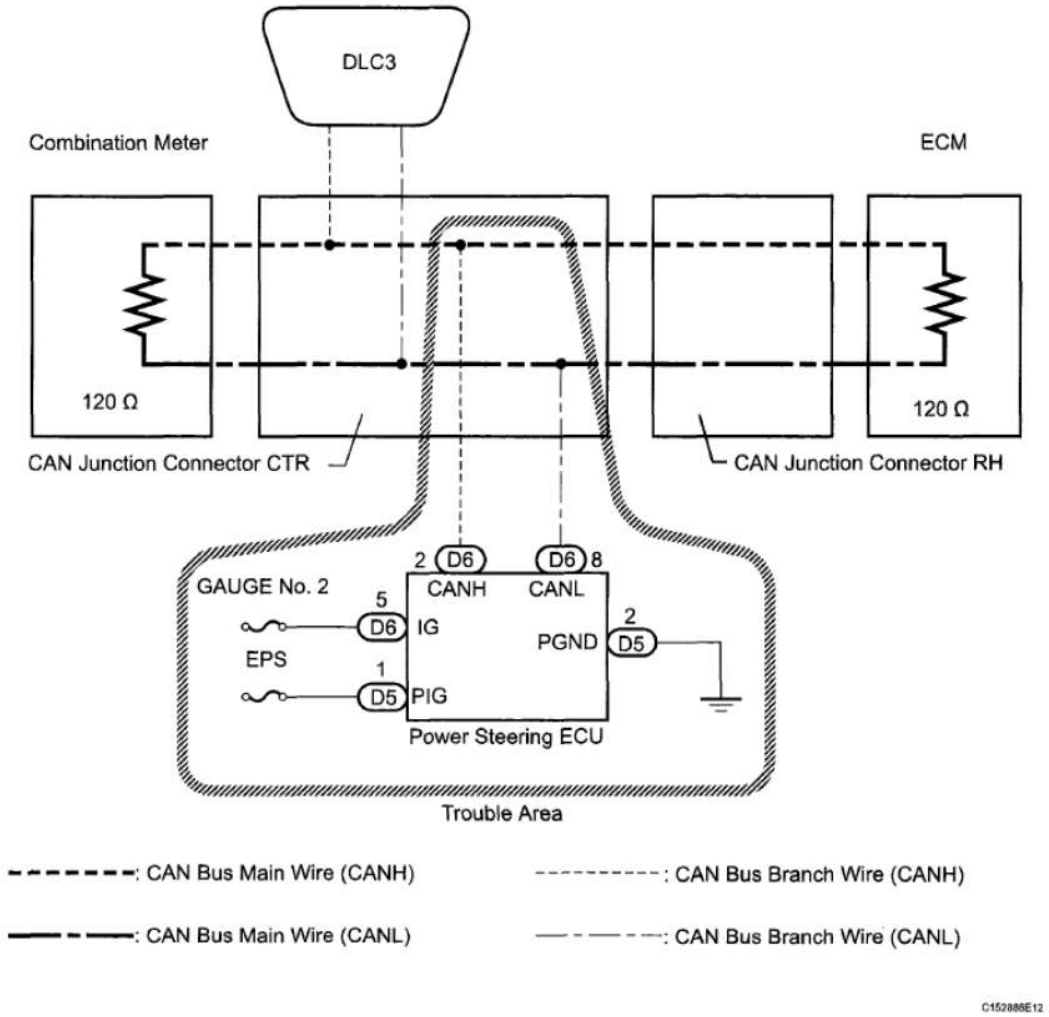


Fig. 67: Power Steering ECU Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of the main wire and the branch wire.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are not in operation.**
- **Before measuring the resistance, leave the vehicle for at least 1 minute and do not operate the ignition switch, any other switches or doors. If the doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor

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communication on the CAN. This communication will cause the resistance value to change.

- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK CAN BUS WIRE FOR DISCONNECTION (POWER STEERING ECU BRANCH WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the power steering ECU connector.
   c. Measure the resistance according to the value (s) in the table below.

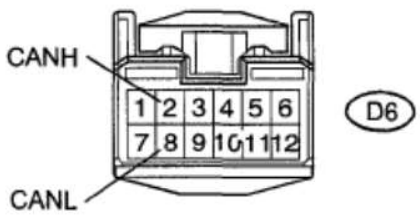
   Standard resistance

   TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D6-2 (CANH) - D6-8 (CANL)	Ignition switch off	54 to 69 ohms

   NG: REPAIR OR REPLACE CAN BRANCH WIRE OR CONNECTOR (POWER STEERING ECU BRANCH WIRE)

Front view of wire harness connector:
(to Power Steering ECU)



C128052E10

Fig. 68: Identifying Power Steering ECU Connector Terminals (CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   OK: Go to next step

2. **CHECK WIRE HARNESS (POWER STEERING ECU - BATTERY AND BODY GROUND)**
   a. Disconnect the power steering ECU connectors.
   b. Measure the resistance according to the value (s) in the table below.

   Standard resistance

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TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D5-2 (PGND) - Body ground	Always	Below 1 ohms

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

Standard voltage

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
D5-1 (PIG) - Body ground	Always	10 to 14 V
D6-5 (IG) - Body ground	Ignition switch on (IG)	10 to 14 V

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Power Steering ECU)

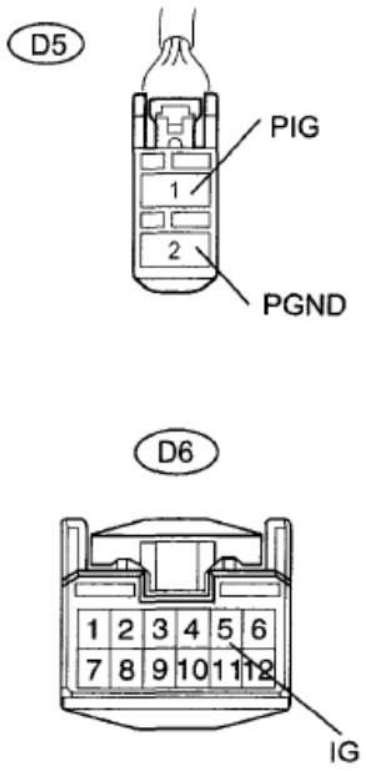


Fig. 69: Identifying Power Steering ECU Connector Terminals (PIG, PGND And IG)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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OK: REPLACE POWER STEERING ECU (See **REMOVAL**)

STEERING ANGLE SENSOR COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
Steering Angle Sensor Communication Stop Mode	• "Steering Angle Sensor" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "Steering Angle Sensor Communication Stop Mode" in "DTC COMBINATION TABLE"	• Power source circuit of steering angle sensor • Steering angle sensor branch wire or connector • Steering angle sensor

WIRING DIAGRAM

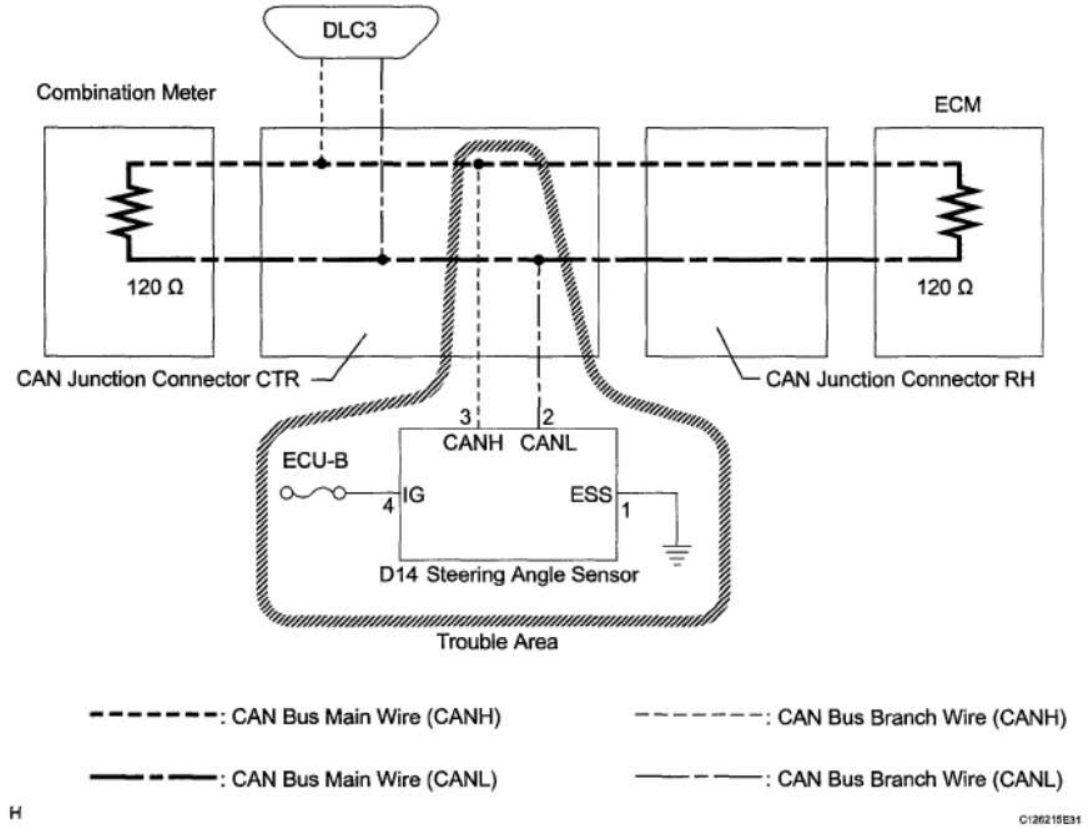


Fig. 70: Steering Angle Sensor Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are not operating.**
- **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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK CAN BUS LINE FOR DISCONNECTION (STEERING ANGLE SENSOR BRANCH WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the steering angle sensor connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D14-3 (CANH) - D14-2 (CANL)	Ignition switch off	54 to 69 ohms

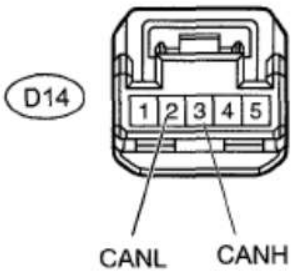
NG: REPAIR OR REPLACE CAN BRANCH WIRE CONNECTED TO STEERING ANGLE SENSOR

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Front view of wire harness connector:
(to Steering Angle Sensor)



C165629E03

Fig. 71: Identifying Steering Angle Sensor Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **CHECK HARNESS AND CONNECTOR (IG, ESS)**
   a. Disconnect the steering angle sensor connector.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D14-1 (ESS) - Body ground	Always	Below 1 ohms

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

Standard voltage

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
D14-4 (IG) - Body ground	Ignition switch on (IG)	10 to 14 V

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Front view of wire harness connector:
(to Steering Angle Sensor)

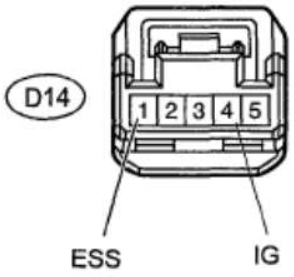


Fig. 72: Identifying Steering Angle Sensor Connector Terminals (ESS And IG)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: REPLACE STEERING ANGLE SENSOR (See **REMOVAL**)

YAW RATE SENSOR COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
Yaw Rate Sensor Communication Stop Mode	• "Yaw Rate/Decelerate Sensor" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "Yaw Rate Sensor Communication Stop Mode" in "DTC COMBINATION TABLE"	• Power source circuit of yaw rate sensor • Yaw rate sensor branch wire or connector • Yaw rate sensor

WIRING DIAGRAM

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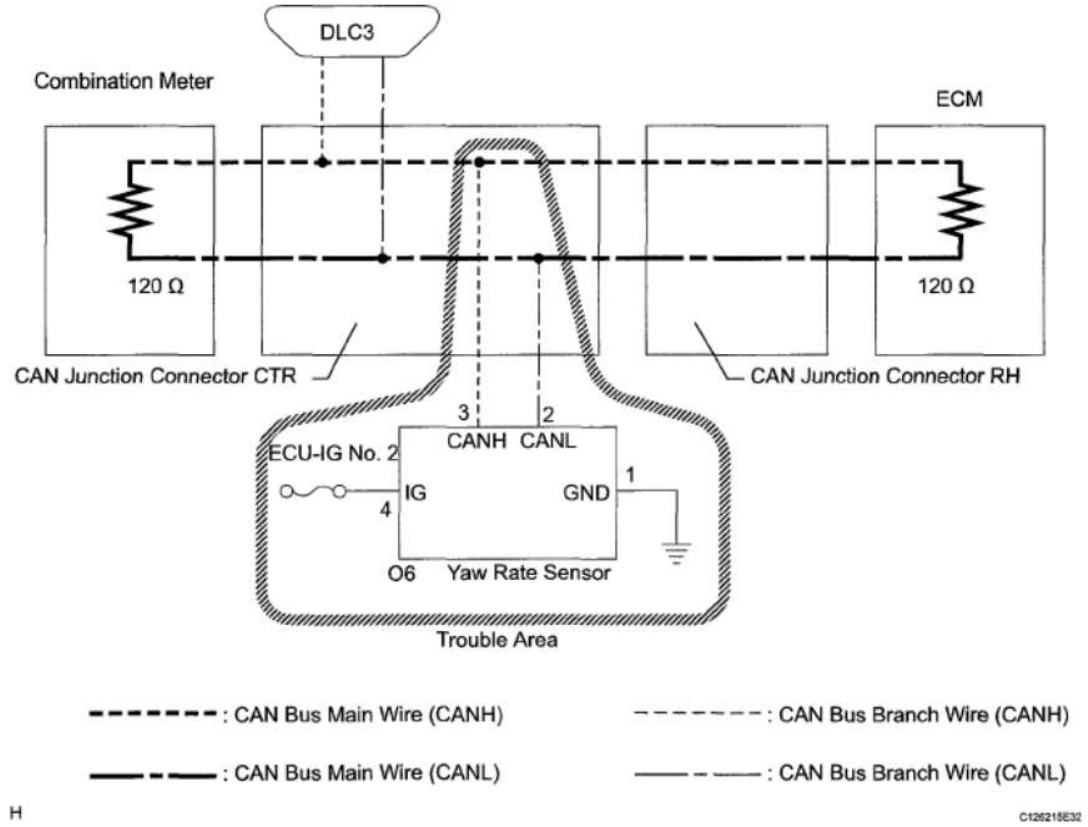


Fig. 73: Yaw Rate Sensor Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistance of CAN main wires and CAN branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are not operating.**
- **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 the doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

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1. **CHECK FOR OPEN IN CAN BUS WIRE (YAW RATE SENSOR BRANCH WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the yaw rate sensor connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
O6-3 (CANH) - O6-2 (CANL)	Ignition switch off	54 to 69 ohms

NG: REPAIR OR REPLACE YAW RATE SENSOR BRANCH WIRE OR CONNECTOR



Fig. 74: Identifying Yaw Rate Sensor Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **CHECK WIRE HARNESS (IG, GND)**
   a. Disconnect the yaw rate sensor connector.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
O6-1 (GND) - Body ground	Always	Below 1 ohms

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

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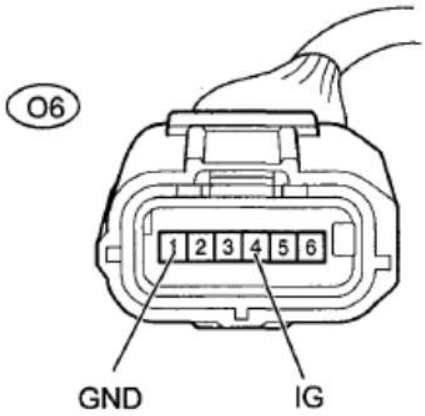
Standard voltage

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
O6-4 (IG) - Body ground	Ignition switch on (IG)	10 to 14 V

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Yaw Rate Sensor)



C165630E05

Fig. 75: Identifying Yaw Rate Sensor Connector Terminals (GND And IG)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE YAW RATE SENSOR (See **REMOVAL**)

ECM COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
ECM Communication Stop Mode	• "Engine" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "ECM Communication Stop Mode" in "DTC COMBINATION TABLE"	• Power source circuit of ECM • ECM

WIRING DIAGRAM

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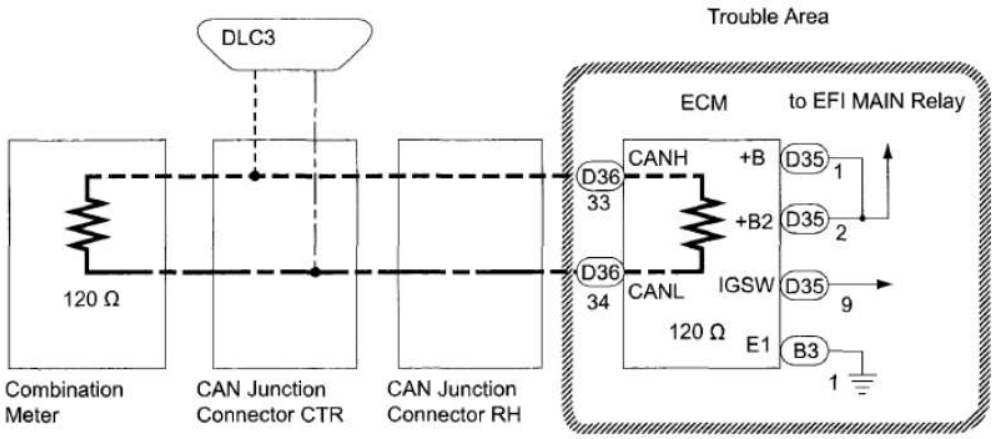
2GR-FE Engine:

- - - - - - -: CAN Bus Main Wire (CANH)

——— - ———: CAN Bus Main Wire (CANL)

- - - - - - -: CAN Bus Branch Wire (CANH)

——— - ———: CAN Bus Branch Wire (CANL)



H

C169683E03

Fig. 76: ECM Communication Stop Mode - Wiring Diagram (1 Of 2)
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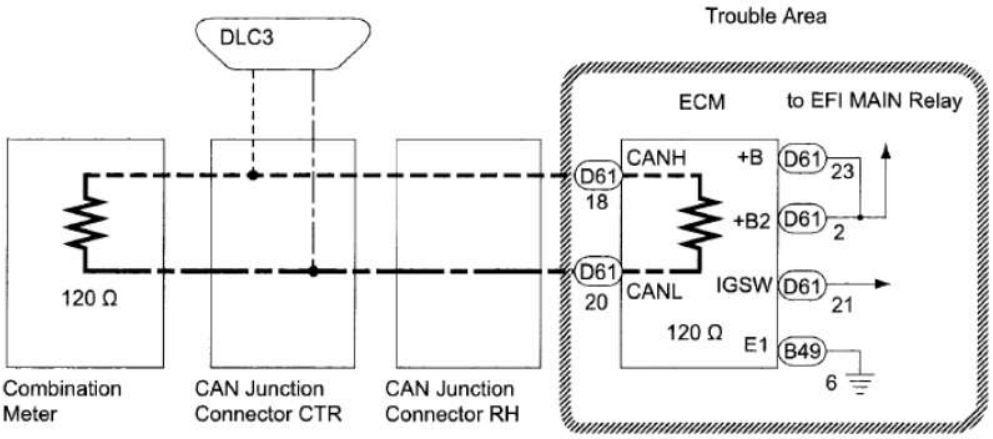
1AR-FE Engine:

- - - - - - -: CAN Bus Main Wire (CANH)

——— - ———: CAN Bus Main Wire (CANL)

- - - - - - -: CAN Bus Branch Wire (CANH)

——— - ———: CAN Bus Branch Wire (CANL)



H

C169953E04

Fig. 77: ECM Communication Stop Mode - Wiring Diagram (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are not operating.**
- **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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

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1. **CHECK FOR OPEN IN CAN NO. 1 BUS MAIN WIRE (ECM MAIN WIRE)**
   a. Turn the ignition switch off.
   b. 2GR-FE Engine:
      1. Disconnect the ECM connector.
      2. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D36-33 (CANH) - D36-34 (CANL)	Ignition switch off	108 to 132 ohms

Rear view of wire harness connector:
(to ECM)

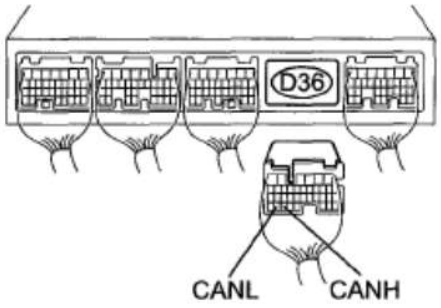


Fig. 78: Identifying ECM Connector Terminals (2GR-FE Engine)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   c. 1AR-FE Engine:
      1. Disconnect the ECM connector.
      2. Measure the resistance according to the value (s) in the table below.

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition
D61-18 (CANH) - D61-20 (CANL)	Ignition switch off	108 to 132 ohms

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

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Rear view of wire harness connector:
(to ECM)

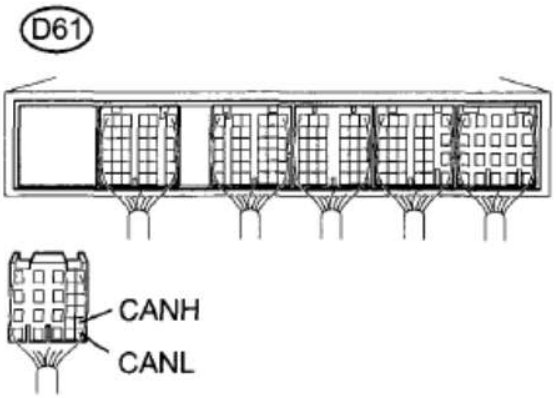


Fig. 79: Identifying ECM Connector Terminals (1AR-FE Engine)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **GO TO WIRE HARNESS (POWER SOURCE CIRCUIT)**
   a. Check the ECM power source circuit (2GR-FE: See **ECM POWER SOURCE CIRCUIT** , 1AR-FE: See **ECM POWER SOURCE CIRCUIT**).

Result

DETECTION ITEM CHART

Result	Proceed to
OK (2GR-FE)	A
OK (1AR-FE)	B
NG	C

B: REPLACE ECM (See **REMOVAL**)

C: REPAIR OR REPLACE HARNESS OR CONNECTOR

A: REPLACE ECM (See **FUEL INJECTOR CIRCUIT**)

MAIN BODY ECU COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area

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Main Body ECU Communication Stop Mode	• "Main body" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "Main Body ECU Communication Stop Mode" in "DTC combination table"	• Power source circuit of the main body ECU • Main body ECU branch wire or connector • Main body ECU

WIRING DIAGRAM

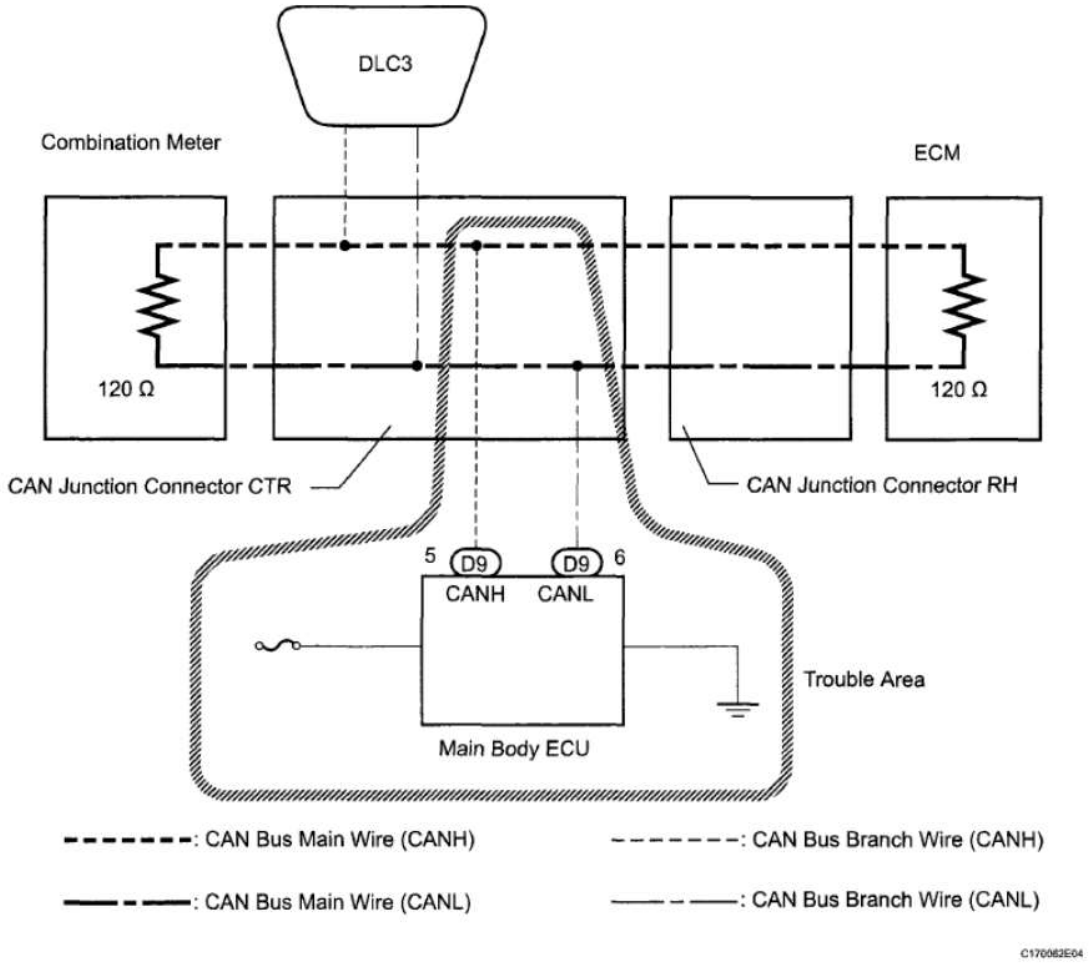


Fig. 80: Main Body ECU Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **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 and light reminder warning system are not in operation.**

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- **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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK CAN BUS LINE FOR DISCONNECTION (MAIN BODY ECU BRANCH WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the main body ECU connector.
   c. Measure the resistance according to the value (s) in the table below.

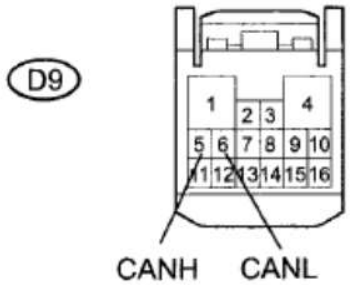
Standard resistance

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
D9-5 (CANH) - D9-6 (CANL)	Ignition switch off	54 to 69 ohms

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (MAIN BODY ECU BRANCH WIRE)

Front view of wire harness connector:
(to Main Body ECU)



C196604E02

Fig. 81: Identifying Main Body ECU Connector Terminals

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Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **CHECK POWER SOURCE CIRCUIT (MAIN BODY ECU)**
   a. Check the main body ECU power source circuit (See **IG SIGNAL CIRCUIT**).

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY (MAIN BODY ECU)

COMBINATION METER ECU COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
Combination Meter ECU Communication Stop Mode	• "Combination Meter" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "Combination Meter ECU Communication Stop Mode" in "DTC COMBINATION TABLE"	• Power source circuit of the combination meter • Combination meter main wire or connector • Combination meter

WIRING DIAGRAM

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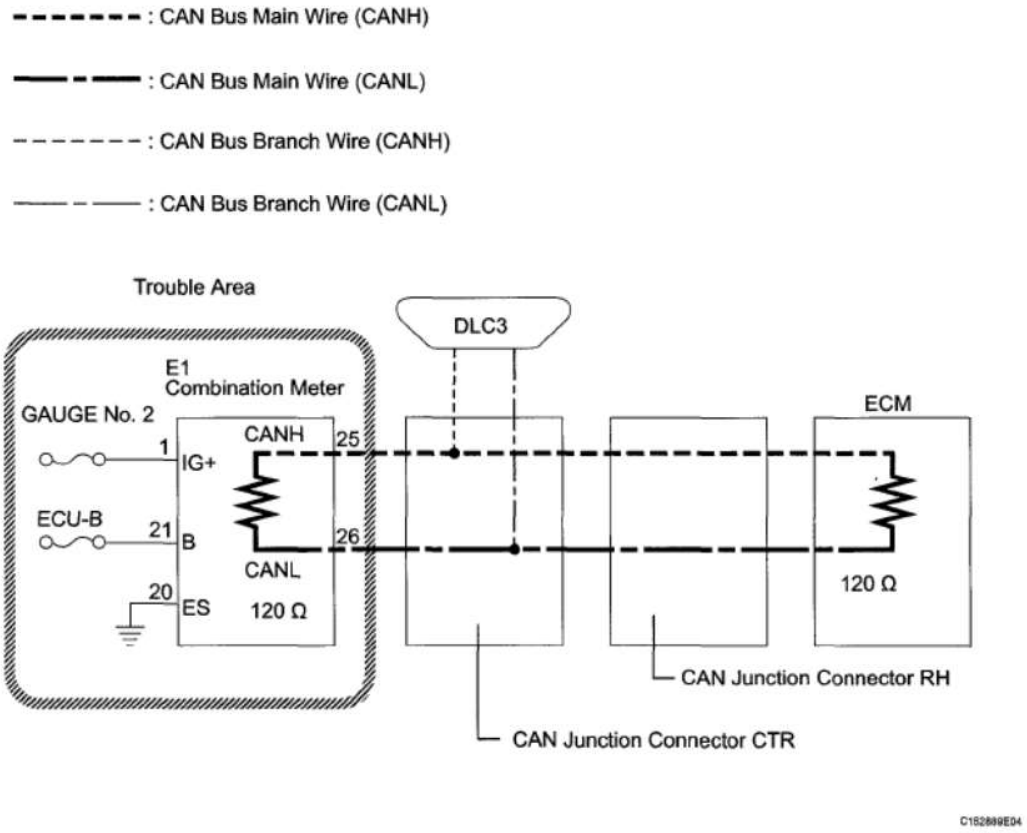


Fig. 82: Combination Meter ECU Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and lighting system are not operating.**
- **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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

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1. **CHECK FOR OPEN IN CAN NO. 1 BUS WIRE (COMBINATION METER MAIN BUS WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the combination meter connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
E1-25 (CANH) - E1-26 (CANL)	Ignition switch off	108 to 132 ohms

NG: REPAIR OR REPLACE CAN BUS MAIN WIRE OR CONNECTOR (COMBINATION METER MAIN BUS WIRE)

Front view of wire harness connector:
(to Combination Meter)

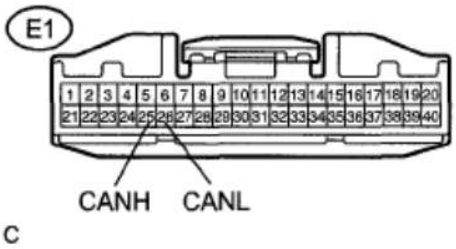


Fig. 83: Identifying Combination Meter Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)**
   a. Disconnect the combination meter connector.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
E1-20 (ES) - Body ground	Always	Below 1 ohms

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

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Standard voltage

DETECTION ITEM CHART

Tester Connection	Condition	Specified Condition
E1-1 (IG+) - Body ground	Ignition switch on (IG)	10 to 14 V
E1-21 (B) - Body ground	Always	10 to 14 V

Front view of wire harness connector:
(to Combination Meter)

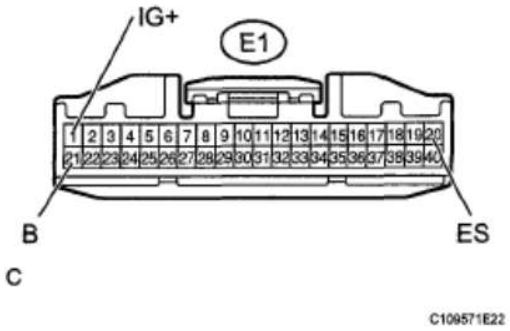


Fig. 84: Identifying Combination Meter Connector Terminals (IG+, B And ES)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: REPLACE COMBINATION METER ASSEMBLY (See **REMOVAL**)

CENTER AIRBAG SENSOR COMMUNICATION STOP MODE

DESCRIPTION

TESTER CONNECTION SPECIFIED CONDITION CHART

Detection Item	Symptom	Trouble Area
Center Airbag Sensor Communication Stop Mode	• "SRS Airbag" is not displayed on "Communication Bus Check" screen of Techstream • Applies to "Center Airbag Sensor Communication Stop Mode" in "DTC COMBINATION TABLE"	• Power source circuit of the center airbag sensor • Center airbag sensor branch wire or connector • Center airbag sensor assembly

WIRING DIAGRAM

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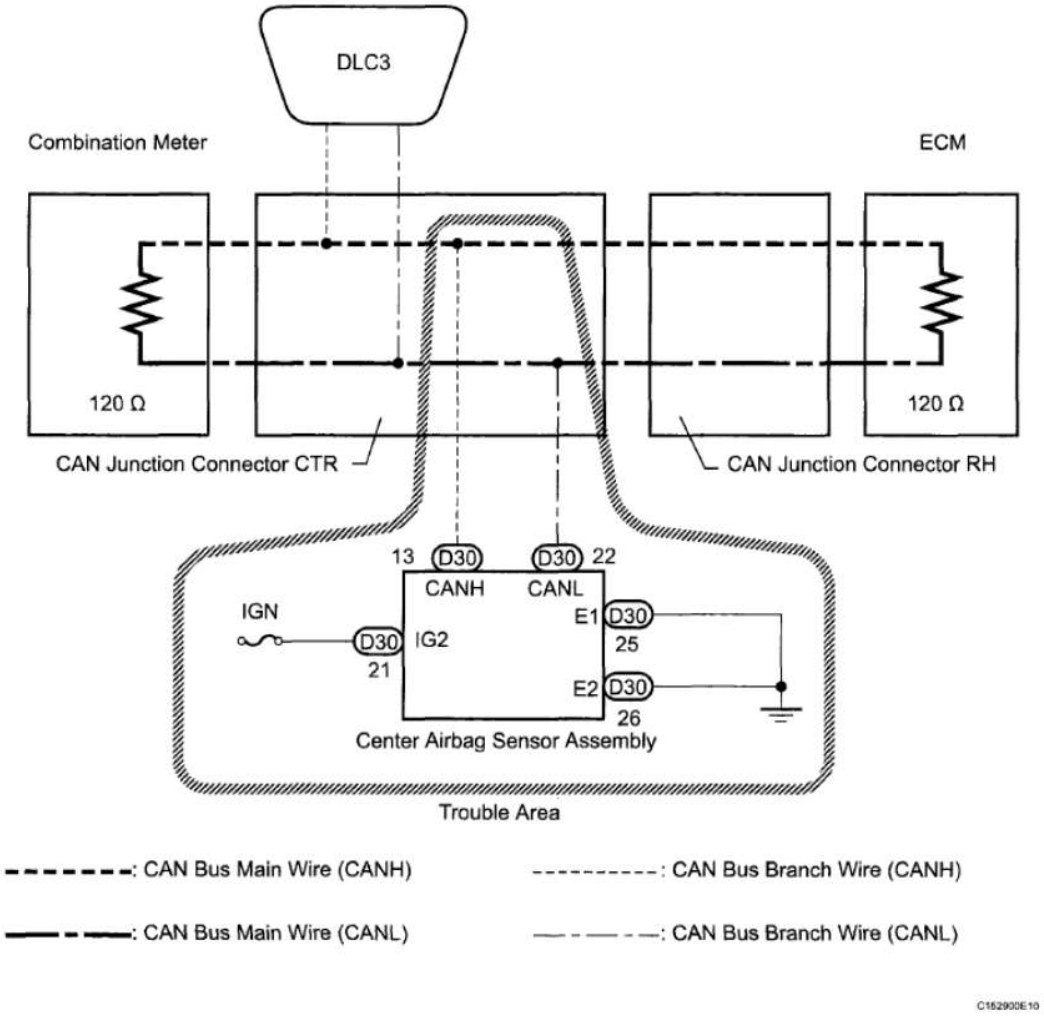


Fig. 85: Center Airbag Sensor Communication Stop Mode - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light remainder warning system are not operating.**
- **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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor

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communication on the CAN. This communication will cause the resistance value to change.

- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK FOR OPEN IN CAN BUS WIRE (CENTER AIRBAG SENSOR BRANCH WIRE)**
   a. Turn the ignition switch off.
   b. Disconnect the center airbag sensor assembly connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D30-13 (CANH) - D30-22 (CANL)	Ignition switch off	54 to 69 ohms

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (CENTER AIRBAG SENSOR ASSEMBLY BRANCH WIRE)

Front view of wire harness connector:
(to Center Airbag Sensor Assembly)

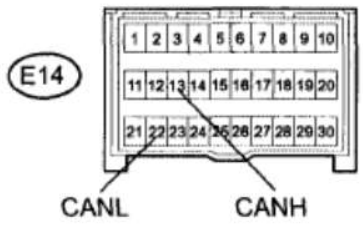


Fig. 86: Identifying Center Airbag Sensor Assembly Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Go to next step

2. **CHECK HARNESS AND CONNECTOR (IG2, E1, E2)**
   a. Disconnect the center airbag sensor assembly connector.
   b. Measure the resistance according to the value (s) in the table below.

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Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D30-25 (E1) - Body ground	Always	Below 1 ohms
D30-26 (E2) - Body ground	Always	Below 1 ohms

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

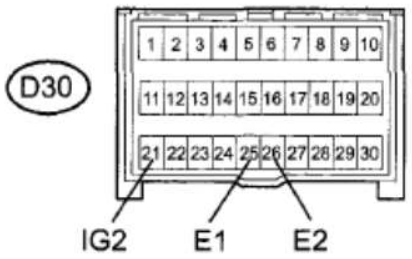
Standard voltage

CAN MAIN BUS LINE SYMPTOM CHART

Tester Connection	Condition	Specified Condition
D30-21 (IG2) - Body ground	Ignition switch on (IG)	10 to 14 V

NG: REPAIR OR REPLACE HARNESS OR CONNECTOR

Front view of wire harness connector:
(to Center Airbag Sensor Assembly)



C C162867E12

Fig. 87: Identifying Center Airbag Sensor Assembly Connector Terminals (IG2, E1 And E2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE CENTER AIRBAG SENSOR ASSEMBLY (See **ON-VEHICLE INSPECTION**)

OPEN IN CAN MAIN BUS LINE

DESCRIPTION

There may be an open circuit in the CAN main wire and/or the DLC3 branch wire when the resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is 70 ohms or higher.

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TESTER CONNECTION SPECIFIED CONDITION CHART

Symptom	Trouble Area
Resistance between terminals 6 (CANH) and 14 (CANL) of DLC3 is 70 ohms or higher.	• CAN bus main wire or connector • CAN junction connector CTR • CAN junction connector RH • ECM • Combination meter

WIRING DIAGRAM

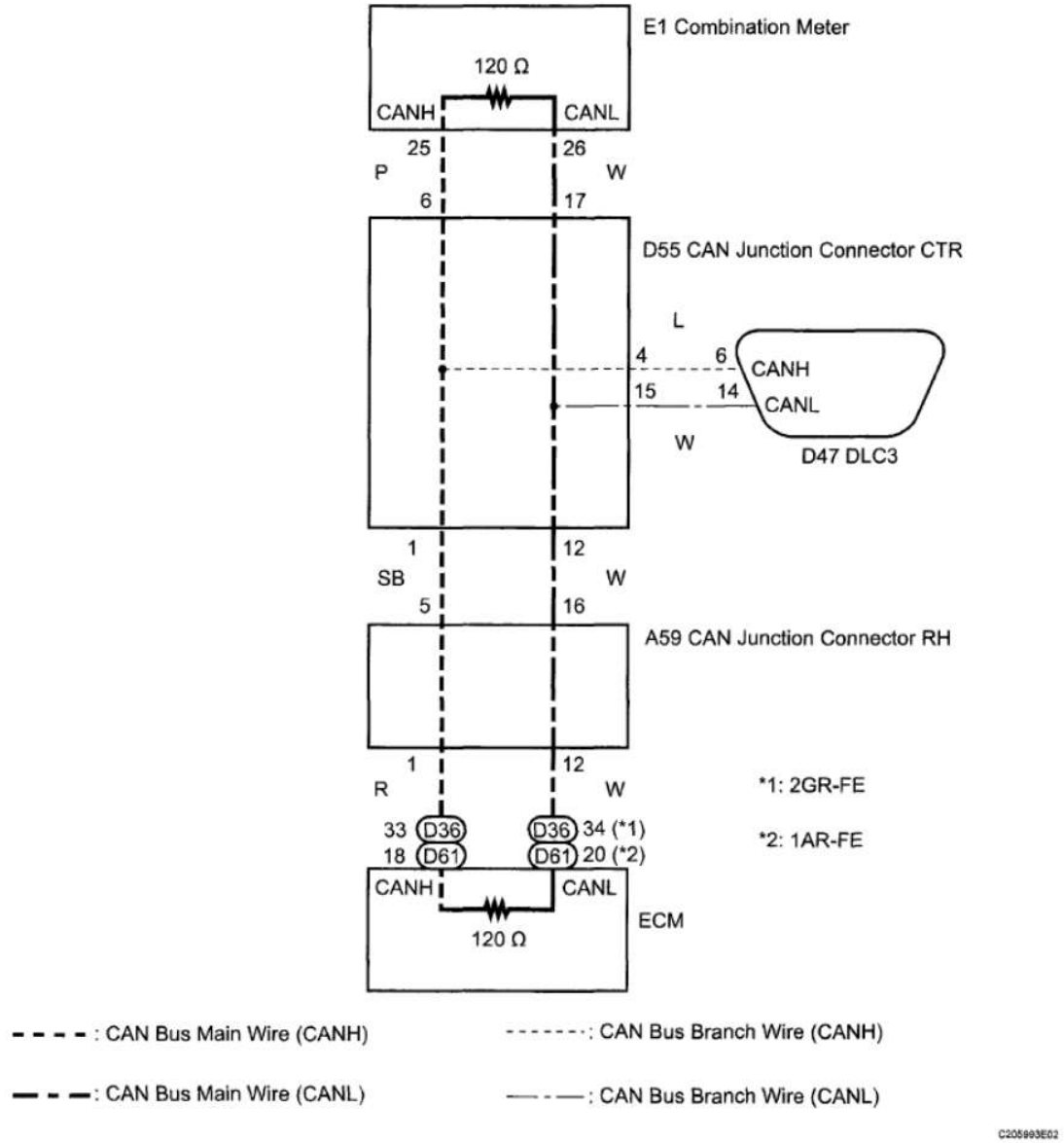


Fig. 88: Open In CAN Main Bus Line - Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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INSPECTION PROCEDURE

NOTE:

- **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 and light reminder warning system are 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 the doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK DLC3**
   a. Turn the ignition switch off.
   b. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D47-6 (CANH) - D47-14 (CANL)	Ignition switch off	108 to 132 ohms

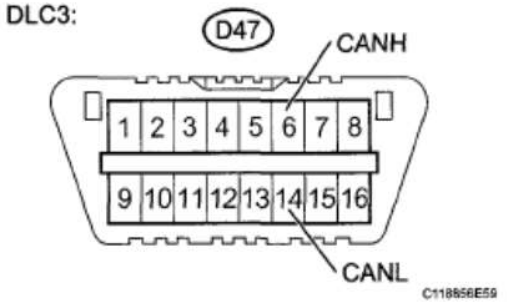


Fig. 89: Identifying DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: **When the measured value is 133 ohms or higher and a CAN communication system diagnostic trouble code is output, there may**

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be a fault besides disconnection of the DLC3 branch wire. For that reason, troubleshooting should be performed again from "HOW TO PROCEED WITH TROUBLESHOOTING" after repairing the trouble area.

NG: REPAIR OR REPLACE CAN BRANCH WIRE CONNECTED TO DLC3

OK: Go to next step

2. **CHECK FOR OPEN IN CAN BUS MAIN WIRE (CAN JUNCTION CONNECTOR CTR)**
   a. Turn the ignition switch off.
   b. Disconnect the CAN junction connector CTR.
   c. Measure the resistance according to the value (s) in the table below.

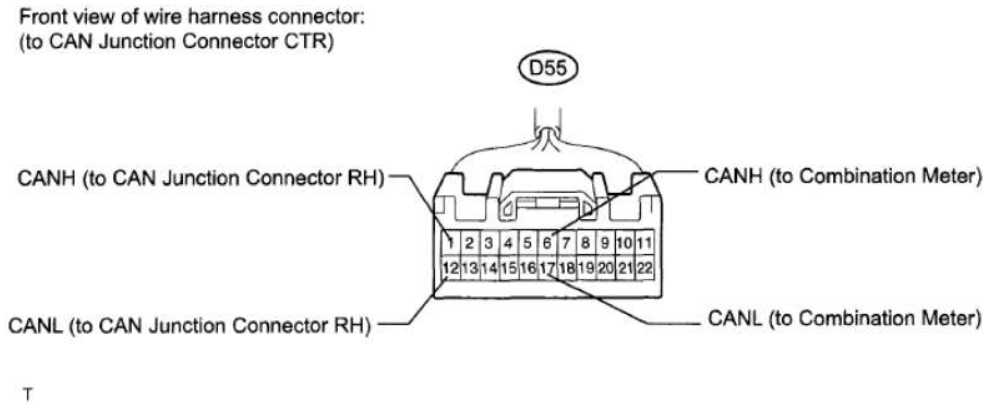


Fig. 90: Identifying CAN Junction CTR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-1 (CANH) - D55-12 (CANL)	SB - W	CAN junction connector RH	Ignition switch off	108 to 132 ohms
D55-6 (CANH) - D55-17 (CANL)	P-W	Combination meter	Ignition switch off	108 to 132 ohms

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (CAN junction connector main wire)	B

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NG (Combination meter main wire)	C

B: Go to step 3

C: Go to step 4

A: REPLACE CAN JUNCTION CONNECTOR CTR

3. **CHECK FOR OPEN IN CAN BUS MAIN WIRE (COMBINATION METER)**
   a. Reconnect the CAN junction connector CTR.
   b. Disconnect the combination meter connector.
   c. Measure the resistance according to the value (s) in the table below.

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
E1-25 (CANH) - E1-26 (CANL)	Ignition switch off	108 to 132 ohms

NG: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (CAN JUNCTION CONNECTOR CTR - COMBINATION METER)

Front view of wire harness connector:
(to Combination Meter)

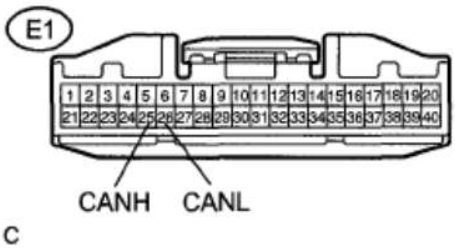


Fig. 91: Identifying Combination Meter Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE COMBINATION METER ASSEMBLY (See **REMOVAL**)

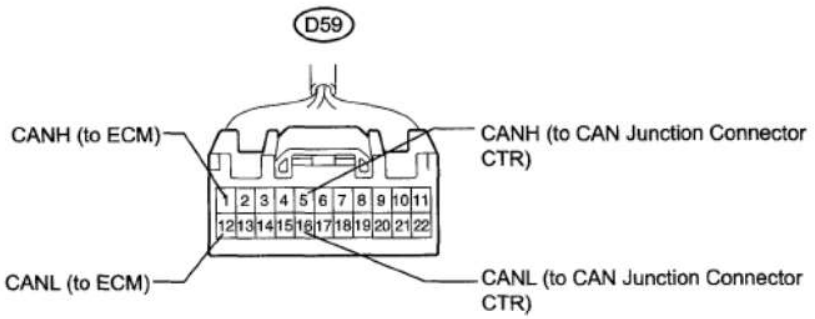
4. **CHECK FOR OPEN IN CAN BUS MAIN WIRE (CAN JUNCTION CONNECTOR RH)**
   a. Reconnect the CAN junction connector CTR.
   b. Disconnect the CAN junction connector RH.
   c. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:



T

Fig. 92: Identifying Can Junction Connector RH Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D59-1 (CANH) - D59-12 (CANL)	R-W	ECM	Ignition switch off	108 to 132 ohms
D55-5 (CANH) - D55-16 (CANL)	SB - W	CAN junction connector CTR	Ignition switch off	108 to 132 ohms

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (ECM main wire)	B
NG (CAN junction connector)	C

B: Go to step 5

C: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (CAN JUNCTION CONNECTOR CTR - CAN JUNCTION CONNECTOR RH)

A: REPLACE CAN JUNCTION CONNECTOR RH

5. **CHECK FOR OPEN IN CAN BUS MAIN WIRE (ECM)**
   a. Reconnect the CAN junction connector RH.
   b. 2GR-FE engine:
      1. Disconnect the ECM connector.
      2. Measure the resistance according to the value (s) in the table below.

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Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D36-33 (CANH) - D36-34 (CANL)	Ignition switch off	108 to 132 ohms

Rear view of wire harness connector:
(to ECM)

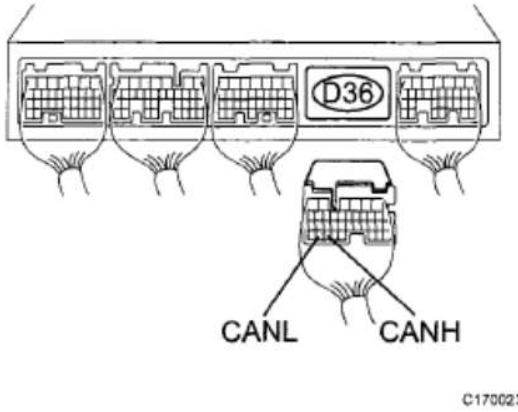


Fig. 93: Identifying ECM Connector Terminals (2GR-FE Engine)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

c. 1AR-FE engine:
   1. Disconnect the ECM connector.
   2. Measure the resistance according to the value (s) in the table below.

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition
D61-18 (CANH) - D61-20 (CANL)	Ignition switch off	108 to 132 ohms

Result

CAN BUS LINES FOR SYMPTOM CHART

Result	Proceed to
OK (2GR-FE engine)	A
OK (1AR-FE engine)	B
NG	C

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B: REPLACE ECM (See **REMOVAL**)

Rear view of wire harness connector:
(to ECM)

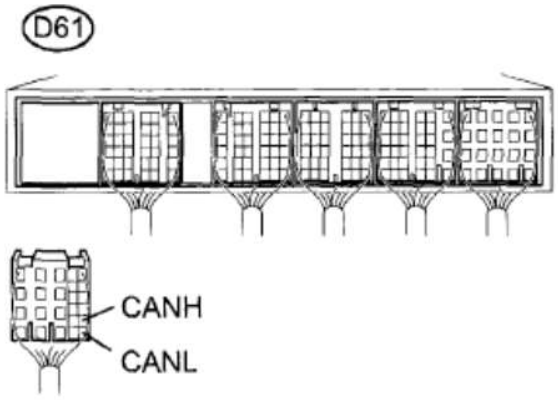


Fig. 94: Identifying ECM Connector Terminals (1AR-FE Engine)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

C: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (CAN JUNCTION CONNECTOR RH - ECM)

A: REPLACE ECM (See **FUEL INJECTOR CIRCUIT**)

CHECK CAN BUS LINES FOR SHORT CIRCUIT

DESCRIPTION

There may be a short circuit in the CAN main wire and/or CAN branch wire when the resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is below 54 ohms.

TESTER CONNECTION SPECIFIED CONDITION CHART

Symptom	Trouble Area
Resistance between terminals 6 (CANH) and 14 (CANL) of DLC3 is below 54 ohms.	• Short in CAN bus wire • Skid control ECU • Power steering ECU • Steering angle sensor • Yaw rate sensor • ECM • Center airbag sensor assembly • Air conditioning amplifier

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	• Combination meter • Main body ECU • Accessory gateway • CAN junction connector CTR • CAN junction connector RH

WIRING DIAGRAM

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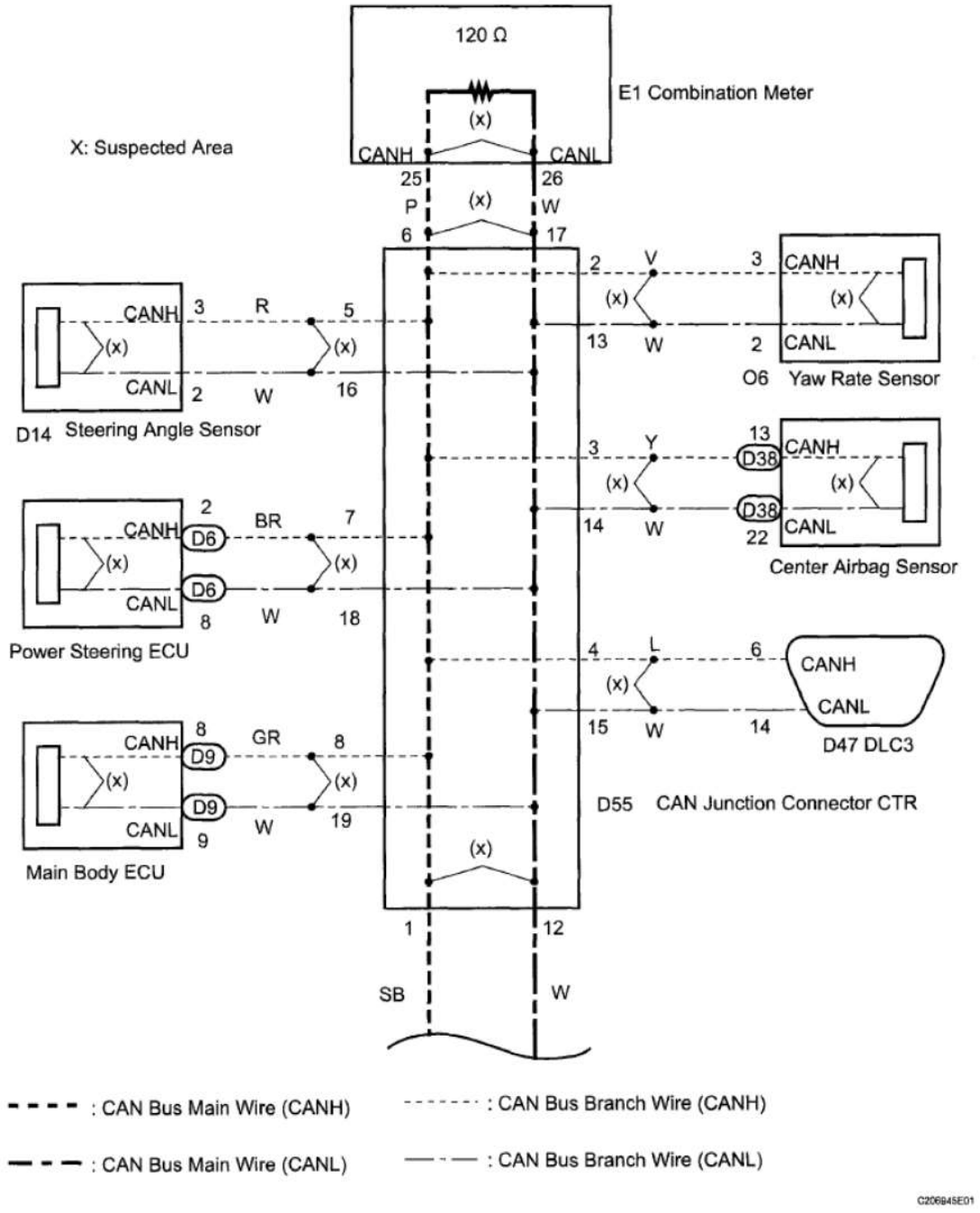


Fig. 95: CAN Bus Lines For Short - Wiring Diagram (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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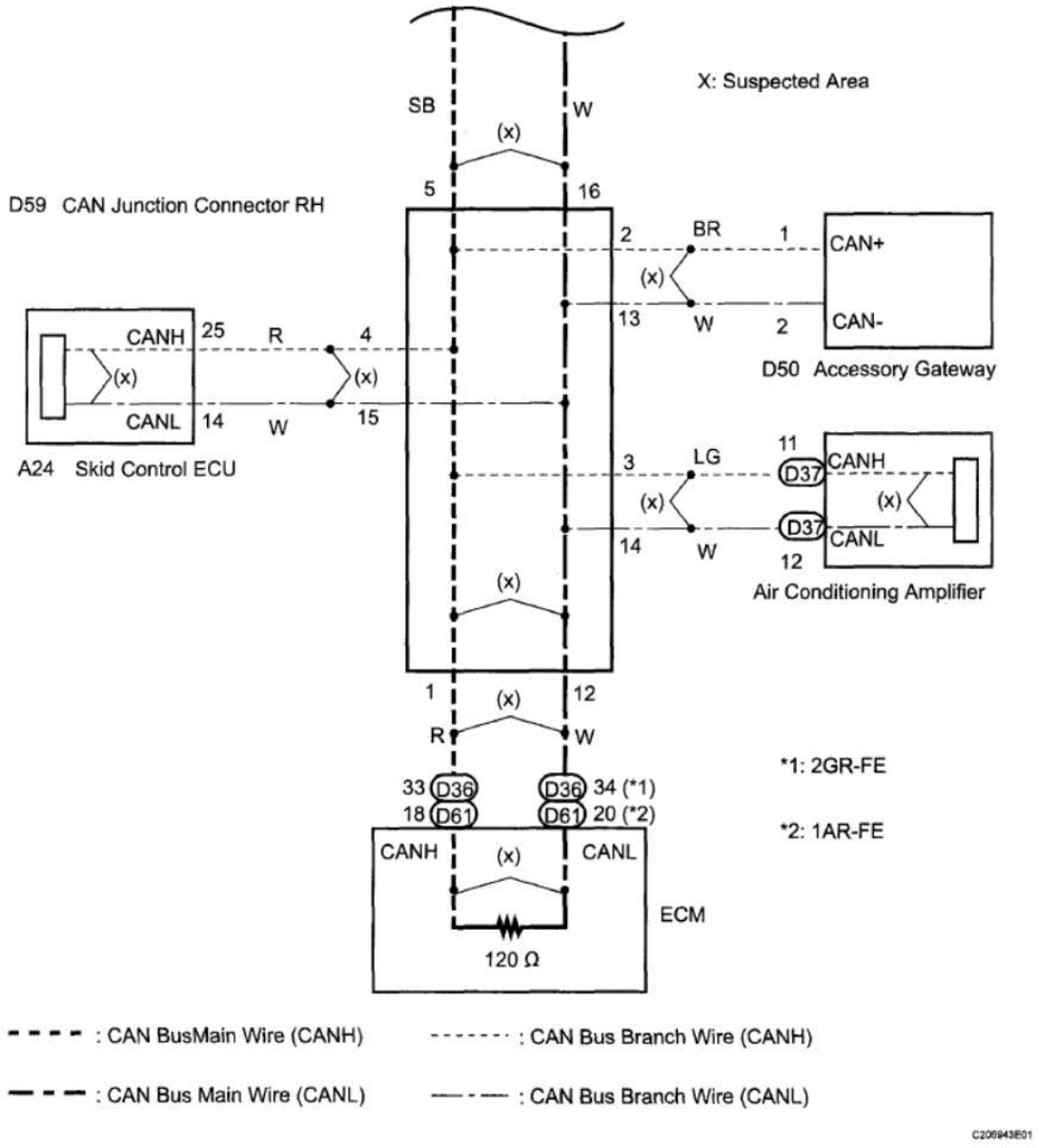


Fig. 96: CAN Bus Lines For Short - Wiring Diagram (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light reminder warning system are not operating.**
- **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 any doors need to be opened in order to check the connectors,**

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open the doors and leave them open.

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK FOR SHORT IN CAN BUS WIRES (CAN JUNCTION CONNECTOR CTR)**
   a. Turn the ignition switch off.
   b. Disconnect the CAN junction connector CTR.
   c. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(CAN Junction Connector CTR)

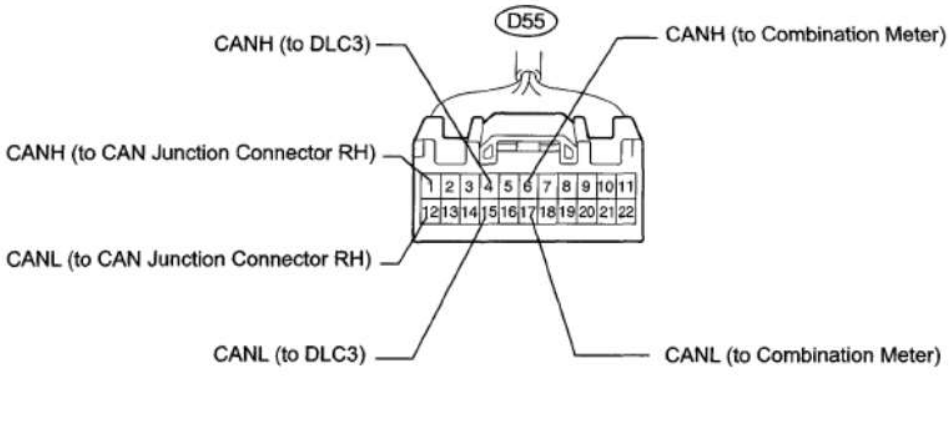


Fig. 97: Identifying CAN Junction CTR Connector Terminals CANH (To DLC3) And CANL (To Combination Meter)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-1 (CANH) - D55-12 (CANL)	SB - W	CAN junction connector RH	Ignition switch off	108 to 132 ohms
D55-4 (CANH) - D55-15 (CANL)	L-W	DLC3	Ignition switch off	1 Mohms or higher

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D55-6 (CANH) - D55-17 (CANL)	P-W	Combination meter	Ignition switch off	108 to 132 ohms

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (DLC3 branch wire)	B
NG (Combination meter main wire)	C
NG (CAN junction connector RH main wire)	D

B: REPAIR OR REPLACE CAN BRANCH WIRE CONNECTED TO DLC3

C: Go to step 4

D: Go to step 5

A: Go to next step

2. **CHECK FOR SHORT IN CAN BUS WIRES (CAN JUNCTION CONNECTOR CTR)**
   a. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(CAN Junction Connector CTR)

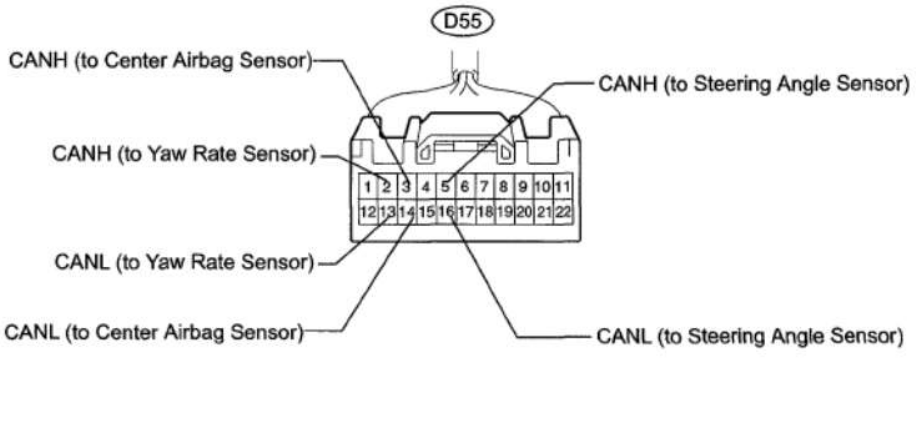


Fig. 98: Identifying CAN Junction CTR Connector Terminals CANH (Center Airbag Sensor) And CANL (Steering Angle Sensor)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

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RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-2 (CANH) - D55-13 (CANL)	V-W	Yaw rate sensor	Ignition switch off	1 Mohms or higher
D55-3 (CANH) - D55-14 (CANL)	Y-W	Center airbag sensor assembly	Ignition switch off	1 Mohms or higher
D55-5 (CANH) - D55-16 (CANL)	R-W	Steering angle sensor	Ignition switch off	1 Mohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Yaw rate sensor branch wire)	B
NG (Center airbag sensor assembly branch wire)	C
NG (Steering angle sensor branch wire)	D

B: Go to step 8

C: Go to step 9

D: Go to step 10

A: Go to next step

3. **CHECK FOR SHORT IN CAN BUS WIRES (CAN JUNCTION CONNECTOR CTR)**
   a. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(CAN Junction Connector CTR)

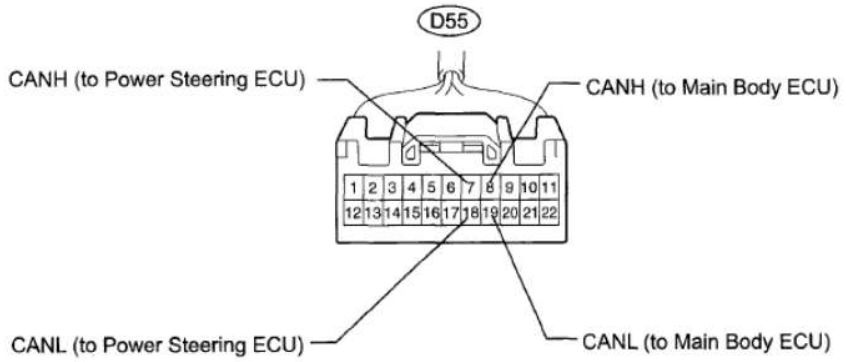


Fig. 99: Identifying CAN Junction CTR Connector Terminals CANH (Power Steering ECU) And CANL (Main Body ECU)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-7 (CANH) - D55-18 (CANL)	BR-W	Power steering ECU	Ignition switch off	1 Mohms or higher
D55-8 (CANH) - D55-19 (CANL)	GR-W	Main body ECU	Ignition switch off	1 Mohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Power steering ECU branch wire)	B
NG (Main body ECU branch wire)	C

B: Go to step 11

C: Go to step 12

A: REPLACE CAN JUNCTION CONNECTOR CTR

4. **CHECK FOR SHORT IN CAN BUS WIRES (COMBINATION METER ECU MAIN WIRE)**

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a. Disconnect the combination meter connector.

Front view of wire harness connector:
(to Combination Meter)

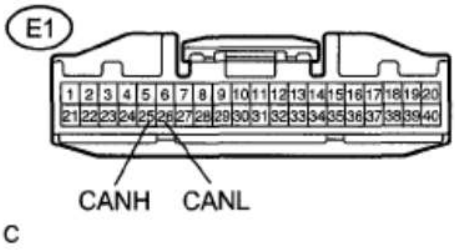


Fig. 100: Identifying Combination Meter Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-6 (CANH) - D55-17 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (COMBINATION METER MAIN WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

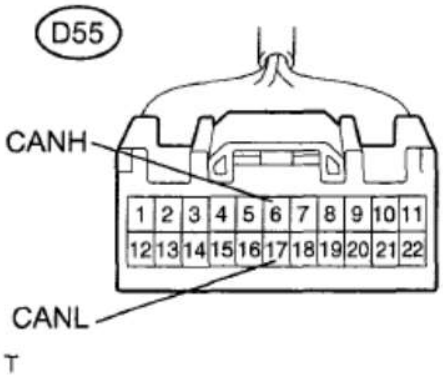


Fig. 101: Identifying CAN Junction Connector CTR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE COMBINATION METER (See **REMOVAL**)

5. **CHECK FOR SHORT IN CAN BUS WIRES (CAN JUNCTION CONNECTOR RH)**
   a. Disconnect the CAN junction connector RH.
   b. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(CAN Junction Connector RH)

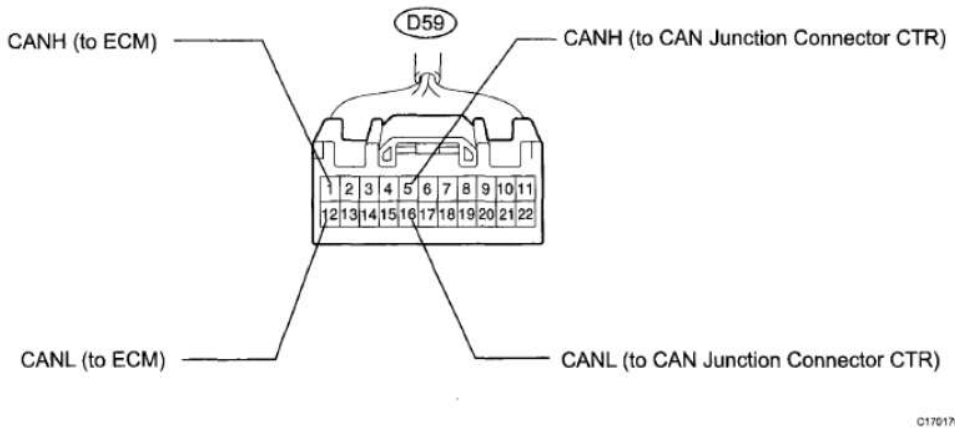


Fig. 102: Identifying CAN Junction Connector RH Connector Terminals CANH (ECM) AND CANL (CAN Junction Connector CTR)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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HINT:

The resistance must be measured after the CAN junction connector CTR is disconnected.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D59-1 (CANH) - D59-12 (CANL)	R-W	ECM	Ignition switch off	108 to 132 ohms
D59-5 (CANH) - D55-16 (CANL)	SB - W	CAN junction connector CTR	Ignition switch off	1 Mohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (ECM main wire)	B
NG (CAN junction connector main wire)	C

B: Go to step 7

C: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (CAN JUNCTION CONNECTOR CTR - CAN JUNCTION CONNECTOR RH)

A: Go to next step

6. **CHECK FOR SHORT IN CAN BUS WIRES (CAN JUNCTION CONNECTOR RH)**
   a. Measure the resistance according to the value (s) in the table below.

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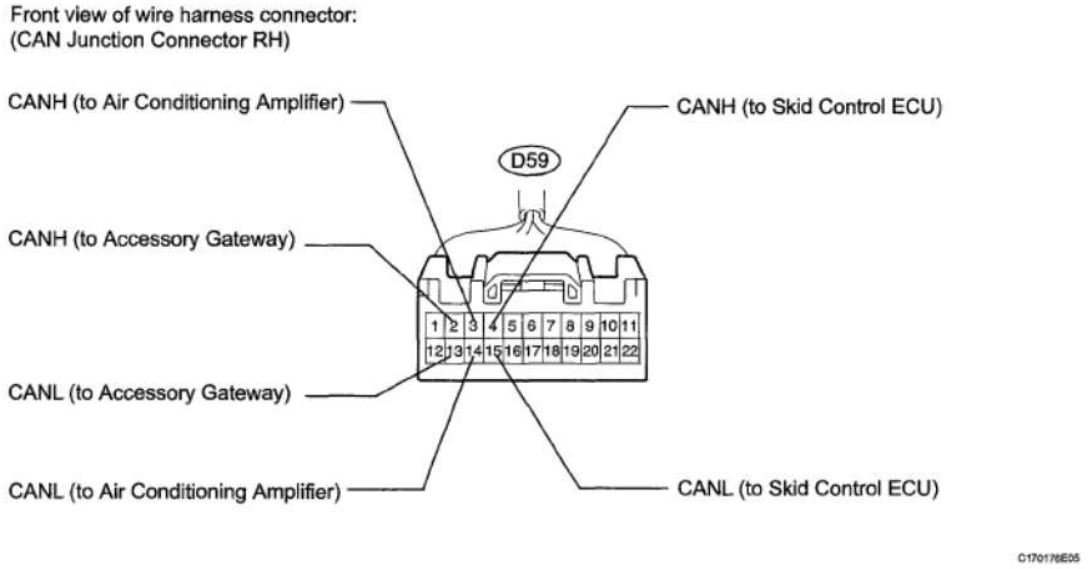


Fig. 103: Identifying CAN Junction Connector RH Connector Terminals CANH (Air Conditioning Amplifier) AND CANL (Skid Control ECU)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D59-2 (CANH) - D59-13 (CANL)	BR-W	Accessory gateway	Ignition switch off	1 Mohms or higher
D59-3 (CANH) - D59-14 (CANL)	LG-W	Air conditioning amplifier	Ignition switch off	1 Mohms or higher
D59-4 (CANH) - D59-15 (CANL)	B - W	Skid control ECU	Ignition switch off	1 Mohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Accessory gateway branch wire)	B
NG (Air conditioning amplifier branch wire)	C
NG (Skid control ECU branch wire)	D

B: Go to step 15

C: Go to step 13

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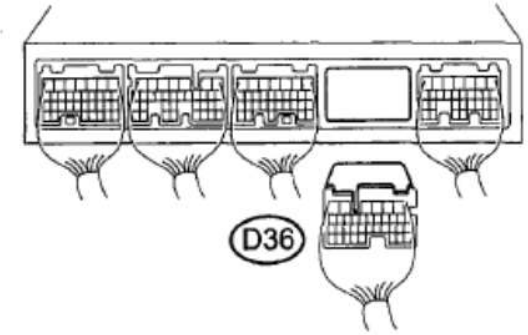
D: Go to step 14

A: REPLACE CAN JUNCTION CONNECTOR RH

7. **CHECK FOR SHORT IN CAN BUS WIRES (ECM MAIN WIRE)**
   a. Disconnect the ECM connector.

Rear view of wire harness connector:
(to ECM)

2GR-FE:



1AR-FE:

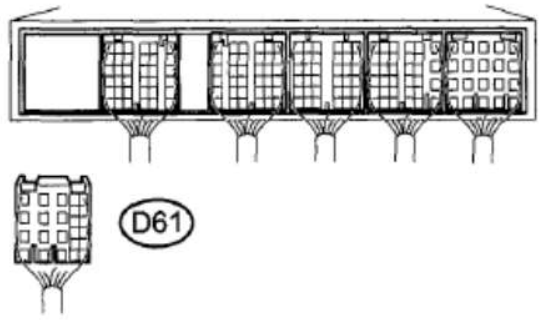


Fig. 104: Identifying ECM Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition
D59-1 (CANH) - D59-12	Ignition switch off	1 Mohms or higher

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(CANL)		

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK (2GR-FE)	A
OK (1AR-FE)	B
NG	C

B: REPLACE ECM (See **REMOVAL**)

C: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (ECM MAIN WIRE)

Front view of wire harness connector:
(to CAN No. 2 Junction Connector)

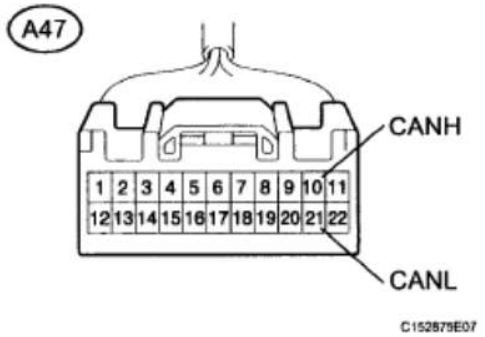


Fig. 105: Identifying CAN Junction Connector Terminals RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

A: REPLACE ECM (See **FUEL INJECTOR CIRCUIT**)

8. **CHECK FOR SHORT IN CAN BUS WIRES (YAW RATE SENSOR BRANCH WIRE)**
   a. Disconnect the yaw rate sensor connector.

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Front view of wire harness connector:
(to Yaw Rate Sensor)

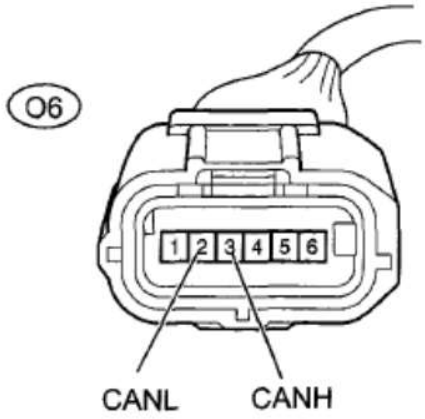


Fig. 106: Identifying Yaw Rate Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

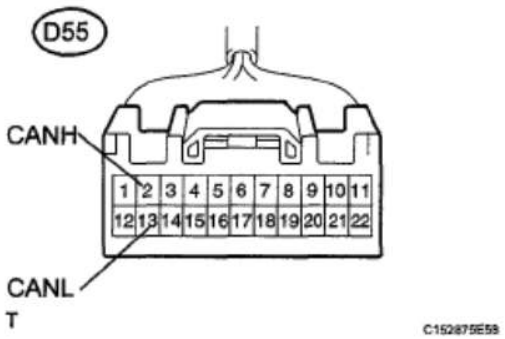
Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-2 (CANH) - D55-13 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (YAW RATE SENSOR BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)



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Fig. 107: Identifying CAN Junction Connector Terminals CTR
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE YAW RATE SENSOR (See **REMOVAL**)

9. **CHECK FOR SHORT IN CAN BUS WIRES (CENTER AIRBAG SENSOR ASSEMBLY BRANCH WIRE)**
   a. Disconnect the center airbag sensor assembly connector.

Center Airbag Sensor Assembly

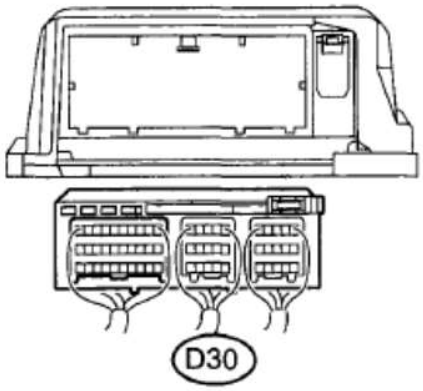


Fig. 108: Identifying Center Airbag Sensor Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-3 (CANH) - D55-14 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (CENTER AIRBAG SENSOR ASSEMBLY)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

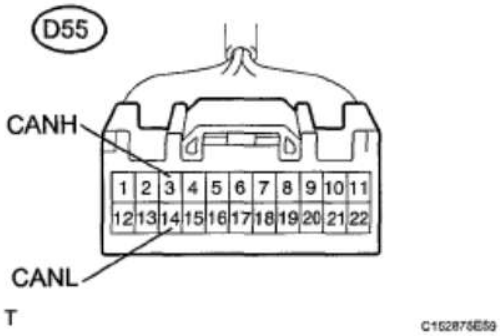


Fig. 109: Identifying CAN Junction Connector Terminals CTR
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE CENTER AIRBAG SENSOR ASSEMBLY (See **ON-VEHICLE INSPECTION**)

10. **CHECK FOR SHORT IN CAN BUS WIRES (STEERING ANGLE SENSOR BRANCH WIRE)**
    a. Disconnect the steering angle sensor connector.

Steering Angle Sensor Connector:

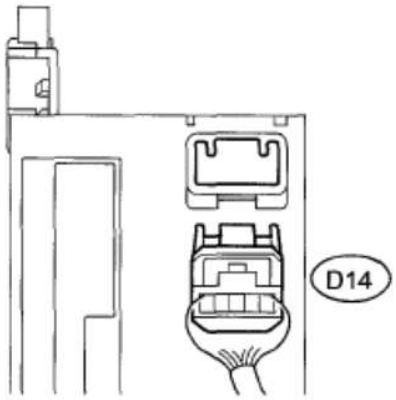


Fig. 110: Identifying Steering Angle Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-5 (CANH) - D55-16 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (STEERING ANGLE SENSOR BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)

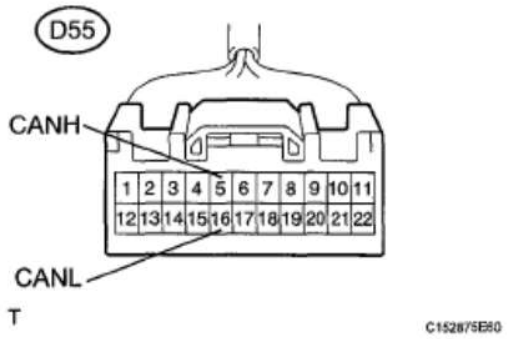


Fig. 111: Identifying CAN Junction CTR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE STEERING ANGLE SENSOR (See **REMOVAL**)

11. **CHECK FOR SHORT IN CAN BUS WIRES (POWER STEERING ECU BRANCH WIRE)**
    a. Disconnect the power steering ECU connector.

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Front view of wire harness connector:
(to Power Steering ECU)



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Fig. 112: Identifying Power Steering ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-7 (CANH) - D55-18 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (POWER STEERING ECU BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

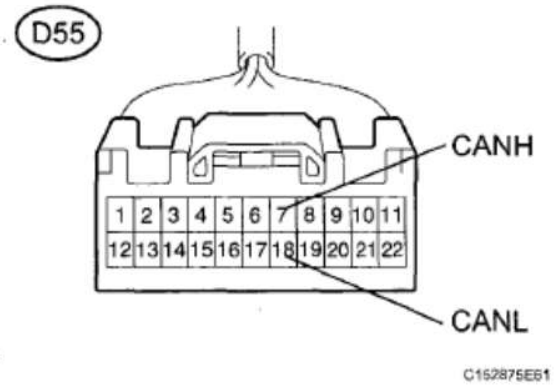


Fig. 113: Identifying CAN Junction CTR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE POWER STEERING ECU (See **REMOVAL**)

12. **CHECK FOR SHORT IN CAN BUS WIRES (MAIN BODY ECU BRANCH WIRE)**
    a. Disconnect the main body ECU connector.

Front view of wire harness connector:
(to Main Body ECU)

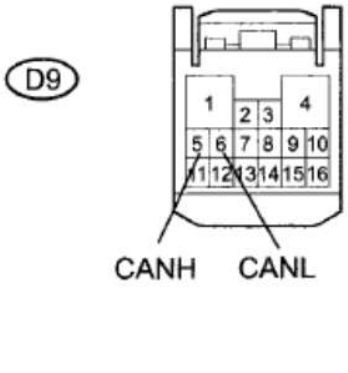


Fig. 114: Identifying Main Body ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-8 (CANH) - D55-19 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (MAIN BODY ECU BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)

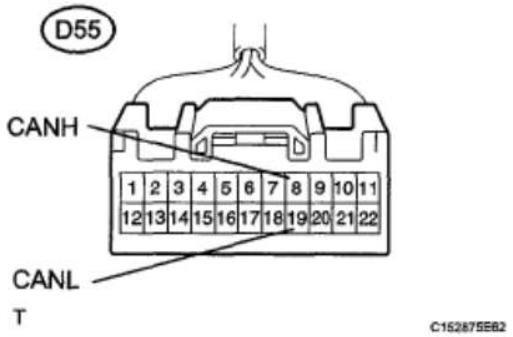


Fig. 115: Identifying CAN Junction CTR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE MAIN BODY ECU

13. **CHECK FOR SHORT IN CAN BUS WIRES (AIR CONDITIONING AMPLIFIER BRANCH WIRE)**
    a. Disconnect the air conditioning amplifier connector.

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Front view of wire harness connector:
(to Air Conditioning Amplifier)

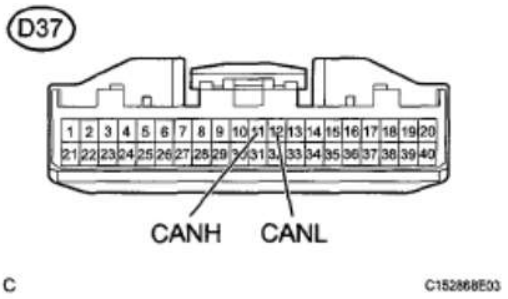


Fig. 116: Identifying Air Conditioning Amplifier Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D59-3 (CANH) - D59-14 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (AIR CONDITIONING AMPLIFIER BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector RH)

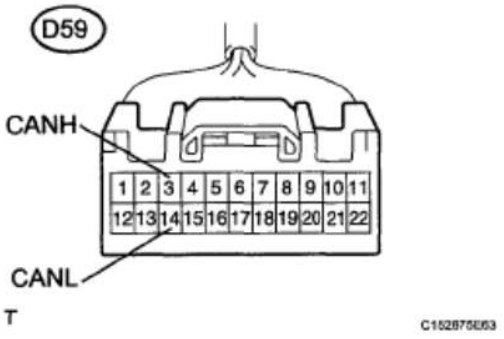


Fig. 117: Identifying CAN Junction RH Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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OK: REPLACE AIR CONDITIONING AMPLIFIER (See **REMOVAL**)

14. **CHECK FOR SHORT IN CAN BUS WIRES (SKID CONTROL ECU BRANCH WIRE)**
    a. Disconnect the skid control ECU connector.

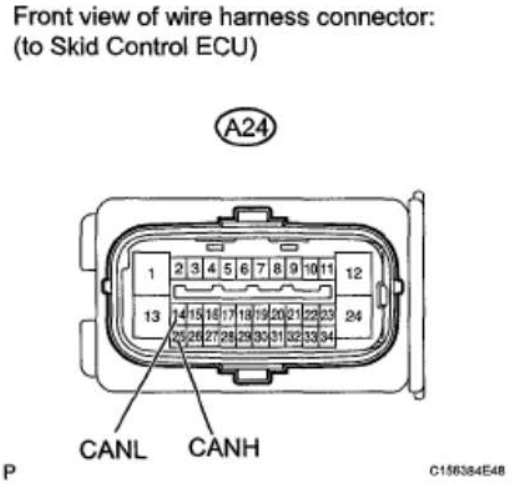


Fig. 118: Identifying Skid Control ECU Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D59-4 (CANH) - D59-15 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (SKID CONTROL ECU BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector RH)

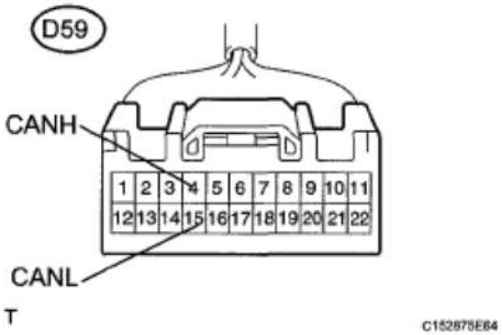


Fig. 119: Identifying CAN Junction RH Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE BRAKE ACTUATOR ASSEMBLY (SKID CONTROL ECU BRANCH WIRE) (See **REMOVAL**)

15. **CHECK FOR SHORT IN CAN BUS WIRES (ACCESSORY GATEWAY BRANCH WIRE)**
    a. Disconnect the accessory gateway connector.

    HINT:

    When accessories not connect it, repair or replace the accessory gateway branch wire or connector.

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

    Standard resistance

CAN BUS LINE SYMPTOM CHART

Tester Connection	Condition	Specified Condition
D59-2 (CANH) - D59-13 (CANL)	Ignition switch off	1 Mohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (ACCESSORY GATEWAY BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector RH)

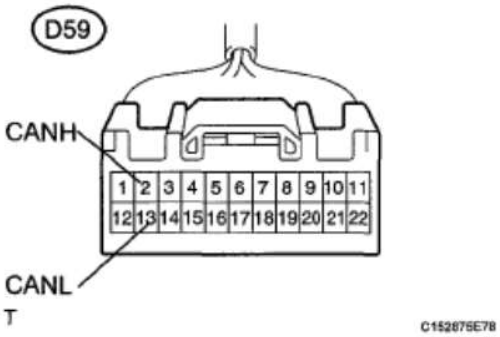


Fig. 120: Identifying CAN Junction RH Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: CHECK AND REPLACE THE ACCESSORY

CHECK CAN BUS LINE FOR SHORT TO +B

DESCRIPTION

There may be a short circuit between the CAN bus line and +B when no resistance exists between terminals 6 (CANH) and 16 (BAT) or terminals 14 (CANL) and 16 (BAT) of the DLC3.

TESTER CONNECTION SPECIFIED CONDITION CHART

Symptom	Trouble Area
No resistance exists between terminals 6 (CANH) and 16 (BAT) or terminals 14 (CANL) and 16 (BAT) of the DLC3.	• Short to +B in CAN bus wire • Skid control ECU • Power steering ECU • Steering angle sensor Yaw rate sensor • ECM • Center airbag sensor assembly • Air conditioning amplifier • Combination meter ECU • Main body ECU Accessory gateway • CAN junction connector CTR • CAN junction connector RH

WIRING DIAGRAM

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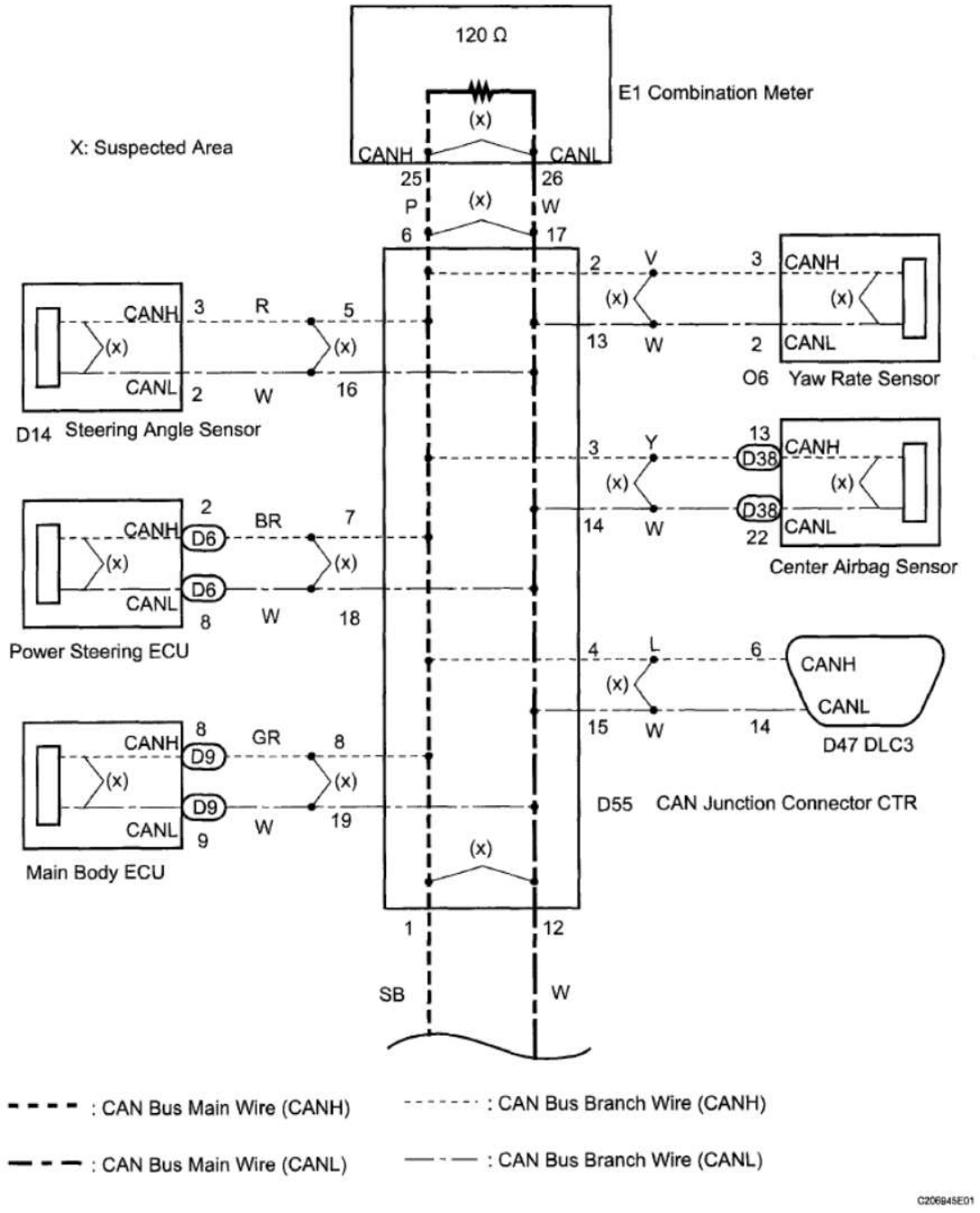


Fig. 121: CAN Bus Line For Short To +B - Wiring Diagram (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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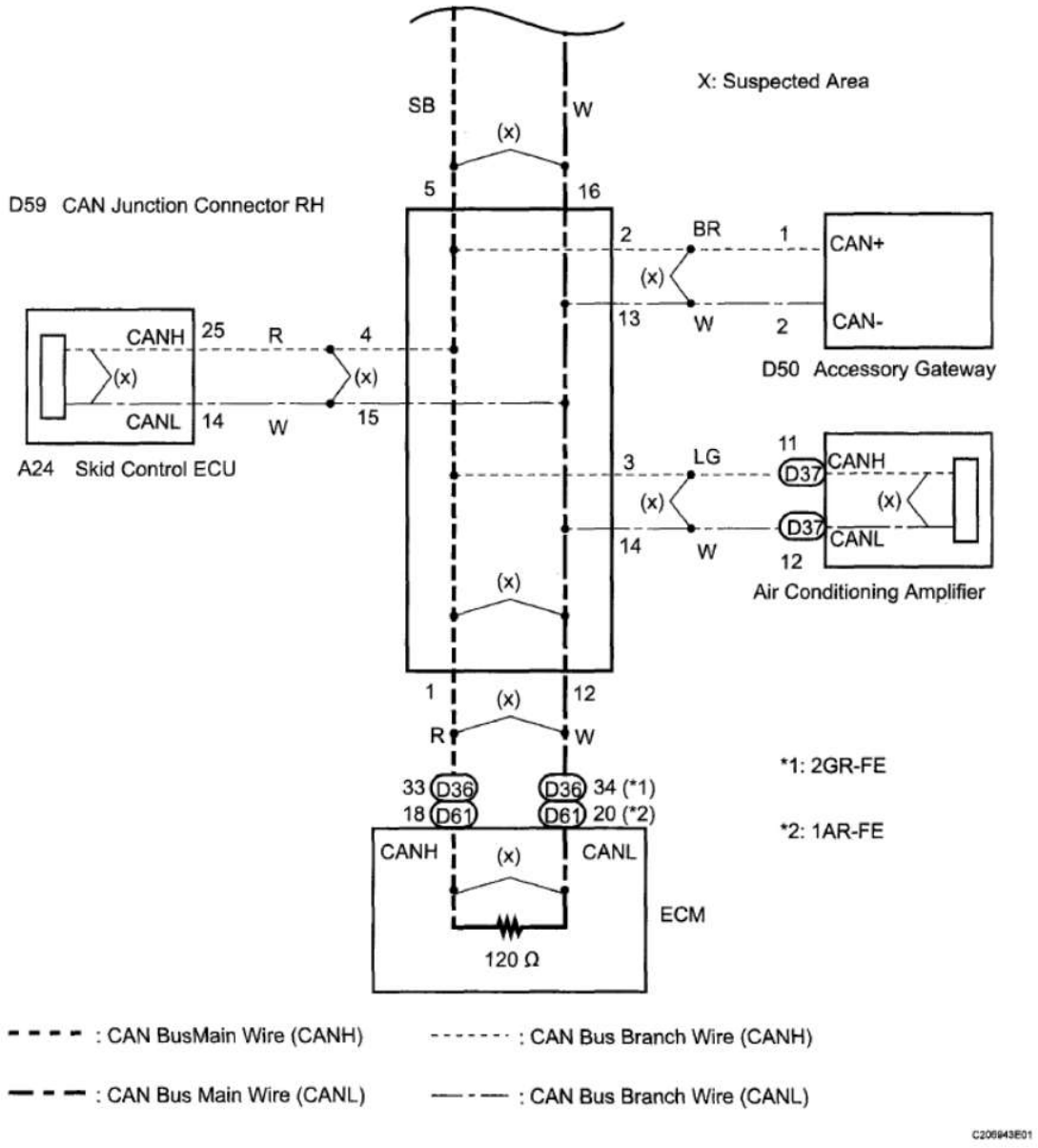


Fig. 122: CAN Bus Line For Short To +B - Wiring Diagram (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **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 and light reminder warning system are 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 the doors need to be opened in order to check the connectors,**

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open the doors and leave them open.

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (CAN JUNCTION CONNECTOR CTR)**
   a. Turn the ignition switch off, and disconnect negative battery terminal.
   b. Disconnect the CAN junction connector CTR.
   c. Measure the resistance according to the value (s) in the table below.

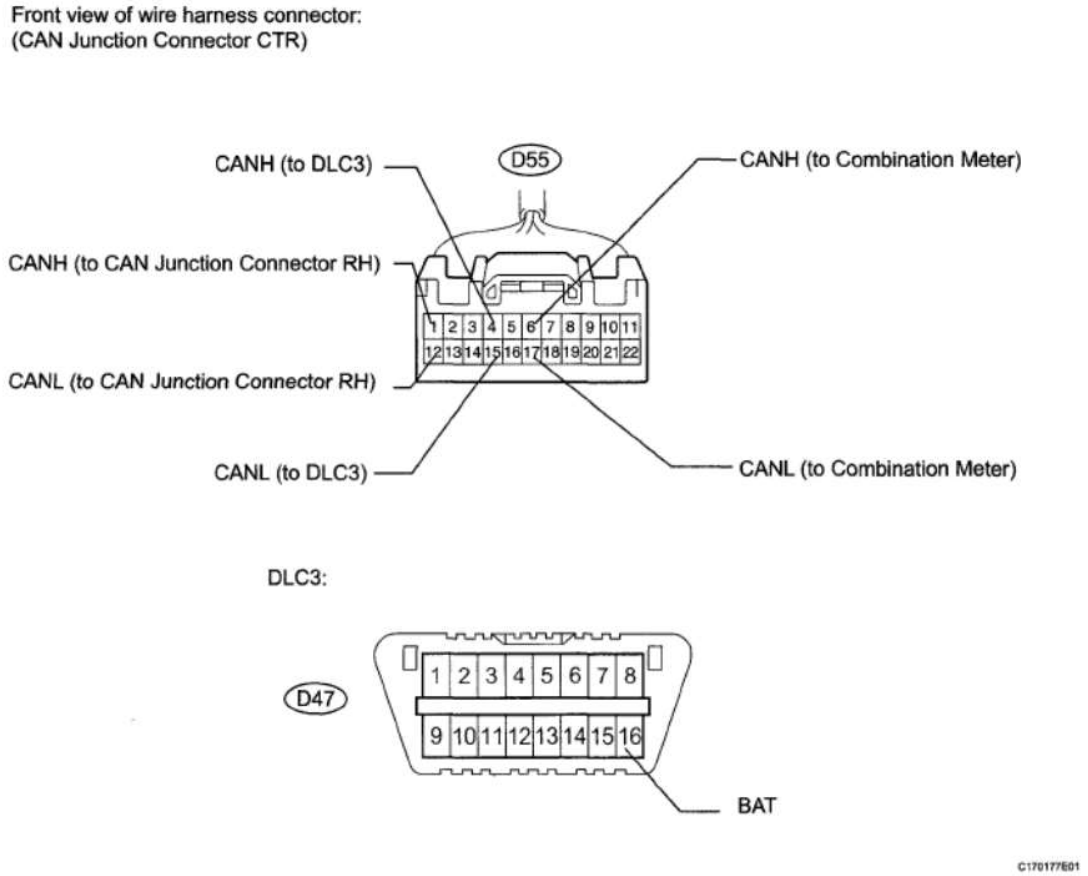


Fig. 123: Identifying CAN Junction Connector CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

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RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-1 (CANH) - D47-16 (BAT)	SB - LG	CAN junction connector RH	Disconnect negative battery terminal	6 kohms or higher
D55-12 (CANL) - D47-16 (BAT)	W - LG	CAN junction connector RH	Disconnect negative battery terminal	6 kohms or higher
D55-4 (CANH) - D47-16 (BAT)	L - LG	DLC3	Disconnect negative battery terminal	6 kohms or higher
D55-15 (CANL) - D47-16 (BAT)	W - LG	DLC3	Disconnect negative battery terminal	6 kohms or higher
D55-6 (CANH) - D47-16 (BAT)	P - LG	Combination meter	Disconnect negative battery terminal	6 kohms or higher
D55-17 (CANL) - D47-16 (BAT)	W - LG	Combination meter	Disconnect negative battery terminal	6 kohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (DLC3 branch wire)	B
NG (Combination meter main wire)	C
NG (CAN junction connector RH main wire)	D

B: REPAIR OR REPLACE CAN BRANCH WIRE CONNECTED TO DLC3

C: Go to step 4

D: Go to step 5

A: Go to next step

2. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (CAN JUNCTION CONNECTOR CTR)**
   a. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(CAN Junction Connector CTR)

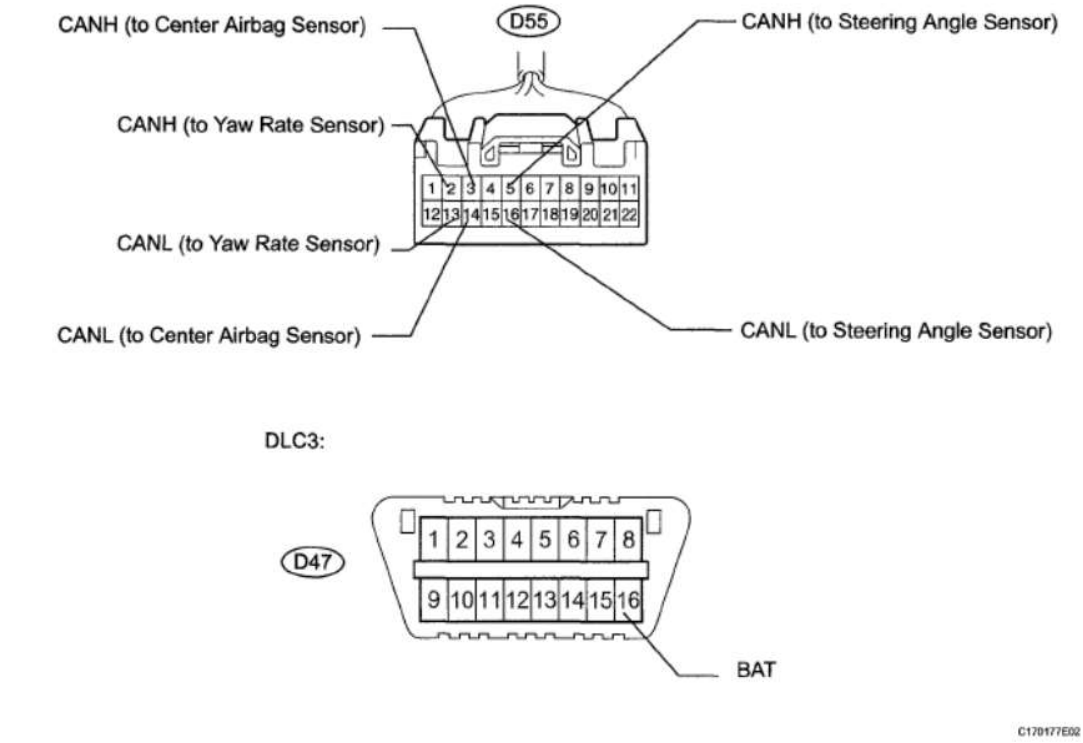


Fig. 124: Identifying CAN Junction Connector CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-2 (CANH) - D47-16 (BAT)	V - LG	Yaw rate sensor	Disconnect negative battery terminal	6 kohms or higher
D55-13 (CANL) - D47-16 (BAT)	W - LG	Yaw rate sensor	Disconnect negative battery terminal	6 kohms or higher
D55-3 (CANH) - D47-16 (BAT)	Y - LG	Center airbag sensor assembly	Disconnect negative battery terminal	6 kohms or higher
D55-14 (CANL) - D47-16 (BAT)	W - LG	Center airbag sensor assembly	Disconnect negative battery terminal	6 kohms or higher
D55-5 (CANH) -	R - LG	Steering angle	Disconnect	6 kohms or higher

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D47-16 (BAT)		sensor	negative battery terminal	
D55-16 (CANL) - D47-16 (BAT)	W - LG	Steering angle sensor	Disconnect negative battery terminal	6 kohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Yaw rate sensor branch wire)	B
NG (Center airbag sensor assembly branch wire)	C
NG (Steering angle sensor branch wire)	D

B: Go to step 8

C: Go to step 9

D: Go to step 10

A: Go to next step

3. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (CAN JUNCTION CONNECTOR CTR)**
   a. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(CAN Junction Connector CTR)

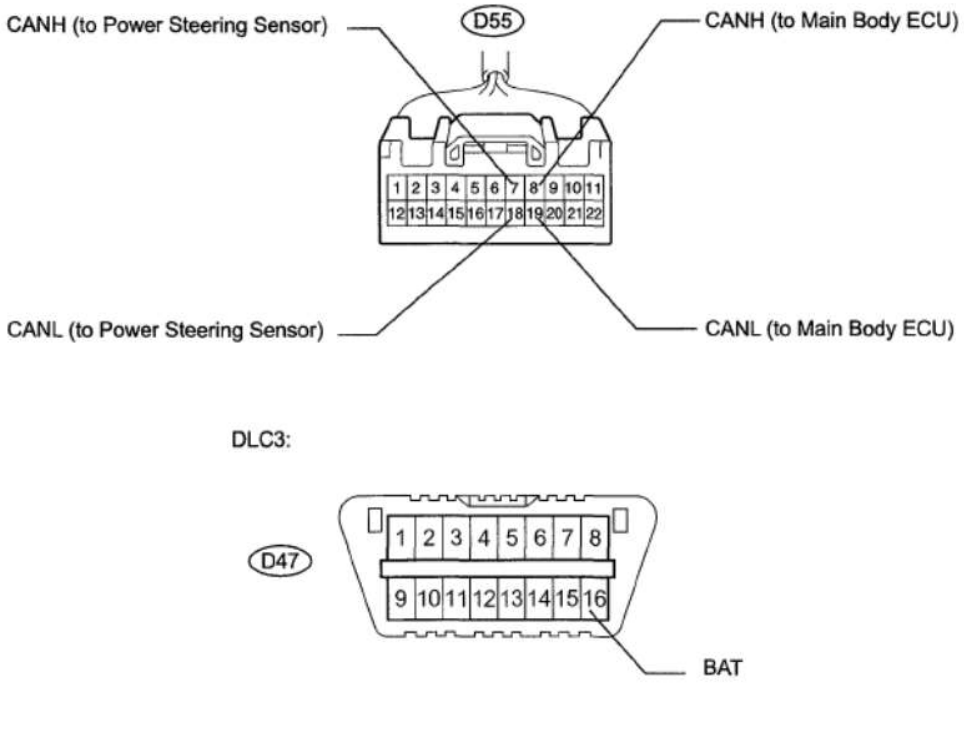


Fig. 125: Identifying CAN Junction Connector CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-7 (CANH) - D47-16 (BAT)	BR - LG	Power steering ECU	Disconnect negative battery terminal	6 kohms or higher
D55-18 (CANL) - D47-16 (BAT)	W - LG	Power steering ECU	Disconnect negative battery terminal	6 kohms or higher
D55-8 (CANH) - D47-16 (BAT)	GR - LG	Main body ECU	Disconnect negative battery terminal	6 kohms or higher
D55-19 (CANL) - D47-16 (BAT)	W - LG	Main body ECU	Disconnect negative battery terminal	6 kohms or higher

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Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Power steering ECU branch wire)	B
NG (Main body ECU branch wire)	C

B: Go to step 11

C: Go to step 12

A: REPLACE CAN JUNCTION CONNECTOR CTR

4. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (COMBINATION METER MAIN WIRE)**
   a. Disconnect the combination meter connector.

Front view of wire harness connector:
(to Combination Meter)

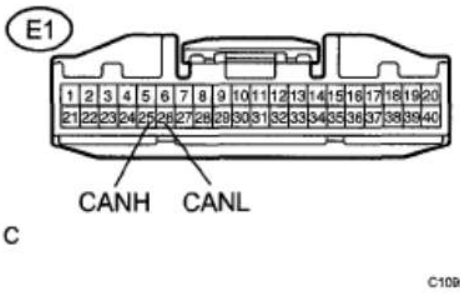


Fig. 126: Identifying Combination Meter Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-6 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D55-17 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (COMBINATION

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METER MAIN WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)

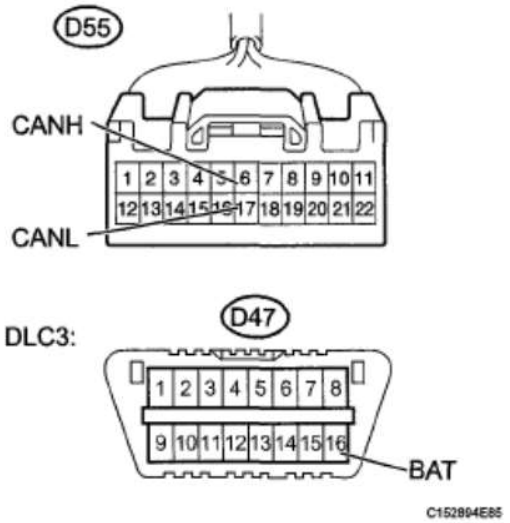


Fig. 127: Identifying CAN Junction CTR Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE COMBINATION METER (See **REMOVAL**)

5. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (CAN JUNCTION CONNECTOR RH)**
   a. Disconnect the CAN junction connector RH
   b. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(CAN Junction Connector RH)

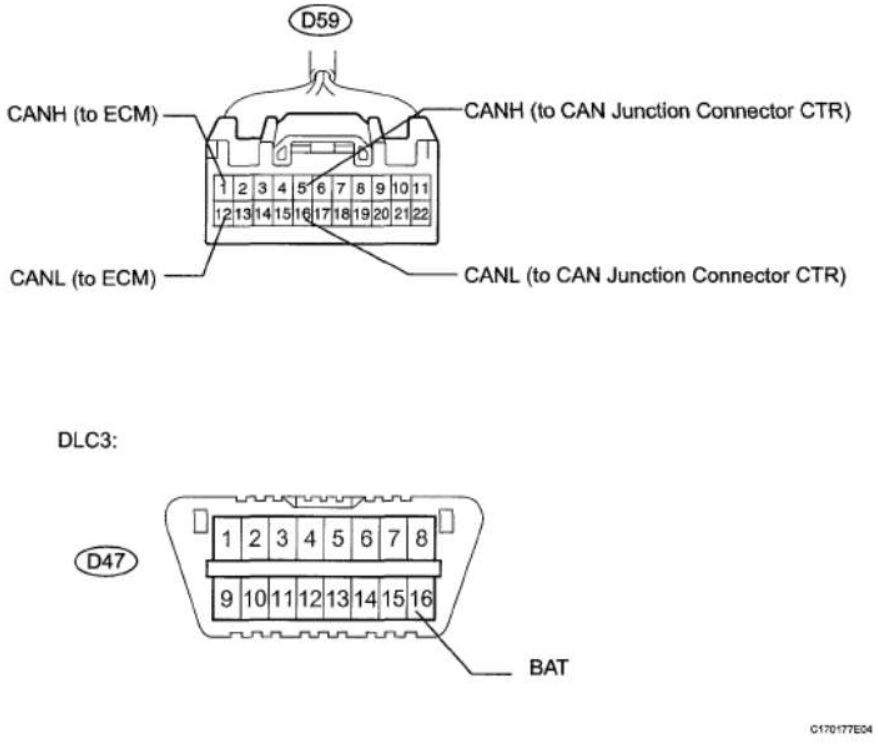


Fig. 128: Identifying CAN Junction Connector RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

The resistance must be measured after the CAN junction connector CTR is disconnected.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D59-1 (CANH) - D47-16 (BAT)	R - LG	ECM	Disconnect negative battery terminal	6 kohms or higher
D59-12 (CANL) - D47-16 (BAT)	W - LG	ECM	Disconnect negative battery terminal	6 kohms or higher
D59-5 (CANH) - D47-16 (BAT)	SB - LG	CAN junction connector CTR	Disconnect negative battery terminal	6 kohms or higher

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D59-16 (CANL) - D47-16 (BAT)	W - LG	CAN junction connector CTR	Disconnect negative battery terminal	6 kohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (ECM main wire)	B
NG (CAN junction connector CTR main wire)	C

B: Go to step 7

C: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (CAN JUNCTION CONNECTOR CTR - CAN JUNCTION CONNECTOR RH)

A: Go to next step

6. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (CAN JUNCTION CONNECTOR RH)**
   a. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(CAN Junction Connector RH)

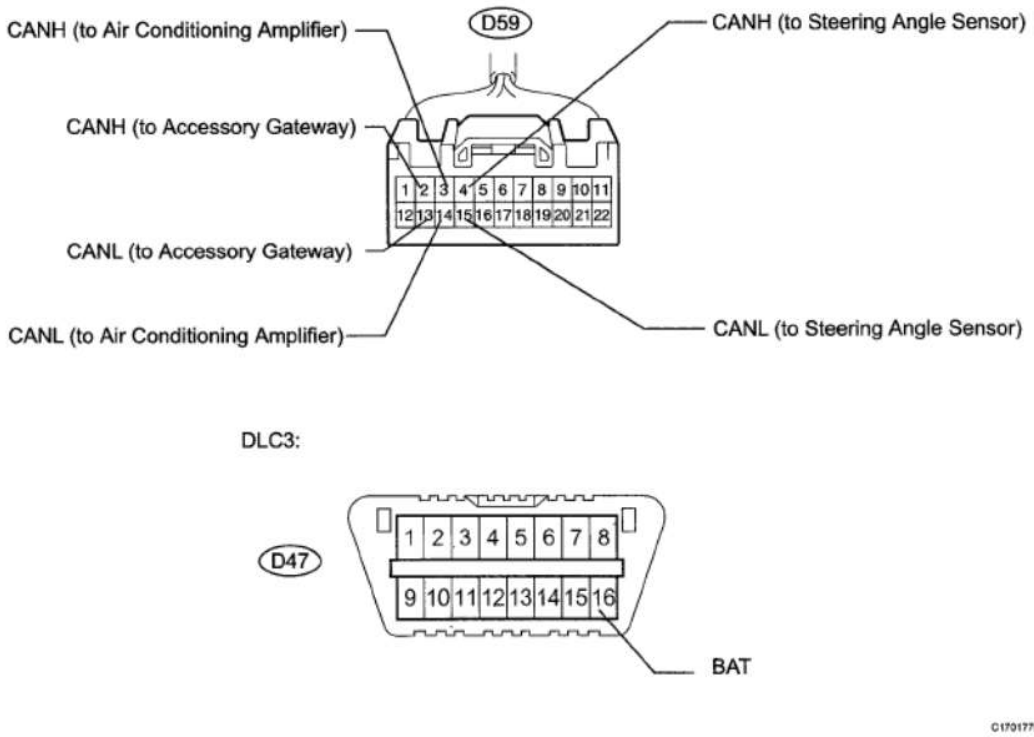


Fig. 129: Identifying CAN Junction Connector RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D59-2 (CANH) - D47-16 (BAT)	BR - LG	Accessory gateway	Disconnect negative battery terminal	6 kohms or higher
D59-13 (CANL) - D47-16 (BAT)	W - LG	Accessory gateway	Disconnect negative battery terminal	6 kohms or higher
D59-3 (CANH) - D47-16 (BAT)	LG - LG	Air conditioning amplifier	Disconnect negative battery terminal	6 kohms or higher
D59-14 (CANL) - D47-16 (BAT)	W - LG	Air conditioning amplifier	Disconnect negative battery terminal	6 kohms or higher
D59-4 (CANH) -	B - LG	Skid control ECU	Disconnect	6 kohms or higher

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D47-16 (BAT)			negative battery terminal	
D59-15 (CANL) - D47-16 (BAT)	W - LG	Skid control ECU	Disconnect negative battery terminal	6 kohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Accessory gateway branch wire)	B
NG (Air conditioning amplifier branch wire)	C
NG (Skid control ECU branch wire)	D

B: Go to step 15

C: Go to step 13

D: Go to step 14

A: REPLACE CAN JUNCTION CONNECTOR RH

7. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (ECM MAIN WIRE)**
   a. Disconnect the ECM connector.

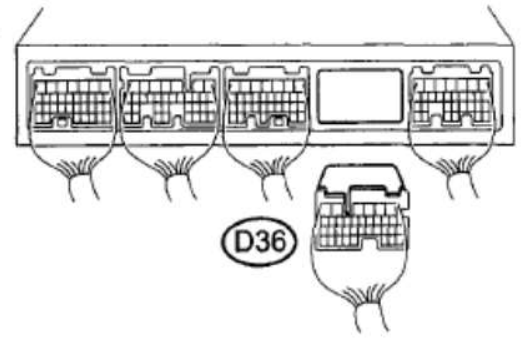
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Rear view of wire harness connector:
(to ECM)

2GR-FE:



1AR-FE:

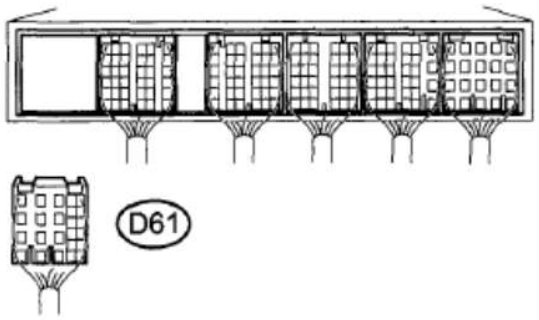


Fig. 130: Identifying ECM Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition
D59-1 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D59-12 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

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Result	Proceed to
OK (2GR-FE)	A
OK (1AR-FE)	B
NG	C

B: REPLACE ECM (See **REMOVAL**)

C: REPAIR OR REPLACE CAN MAIN WIRE OR CONNECTOR (ECM MAIN WIRE)

Front view of wire harness connector:
(CAN Junction Connector RH)

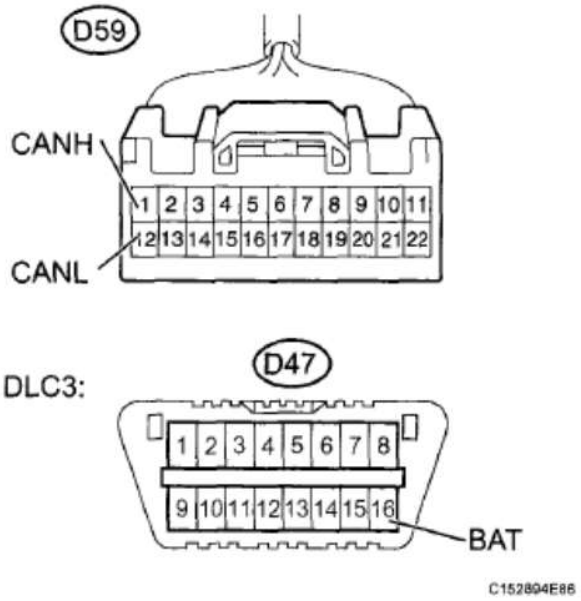


Fig. 131: Identifying CAN Junction RH Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

A: REPLACE ECM (See **FUEL INJECTOR CIRCUIT**)

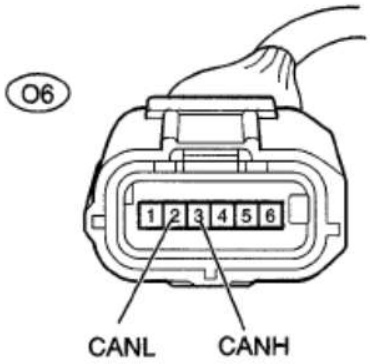
8. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (YAW RATE SENSOR BRANCH WIRE)**
   a. Disconnect the yaw rate sensor connector.

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Front view of wire harness connector:
(to Yaw Rate Sensor)



C165630E04

Fig. 132: Identifying Yaw Rate Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-2 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D55-13 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (YAW RATE SENSOR BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

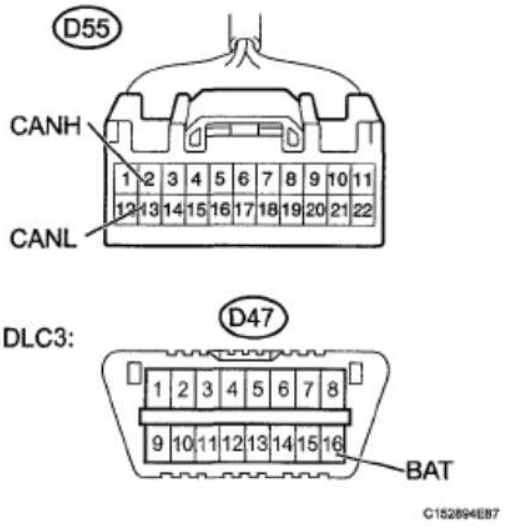


Fig. 133: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE YAW RATE SENSOR (See **REMOVAL**)

9. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (CENTER AIRBAG SENSOR ASSEMBLY BRANCH WIRE)**
   a. Disconnect the center airbag sensor assembly connector.

Center Airbag Sensor Assembly

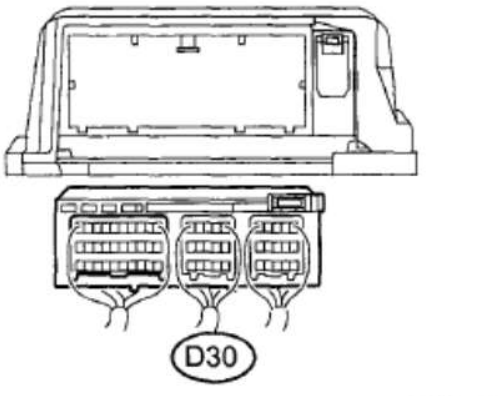


Fig. 134: Identifying Center Airbag Sensor Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-3 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D55-14 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (CENTER AIRBAG SENSOR ASSEMBLY BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)

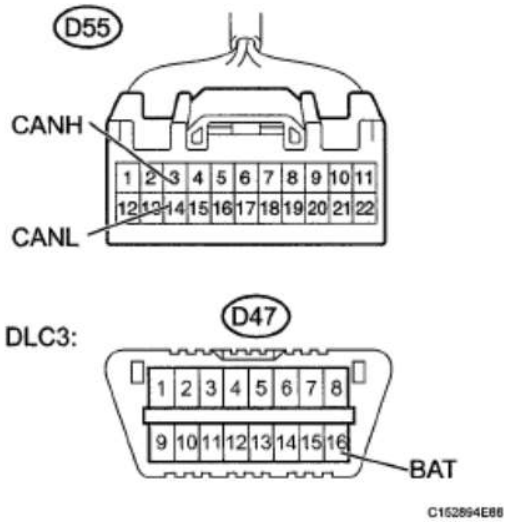


Fig. 135: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE CENTER AIRBAG SENSOR ASSEMBLY (See **ON-VEHICLE INSPECTION**)

10. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (STEERING ANGLE SENSOR BRANCH WIRE)**
    a. Disconnect the steering angle sensor connector.

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Steering Angle Sensor Connector:

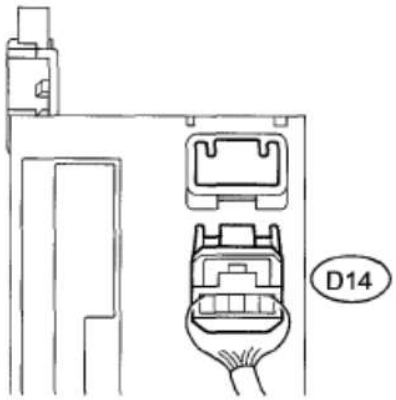


Fig. 136: Identifying Steering Angle Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-5 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D55-16 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (STEERING ANGLE SENSOR BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

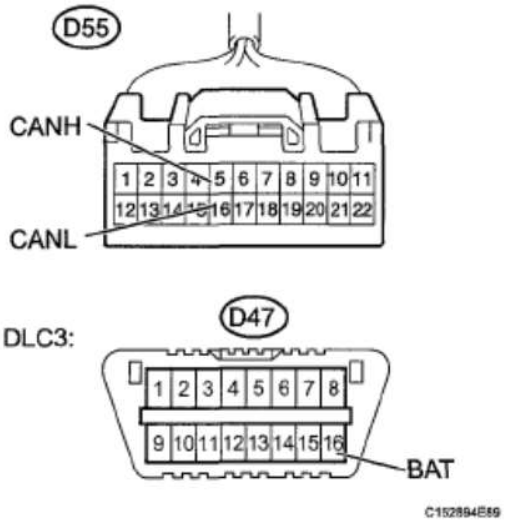


Fig. 137: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE STEERING ANGLE SENSOR (See **REMOVAL**)

11. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (POWER STEERING ECU BRANCH WIRE)**
    a. Disconnect the power steering ECU connector.

Front view of wire harness connector:
(to Power Steering ECU)

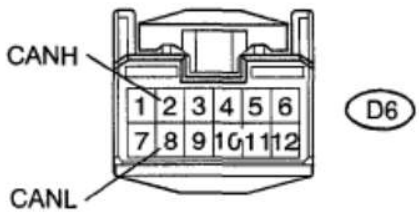


Fig. 138: Identifying Power Steering ECU Connector Terminals (CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-7 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D55-18 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (POWER STEERING ECU BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)

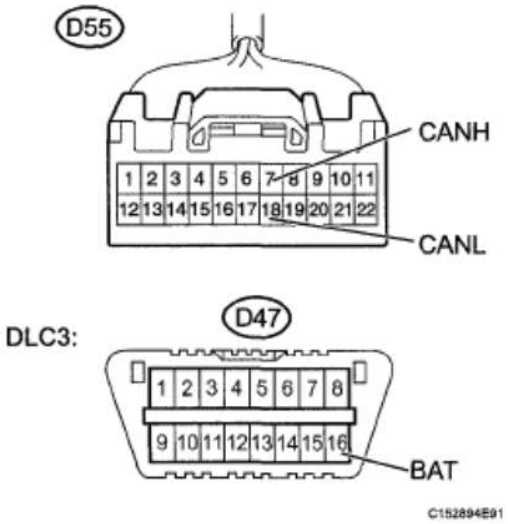


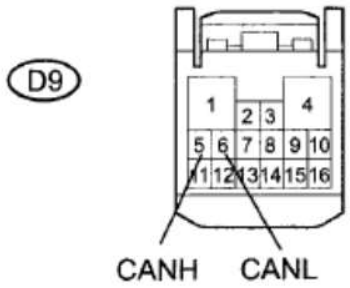
Fig. 139: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE POWER STEERING ECU (See **REMOVAL**)

12. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (MAIN BODY ECU BRANCH WIRE)**
    a. Disconnect the main body ECU connector.

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Front view of wire harness connector:
(to Main Body ECU)



C196604E02

Fig. 140: Identifying Main Body ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-8 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D55-19 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (MAIN BODY ECU BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

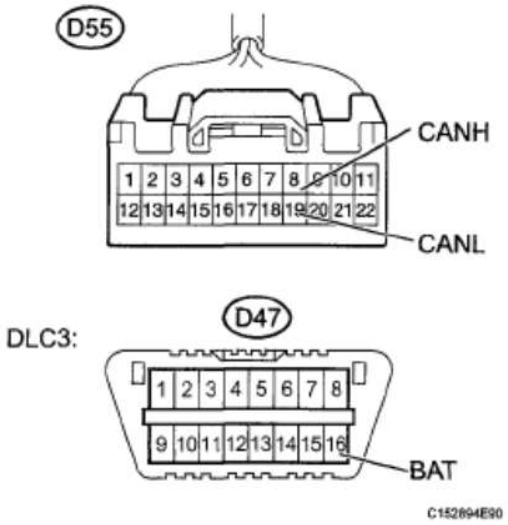


Fig. 141: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE MAIN BODY ECU

13. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (AIR CONDITIONING AMPLIFIER BRANCH WIRE)**
    a. Disconnect the air conditioning amplifier connector.

Front view of wire harness connector:
(to Air Conditioning Amplifier)

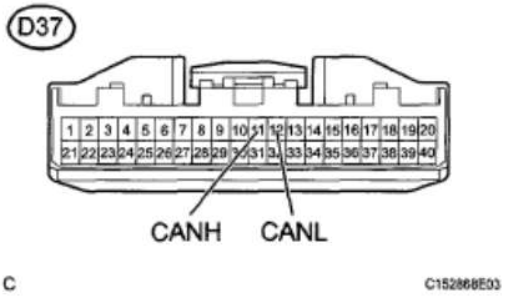


Fig. 142: Identifying Air Conditioning Amplifier Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D59-3 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D59-14 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (AIR CONDITIONING AMPLIFIER BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector RH)

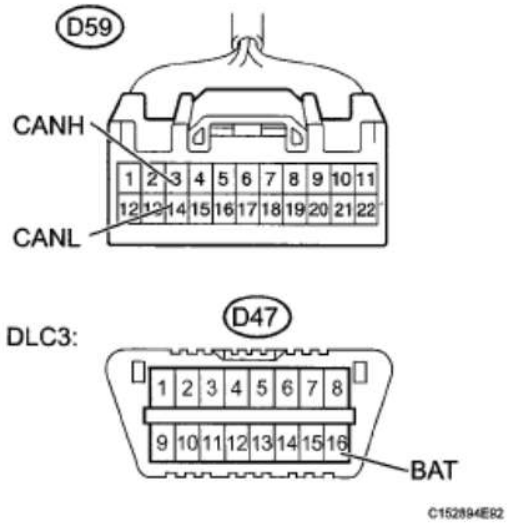


Fig. 143: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE AIR CONDITIONING AMPLIFIER (See **REMOVAL**)

14. **CHECK SHORT TO B+ IN CAN BUS WIRE (SKID CONTROL ECU BRANCH WIRE)**
    a. Disconnect the skid control ECU connector.

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Front view of wire harness connector:
(to Skid Control ECU)

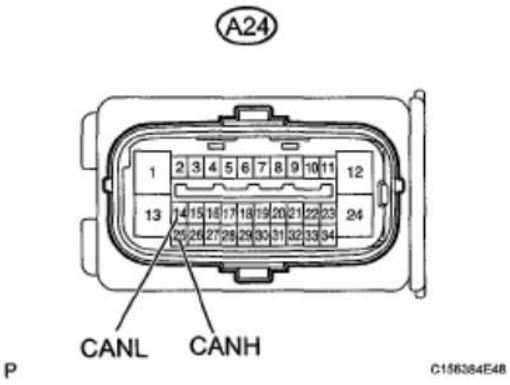


Fig. 144: Identifying Skid Control ECU Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D59-4 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D59-15 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (SKID CONTROL ECU BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector RH)

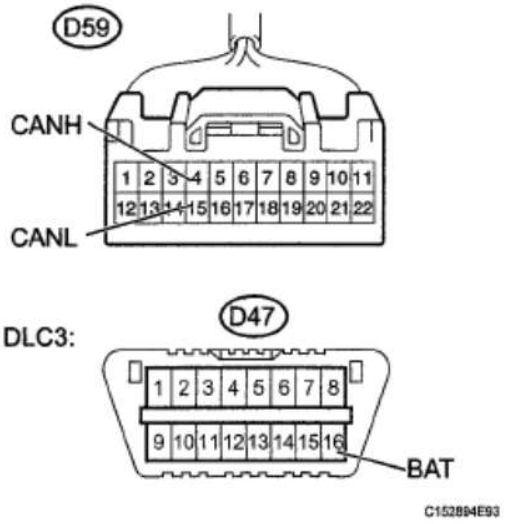


Fig. 145: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE BRAKE ACTUATOR ASSEMBLY (See **REMOVAL**)

15. **CHECK FOR SHORT TO B+ IN CAN BUS WIRE (ACCESSORY GATEWAY BRANCH WIRE)**
    a. Disconnect the accessory gateway connector.

    HINT:

    When accessories not connect it, repair or replace the accessory gateway branch wire or connector.

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

    Standard resistance

    CAN BUS LINE SYMPTOM CHART

Tester Connection	Condition	Specified Condition
D59-2 (CANH) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher
D59-13 (CANL) - D47-16 (BAT)	Disconnect negative battery terminal	6 kohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (ACCESSORY GATEWAY BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector RH)

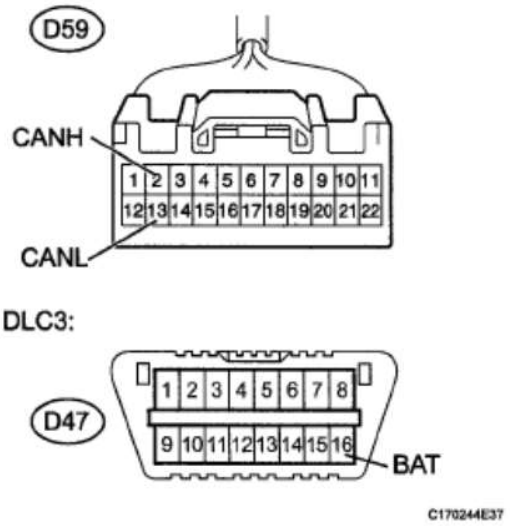


Fig. 146: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: CHECK AND REPLACE THE ACCESSORY

CHECK CAN BUS LINE FOR SHORT TO GND

DESCRIPTION

There may be a short circuit between the CAN bus line and GND when there is no resistance between terminals 6 (CANH) and 4 (CG) or terminals 14 (CANL) and 4 (CG) of the DLC3.

TESTER CONNECTION SPECIFIED CONDITION CHART

Symptom	Trouble Area
No resistance exists between terminals 6 (CANH) and 4 (CG) or terminals 14 (CANL) and 4 (CG) of DLC3.	• Short to GND in CAN bus wire • Skid control ECU • Power steering ECU • Steering angle sensor • Yaw rate sensor • ECM • Center airbag sensor assembly • Air conditioning amplifier • Combination meter ECU • Main body ECU

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	• Accessory gateway • CAN junction connector CTR • CAN junction connector RH

WIRING DIAGRAM

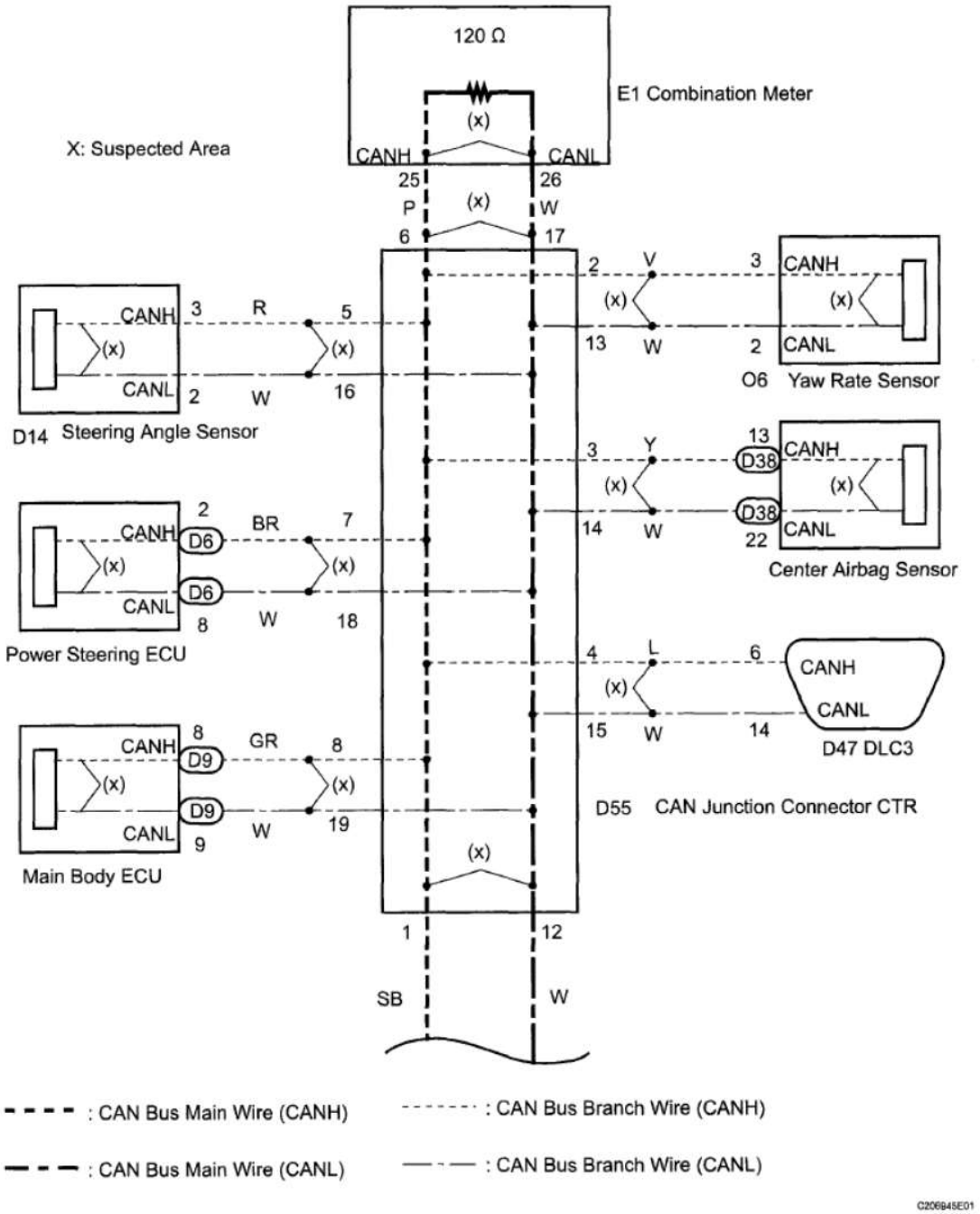


Fig. 147: CAN Bus Line For Short To GND - Wiring Diagram (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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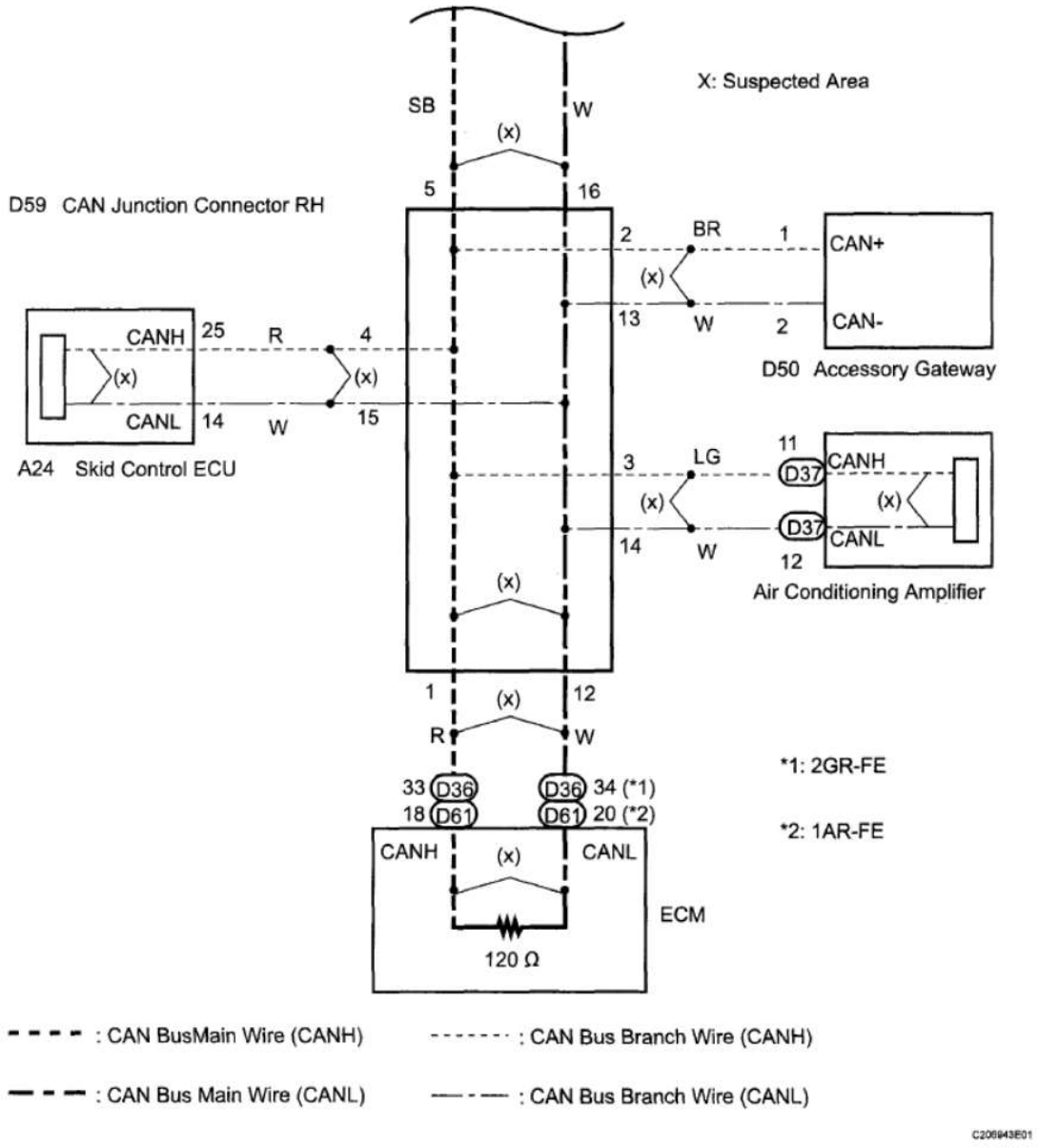


Fig. 148: CAN Bus Line For Short To GND - Wiring Diagram (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE:

- **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 and light reminder warning system are 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 the doors need to be opened in order to check the connectors,**

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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 the resistance variation.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (CAN JUNCTION CONNECTOR CTR)**
   a. Turn the ignition switch off.
   b. Disconnect the CAN junction connector CTR.
   c. Measure the resistance according to the value (s) in the table below.

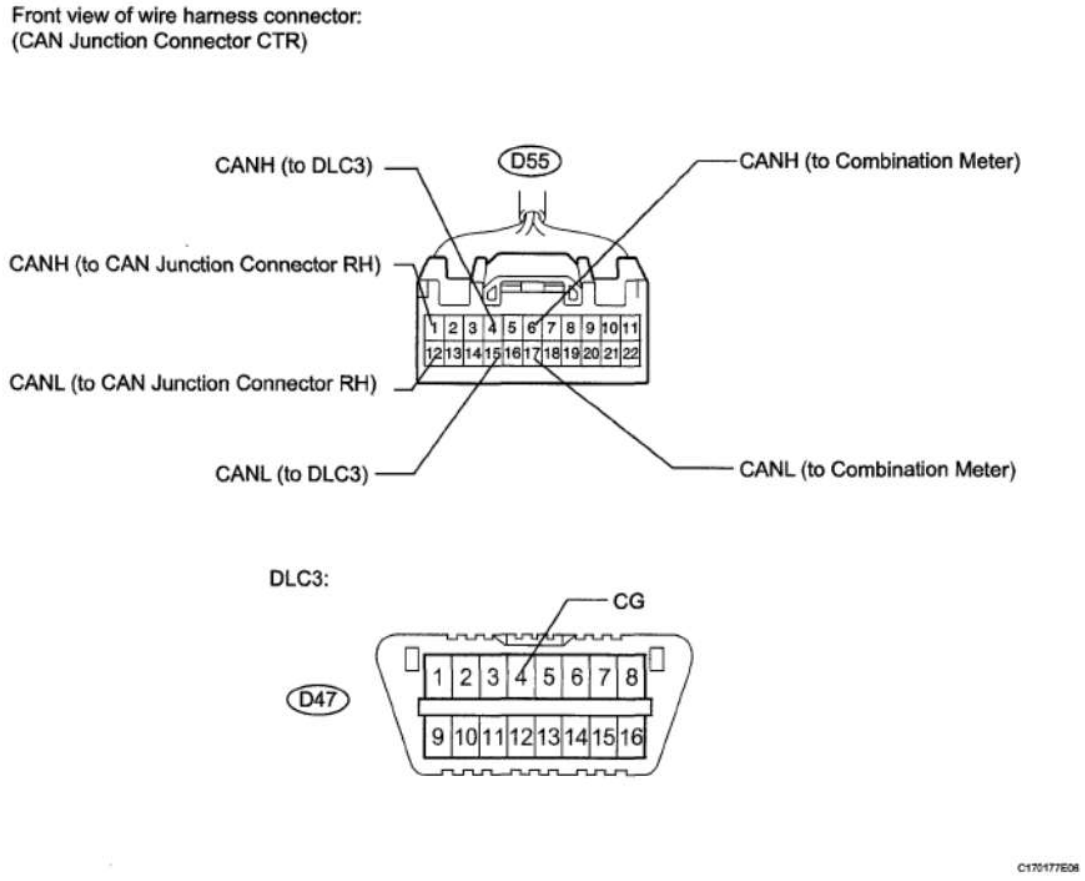


Fig. 149: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

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RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-1 (CANH) - D47-4 (CG)	SB - B	CAN junction connector RH	Ignition switch off	200 ohms or higher
D55-12 (CANL) - D47-4 (CG)	W-B	CAN junction connector RH	Ignition switch off	200 ohms or higher
D55-4 (CANH) - D47-4 (CG)	L-B	DLC3	Ignition switch off	200 ohms or higher
D55-15 (CANL) - D47-4 (CG)	W-B	DLC3	Ignition switch off	200 ohms or higher
D55-6 (CANH) - D47-4 (CG)	P-B	Combination meter	Ignition switch off	200 ohms or higher
D55-17 (CANL) - D47-4 (CG)	W-B	Combination meter	Ignition switch off	200 ohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (DLC3 branch wire)	B
NG (Combination meter main wire)	C
NG (CAN junction connector RH main wire)	D

B: REPAIR OR REPLACE DLC3 BRANCH WIRE

C: Go to step 4

D: Go to step 5

A: Go to next step

2. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (CAN JUNCTION CONNECTOR CTR)**
   a. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(CAN Junction Connector CTR)

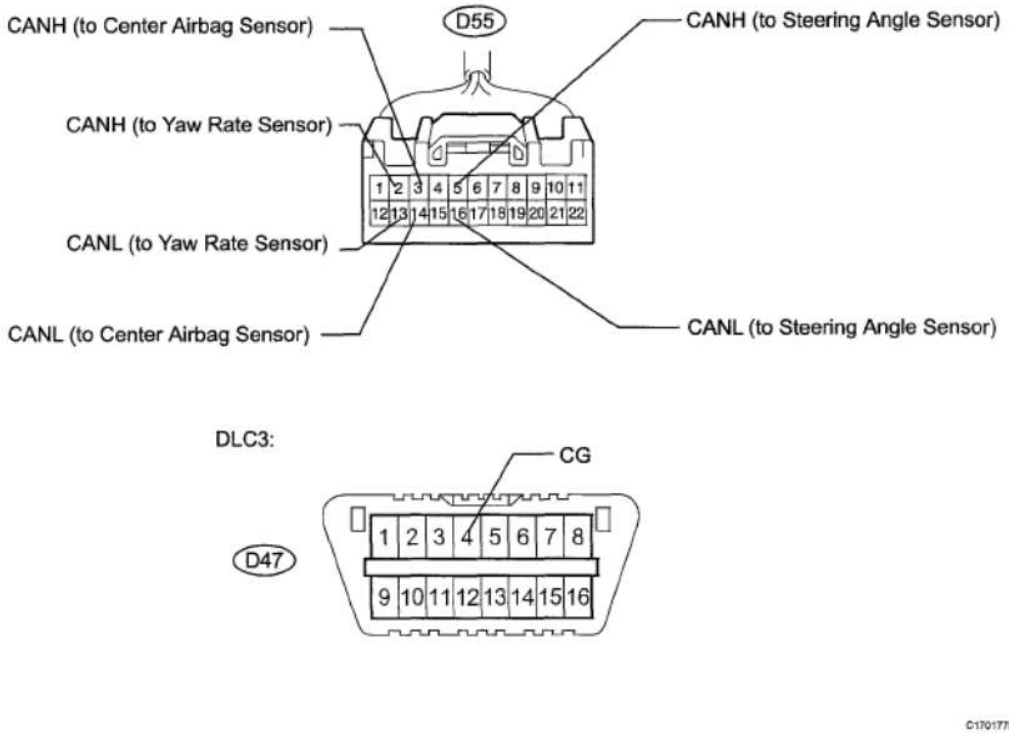


Fig. 150: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-2 (CANH) - D47-4 (CG)	V-B	Yaw rate sensor	Ignition switch off	200 ohms or higher
D55-13 (CANL) - D47-4 (CG)	W-B	Yaw rate sensor	Ignition switch off	200 ohms or higher
D55-3 (CANH) - D47-4 (CG)	Y-B	Center airbag sensor assembly	Ignition switch off	200 ohms or higher
D55-14 (CANL) - D47-4 (CG)	W-B	Center airbag sensor assembly	Ignition switch off	200 ohms or higher
D55-5 (CANH) - D47-4 (CG)	R-B	Steering angle sensor	Ignition switch off	200 ohms or higher
D55-16 (CANL) - D47-4 (CG)	W-B	Steering angle sensor	Ignition switch off	200 ohms or higher

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Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Yaw rate sensor branch wire)	B
NG (Center airbag sensor assembly branch wire)	C
NG (Steering angle sensor branch wire)	D

B: Go to step 8

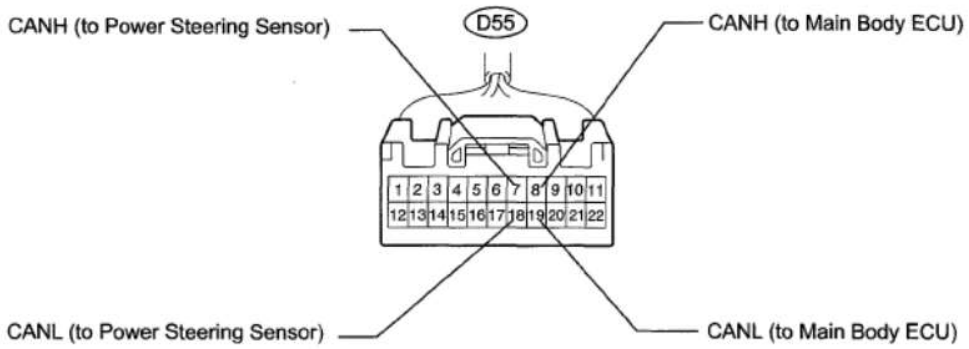
C: Go to step 9

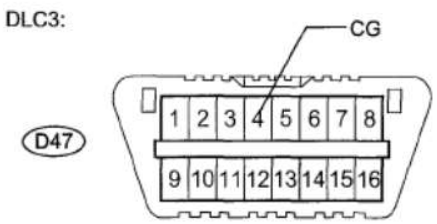
D: Go to step 10

A: Go to next step

3. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (CAN JUNCTION CONNECTOR CTR)**
   a. Measure the resistance according to the value (s) in the table below.

Front view of wire harness connector:
(CAN Junction Connector CTR)





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Fig. 151: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D55-7 (CANH) - D47-4 (CG)	BR-B	Power steering ECU	Ignition switch off	200 ohms or higher
D55-18 (CANL) - D47-4 (CG)	W-B	Power steering ECU	Ignition switch off	200 ohms or higher
D55-8 (CANH) - D47-4 (CG)	GR-B	Main body ECU	Ignition switch off	200 ohms or higher
D55-19 (CANL) - D47-4 (CG)	W-B	Main body ECU	Ignition switch off	200 ohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Power steering ECU branch wire)	B
NG (Main body ECU branch wire)	C

B: Go to step 11

C: Go to step 12

A: REPLACE CAN JUNCTION CONNECTOR CTR

4. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (COMBINATION METER MAIN WIRE)**
   a. Disconnect the combination meter connector.

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Front view of wire harness connector:
(to Combination Meter)

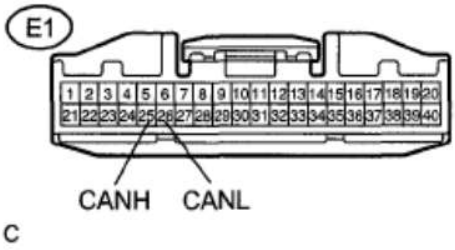


Fig. 152: Identifying Combination Meter Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-6 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D55-17 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS MAIN WIRE OR CONNECTOR (COMBINATION METER MAIN WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

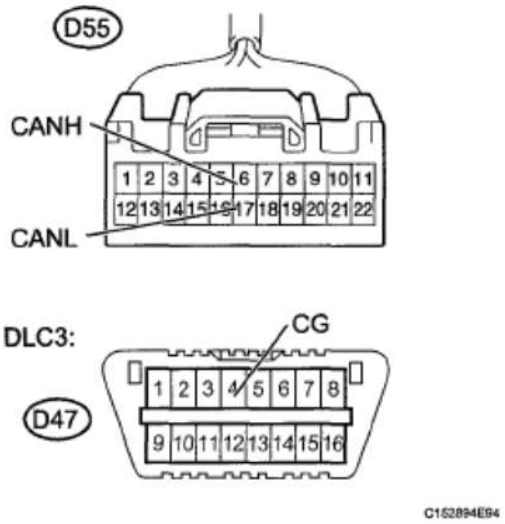


Fig. 153: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE COMBINATION METER (See **REMOVAL**)

5. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (CAN JUNCTION CONNECTOR RH)**
   a. Disconnect the CAN junction connector RH.
   b. Measure the resistance according to the value (s) in the table below.

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Front view of wire harness connector:
(CAN Junction Connector RH)

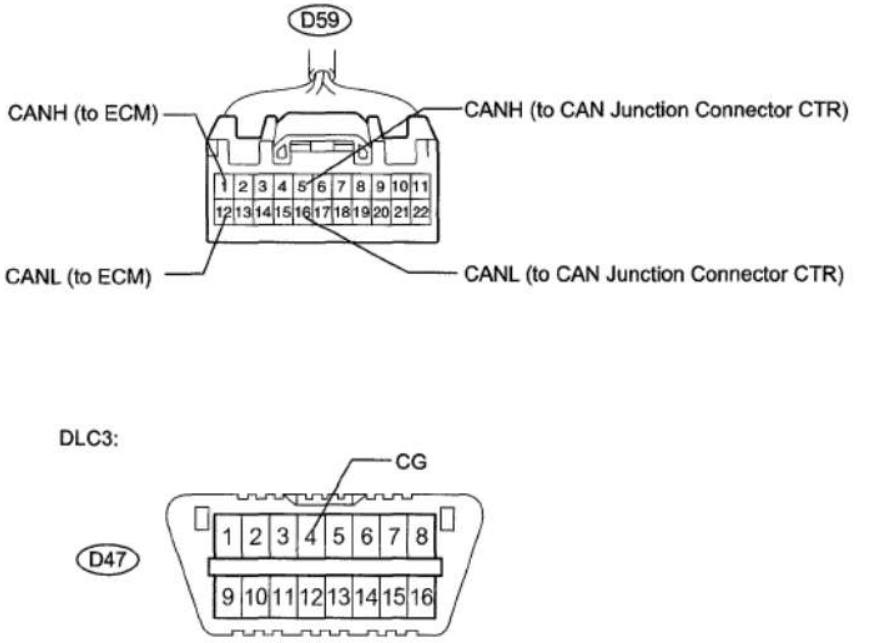


Fig. 154: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

The resistance must be measured after the CAN junction connector CTR is disconnected.

Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D59-1 (CANH) - D47-4 (CG)	R-B	ECM	Ignition switch off	200 ohms or higher
D59-12 (CANL) - D47-4 (CG)	W-B	ECM	Ignition switch off	200 ohms or higher
D59-5 (CANH) - D47-4 (CG)	SB - B	CAN junction connector CTR	Ignition switch off	200 ohms or higher
D59-16 (CANL) - D47-4 (CG)	W-B	CAN junction connector CTR	Ignition switch off	200 ohms or higher

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Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (ECM main wire)	B
NG (CAN junction connector CTR main wire)	C

B: Go to step 7

C: REPAIR OR REPLACE CAN BUS MAIN WIRE OR CONNECTOR (CAN JUNCTION CONNECTOR - CAN JUNCTION CONNECTOR RH)

A: Go to next step

6. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (CAN JUNCTION CONNECTOR RH)**
   a. Measure the resistance according to the value (s) in the table below.

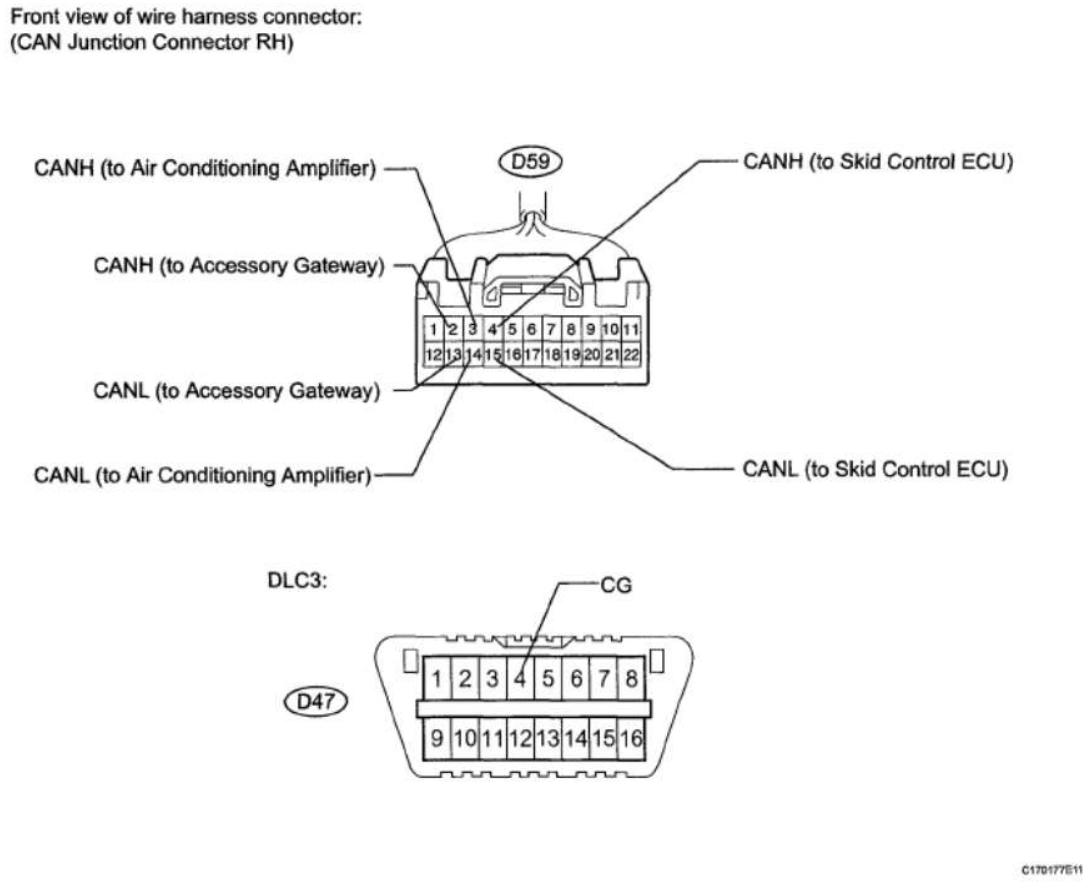


Fig. 155: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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Standard resistance

RESULT CHART

Tester Connection	Wiring Color	Connect to	Condition	Specified Condition
D59-2 (CANH) - D47-4 (CG)	BR-B	Accessory gateway	Ignition switch off	200 ohms or higher
D59-13 (CANL) - D47-4 (CG)	W-B	Accessory gateway	Ignition switch off	200 ohms or higher
D59-3 (CANH) - D47-4 (CG)	LG-B	Air conditioning amplifier	Ignition switch off	200 ohms or higher
D59-14 (CANL) - D47-4 (CG)	W-B	Air conditioning amplifier	Ignition switch off	200 ohms or higher
D59-4 (CANH) - D47-4 (CG)	B - B	Skid control ECU	Ignition switch off	200 ohms or higher
D55-15 (CANL) - D47-4 (CG)	W-B	Skid control ECU	Ignition switch off	200 ohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK	A
NG (Accessory gateway branch wire)	B
NG (Air conditioning amplifier branch wire)	C
NG (Skid control ECU branch wire)	D

B: Go to step 15

C: Go to step 13

D: Go to step 14

A: REPLACE CAN JUNCTION CONNECTOR RH

7. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (ECM MAIN WIRE)**
   a. Disconnect the ECM connector.

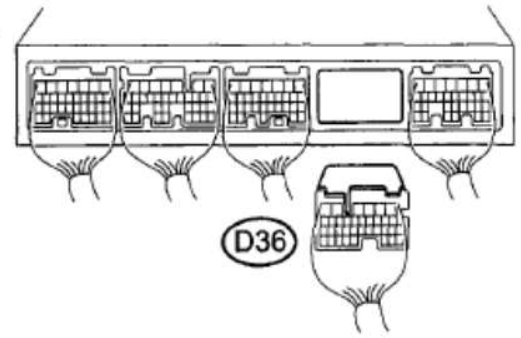
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Rear view of wire harness connector:
(to ECM)

2GR-FE:



1AR-FE:

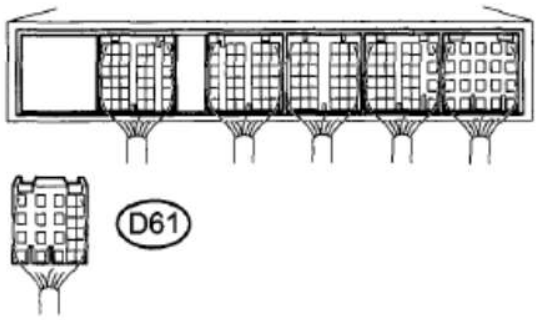


Fig. 156: Identifying ECM Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

RESULT CHART

Tester Connection	Condition	Specified Condition
D59-1 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D59-12 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

Result

TESTER CONNECTION SPECIFIED CONDITION CHART

Result	Proceed to
OK (2GR-FE)	A

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OK (1AR-FE)	B
NG	C

B: REPLACE ECM (See **REMOVAL**)

C: REPAIR OR REPLACE CAN BUS MAIN WIRE OR CONNECTOR (ECM MAIN WIRE)

Front view of wire harness connector:
(CAN Junction Connector RH)

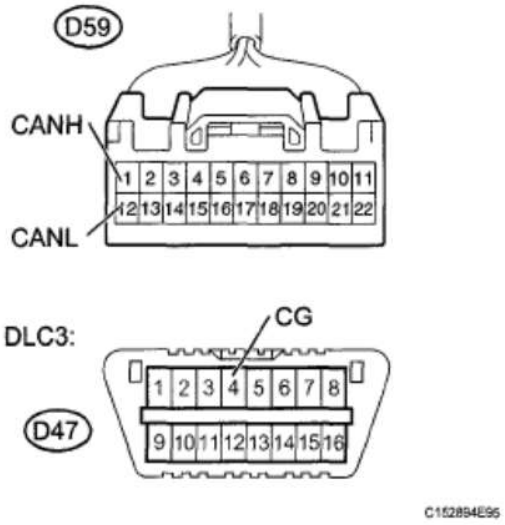


Fig. 157: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

A: REPLACE ECM (See **FUEL INJECTOR CIRCUIT**)

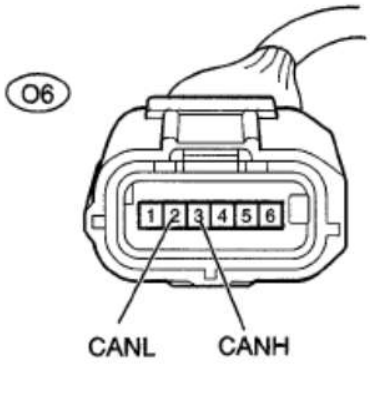
8. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (YAW RATE SENSOR BRANCH WIRE)**
   a. Disconnect the yaw rate sensor connector.

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Front view of wire harness connector:
(to Yaw Rate Sensor)



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Fig. 158: Identifying Yaw Rate Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-2 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D55-13 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (YAW RATE SENSOR BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

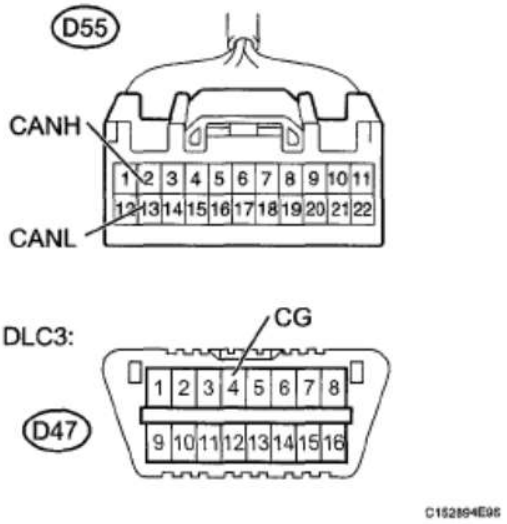


Fig. 159: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE YAW RATE SENSOR (See **REMOVAL**)

9. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (CENTER AIRBAG SENSOR ASSEMBLY BRANCH WIRE)**
   a. Disconnect the center airbag sensor assembly connector.

Center Airbag Sensor Assembly

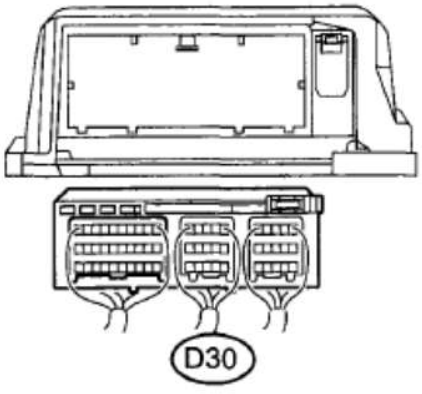


Fig. 160: Identifying Center Airbag Sensor Assembly Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-3 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D55-14 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (CENTER AIRBAG SENSOR ASSEMBLY BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)

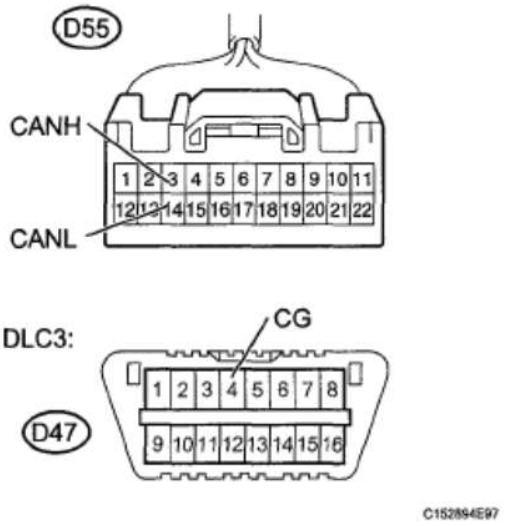


Fig. 161: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE CENTER AIRBAG SENSOR ASSEMBLY (See **ON-VEHICLE INSPECTION**)

10. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (STEERING ANGLE SENSOR BRANCH WIRE)**
    a. Disconnect the steering angle sensor connector.

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Steering Angle Sensor Connector:

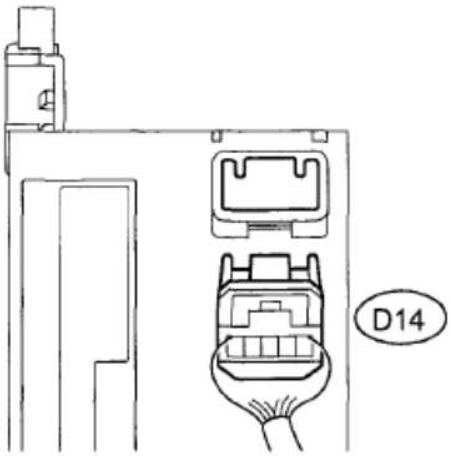


Fig. 162: Identifying Steering Angle Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-5 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D55-16 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (STEERING ANGLE SENSOR BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

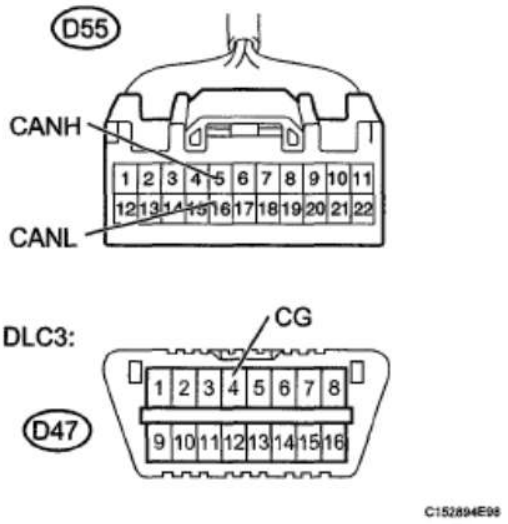


Fig. 163: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE STEERING ANGLE SENSOR (See **REMOVAL**)

11. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (POWER STEERING ECU BRANCH WIRE)**
    a. Disconnect the power steering ECU connector.

Front view of wire harness connector:
(to Power Steering ECU)

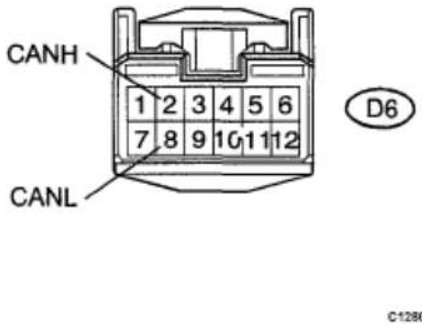


Fig. 164: Identifying Power Steering ECU Connector Terminals (CANH And CANL)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-7 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D55-18 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (POWER STEERING ECU BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector CTR)

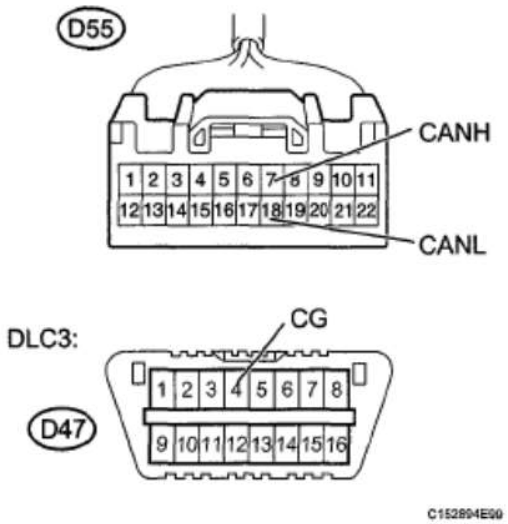


Fig. 165: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE POWER STEERING ECU (See **REMOVAL**)

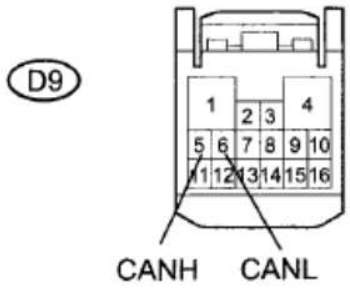
12. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (MAIN BODY ECU BRANCH WIRE)**
    a. Disconnect the main body ECU connector.

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Front view of wire harness connector:
(to Main Body ECU)



C196604E02

Fig. 166: Identifying Main Body ECU Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D55-8 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D55-19 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (MAIN BODY ECU BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector CTR)

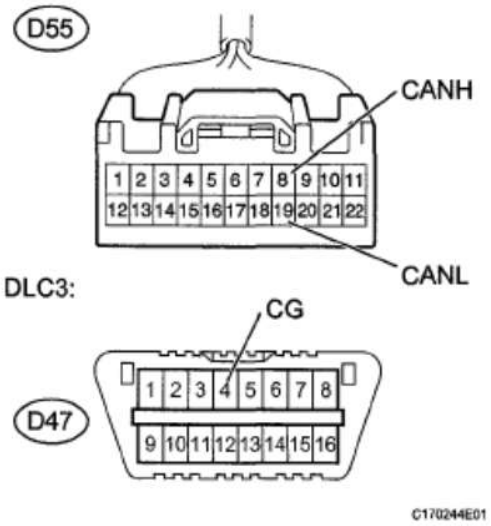


Fig. 167: Identifying CAN Junction CTR And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE MAIN BODY ECU

13. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (AIR CONDITIONING AMPLIFIER BRANCH WIRE)**
    a. Disconnect the air conditioning amplifier connector.

Front view of wire harness connector:
(to Air Conditioning Amplifier)

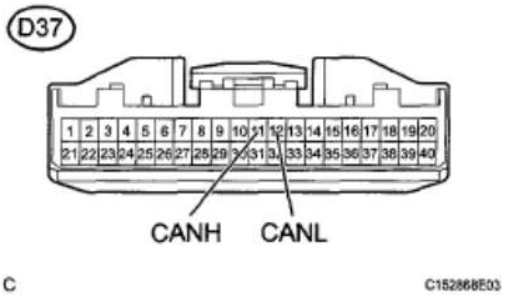


Fig. 168: Identifying Air Conditioning Amplifier Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D59-3 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D59-14 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (AIR CONDITIONING AMPLIFIER BRANCH WIRE)

Front view of wire harness connector:
(CAN Junction Connector RH)

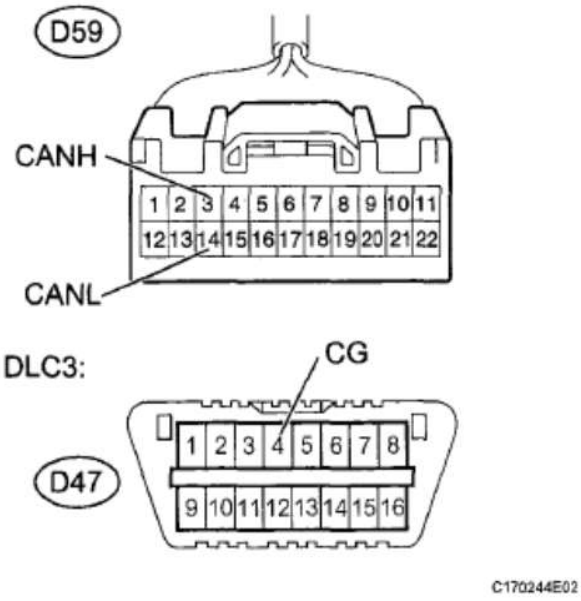


Fig. 169: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE AIR CONDITIONING AMPLIFIER (See **REMOVAL**)

14. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (SKID CONTROL ECU BRANCH WIRE)**
    a. Disconnect the skid control ECU connector.

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Front view of wire harness connector:
(to Skid Control ECU)

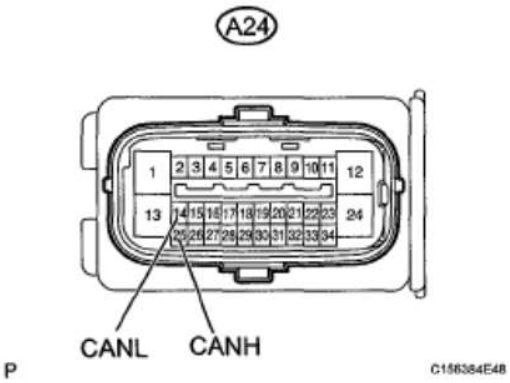


Fig. 170: Identifying Skid Control ECU Connector Terminals (CANL And CANH)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard resistance

TESTER CONNECTION SPECIFIED CONDITION CHART

Tester Connection	Condition	Specified Condition
D59-4 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D59-15 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (SKID CONTROL ECU BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector RH)

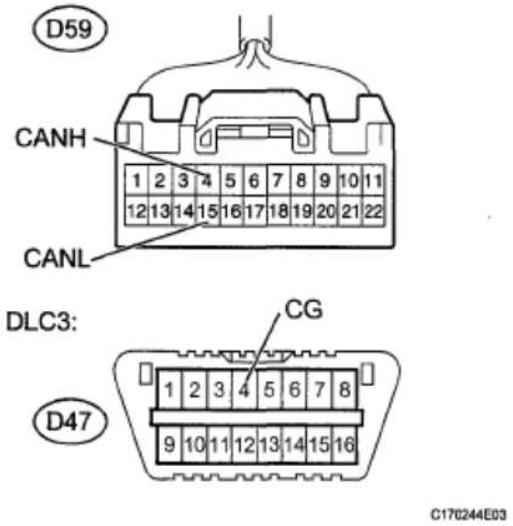


Fig. 171: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: REPLACE BRAKE ACTUATOR ASSEMBLY (See **REMOVAL**)

15. **CHECK FOR SHORT TO GND IN CAN BUS WIRE (ACCESSORY GATEWAY BRANCH WIRE)**
    a. Disconnect the accessory gateway connector.

    HINT:

    When accessories not connect it, repair or replace the accessory gateway branch wire or connector.

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

    Standard resistance

    CAN BUS LINE SYMPTOM CHART

Tester Connection	Condition	Specified Condition
D59-2 (CANH) - D47-4 (CG)	Ignition switch off	200 ohms or higher
D59-13 (CANL) - D47-4 (CG)	Ignition switch off	200 ohms or higher

NG: REPAIR OR REPLACE CAN BUS BRANCH WIRE OR CONNECTOR (ACCESSORY GATEWAY BRANCH WIRE)

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Front view of wire harness connector:
(CAN Junction Connector RH)

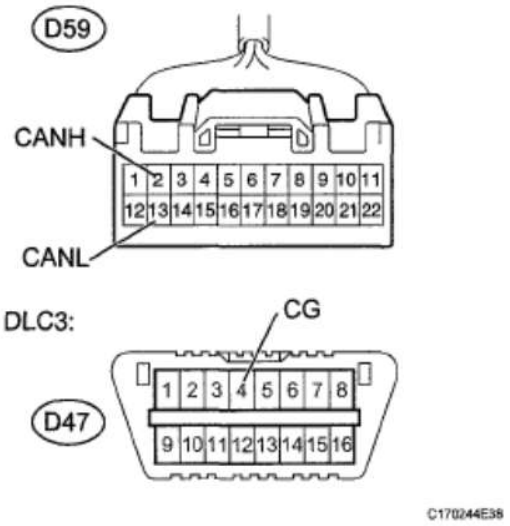


Fig. 172: Identifying CAN Junction RH And DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: CHECK AND REPLACE THE ACCESSORY

OPEN IN ONE SIDE OF CAN BRANCH LINE

DESCRIPTION

If some ECUs and sensors are not displayed on the "Communication Bus Check" screen of Techstream and some ECUs and sensors repeatedly appear and disappear from the screen when the CAN main bus wires are normal (there is no open, short, short to B+, or short to GND in the main bus wires), there may be an open circuit in either of the CAN branch wires.

HINT:

If some ECUs and sensors repeatedly appear and disappear from the "Communication Bus Check" screen, communication between the normal ECUs (sensors) and Techstream may be affected by the incomplete signals that are output from the ECU that has an open circuit in either of its CAN branch wires. In this case, the CAN branch wires for the ECUs and sensors that repeatedly appear and disappear from the screen are normal and the ECU that is not displayed on the screen may be the main cause of the problem (this ECU may have an open circuit in either of its CAN branch wires).

SYMPTOM CHART

Symptom	Trouble Area
	One side of the CAN branch wire is open

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2 or more ECUs and/or sensors repeatedly appear and disappear on the Techstream "Bus Check" screen.	• ECM • Combination meter • Power steering ECU • Skid control ECU • Steering angle sensor • Yaw rate sensor • Air conditioning amplifier • Center airbag sensor assembly • Main body ECU • Accessory gateway

INSPECTION PROCEDURE

NOTE:

- **Turn the ignition switch off before measuring the resistances of CAN bus main wires and CAN bus branch wires.**
- **After the ignition switch is turned off, check that the key reminder warning system and light remainder warning system are not operating.**
- **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 any doors need to be opened in order to check the connectors, open the doors and leave them open.**

HINT:

- Operating the ignition switch, any other switches, or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring due to vibration of the vehicle. In such a case, wiggling the ECUs or wire harness while performing the inspection below will help determine the cause of the malfunction.

1. **CHECK FOR OPEN IN ONE SIDE OF CAN NO. 1 BUS BRANCH WIRE**
   a. Confirm the systems (ECUs and sensors), which use CAN communication, equipped on the vehicle. (See **SYSTEM DIAGRAM**)
   b. Using Techstream, select and perform "Bus Check". (See **DIAGNOSIS SYSTEM**)
   c. Observe the screen for approximately 1 minute to check the ECUs and sensors that are not displayed on the screen and also those that repeatedly appear and disappear from the screen.
   d. Check that the ECUs and sensors, which are connected to the ECUs or sensors that are not displayed on the screen.
   e. Check that the ECUs and sensors, which repeatedly appeared and disappeared from the "Bus Check" screen, are constantly displayed.

   NEXT: GO TO CORRESPONDING COMMUNICATION STOP MODE

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