

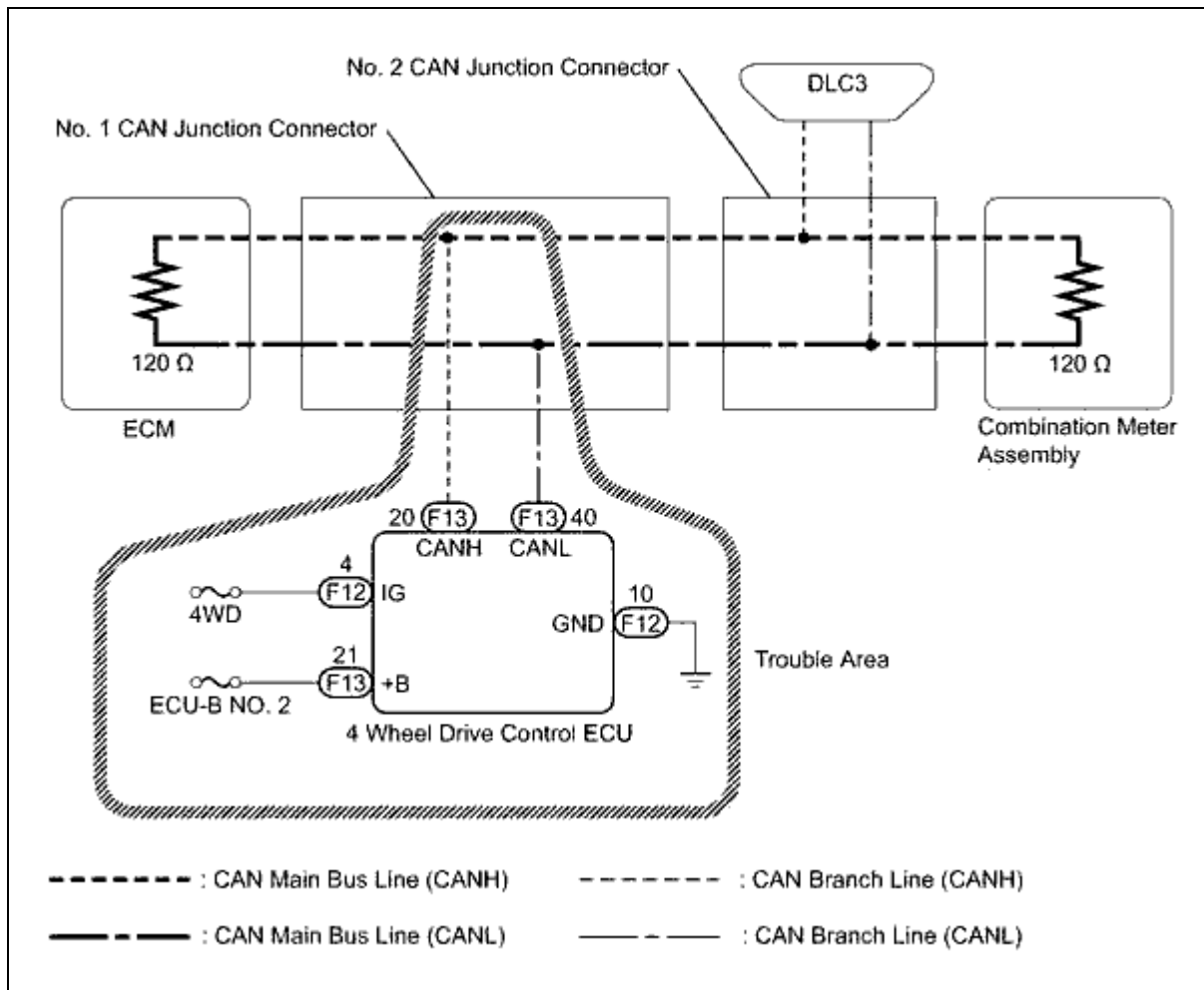
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|-------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                    | 6.6 J                | <b>Doc ID:</b> RM00000109K0G1X           |
| <b>Model Year Start:</b> 2016                                                                                                       | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: 4WD Control ECU Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## 4WD Control ECU Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                          | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                  | TROUBLE AREA                                                                                                                                                                                                                                                 |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4WD Control ECU Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• "Four Wheel Drive Control" is not displayed on the CAN Bus Check screen of the Techstream <a href="#">INFO</a></li> <li>• Communication system DTCs (DTCs that start with U) that correspond to "4WD Control ECU Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>• 4 wheel drive control ECU branch line or connector</li> <li>• Power source circuit of 4 wheel drive control ECU</li> <li>• 4 wheel drive control ECU ground circuit</li> <li>• 4 wheel drive control ECU</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work [INFO](#).
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output [INFO](#).
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 20 seconds.
- After the repair, perform the CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed [INFO](#).

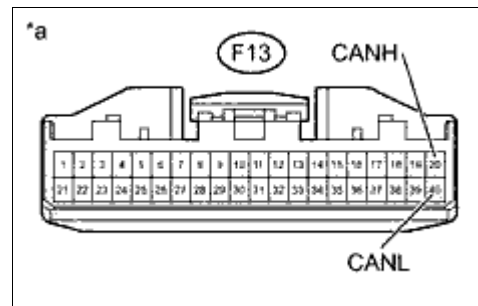
### HINT:

- 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 may help determine the cause of the malfunction.

## PROCEDURE

### 1. CHECK FOR OPEN IN CAN BUS LINES (4 WHEEL DRIVE CONTROL ECU BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.



(b) Disconnect the 4 wheel drive control ECU connector.

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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| F13-20 (CANH) - F13-40 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

#### Text in Illustration

\*a Front view of wire harness connector  
(to 4 Wheel Drive Control ECU)

**NG** ► REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (4 WHEEL DRIVE CONTROL ECU)

**OK**

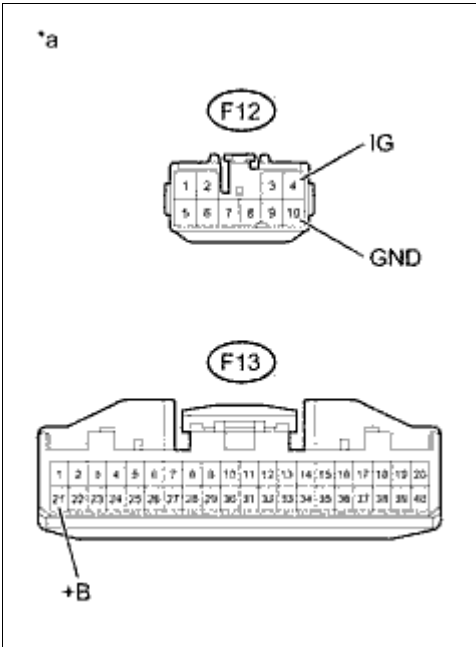
### 2. CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)

(a) Disconnect the 4 wheel drive control ECU connector.

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| F12-10 (GND) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(c) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION         | SWITCH CONDITION   | SPECIFIED CONDITION |
|---------------------------|--------------------|---------------------|
| F13-21 (+B) - Body ground | Always             | 11 to 14 V          |
| F12-4 (IG) - Body ground  | Ignition switch ON | 11 to 14 V          |

Text in Illustration

|    |                                                                        |
|----|------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to 4 Wheel Drive Control ECU) |
|----|------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ► REPLACE 4 WHEEL DRIVE CONTROL ECU



|                                                                                                                                                |                      |                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                               | 6.6 J                | <b>Doc ID:</b> RM000000WIP0HUX           |
| <b>Model Year Start:</b> 2016                                                                                                                  | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Air Conditioning Amplifier Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

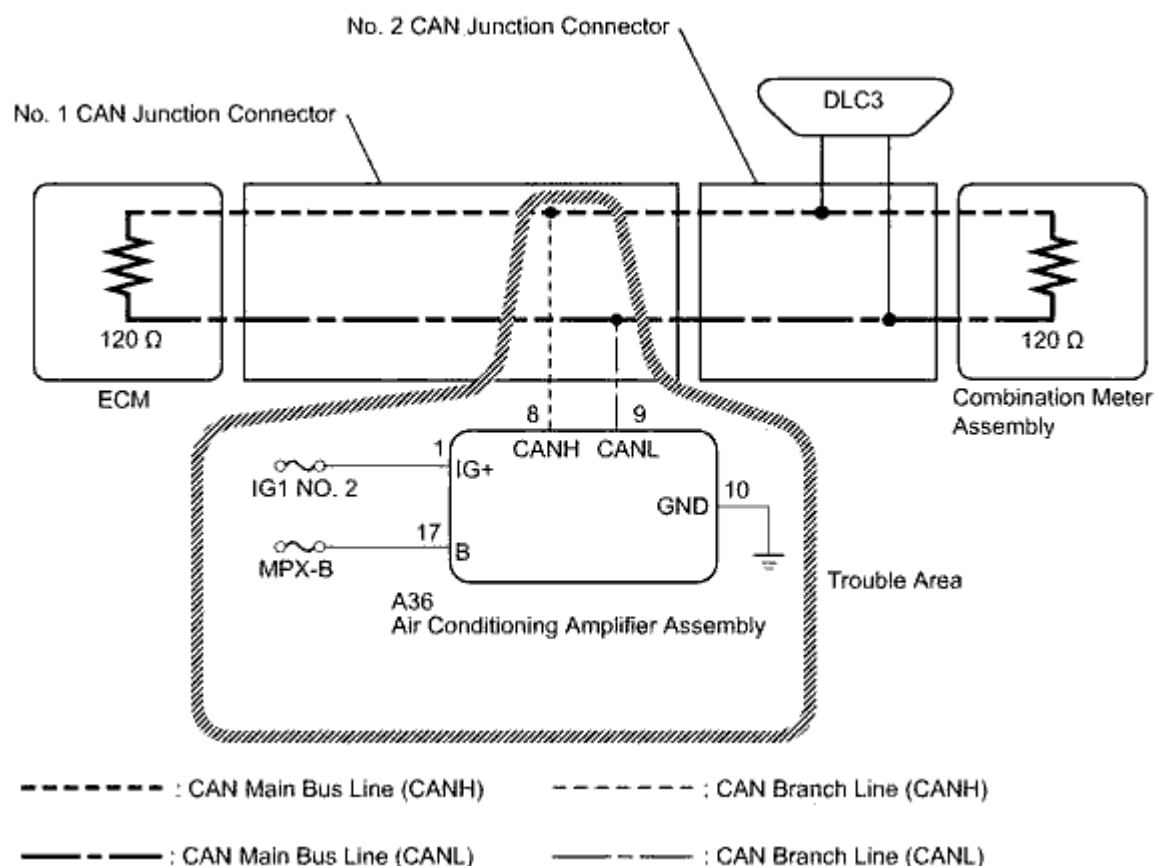
## Air Conditioning Amplifier Communication Stop Mode

## DESCRIPTION

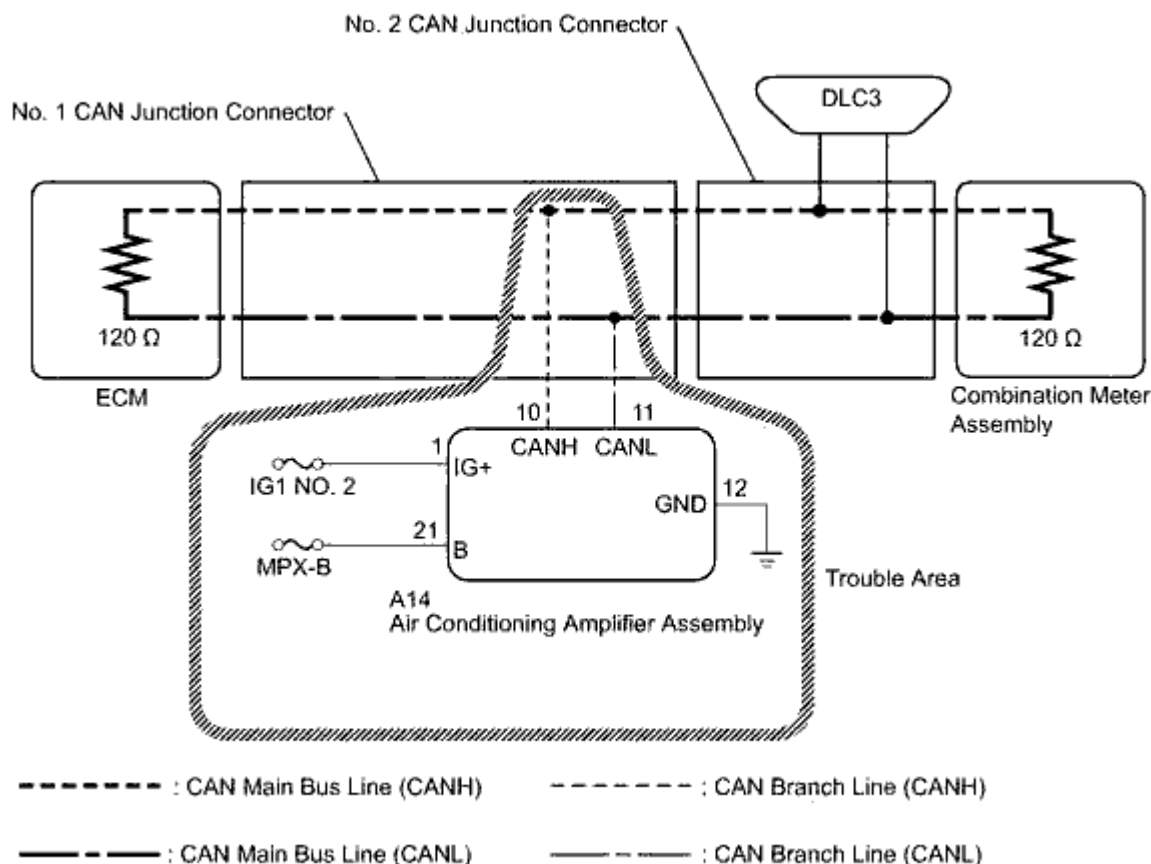
| DETECTION ITEM                                     | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                               | TROUBLE AREA                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Air Conditioning Amplifier Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• "Air Conditioning Amplifier" is not displayed on the CAN Bus Check screen of the Techstream <a href="#">INFO</a></li> <li>• Communication system DTCs (DTCs that start with U) that correspond to "Air Conditioning Amplifier Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>• Air conditioning amplifier assembly branch line or connector</li> <li>• Power source circuit of air conditioning amplifier assembly</li> <li>• Air conditioning amplifier assembly ground circuit</li> <li>• Air conditioning amplifier assembly</li> </ul> |

## WIRING DIAGRAM

for Automatic Air Conditioning System:



for Manual Air Conditioning System:



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work **INFO**.
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 10 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

### 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 may help determine the cause of the malfunction.

## PROCEDURE

|    |              |
|----|--------------|
| 1. | SYSTEM CHECK |
|----|--------------|

(a) Check the vehicle specifications.

### Result

| RESULT                                | PROCEED TO |
|---------------------------------------|------------|
| for Automatic Air Conditioning System | A          |
| for Manual Air Conditioning System    | B          |

**B** ► GO TO STEP 4

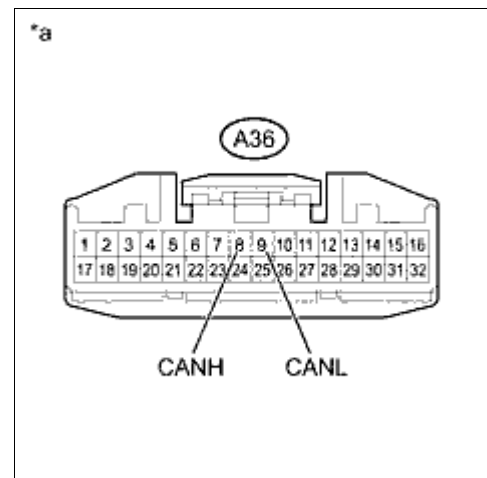
**A**



|    |                                                                                   |
|----|-----------------------------------------------------------------------------------|
| 2. | CHECK FOR OPEN IN CAN BUS LINES (AIR CONDITIONING AMPLIFIER ASSEMBLY BRANCH LINE) |
|----|-----------------------------------------------------------------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the air conditioning amplifier assembly connector.



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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| A36-8 (CANH) - A36-9 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

**Text in Illustration**

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Air Conditioning Amplifier Assembly) |
|----|----------------------------------------------------------------------------------|

**NG**  **REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (AIR CONDITIONING AMPLIFIER ASSEMBLY)**

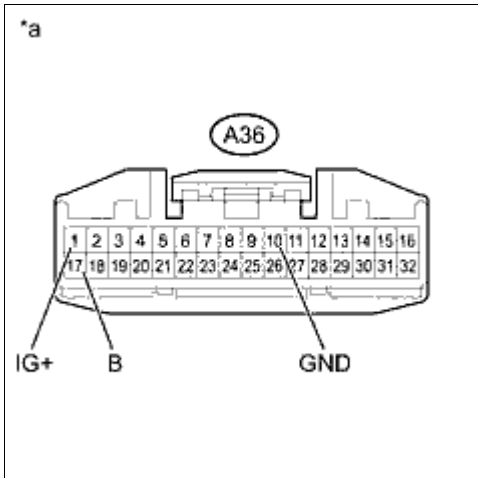
**OK**  


|           |                                                           |
|-----------|-----------------------------------------------------------|
| <b>3.</b> | <b>CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)</b> |
|-----------|-----------------------------------------------------------|

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| A36-10 (GND) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION         | SWITCH CONDITION   | SPECIFIED CONDITION |
|---------------------------|--------------------|---------------------|
| A36-1 (IG+) - Body ground | Ignition switch ON | 11 to 14 V          |
| A36-17 (B) - Body ground  | Always             | 11 to 14 V          |

**Text in Illustration**

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Air Conditioning Amplifier Assembly) |
|----|----------------------------------------------------------------------------------|

**NG**  **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

**OK**  **REPLACE AIR CONDITIONING AMPLIFIER**

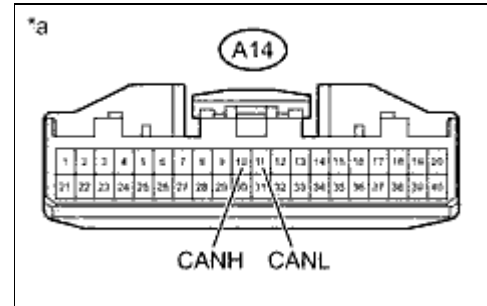
## ASSEMBLY

4.

### CHECK FOR OPEN IN CAN BUS LINES (AIR CONDITIONING AMPLIFIER ASSEMBLY BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the air conditioning amplifier assembly connector.



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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| A14-10 (CANH) - A14-11 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

#### Text in Illustration

\*a

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

**NG** ► REPAIR OR REPLACE CAN BRANCH LINE OR  
CONNECTOR (AIR CONDITIONING AMPLIFIER  
ASSEMBLY)

**OK**

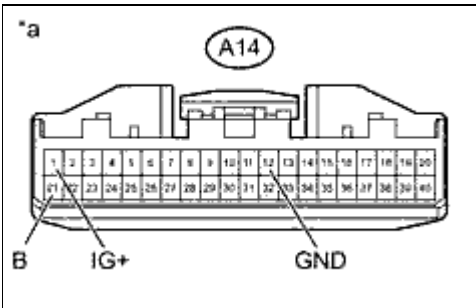
5.

### CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| A14-12 (GND) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION         | SWITCH CONDITION   | SPECIFIED CONDITION |
|---------------------------|--------------------|---------------------|
| A14-1 (IG+) - Body ground | Ignition switch ON | 11 to 14 V          |
| A14-21 (B) - Body ground  | Always             | 11 to 14 V          |

**Text in Illustration**

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Air Conditioning Amplifier Assembly) |
|----|----------------------------------------------------------------------------------|

**NG** ► **REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)**

**OK** ► **REPLACE AIR CONDITIONING AMPLIFIER  
ASSEMBLY**



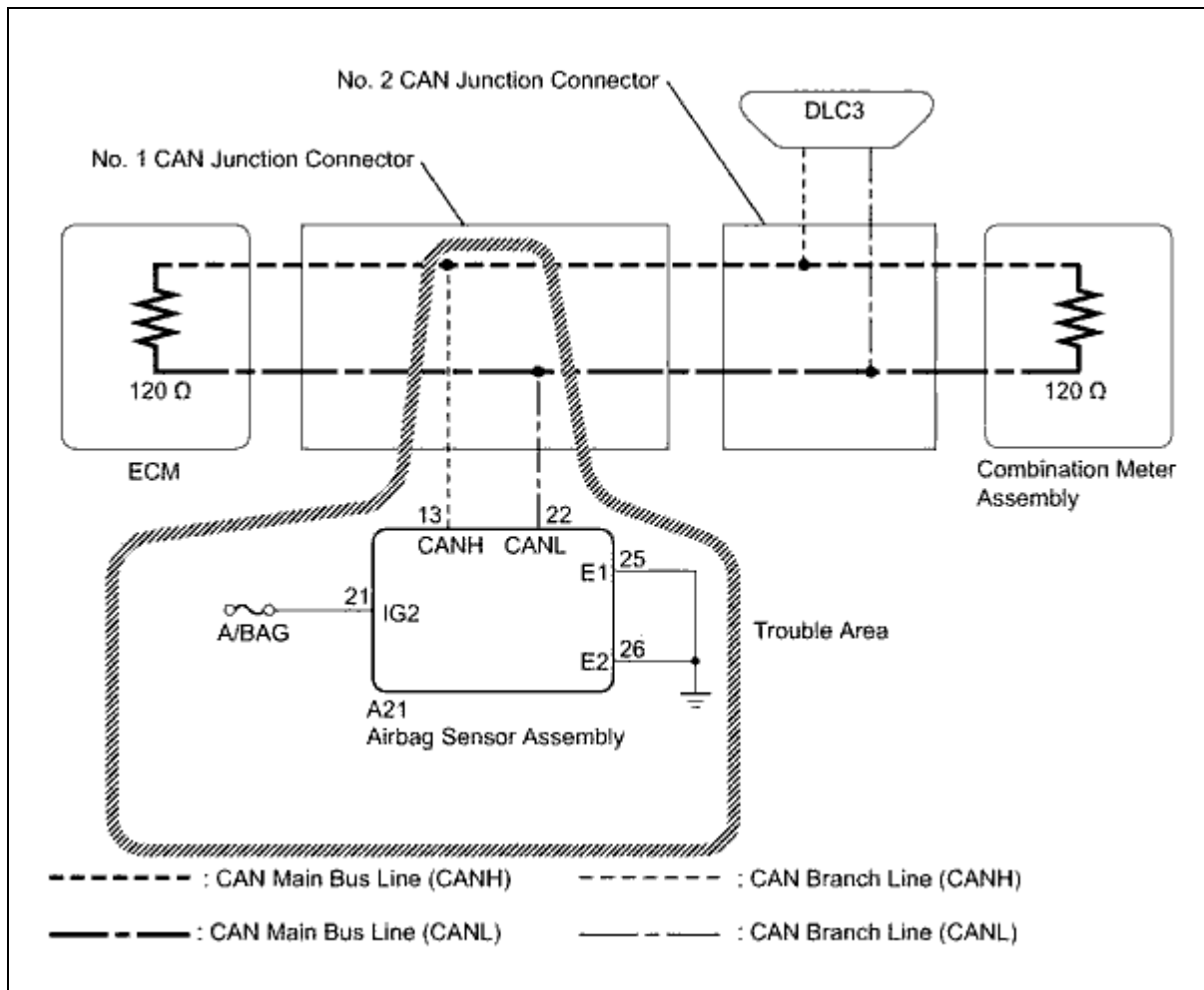
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| <b>Last Modified:</b> 11-13-2015                                                                                                         | 6.6 J                | <b>Doc ID:</b> RM000001WG908AX           |
| <b>Model Year Start:</b> 2016                                                                                                            | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Center Airbag Sensor Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Center Airbag Sensor Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                               | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                     | TROUBLE AREA                                                                                                                                                                                                                                     |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Center Airbag Sensor Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• "Airbag" is not displayed on the CAN Bus Check screen of the Techstream <a href="#">INFO</a></li> <li>• Communication system DTCs (DTCs that start with U) that correspond to "Center Airbag Sensor Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>• Airbag sensor assembly branch line or connector</li> <li>• Power source circuit of airbag sensor assembly</li> <li>• Airbag sensor assembly ground circuit</li> <li>• Airbag sensor assembly</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work [INFO](#).
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output [INFO](#).
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 60 seconds and then drive the vehicle at a speed of 5 km/h (3 mph) or more for 6.2 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed [INFO](#).

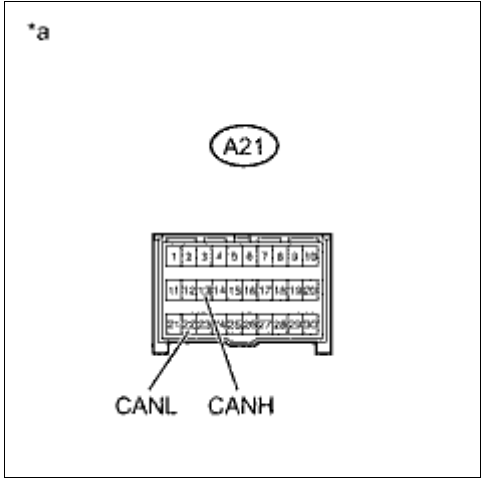
### HINT:

- 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 may help determine the cause of the malfunction.

PROCEDURE

|    |                                                                      |
|----|----------------------------------------------------------------------|
| 1. | CHECK FOR OPEN IN CAN BUS LINES (AIRBAG SENSOR ASSEMBLY BRANCH LINE) |
|----|----------------------------------------------------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.



(b) Disconnect the airbag sensor assembly connector.

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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| A21-13 (CANH) - A21-22 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 Ω          |

Text in Illustration

|    |                                                                  |
|----|------------------------------------------------------------------|
| *a | Front view of wire harness connector (to Airbag Sensor Assembly) |
|----|------------------------------------------------------------------|

NG ► REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (AIRBAG SENSOR ASSEMBLY)

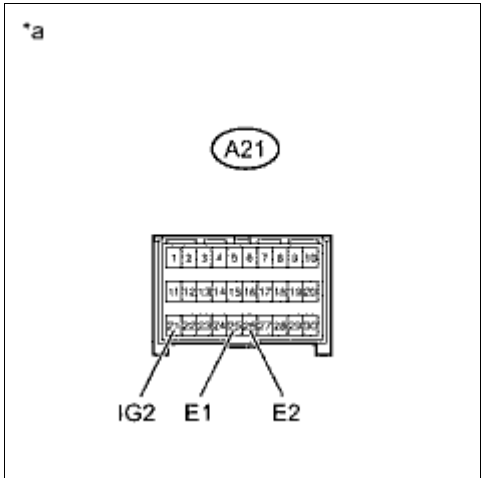
OK  
▼

|    |                                                    |
|----|----------------------------------------------------|
| 2. | CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT) |
|----|----------------------------------------------------|

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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED CONDITION |
|---------------------------|-------------------------------------------------------|---------------------|
| A21-25 (E1) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 Ω           |
| A21-26 (E2) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 Ω           |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION          | SWITCH CONDITION   | SPECIFIED CONDITION |
|----------------------------|--------------------|---------------------|
| A21-21 (IG2) - Body ground | Ignition switch ON | 11 to 14 V          |

Text in Illustration

|    |                                                                     |
|----|---------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Airbag Sensor Assembly) |
|----|---------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ► REPLACE AIRBAG SENSOR ASSEMBLY



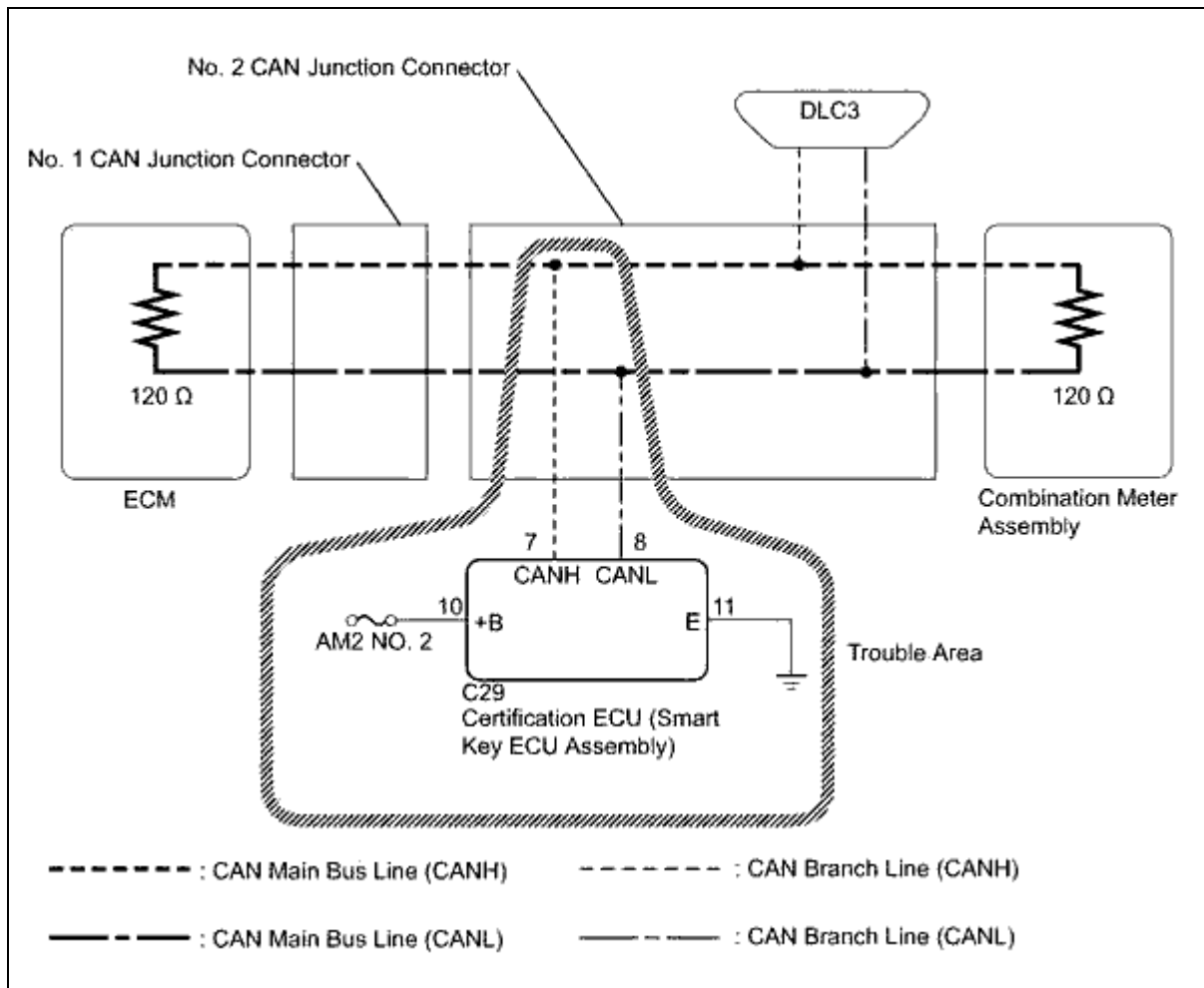
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| <b>Last Modified:</b> 11-13-2015                                                                                                      | 6.6 J                | <b>Doc ID:</b> RM0000027XY05TX           |
| <b>Model Year Start:</b> 2016                                                                                                         | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Certification ECU Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Certification ECU Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                            | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                 | TROUBLE AREA                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Certification ECU Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• "Certification (Smart)" is not displayed on the CAN Bus Check screen of the Techstream <a href="#">INFO</a></li> <li>• Communication system DTCs (DTCs that start with U) that correspond to "Certification ECU Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>• Certification ECU (Smart key ECU assembly) branch line or connector</li> <li>• Power source circuit of certification ECU (smart key ECU assembly)</li> <li>• Certification ECU (Smart key ECU assembly) ground circuit</li> <li>• Certification ECU (Smart key ECU assembly)</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work [INFO](#).
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output [INFO](#).
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 20 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed [INFO](#).
- If the certification ECU (smart key ECU assembly) is replaced, refer to Registration [INFO](#).

### HINT:

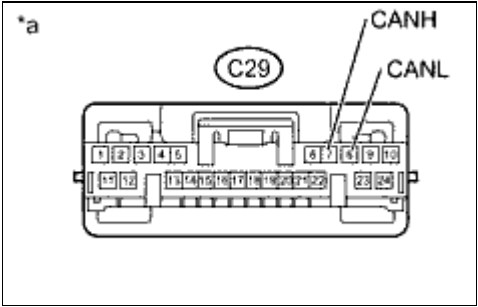
- Operating the ignition switch, any other switches or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring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

PROCEDURE

|    |                                                                                          |
|----|------------------------------------------------------------------------------------------|
| 1. | CHECK FOR OPEN IN CAN BUS LINES (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) BRANCH LINE) |
|----|------------------------------------------------------------------------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the certification ECU (smart key ECU assembly) connector.



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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| C29-7 (CANH) - C29-8 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 Ω          |

Text in Illustration

|    |                                                                                         |
|----|-----------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Certification ECU (Smart Key ECU Assembly)) |
|----|-----------------------------------------------------------------------------------------|

NG REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (CERTIFICATION ECU (SMART KEY ECU ASSEMBLY))

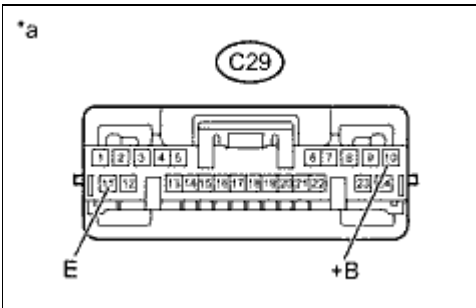
OK

|    |                                                    |
|----|----------------------------------------------------|
| 2. | CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT) |
|----|----------------------------------------------------|

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

Standard Resistance:

| TESTER CONNECTION        | CONDITION                                             | SPECIFIED CONDITION |
|--------------------------|-------------------------------------------------------|---------------------|
| C29-11 (E) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION         | CONDITION | SPECIFIED CONDITION |
|---------------------------|-----------|---------------------|
| C29-10 (+B) - Body ground | Always    | 11 to 14 V          |

**Text in Illustration**

|    |                                                                                         |
|----|-----------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Certification ECU (Smart Key ECU Assembly)) |
|----|-----------------------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ► REPLACE CERTIFICATION ECU (SMART KEY ECU  
ASSEMBLY)



|                                                                                                                                |                      |                                          |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                               | 6.6 J                | <b>Doc ID:</b> RM000000WIT09ZX           |
| <b>Model Year Start:</b> 2016                                                                                                  | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Check CAN Bus Line for Short to +B; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

**Check CAN Bus Line for Short to +B**

## **DESCRIPTION**

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

| SYMPTOM                                                                                             | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No resistance exists between terminals 6 (CANH) and 16 (BAT) or 14 (CANL) and 16 (BAT) of the DLC3. | <ul style="list-style-type: none"> <li>• Short to +B in CAN main bus lines</li> <li>• Short to +B in CAN branch lines</li> <li>• ECM</li> <li>• Main body ECU (Multiplex network body ECU)</li> <li>• Air conditioning amplifier assembly</li> <li>• Airbag sensor assembly</li> <li>• Spiral cable with sensor sub-assembly</li> <li>• Combination meter assembly</li> <li>• Certification ECU (Smart key ECU assembly)*1</li> <li>• 4 wheel drive control ECU*2</li> <li>• Navigation receiver assembly*3</li> <li>• Radio and display receiver assembly*4</li> <li>• Network gateway ECU*5</li> <li>• Door control and tire pressure monitoring system receiver assembly*6</li> <li>• Brake booster assembly (Skid control ECU)*7</li> <li>• Brake actuator assembly (Skid control ECU)*8</li> <li>• No. 1 CAN junction connector</li> <li>• No. 2 CAN junction connector</li> </ul> |

\*1: w/ Smart Key System

\*2: for 4WD

\*3: for Navigation Receiver Type

\*4: for Radio and Display Type

\*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System

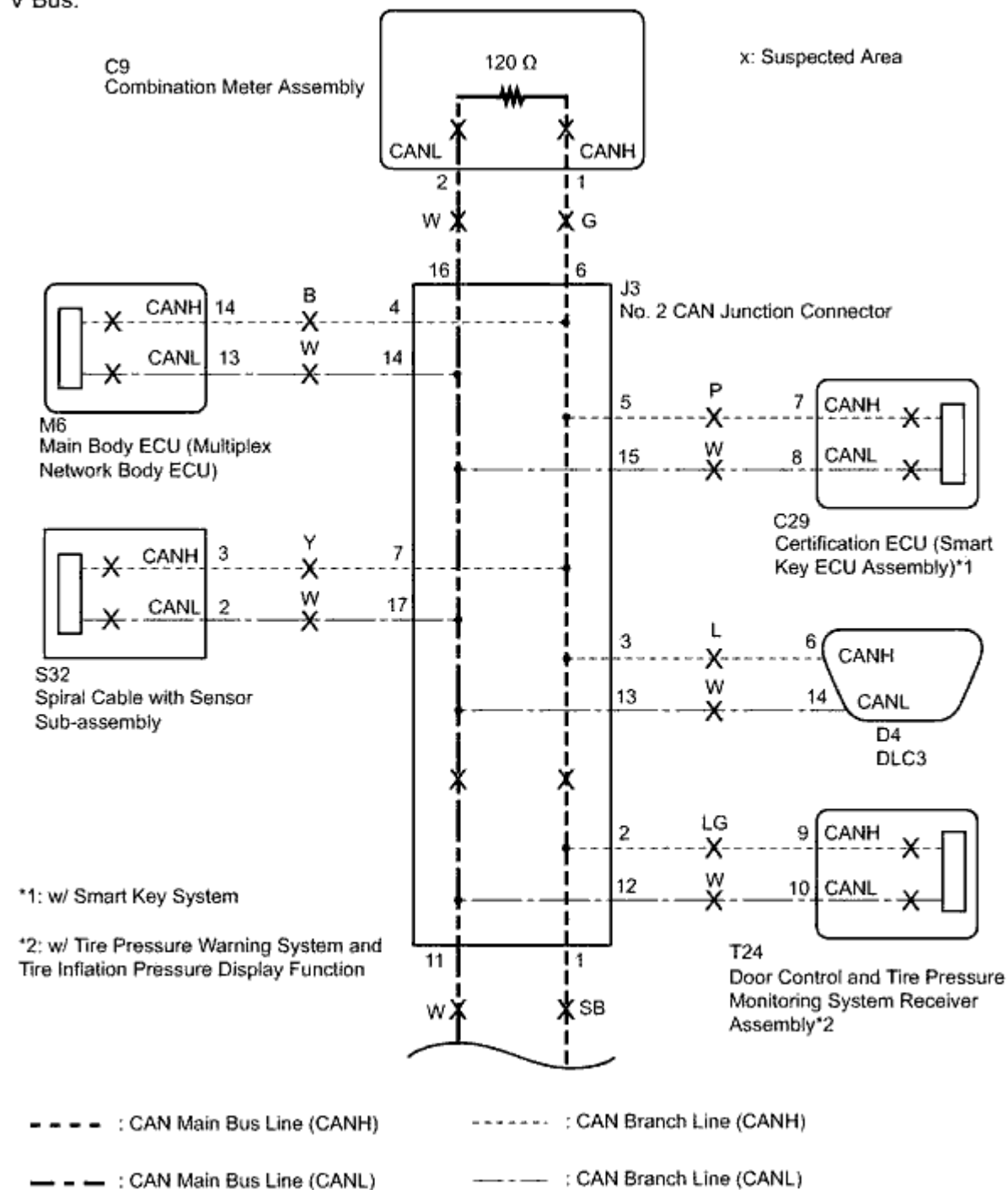
\*6: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*7: for Hydraulic Brake Booster

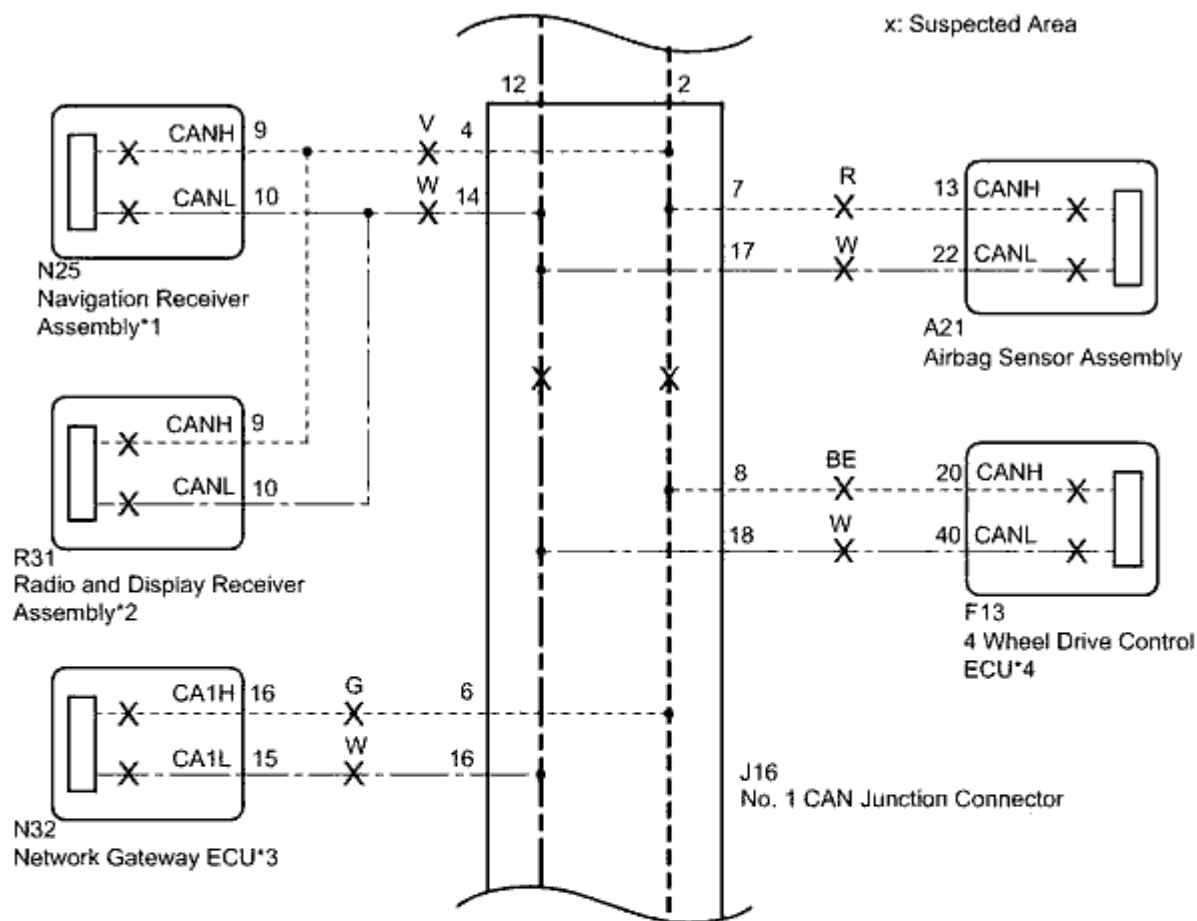
\*8: for Vacuum Brake Booster

## **WIRING DIAGRAM**

# V Bus:



# V Bus:



\*1: for Navigation Receiver Type

\*2: for Radio and Display Type

\*3: w/ Blind Spot Monitor System or Intuitive Parking Assist System

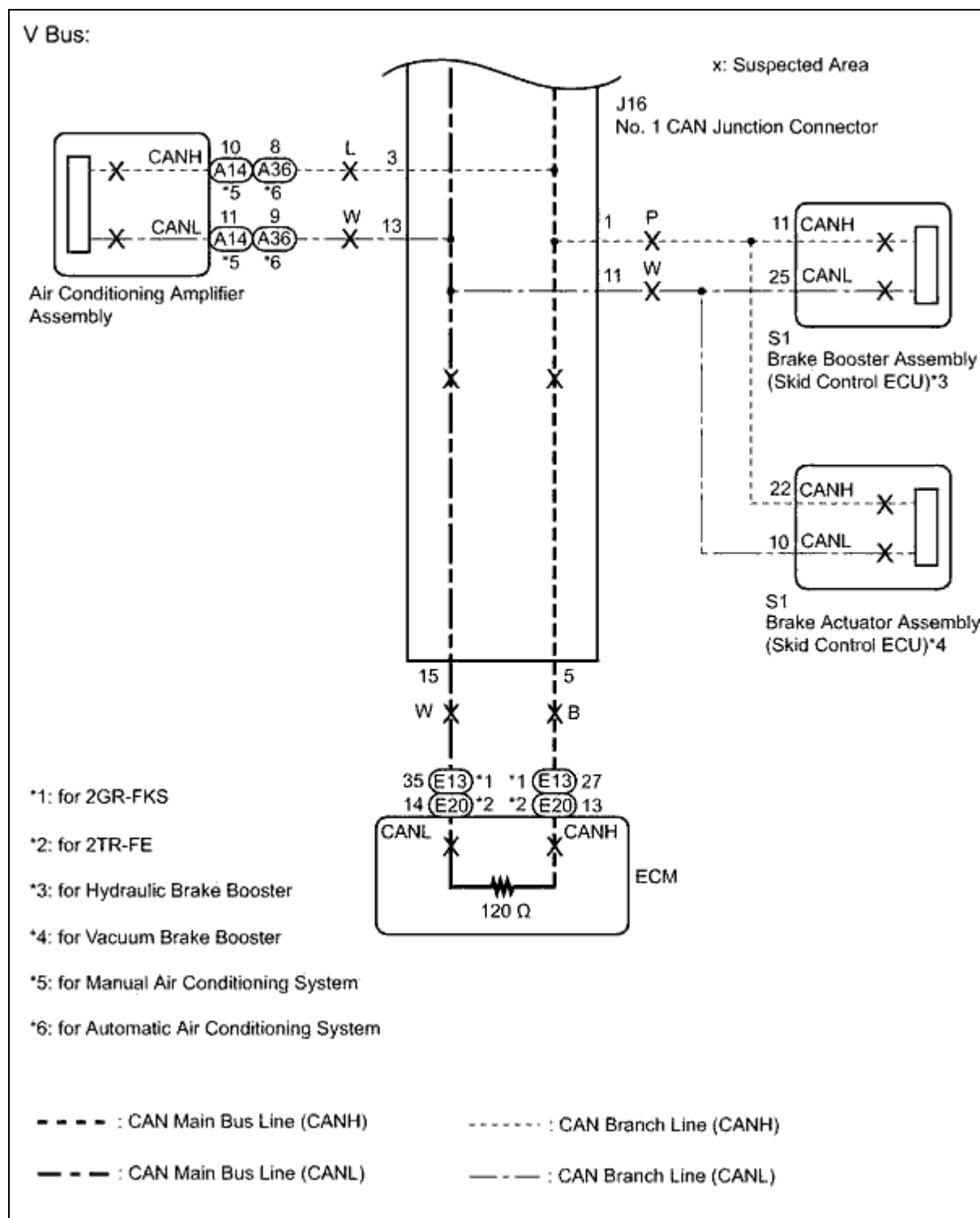
\*4: for 4WD

--- : CAN Main Bus Line (CANH)

..... : CAN Branch Line (CANH)

-.- : CAN Main Bus Line (CANL)

— : CAN Branch Line (CANL)



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or any switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work INFO.

- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output INFO.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 60 seconds, and then drive the vehicle at a speed of 36 km/h (22 mph) or more for 6.2 seconds or more.
- After the repair, perform CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed INFO.

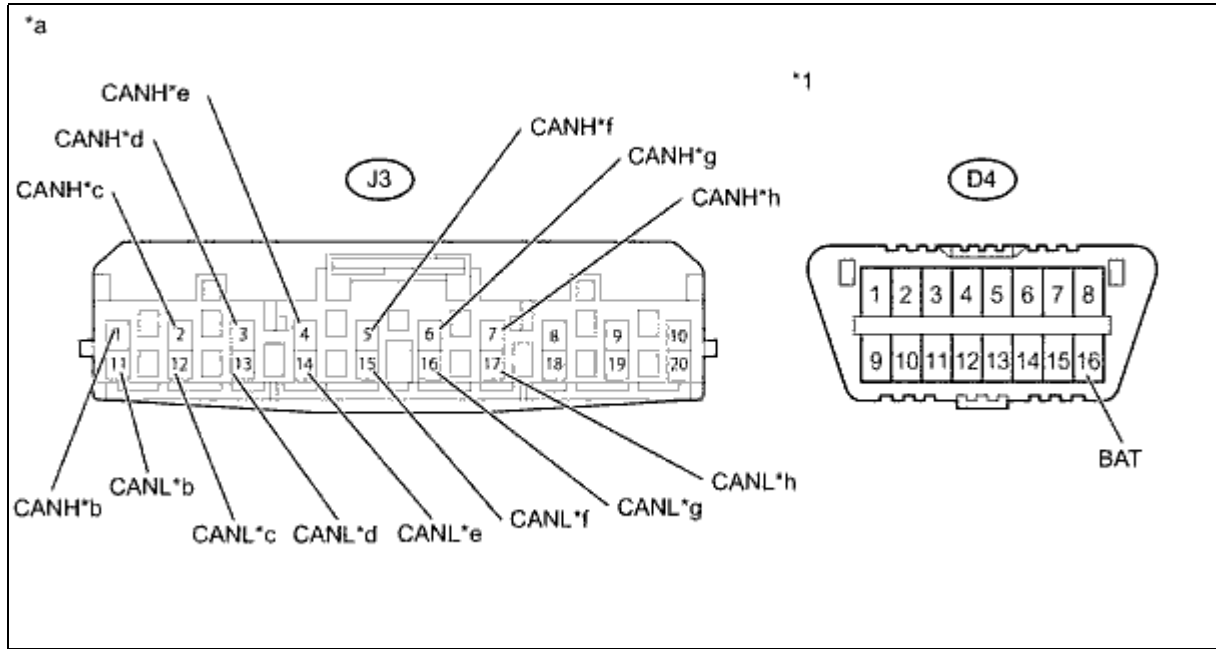
**HINT:**

- 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 may help determine the cause of the malfunction.

**PROCEDURE**

|    |                                                                             |
|----|-----------------------------------------------------------------------------|
| 1. | <b>CHECK FOR SHORT TO +B IN CAN BUS LINE (NO. 2 CAN JUNCTION CONNECTOR)</b> |
|----|-----------------------------------------------------------------------------|

- (a) Disconnect the cable from the negative (-) battery terminal.
- (b) Disconnect the No. 2 CAN junction connector.



**Text in Illustration**

|    |                                                                                                                                                      |    |                                 |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------------|
| *1 | DLC3                                                                                                                                                 | -  | -                               |
| *a | Front view of wire harness connector<br>(to No. 2 CAN Junction Connector)                                                                            | *b | to No. 1 CAN Junction Connector |
| *c | to Door Control and Tire Pressure Monitoring System Receiver Assembly (w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function) | *d | to DLC3                         |

|    |                                               |    |                                                                     |
|----|-----------------------------------------------|----|---------------------------------------------------------------------|
| *e | to Main Body ECU (Multiplex Network Body ECU) | *f | to Certification ECU (Smart Key ECU Assembly) (w/ Smart Key System) |
| *g | to Combination Meter Assembly                 | *h | to Spiral Cable with Sensor Sub-assembly                            |

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION | CONNECTED TO                                                         |
|----------------------------|-------------------------------------------------------|---------------------|----------------------------------------------------------------------|
| J3-1 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | No. 1 CAN junction connector                                         |
| J3-11 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                      |
| J3-2 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Door control and tire pressure monitoring system receiver assembly*1 |
| J3-12 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                      |
| J3-3 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | DLC3                                                                 |
| J3-13 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                      |
| J3-4 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Main body ECU (multiplex network body ECU)                           |
| J3-14 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                      |
| J3-5 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Certification ECU (smart key ECU assembly)*2                         |
| J3-15 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                      |
| J3-6 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Combination meter assembly                                           |
| J3-16 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                      |
| J3-7 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Spiral cable with sensor sub-assembly                                |
| J3-17 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                      |

\*1: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*2: w/ Smart Key System

## Result

|        |            |
|--------|------------|
| RESULT | PROCEED TO |
|--------|------------|

| RESULT                                      | PROCEED TO |
|---------------------------------------------|------------|
| OK                                          | A          |
| NG (No. 1 CAN Junction Connector main line) | B          |
| NG (ECU or sensor bus line)                 | C          |
| NG (DLC3 branch line)                       | D          |

**B** ► **GO TO STEP 2**

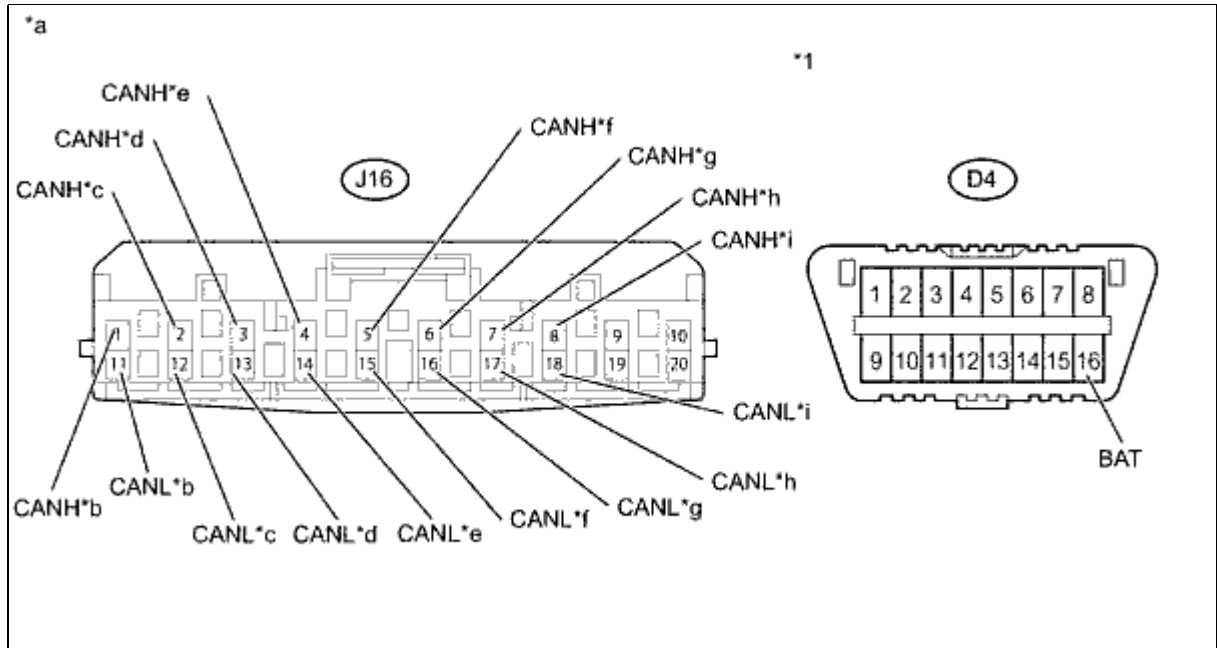
**C** ► **GO TO STEP 3**

**D** ► **REPAIR OR REPLACE CAN BRANCH LINE CONNECTED TO DLC3**

**A** ► **REPLACE NO. 2 CAN JUNCTION CONNECTOR**

|    |                                                                             |
|----|-----------------------------------------------------------------------------|
| 2. | <b>CHECK FOR SHORT TO +B IN CAN BUS LINE (NO. 1 CAN JUNCTION CONNECTOR)</b> |
|----|-----------------------------------------------------------------------------|

(a) Disconnect the No. 1 CAN junction connector.



**Text in Illustration**

|    |                                                                        |    |                                                                                                                                                     |
|----|------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| *1 | DLC3                                                                   | -  | -                                                                                                                                                   |
| *a | Front view of wire harness connector (to No. 1 CAN Junction Connector) | *b | to Brake Booster Assembly (Skid Control ECU) (for Hydraulic Brake Booster) or Brake Actuator Assembly (Skid Control ECU) (for Vacuum Brake Booster) |
| *c | to No. 2 CAN Junction Connector                                        | *d | to Air Conditioning Amplifier Assembly                                                                                                              |

|    |                                                                                                                                    |    |                           |
|----|------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|
| *e | to Navigation Receiver Assembly (for Navigation Receiver Type) or Radio and Display Receiver Assembly (for Radio and Display Type) | *f | to ECM                    |
| *g | to Network Gateway ECU (w/ Blind Spot Monitor System or Intuitive Parking Assist System)                                           | *h | to Airbag Sensor Assembly |
| *i | to 4 Wheel Drive Control ECU (for 4WD)                                                                                             | -  | -                         |

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION | CONNECTED TO                                                                                |
|-----------------------------|-------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------|
| J16-1 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2 |
| J16-11 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                                             |
| J16-2 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | No. 2 CAN junction connector                                                                |
| J16-12 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                                             |
| J16-3 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Air conditioning amplifier assembly                                                         |
| J16-13 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                                             |
| J16-4 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Navigation receiver assembly*3 or radio and display receiver assembly*4                     |
| J16-14 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                                             |
| J16-5 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | ECM                                                                                         |
| J16-15 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                                             |
| J16-6 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Network gateway ECU*5                                                                       |
| J16-16 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                                             |
| J16-7 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Airbag sensor assembly                                                                      |
| J16-17 (CANL) - D4-16 (BAT) |                                                       |                     |                                                                                             |
| J16-8 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery          | 6 kΩ or higher      | 4 wheel drive control ECU*6                                                                 |

| TESTER CONNECTION              | CONDITION | SPECIFIED CONDITION | CONNECTED TO |
|--------------------------------|-----------|---------------------|--------------|
| J16-18 (CANL) -<br>D4-16 (BAT) | terminal  |                     |              |

- \*1: for Hydraulic Brake Booster
- \*2: for Vacuum Brake Booster
- \*3: for Navigation Receiver Type
- \*4: for Radio and Display Type
- \*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System
- \*6: for 4WD

## Result

| RESULT                                      | PROCEED TO |
|---------------------------------------------|------------|
| OK                                          | A          |
| NG (ECU or sensor bus line)                 | B          |
| NG (No. 2 CAN junction connector main line) | C          |

**B** ► GO TO STEP 3

**C** ► REPAIR OR REPLACE CAN MAIN BUS LINE (NO. 1  
CAN JUNCTION CONNECTOR - NO. 2 CAN JUNCTION  
CONNECTOR)

**A** ► REPLACE NO. 1 CAN JUNCTION CONNECTOR

|           |                                                            |
|-----------|------------------------------------------------------------|
| <b>3.</b> | <b>CHECK FOR SHORT TO +B IN CAN BUS LINE (ECU, SENSOR)</b> |
|-----------|------------------------------------------------------------|

(a) Reconnect all wire harness connectors (No. 1 CAN junction connector and No. 2 CAN junction connector).

(b) Disconnect the ECU or sensor connected to the CAN bus line that is shorted to +B.

## HINT:

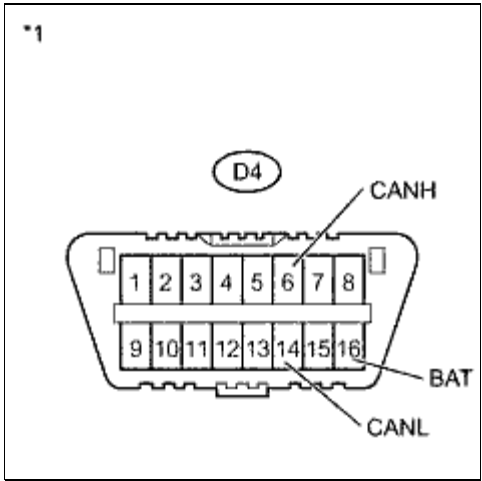
If the ECU or sensor has multiple connectors, disconnect the connector that includes the CAN bus lines. To determine the ECU or sensor that is connected to the shorted bus line, refer to the terminals of ECU tables

INFO

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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                                | SPECIFIED CONDITION |
|-------------------------------|----------------------------------------------------------|---------------------|
| D4-6 (CANH) -<br>D4-16 (BAT)  | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher      |
| D4-14 (CANL) -<br>D4-16 (BAT) |                                                          |                     |



Text in Illustration

|    |      |
|----|------|
| *1 | DLC3 |
|----|------|

HINT:

If the resistance changes to 6 kΩ or higher when the connector is disconnected from the ECU or sensor, there may be a short in the ECU or sensor.

**NG** ► REPAIR OR REPLACE CORRESPONDING ECU OR SENSOR BUS LINE OR CONNECTOR

**OK** ► REPLACE CORRESPONDING ECU OR SENSOR



|                                                                                                                                 |                      |                                          |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                | 6.6 J                | <b>Doc ID:</b> RM000000WIU0A0X           |
| <b>Model Year Start:</b> 2016                                                                                                   | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Check CAN Bus Line for Short to GND; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

**Check CAN Bus Line for Short to GND**

## **DESCRIPTION**

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

| SYMPTOM                                                                                         | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No resistance exists between terminals 6 (CANH) and 4 (CG) or 14 (CANL) and 4 (CG) of the DLC3. | <ul style="list-style-type: none"> <li>• Short ground in CAN main bus lines</li> <li>• Short ground in CAN branch lines</li> <li>• ECM</li> <li>• Main body ECU (Multiplex network body ECU)</li> <li>• Air conditioning amplifier assembly</li> <li>• Airbag sensor assembly</li> <li>• Spiral cable with sensor sub-assembly</li> <li>• Combination meter assembly</li> <li>• Certification ECU (Smart key ECU assembly)*1</li> <li>• 4 wheel drive control ECU*2</li> <li>• Navigation receiver assembly*3</li> <li>• Radio and display receiver assembly*4</li> <li>• Network gateway ECU*5</li> <li>• Door control and tire pressure monitoring system receiver assembly*6</li> <li>• Brake booster assembly (Skid control ECU)*7</li> <li>• Brake actuator assembly (Skid control ECU)*8</li> <li>• No. 1 CAN junction connector</li> <li>• No. 2 CAN junction connector</li> </ul> |

\*1: w/ Smart Key System

\*2: for 4WD

\*3: for Navigation Receiver Type

\*4: for Radio and Display Type

\*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System

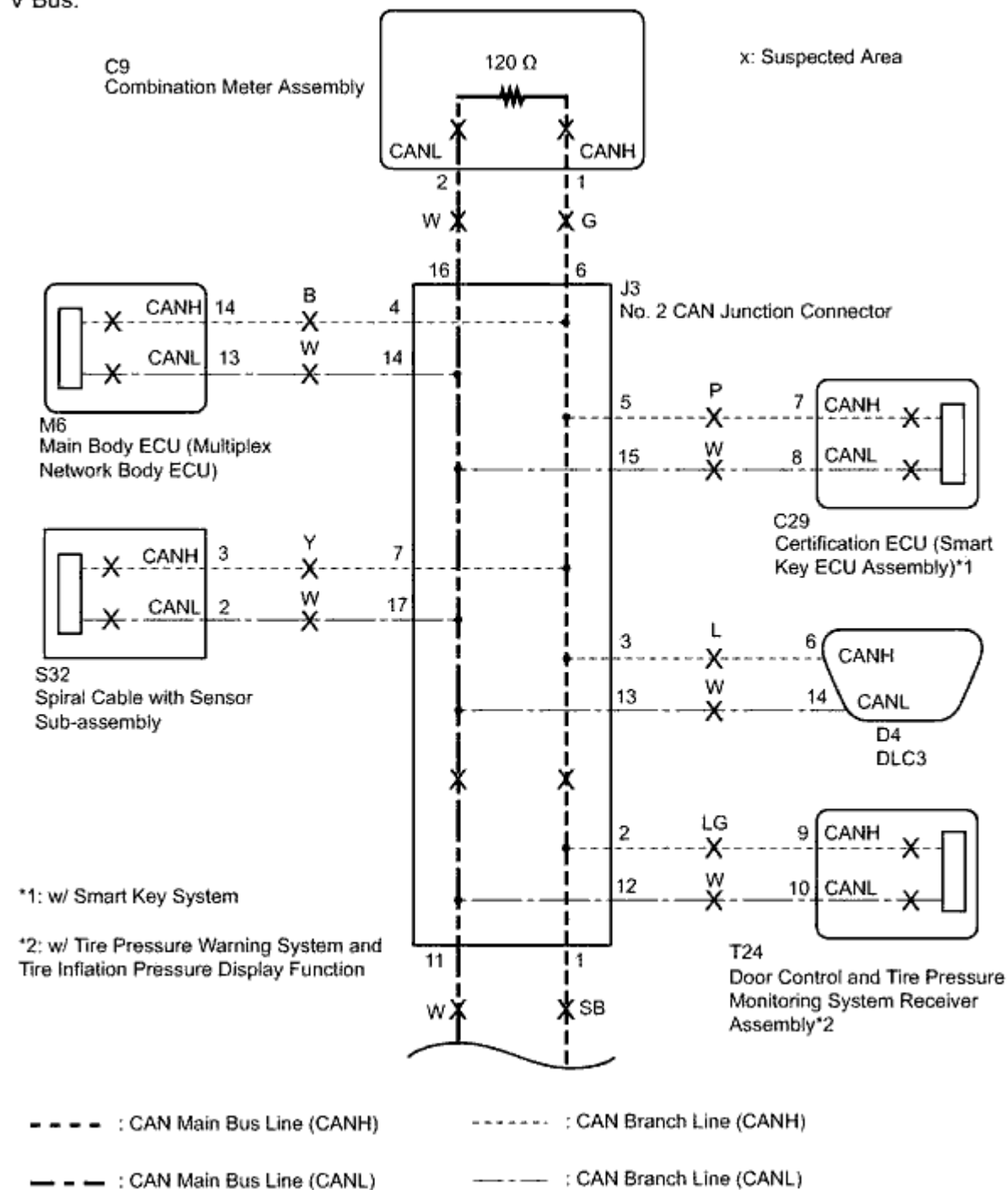
\*6: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*7: for Hydraulic Brake Booster

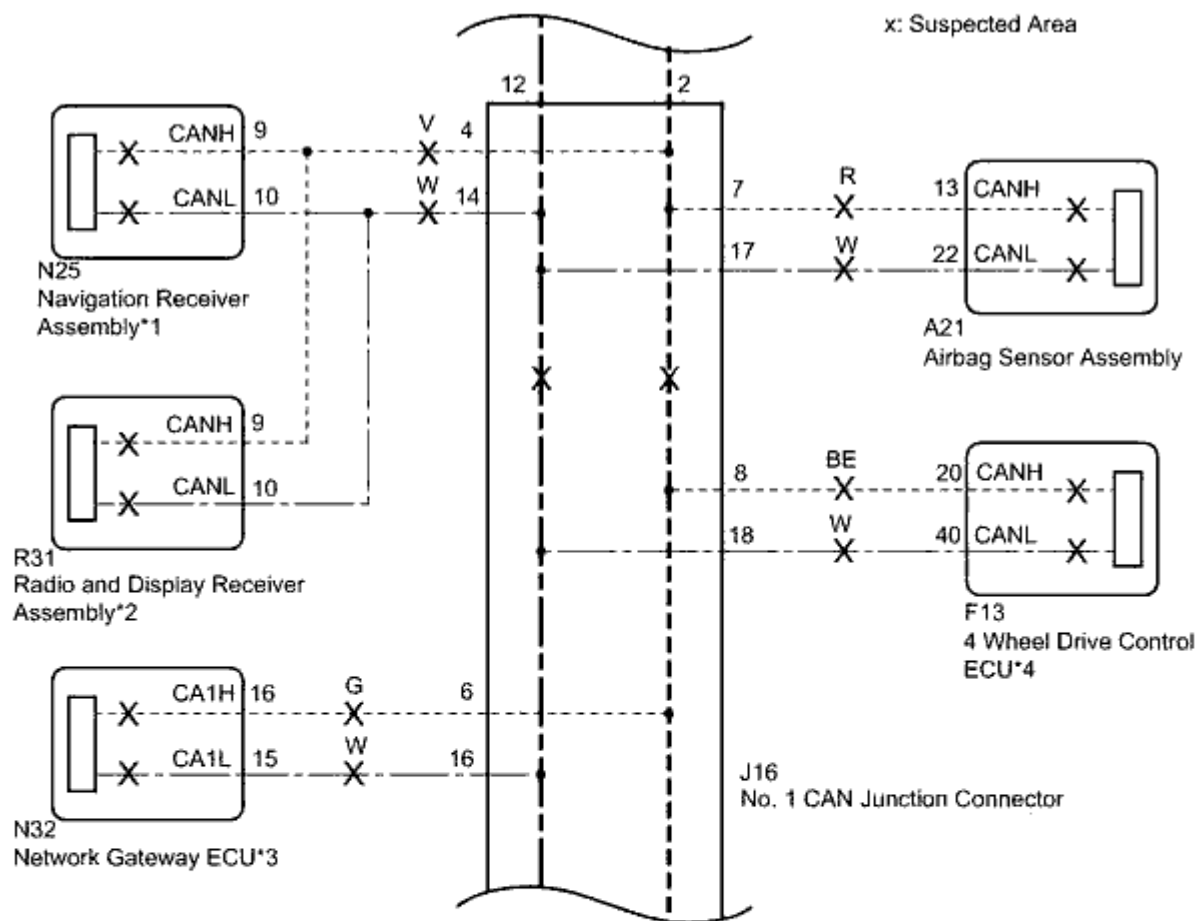
\*8: for Vacuum Brake Booster

## **WIRING DIAGRAM**

# V Bus:



# V Bus:



\*1: for Navigation Receiver Type

\*2: for Radio and Display Type

\*3: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*4: for 4WD

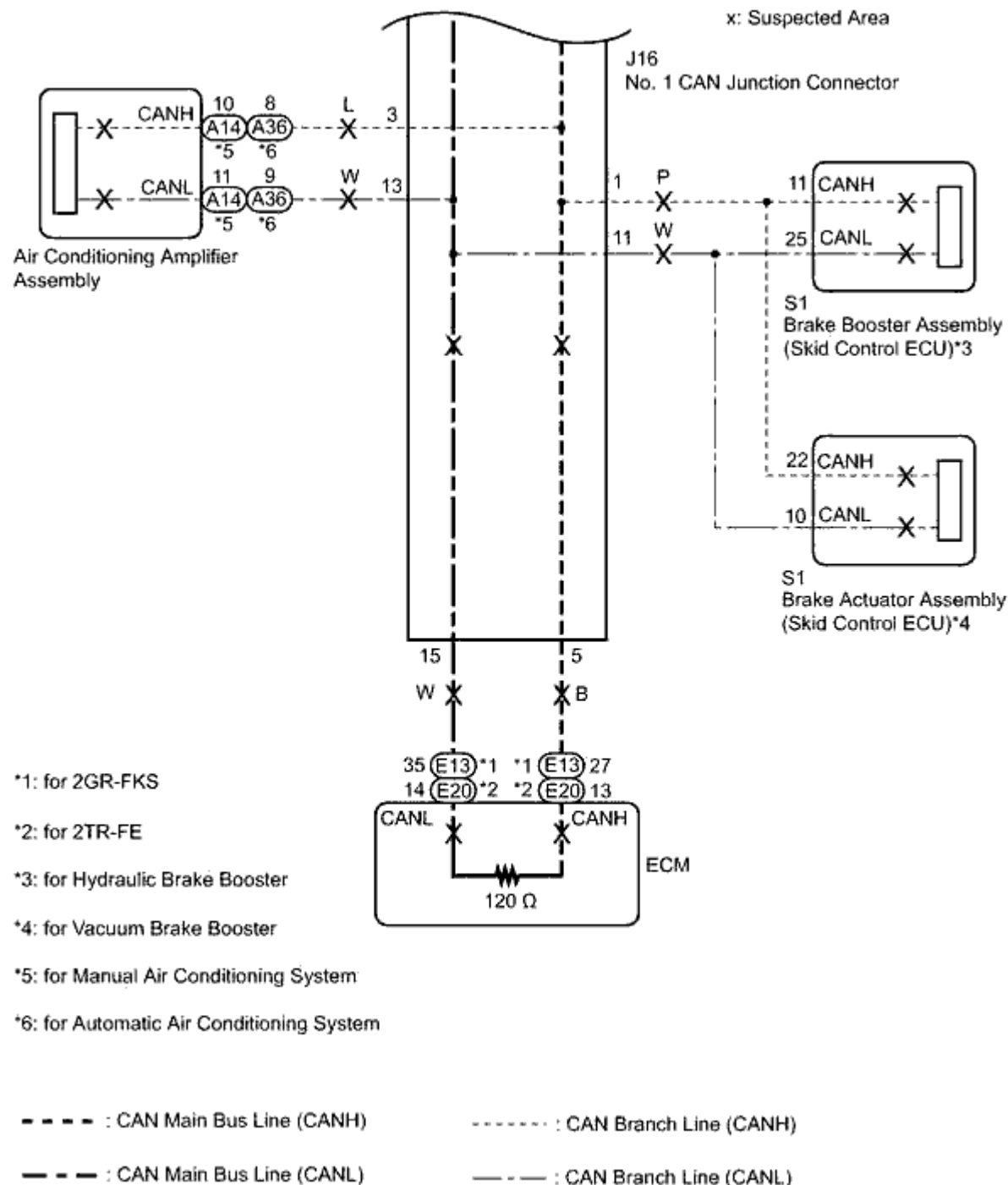
--- : CAN Main Bus Line (CANH)

..... : CAN Branch Line (CANH)

-.-.- : CAN Main Bus Line (CANL)

-.-.- : CAN Branch Line (CANL)

V Bus:



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or any switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work INFO.

- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 60 seconds, and then drive the vehicle at a speed of 36 km/h (22 mph) or more for 6.2 seconds or more.
- After the repair, perform CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

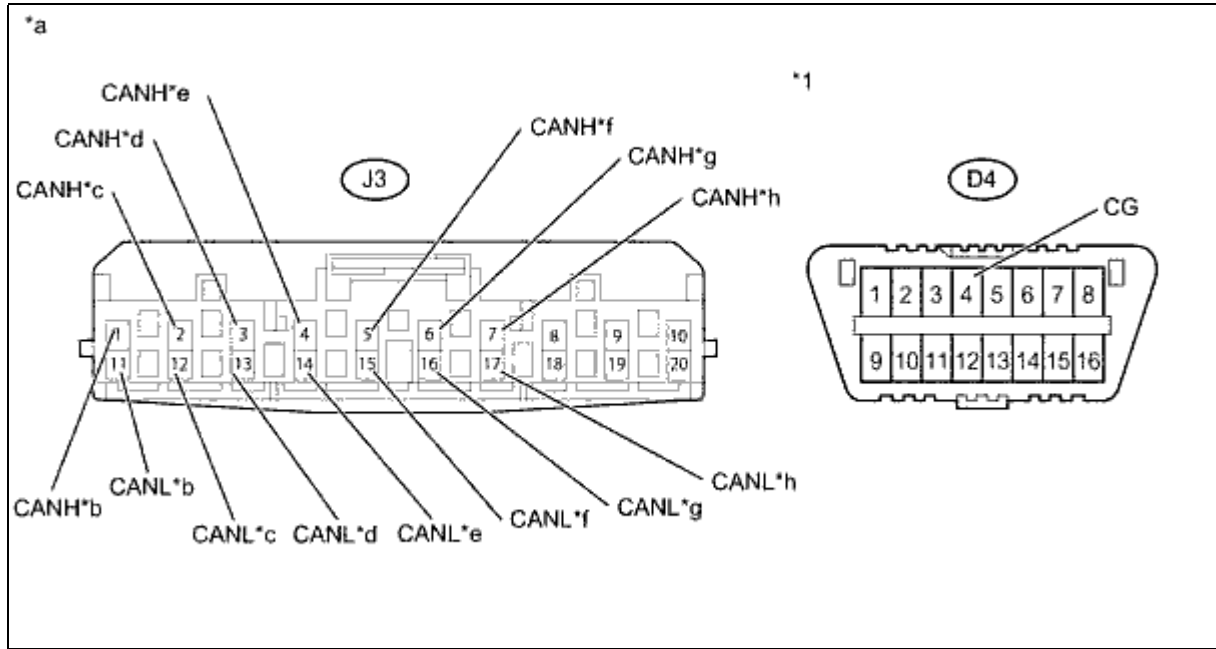
**HINT:**

- 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 may help determine the cause of the malfunction.

**PROCEDURE**

|    |                                                                       |
|----|-----------------------------------------------------------------------|
| 1. | CHECK FOR SHORT TO GND IN CAN BUS LINE (NO. 2 CAN JUNCTION CONNECTOR) |
|----|-----------------------------------------------------------------------|

- (a) Disconnect the cable from the negative (-) battery terminal.
- (b) Disconnect the No. 2 CAN junction connector.



**Text in Illustration**

|    |                                                                                                                                                      |    |                                 |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------------|
| *1 | DLC3                                                                                                                                                 | -  | -                               |
| *a | Front view of wire harness connector<br>(to No. 2 CAN Junction Connector)                                                                            | *b | to No. 1 CAN Junction Connector |
| *c | to Door Control and Tire Pressure Monitoring System Receiver Assembly (w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function) | *d | to DLC3                         |

|    |                                               |    |                                                                     |
|----|-----------------------------------------------|----|---------------------------------------------------------------------|
| *e | to Main Body ECU (Multiplex Network Body ECU) | *f | to Certification ECU (Smart Key ECU Assembly) (w/ Smart Key System) |
| *g | to Combination Meter Assembly                 | *h | to Spiral Cable with Sensor Sub-assembly                            |

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

Standard Resistance:

| TESTER CONNECTION        | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                                                         |
|--------------------------|-------------------------------------------------------|------------------------|----------------------------------------------------------------------|
| J3-1 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | No. 1 CAN junction connector                                         |
| J3-11 (CANL) - D4-4 (CG) |                                                       |                        |                                                                      |
| J3-2 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Door control and tire pressure monitoring system receiver assembly*1 |
| J3-12 (CANL) - D4-4 (CG) |                                                       |                        |                                                                      |
| J3-3 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | DLC3                                                                 |
| J3-13 (CANL) - D4-4 (CG) |                                                       |                        |                                                                      |
| J3-4 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Main body ECU (multiplex network body ECU)                           |
| J3-14 (CANL) - D4-4 (CG) |                                                       |                        |                                                                      |
| J3-5 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Certification ECU (smart key ECU assembly)*2                         |
| J3-15 (CANL) - D4-4 (CG) |                                                       |                        |                                                                      |
| J3-6 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Combination meter assembly                                           |
| J3-16 (CANL) - D4-4 (CG) |                                                       |                        |                                                                      |
| J3-7 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Spiral cable with sensor sub-assembly                                |
| J3-17 (CANL) - D4-4 (CG) |                                                       |                        |                                                                      |

\*1: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*2: w/ Smart Key System

## Result

|        |            |
|--------|------------|
| RESULT | PROCEED TO |
|--------|------------|

| RESULT                                      | PROCEED TO |
|---------------------------------------------|------------|
| OK                                          | A          |
| NG (No. 1 CAN junction connector main line) | B          |
| NG (ECU or sensor bus line)                 | C          |
| NG (DLC3 branch line)                       | D          |

**B** ► **GO TO STEP 2**

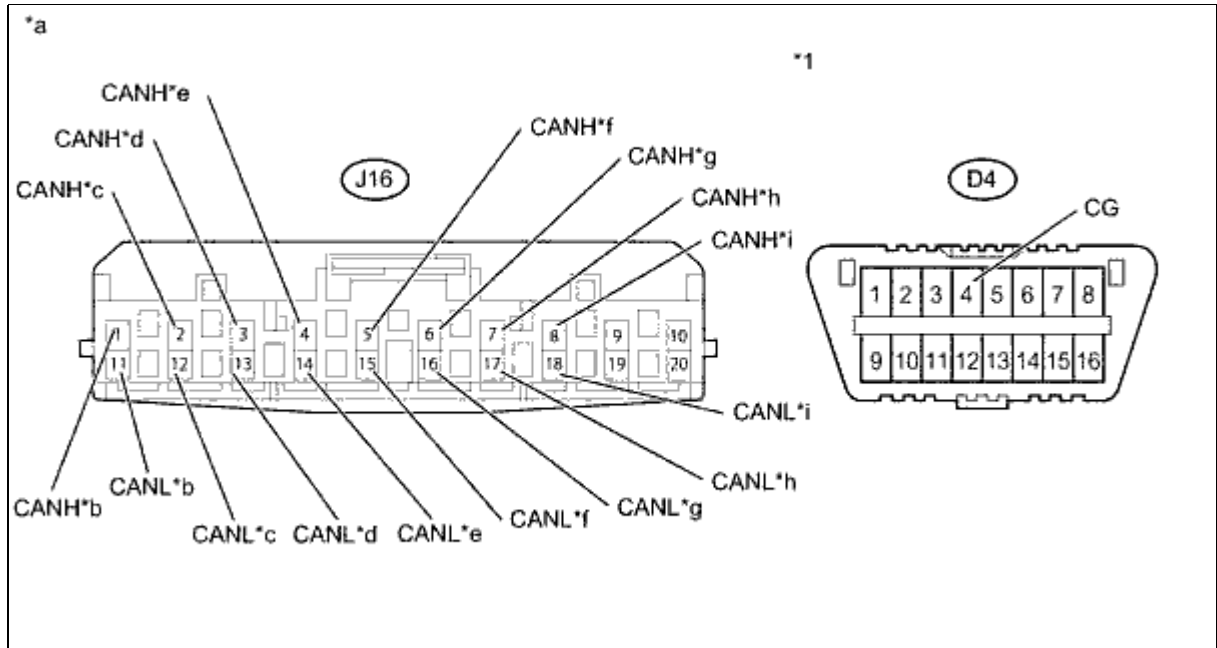
**C** ► **GO TO STEP 3**

**D** ► **REPAIR OR REPLACE CAN BRANCH LINE CONNECTED TO DLC3**

**A** ► **REPLACE NO. 2 CAN JUNCTION CONNECTOR**

|    |                                                                              |
|----|------------------------------------------------------------------------------|
| 2. | <b>CHECK FOR SHORT TO GND IN CAN BUS LINE (NO. 1 CAN JUNCTION CONNECTOR)</b> |
|----|------------------------------------------------------------------------------|

(a) Disconnect the No. 1 CAN junction connector.



**Text in Illustration**

|    |                                                                        |    |                                                                                                                                                     |
|----|------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| *1 | DLC3                                                                   | -  | -                                                                                                                                                   |
| *a | Front view of wire harness connector (to No. 1 CAN Junction Connector) | *b | to Brake Booster Assembly (Skid Control ECU) (for Hydraulic Brake Booster) or Brake Actuator Assembly (Skid Control ECU) (for Vacuum Brake Booster) |
| *c | to No. 2 CAN Junction Connector                                        | *d | to Air Conditioning Amplifier Assembly                                                                                                              |

|    |                                                                                                                                    |    |                           |
|----|------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------|
| *e | to Navigation Receiver Assembly (for Navigation Receiver Type) or Radio and Display Receiver Assembly (for Radio and Display Type) | *f | to ECM                    |
| *g | to Network Gateway ECU (w/ Blind Spot Monitor System or Intuitive Parking Assist System)                                           | *h | to Airbag Sensor Assembly |
| *i | to 4 Wheel Drive Control ECU (for 4WD)                                                                                             | -  | -                         |

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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                                                                                |
|---------------------------|-------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------|
| J16-1 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2 |
| J16-11 (CANL) - D4-4 (CG) |                                                       |                        |                                                                                             |
| J16-2 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | No. 2 CAN junction connector                                                                |
| J16-12 (CANL) - D4-4 (CG) |                                                       |                        |                                                                                             |
| J16-3 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Air conditioning amplifier assembly                                                         |
| J16-13 (CANL) - D4-4 (CG) |                                                       |                        |                                                                                             |
| J16-4 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Navigation receiver assembly*3 or radio and display receiver assembly*4                     |
| J16-14 (CANL) - D4-4 (CG) |                                                       |                        |                                                                                             |
| J16-5 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | ECM                                                                                         |
| J16-15 (CANL) - D4-4 (CG) |                                                       |                        |                                                                                             |
| J16-6 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Network gateway ECU*5                                                                       |
| J16-16 (CANL) - D4-4 (CG) |                                                       |                        |                                                                                             |
| J16-7 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Airbag sensor assembly                                                                      |
| J16-17 (CANL) - D4-4 (CG) |                                                       |                        |                                                                                             |
| J16-8 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | 4 wheel drive control ECU*6                                                                 |

| TESTER CONNECTION         | CONDITION | SPECIFIED CONDITION | CONNECTED TO |
|---------------------------|-----------|---------------------|--------------|
| J16-18 (CANL) - D4-4 (CG) |           |                     |              |

- \*1: for Hydraulic Brake Booster
- \*2: for Vacuum Brake Booster
- \*3: for Navigation Receiver Type
- \*4: for Radio and Display Type
- \*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System
- \*6: for 4WD

## Result

| RESULT                                      | PROCEED TO |
|---------------------------------------------|------------|
| OK                                          | A          |
| NG (ECU or sensor bus line)                 | B          |
| NG (No. 2 CAN junction connector main line) | C          |

**B** ► **GO TO STEP 3**

**C** ► **REPAIR OR REPLACE CAN MAIN BUS LINE (NO. 1 CAN JUNCTION CONNECTOR - NO. 2 CAN JUNCTION CONNECTOR)**

**A** ► **REPLACE NO. 1 CAN JUNCTION CONNECTOR**

|           |                                                             |
|-----------|-------------------------------------------------------------|
| <b>3.</b> | <b>CHECK FOR SHORT TO GND IN CAN BUS LINE (ECU, SENSOR)</b> |
|-----------|-------------------------------------------------------------|

(a) Reconnect all wire harness connectors (No. 1 CAN junction connector and No. 2 CAN junction connector).

(b) Disconnect the ECU or sensor connected to the CAN bus line that is shorted to ground.

## HINT:

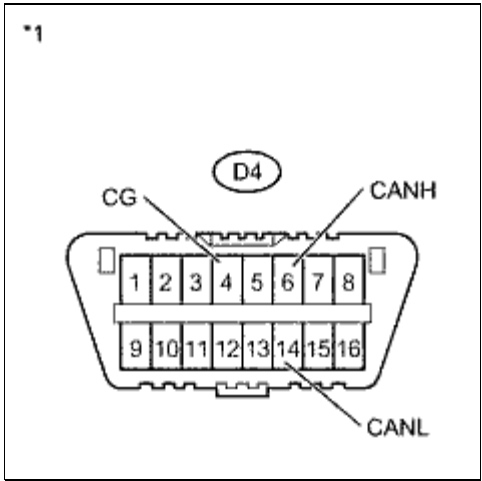
If the ECU or sensor has multiple connectors, disconnect the connector that includes the CAN bus lines. To determine the ECU or sensor that is connected to the shorted bus line, refer to the terminals of ECU tables

INFO .

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                                | SPECIFIED CONDITION |
|-----------------------------|----------------------------------------------------------|---------------------|
| D4-6 (CANH) -<br>D4-4 (CG)  | Cable disconnected from<br>negative (-) battery terminal | 200 Ω or higher     |
| D4-14 (CANL) -<br>D4-4 (CG) |                                                          |                     |



Text in Illustration

|    |      |
|----|------|
| *1 | DLC3 |
|----|------|

HINT:

If the resistance changes to 200 Ω or higher when the connector is disconnected from the ECU or sensor, there may be a short in the ECU or sensor.

**NG** ► REPAIR OR REPLACE CORRESPONDING ECU OR SENSOR BUS LINE OR CONNECTOR

**OK** ► REPLACE CORRESPONDING ECU OR SENSOR



|                                                                                                                                   |                      |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                  | 6.6 J                | <b>Doc ID:</b> RM000000WIN0ADX           |
| <b>Model Year Start:</b> 2016                                                                                                     | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Check CAN Bus Lines for Short Circuit; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

**Check CAN Bus Lines for Short Circuit**

## **DESCRIPTION**

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

| SYMPTOM                                                                        | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is below 54 Ω. | <ul style="list-style-type: none"> <li>• Short in CAN main bus lines</li> <li>• Short in CAN branch lines</li> <li>• ECM</li> <li>• Main body ECU (Multiplex network body ECU)</li> <li>• Air conditioning amplifier assembly</li> <li>• Airbag sensor assembly</li> <li>• Spiral cable with sensor sub-assembly</li> <li>• Combination meter assembly</li> <li>• Certification ECU (Smart key ECU assembly)*1</li> <li>• 4 wheel drive control ECU*2</li> <li>• Navigation receiver assembly*3</li> <li>• Radio and display receiver assembly*4</li> <li>• Network gateway ECU*5</li> <li>• Door control and tire pressure monitoring system receiver assembly*6</li> <li>• Brake booster assembly (Skid control ECU)*7</li> <li>• Brake actuator assembly (Skid control ECU)*8</li> <li>• No. 1 CAN junction connector</li> <li>• No. 2 CAN junction connector</li> </ul> |

\*1: w/ Smart Key System

\*2: for 4WD

\*3: for Navigation Receiver Type

\*4: for Radio and Display Type

\*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System

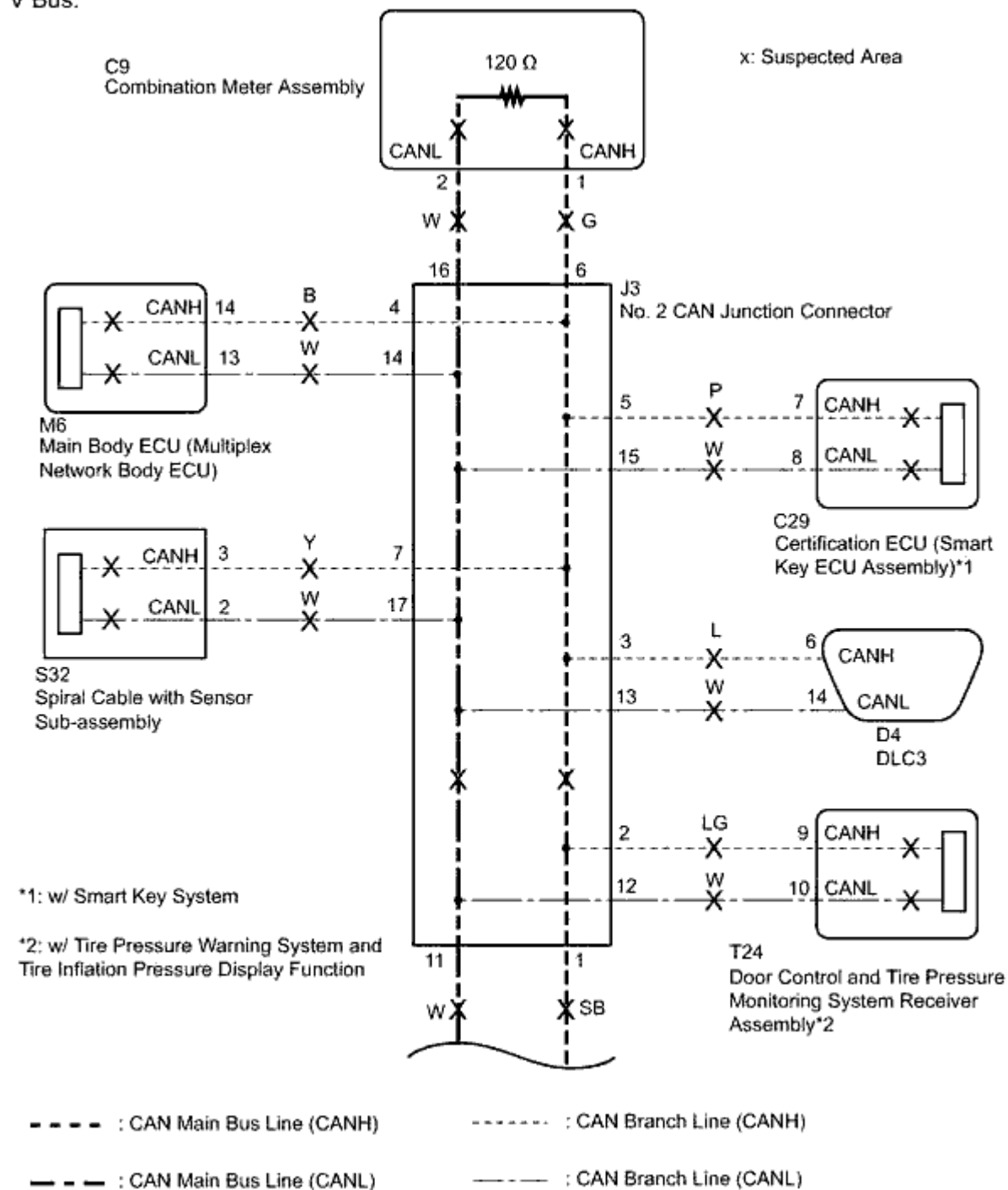
\*6: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*7: for Hydraulic Brake Booster

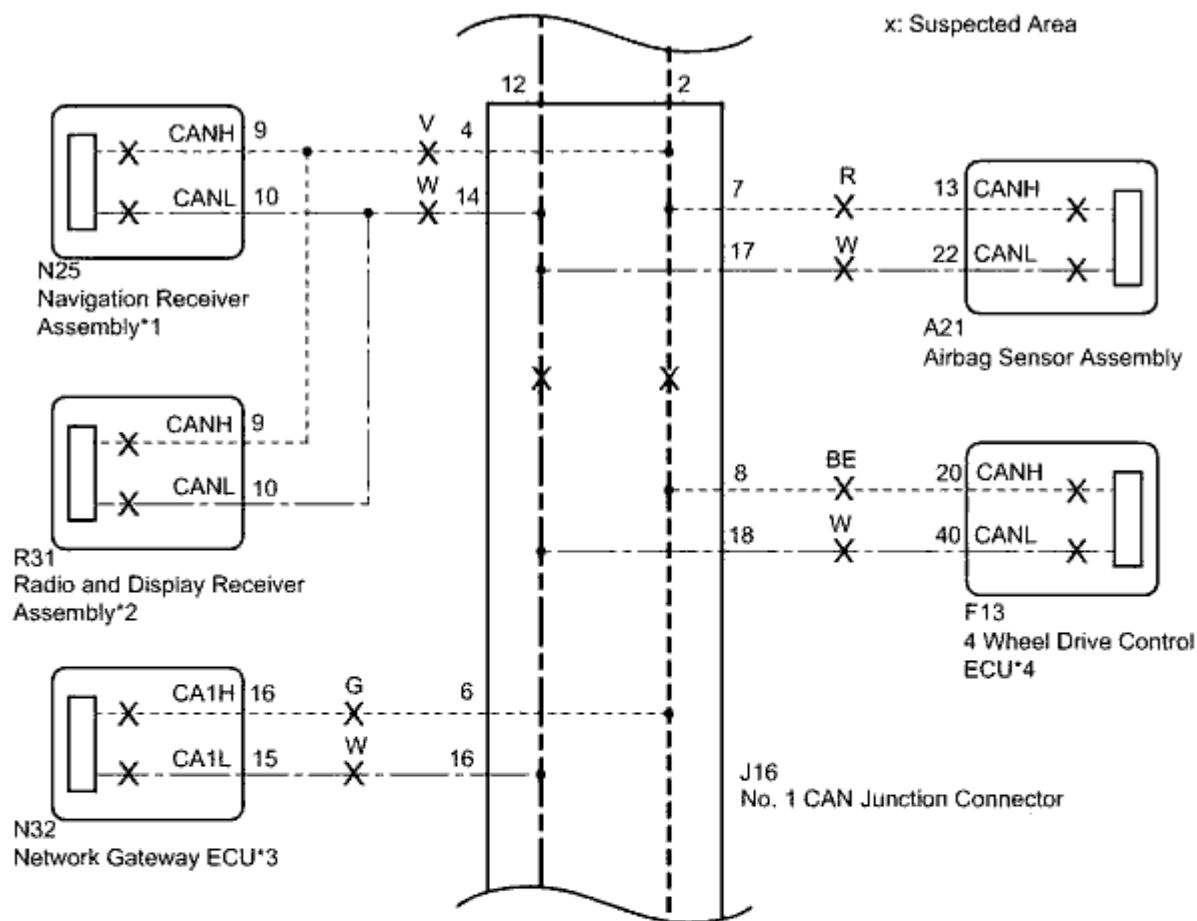
\*8: for Vacuum Brake Booster

## **WIRING DIAGRAM**

# V Bus:



# V Bus:



\*1: for Navigation Receiver Type

\*2: for Radio and Display Type

\*3: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*4: for 4WD

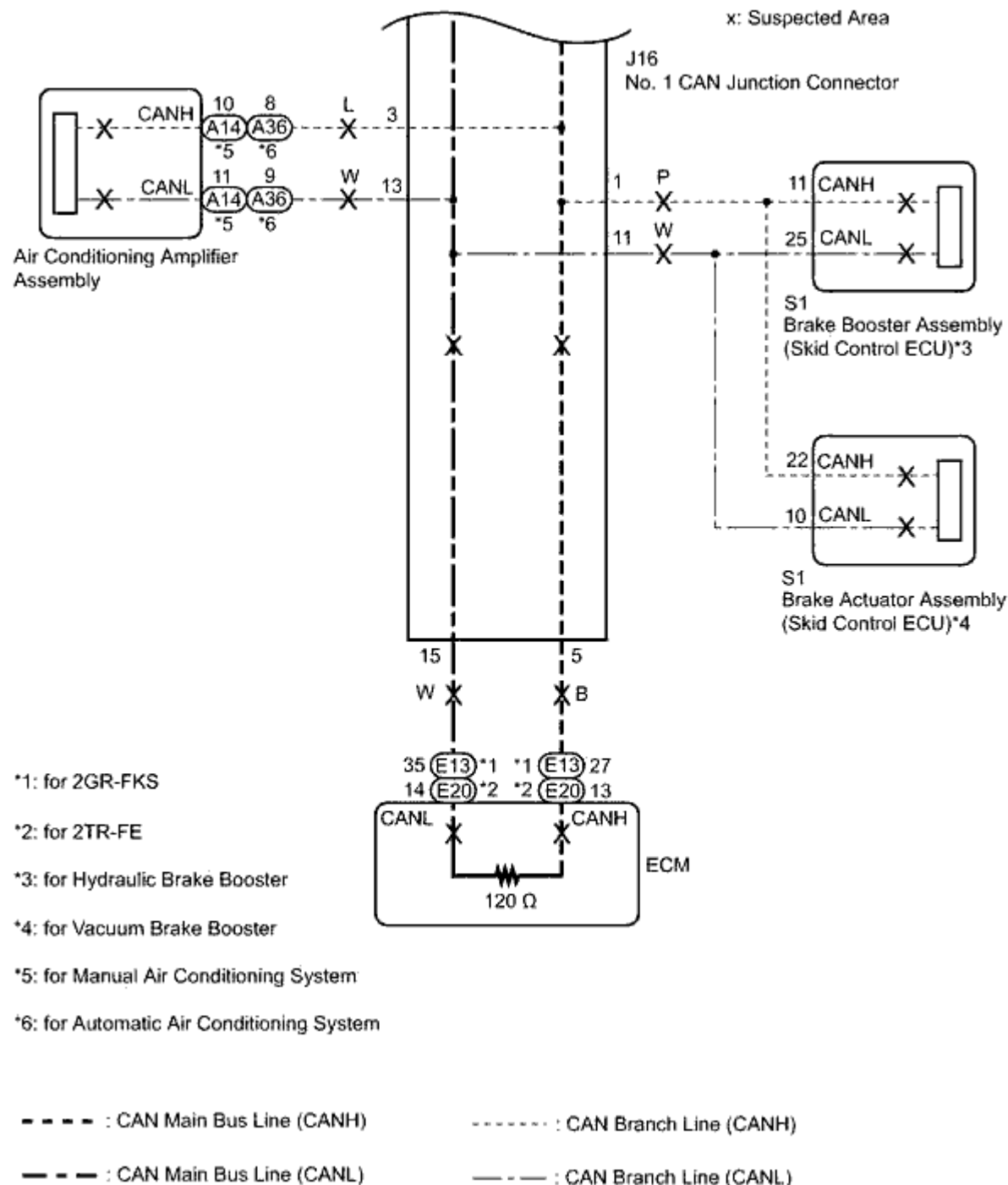
--- : CAN Main Bus Line (CANH)

----- : CAN Branch Line (CANH)

--- : CAN Main Bus Line (CANL)

----- : CAN Branch Line (CANL)

V Bus:



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or any switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work **INFO**.

- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 60 seconds, and then drive the vehicle at a speed of 36 km/h (22 mph) or more for 6.2 seconds or more.
- After the repair, perform CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

#### 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 may help determine the cause of the malfunction.

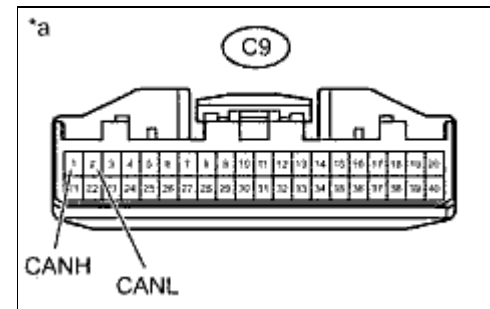
## PROCEDURE

1.

### CHECK FOR SHORT IN CAN BUS LINES (COMBINATION METER ASSEMBLY - NO. 2 CAN JUNCTION CONNECTOR)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the combination meter assembly connector.



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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED CONDITION |
|---------------------------|-------------------------------------------------------|---------------------|
| C9-1 (CANH) - C9-2 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

#### Text in Illustration

\*a

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

#### HINT:

If the resistance becomes normal (between 108 to 132  $\Omega$ ) when the connector is disconnected, there may be a short in the combination meter assembly.

**NG** ➡ GO TO STEP 2

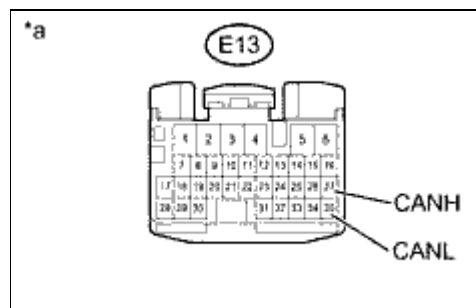
**OK** ➡ REPLACE COMBINATION METER ASSEMBLY

## 2. CHECK FOR SHORT IN CAN BUS LINES (ECM - NO. 1 CAN JUNCTION CONNECTOR)

(a) for 2GR-FKS

(1) Reconnect the C9 combination meter assembly connector.

(2) Disconnect the ECM connector.



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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| E13-27 (CANH) - E13-35 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

### Text in Illustration

|    |                                               |
|----|-----------------------------------------------|
| *a | Front view of wire harness connector (to ECM) |
|----|-----------------------------------------------|

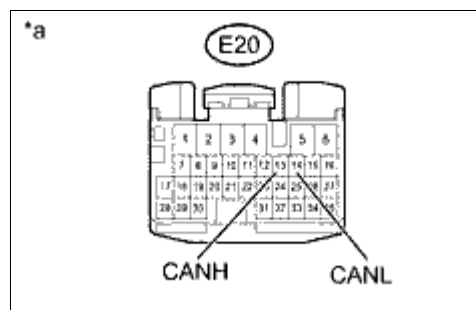
### HINT:

If the resistance becomes normal (between 108 to 132  $\Omega$ ) when the connector is disconnected, there may be a short in the ECM.

(b) for 2TR-FE

(1) Reconnect the C9 combination meter assembly connector.

(2) Disconnect the ECM connector.



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

Standard Resistance:

| TESTER CONNECTION | CONDITION | SPECIFIED |
|-------------------|-----------|-----------|
|-------------------|-----------|-----------|

|                               |                                                       |                     |
|-------------------------------|-------------------------------------------------------|---------------------|
|                               |                                                       | CONDITION           |
| E20-13 (CANH) - E20-14 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

#### Text in Illustration

|    |                                               |
|----|-----------------------------------------------|
| *a | Front view of wire harness connector (to ECM) |
|----|-----------------------------------------------|

#### HINT:

If the resistance becomes normal (between 108 to 132  $\Omega$ ) when the connector is disconnected, there may be a short in the ECM.

#### Result

| RESULT           | PROCEED TO |
|------------------|------------|
| OK (for 2GR-FKS) | A          |
| OK (for 2TR-FE)  | B          |
| NG               | C          |

**B** ► REPLACE ECM

**C** ► GO TO STEP 3

**A** ► REPLACE ECM

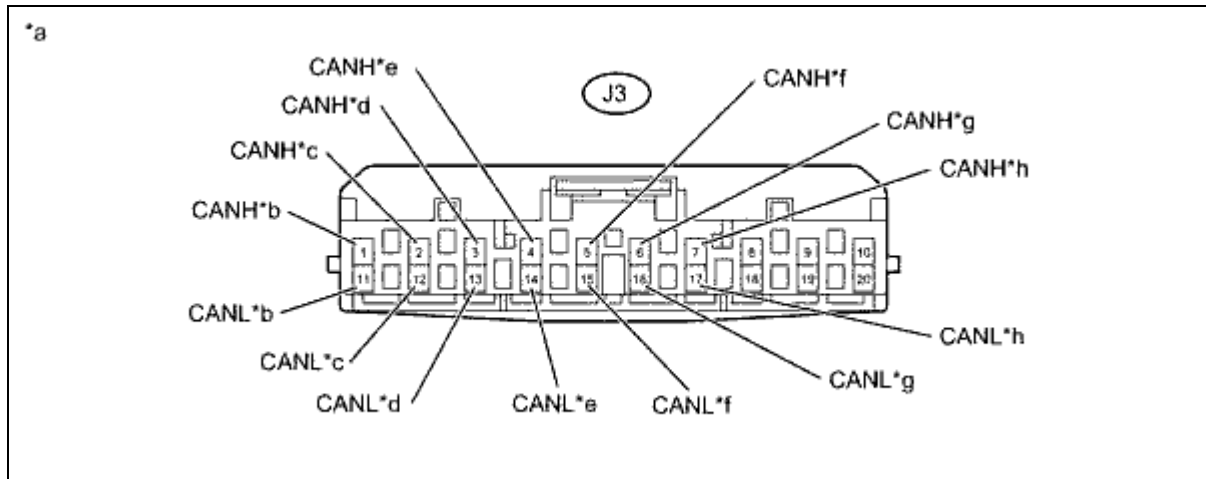
|           |                                                                        |
|-----------|------------------------------------------------------------------------|
| <b>3.</b> | <b>CHECK FOR SHORT IN CAN BUS LINES (NO. 2 CAN JUNCTION CONNECTOR)</b> |
|-----------|------------------------------------------------------------------------|

(a) Reconnect the E13\*1 or E20\*2 ECM connector.

\*1: for 2GR-FKS

\*2: for 2TR-FE

(b) Disconnect the No. 2 CAN junction connector.



### Text in Illustration

|    |                                                                                                                                                      |    |                                                                     |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to No. 2 CAN Junction Connector)                                                                            | *b | to No. 1 CAN Junction Connector                                     |
| *c | to Door Control and Tire Pressure Monitoring System Receiver Assembly (w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function) | *d | to DLC3                                                             |
| *e | to Main Body ECU (Multiplex Network Body ECU)                                                                                                        | *f | to Certification ECU (Smart Key ECU Assembly) (w/ Smart Key System) |
| *g | to Combination Meter Assembly                                                                                                                        | *h | to Spiral Cable with Sensor Sub-assembly                            |

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                                                         |
|----------------------------|-------------------------------------------------------|------------------------|----------------------------------------------------------------------|
| J3-1 (CANH) - J3-11 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | No. 1 CAN junction connector                                         |
| J3-2 (CANH) - J3-12 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Door control and tire pressure monitoring system receiver assembly*1 |
| J3-3 (CANH) - J3-13 (CANL) | Cable disconnected from negative (-) battery terminal | 1 M $\Omega$ or higher | DLC3                                                                 |
| J3-4 (CANH) - J3-14 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Main body ECU (multiplex network body ECU)                           |
| J3-5 (CANH) - J3-15 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Certification ECU (smart key ECU assembly)*2                         |
| J3-6 (CANH) - J3-16 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | Combination meter assembly                                           |
| J3-7 (CANH) - J3-17 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | Spiral cable with sensor sub-assembly                                |

\*1: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*2: w/ Smart Key System

## Result

| RESULT                                       | PROCEED TO |
|----------------------------------------------|------------|
| OK                                           | A          |
| NG (No. 1 CAN junction connector main lines) | B          |
| NG (ECU or sensor branch lines)              | C          |
| NG (Combination meter assembly main lines)   | D          |
| NG (DLC3 branch lines)                       | E          |

**B** ► **GO TO STEP 4**

**C** ► **GO TO STEP 5**

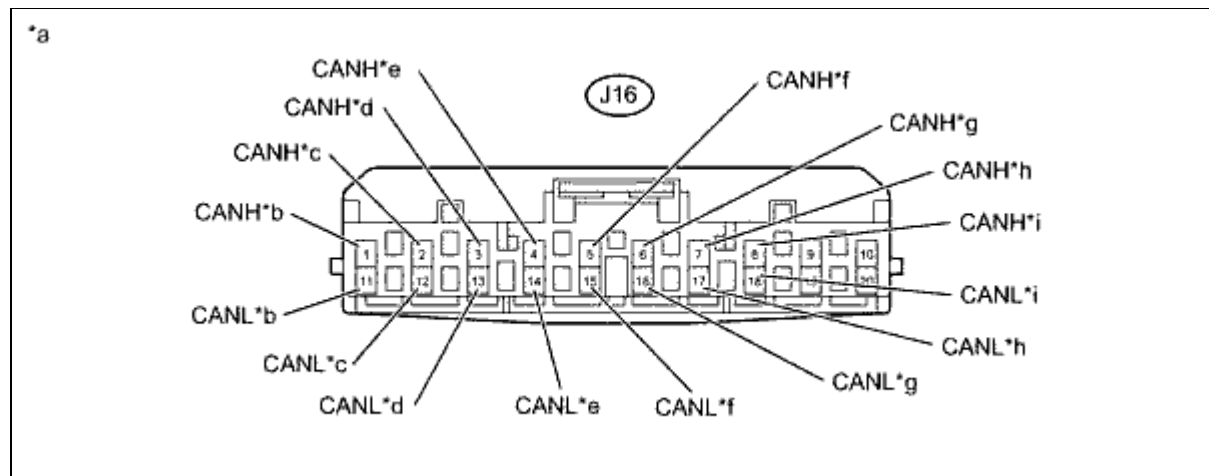
**D** ► **REPAIR OR REPLACE CAN MAIN BUS LINES  
(COMBINATION METER ASSEMBLY - NO. 2 CAN  
JUNCTION CONNECTOR)**

**E** ► **REPAIR OR REPLACE CAN BRANCH LINES  
CONNECTED TO DLC3**

**A** ► **REPLACE NO. 2 CAN JUNCTION CONNECTOR**

## 4. CHECK FOR SHORT IN CAN BUS LINES (NO. 1 CAN JUNCTION CONNECTOR)

(a) Disconnect the No. 1 CAN junction connector.



### Text in Illustration

|    |                                      |    |                                                                                                       |
|----|--------------------------------------|----|-------------------------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector | *b | to Brake Booster Assembly (Skid Control ECU) (for Hydraulic Brake Booster) or Brake Actuator Assembly |
|----|--------------------------------------|----|-------------------------------------------------------------------------------------------------------|

|    |                                                                                                                                    |    |                                               |
|----|------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------------------------------|
|    | (to No. 1 CAN Junction Connector)                                                                                                  |    | (Skid Control ECU) (for Vacuum Brake Booster) |
| *c | to No. 2 CAN Junction Connector                                                                                                    | *d | to Air Conditioning Amplifier Assembly        |
| *e | to Navigation Receiver Assembly (for Navigation Receiver Type) or Radio and Display Receiver Assembly (for Radio and Display Type) | *f | to ECM                                        |
| *g | to Network Gateway ECU (w/ Blind Spot Monitor System or Intuitive Parking Assist System)                                           | *h | to Airbag Sensor Assembly                     |
| *i | to 4 Wheel Drive Control ECU (for 4WD)                                                                                             | -  | -                                             |

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

Standard Resistance:

| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                                                                                |
|------------------------------|-------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------|
| J16-1 (CANH) - J16-11 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2 |
| J16-2 (CANH) - J16-12 (CANL) | Cable disconnected from negative (-) battery terminal | 1 M $\Omega$ or higher | No. 2 CAN junction connector                                                                |
| J16-3 (CANH) - J16-13 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Air conditioning amplifier assembly                                                         |
| J16-4 (CANH) - J16-14 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Navigation receiver assembly*3 or radio and display receiver assembly*4                     |
| J16-5 (CANH) - J16-15 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | ECM                                                                                         |
| J16-6 (CANH) - J16-16 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Network gateway ECU*5                                                                       |
| J16-7 (CANH) - J16-17 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Airbag sensor assembly                                                                      |
| J16-8 (CANH) - J16-18 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | 4 wheel drive control ECU*6                                                                 |

\*1: for Hydraulic Brake Booster

\*2: for Vacuum Brake Booster

\*3: for Navigation Receiver Type

\*4: for Radio and Display Type

\*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*6: for 4WD

## Result

| RESULT                                       | PROCEED TO |
|----------------------------------------------|------------|
| OK                                           | A          |
| NG (ECU or sensor branch lines)              | B          |
| NG (No. 2 CAN junction connector main lines) | C          |
| NG (ECM main lines)                          | D          |

**B** ► GO TO STEP 5

**C** ► REPAIR OR REPLACE CAN MAIN BUS LINES (NO. 1 CAN JUNCTION CONNECTOR - NO. 2 CAN JUNCTION CONNECTOR)

**D** ► REPAIR OR REPLACE CAN MAIN BUS LINES (ECM - NO. 1 CAN JUNCTION CONNECTOR)

**A**  
▼

|           |                                                       |
|-----------|-------------------------------------------------------|
| <b>5.</b> | <b>CHECK FOR SHORT IN CAN BUS LINES (ECU, SENSOR)</b> |
|-----------|-------------------------------------------------------|

- (a) Reconnect all wire harness connectors (No. 1 CAN junction connector and No. 2 CAN junction connector).
- (b) Disconnect the connector that includes terminals CANH and CANL from the ECU or sensor to which the short circuited branch line is connected **INFO**.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

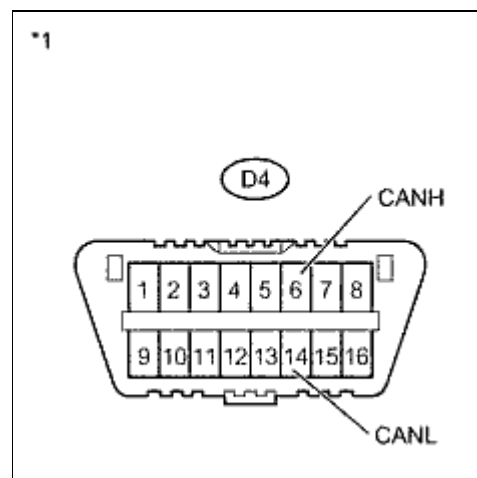
| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| D4-6 (CANH) - D4-14 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

### Text in Illustration

|    |      |
|----|------|
| *1 | DLC3 |
|----|------|

### HINT:

If the resistance becomes normal (between 54 and 69  $\Omega$ ) when the connector is disconnected from the ECU or sensor, there may



be a short in the ECU or sensor.

**NG** ► REPAIR OR REPLACE CORRESPONDING ECU OR  
SENSOR BRANCH LINES OR CONNECTOR

**OK** ► REPLACE CORRESPONDING ECU OR SENSOR



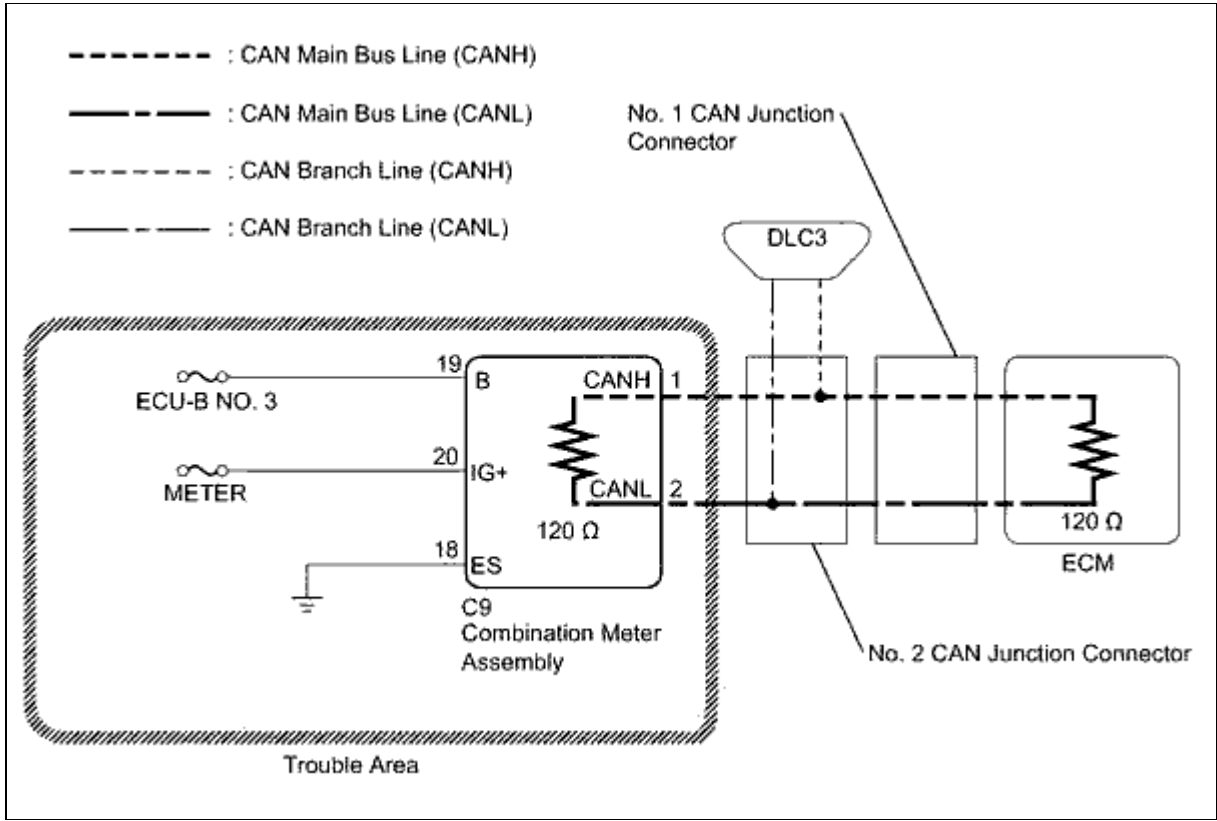
|                                                                                                                                           |                      |                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                          | 6.6 J                | <b>Doc ID:</b> RM000001F1S0ACX           |
| <b>Model Year Start:</b> 2016                                                                                                             | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Combination Meter ECU Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

Combination Meter ECU Communication Stop Mode

DESCRIPTION

| DETECTION ITEM                                | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                       | TROUBLE AREA                                                                                                                                                                                                                                           |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Combination Meter ECU Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>"Combination Meter" is not displayed on the CAN Bus Check screen of the Techstream <span>INFO</span></li> <li>Communication system DTCs (DTCs that start with U) that correspond to "Combination Meter ECU Communication Stop Mode" in "DTC Combination Table" are output <span>INFO</span></li> </ul> | <ul style="list-style-type: none"> <li>Combination meter assembly main line or connector</li> <li>Power source circuit of combination meter assembly</li> <li>Combination meter assembly ground circuit</li> <li>Combination meter assembly</li> </ul> |

WIRING DIAGRAM



# INSPECTION PROCEDURE

## NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work **INFO** .
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO** .
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 20 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO** .

## HINT:

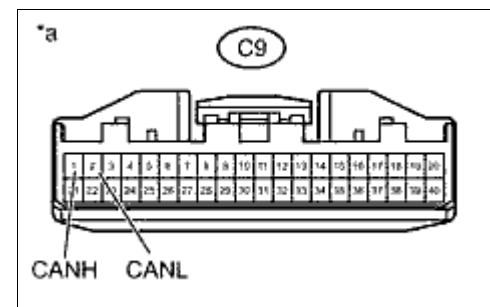
- Operating the ignition switch, any other switches or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring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

# PROCEDURE

## 1. CHECK FOR OPEN IN CAN BUS LINES (COMBINATION METER ASSEMBLY MAIN LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the combination meter assembly connector.



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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED CONDITION |
|---------------------------|-------------------------------------------------------|---------------------|
| C9-1 (CANH) - C9-2 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

## Text in Illustration

\*a Front view of wire harness connector  
(to Combination Meter Assembly)

**NG** ▶ REPAIR OR REPLACE CAN MAIN BUS LINE OR  
CONNECTOR (COMBINATION METER ASSEMBLY  
MAIN LINE)

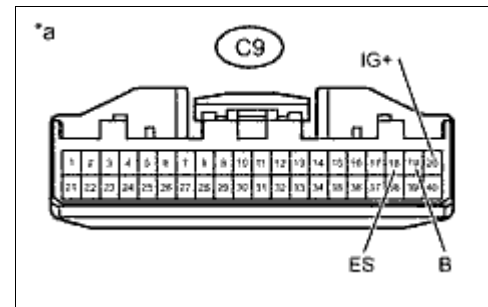
**OK**  
▼

**2. CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)**

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

Standard Resistance:

| TESTER CONNECTION        | CONDITION                                             | SPECIFIED CONDITION |
|--------------------------|-------------------------------------------------------|---------------------|
| C9-18 (ES) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION         | SWITCH CONDITION   | SPECIFIED CONDITION |
|---------------------------|--------------------|---------------------|
| C9-20 (IG+) - Body ground | Ignition switch ON | 11 to 14 V          |
| C9-19 (B) - Body ground   | Always             | 11 to 14 V          |

**Text in Illustration**

|    |                                                                         |
|----|-------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Combination Meter Assembly) |
|----|-------------------------------------------------------------------------|

**NG** ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ▶ REPLACE COMBINATION METER ASSEMBLY



|                                                                                                              |                      |                                          |
|--------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                             | 6.6 D                | <b>Doc ID:</b> RM000000WIB0EMX           |
| <b>Model Year Start:</b> 2016                                                                                | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: DIAGNOSIS SYSTEM; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## **DIAGNOSIS SYSTEM**

### **1. ECUS OR SENSORS WHICH COMMUNICATE THROUGH CAN COMMUNICATION SYSTEM**

#### (a) V Bus

- (1) Combination meter assembly
- (2) Main body ECU (Multiplex network body ECU)
- (3) Spiral cable with sensor sub-assembly
- (4) Airbag sensor assembly
- (5) ECM
- (6) Air conditioning amplifier assembly
- (7) Network gateway ECU\*1
- (8) Navigation receiver assembly\*2
- (9) Radio and display receiver assembly\*3
- (10) Certification ECU (Smart key ECU assembly)\*4
- (11) Brake booster assembly (Skid control ECU)\*5
- (12) Brake actuator assembly (Skid control ECU)\*6
- (13) Door control and tire pressure monitoring system receiver assembly\*7
- (14) 4 wheel drive control ECU\*8

#### (b) Sub bus 2\*1

- (1) Network gateway ECU
- (2) Clearance warning ECU assembly\*9
- (3) Blind spot monitor sensor LH\*10

\*1: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*2: for Navigation Receiver Type

\*3: for Radio and Display Type

\*4: w/ Smart Key System

\*5: for Hydraulic Brake Booster

\*6: for Vacuum Brake Booster

\*7: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*8: for 4WD

\*9: w/ Intuitive Parking Assist System

\*10: w/ Blind Spot Monitor System

### **2. CHECK FOR INSTALLED SYSTEMS (ECUS AND SENSORS) THAT ADOPT CAN COMMUNICATION**

- (a) The systems (ECUs and sensors) that adopt CAN communication vary depending on the vehicle and optional equipment. Check which systems (ECUs and sensors) are installed on the vehicle.

#### **HINT:**

The names of ECUs and sensors shown on the Techstream display may differ from those shown in the DTC Table by ECU section.

| ECU/SENSOR NAME                                                    | TECHSTREAM DISPLAY                            | APPLICABILITY                                                                           |
|--------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------|
| ECM                                                                | ECM (Engine)                                  | Installed on all vehicles                                                               |
| Network gateway ECU                                                | CAN Gateway1                                  | Vehicles with blind spot monitor system or intuitive parking assist system              |
| Combination meter assembly                                         | Combination Meter                             | Installed on all vehicles                                                               |
| Main body ECU (Multiplex network body ECU)                         | Main Body                                     | Installed on all vehicles                                                               |
| Brake booster assembly (Skid control ECU)                          | Skid Control (ABS/VSC /TRAC)                  | Vehicles with hydraulic brake booster                                                   |
| Brake actuator assembly (Skid control ECU)                         | Skid Control (ABS/VSC /TRAC)                  | Vehicles with vacuum brake booster                                                      |
| Spiral cable with sensor sub-assembly                              | Spiral cable (Steering Angle Sensor)          | Installed on all vehicles                                                               |
| Airbag sensor assembly                                             | Airbag                                        | Installed on all vehicles                                                               |
| Certification ECU (Smart key ECU assembly)                         | Certification (Smart)                         | Vehicles with smart key system                                                          |
| Air conditioning amplifier assembly                                | Air Conditioning Amplifier                    | Installed on all vehicles                                                               |
| Navigation receiver assembly                                       | Display and Navigation (AVN1)                 | Vehicles with navigation receiver type                                                  |
| Radio and display receiver assembly                                | Display and Navigation (AVN1)                 | Vehicles with radio and display type                                                    |
| Clearance warning ECU assembly                                     | Clearance warning (Intuitive Parking Assist1) | Vehicles with intuitive parking assist system                                           |
| Blind spot monitor sensor LH                                       | Blind Spot Monitor Master                     | Vehicles with blind spot monitor system                                                 |
| Door control and tire pressure monitoring system receiver assembly | Tire Pressure2                                | Vehicles with tire pressure warning system and tire inflation pressure display function |
| 4 wheel drive control ECU                                          | Four Wheel Drive Control                      | Vehicles with 4WD                                                                       |

### 3. CAN BUS CHECK

#### HINT:

The ECUs and sensors that are properly connected to the CAN communication system can be displayed using the Techstream.

(a) Using the Techstream, select CAN Bus Check screen.

#### NOTICE:

- It may be possible to select buses that do not have ECUs or sensors from the bus selection pull-down menu. This is not a malfunction. (This occurs when optional devices are not on a sub bus that is monitored by a gateway function equipped ECU.)
- In the bus selection pull down menu, all buses applicable to the model are displayed (e.g. LIN communication buses are also displayed). Therefore, refer to the wiring diagrams to check the names of sub buses for CAN communication .

#### HINT:

Different connection statuses are indicated by the background color of ECUs and sensors that are displayed.

## Explanation of CAN Bus Check Screen

| BUS TYPE                                                                                  | BACKGROUND COLOR | CONNECTION STATUS                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V Bus                                                                                     | White            | Communication has been normal since the start of the CAN bus check.                                                                                                                                                                                                                                                                 |
|                                                                                           | Yellow           | Communication stop occurred at least once since the start of the CAN bus check, but communication is currently occurring (unstable communication).                                                                                                                                                                                  |
|                                                                                           | Red              | Communication was established at least once since the start of the CAN bus check, but communication is currently not occurring (unstable communication).                                                                                                                                                                            |
|                                                                                           | Not displayed    | Communication stop has continued since the start of the CAN bus check.*1                                                                                                                                                                                                                                                            |
| Sub bus<br>(gateway function equipped ECU that does not have history of connected ECUs)*2 | White            | Communication has been normal since the start of the CAN bus check.                                                                                                                                                                                                                                                                 |
|                                                                                           | Yellow           | Communication stop occurred at least once since the start of the CAN bus check, but communication is currently occurring (unstable communication).                                                                                                                                                                                  |
|                                                                                           | Red              | Communication was established at least once since the start of the CAN bus check, but communication is currently not occurring (unstable communication).                                                                                                                                                                            |
|                                                                                           | Not displayed    | Communication stop has continued since the start of the CAN bus check.*1                                                                                                                                                                                                                                                            |
| Sub bus<br>(gateway function equipped ECU that has history of connected ECUs)*3           | White            | Communication has been normal since the start of the CAN bus check.                                                                                                                                                                                                                                                                 |
|                                                                                           | Yellow           | Communication stop occurred at least once since the start of the CAN bus check, but communication is currently occurring (unstable communication).                                                                                                                                                                                  |
|                                                                                           | Red              | Currently not communicating (either of the following): <ul style="list-style-type: none"> <li>• Communication stop has continued since the start of the CAN bus check.</li> <li>• Communication was established at least once since the start of the CAN bus check, but communication is currently not occurring.</li> </ul>        |
|                                                                                           | Not displayed    | Either of the following: <ul style="list-style-type: none"> <li>• If a gateway function equipped ECU cannot communicate, the sub bus and ECUs connected to the sub bus will not be displayed.</li> <li>• If no ECUs are connected to the sub bus, "There is no system found on the Communication Bus" will be displayed.</li> </ul> |

**HINT:**

- Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.
- \*1: ECUs that are present in the vehicle but are not displayed on the CAN Bus Check screen.
- \*2: Gateway function equipped ECU that does not memorize the sub bus ECUs that are connected to it.
- \*3: Gateway function equipped ECU that memorizes the sub bus ECUs that are connected to it.
- If none of the connected ECUs are displayed, or there is no response from the vehicle to the Techstream, check the DLC3 branch and the V bus main bus lines for a malfunction.

(b) Observe the connection response screen for approximately 2 minutes to check for a change in connection status of the connected ECUs and sensors.

**HINT:**

- If an open occurs in one of the lines of a CAN branch (except DLC3), output from the other branch line (the line that is not open) will be unstable and it may interfere with the response (display) of other ECUs and sensors.
- If the connection status changes during the inspection, repair the open in the branch line of the ECU or sensor that does not respond (is not detected) and then perform the CAN bus check again.

#### 4. HOW TO INTERPRET CAN BUS CHECK SCREEN

(a) When a communication stop is currently occurring, the probable malfunctioning part can be determined from the CAN bus check and by using the following methods.

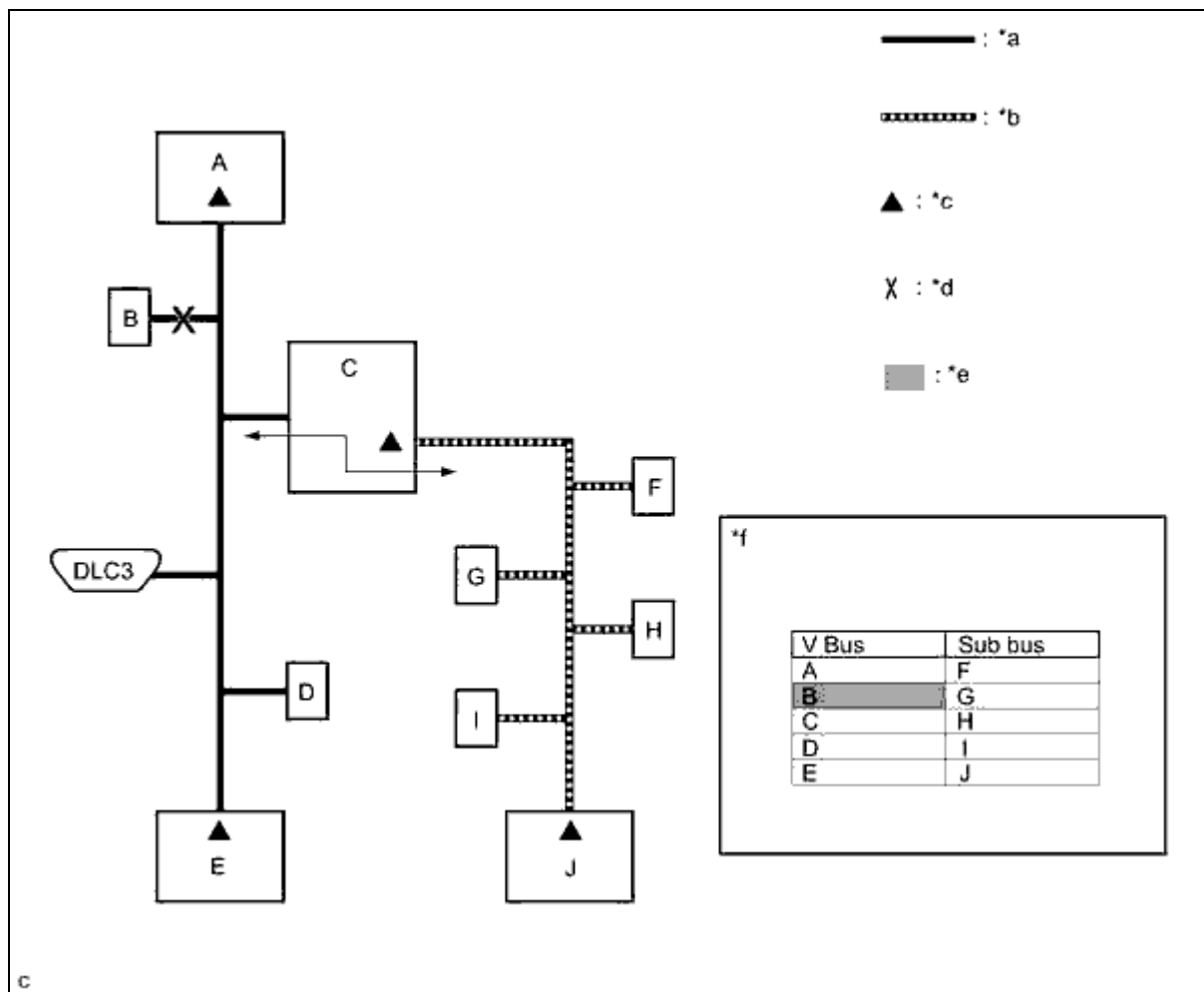
**NOTICE:**

The following CAN bus wiring diagram is provided only as an example. This wiring diagram is different from the actual wiring diagram for this vehicle.

**HINT:**

- When a communication stop is currently occurring, it is easier to determine the probable malfunctioning part from the CAN bus check rather than from communication DTCs.
  - Wait for approximately 2 minutes after turning the ignition switch to ON (or simulate the driving conditions that enable the malfunction to be reproduced) and select the CAN bus check. Then observe the communication status of each ECU on the screen.
- (b) If a communication error of only 1 ECU or sensor is indicated on the CAN Bus Check screen, a communication stop of the ECU or sensor is suspected.

Example: Open in both CAN branch lines of ECU B on the V bus



#### Text in Illustration

|    |                                                            |    |                         |
|----|------------------------------------------------------------|----|-------------------------|
| *a | V Bus                                                      | *b | Sub Bus                 |
| *c | Terminating Resistor                                       | *d | Location of Malfunction |
| *e | Not displayed or background color changes to red or yellow | *f | CAN Bus Check Screen    |

#### HINT:

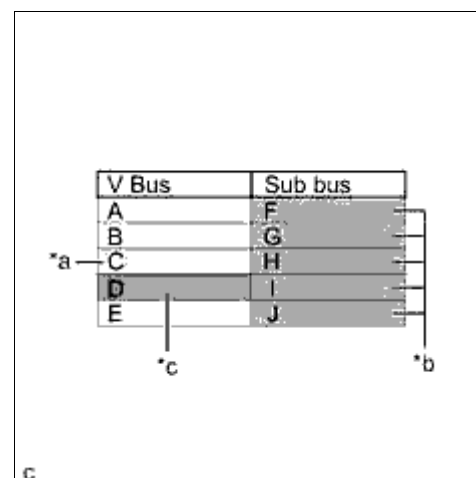
When there are communication stops, ECUs are present in the vehicle even though they are not displayed on the CAN Bus Check screen.

- (c) If communication errors for multiple ECUs or sensors are indicated on the CAN Bus Check screen, then a communication stop of the ECU or sensor that shows a more serious communication stop (an ECU or a sensor which is not displayed) is suspected.

Example: Open in a CAN branch line for ECU D on the V bus

#### Text in Illustration

|    |                                                        |
|----|--------------------------------------------------------|
| *a | Background color periodically changes to yellow or red |
| *b | Not displayed or background color is yellow or red     |
| *c | Not displayed                                          |



## Explanation of CAN Bus Check Screen

| BUS TYPE                                                                               | BACKGROUND COLOR | CONNECTION STATUS                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V Bus                                                                                  | White            | Communication has been normal since the start of the CAN bus check.                                                                                                                                            |
|                                                                                        | Yellow           | Communication stop occurred at least once since the start of the CAN bus check, but communication is currently occurring (unstable communication).                                                             |
|                                                                                        | Red              | Communication was established at least once since the start of the CAN bus check, but communication is currently not occurring (unstable communication).                                                       |
|                                                                                        | Not displayed    | Communication stop has continued since the start of the CAN bus check.*1                                                                                                                                       |
| Sub bus (gateway function equipped ECU that does not have history of connected ECUs)*2 | White            | Communication has been normal since the start of the CAN bus check.                                                                                                                                            |
|                                                                                        | Yellow           | Communication stop occurred at least once since the start of the CAN bus check, but communication is currently occurring (unstable communication).                                                             |
|                                                                                        | Red              | Communication was established at least once since the start of the CAN bus check, but communication is currently not occurring (unstable communication).                                                       |
|                                                                                        | Not displayed    | Communication stop has continued since the start of the CAN bus check.*1                                                                                                                                       |
| Sub bus (gateway function equipped ECU that has history of connected ECUs)*3           | White            | Communication has been normal since the start of the CAN bus check.                                                                                                                                            |
|                                                                                        | Yellow           | Communication stop occurred at least once since the start of the CAN bus check, but communication is currently occurring (unstable communication).                                                             |
|                                                                                        | Red              | Currently not communicating (either of the following): <ul style="list-style-type: none"> <li>• Communication stop has continued since the start of the CAN bus check.</li> <li>• Communication was</li> </ul> |

| BUS TYPE | BACKGROUND COLOR | CONNECTION STATUS                                                                                                                                                                                                                                                                                                                      |
|----------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                  | established at least once since the start of the CAN bus check, but communication is currently not occurring.                                                                                                                                                                                                                          |
|          | Not displayed    | <p>Either of the following:</p> <ul style="list-style-type: none"> <li>• If a gateway function equipped ECU cannot communicate, sub bus and ECUs connected to the sub bus will not be displayed.</li> <li>• If no ECUs are connected to the sub bus, "There is no system found on the Communication Bus" will be displayed.</li> </ul> |

#### HINT:

- Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.
- \*1: ECUs that are present in the vehicle but are not displayed on the CAN Bus Check screen.
- \*2: Gateway function equipped ECU that does not memorize the sub bus ECUs that are connected to it.
- \*3: Gateway function equipped ECU that memorizes the sub bus ECUs that are connected to it.
- The example of the CAN Bus Check screen in the illustration shows the result of electrical noise on the CAN bus which is caused by an open in a CAN branch line of ECU D (output from the other branch line is unstable) and the communication of ECU C is also unstable. In addition, in this example, ECU C is equipped with a gateway function. Therefore, communication is also unstable between the sub bus ECUs of ECU C and the V bus.
- The example in the illustration shows that ECU D is not displayed on the CAN Bus Check screen. This indicates a more significant communication stop. In this case, a communication stop of ECU D is suspected.

- (d) If a communication error is indicated on both the V bus and sub bus on the CAN Bus Check screen, suspect any communication stop displayed for the V bus first.

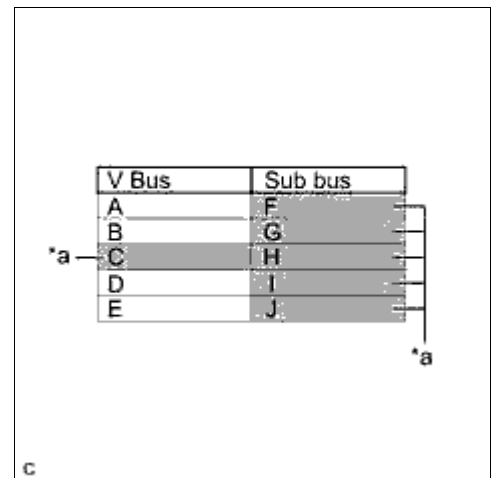
Example: Open in both CAN branch lines of ECU C on the V bus

#### Text in Illustration

|    |                                                  |
|----|--------------------------------------------------|
| *a | Not displayed or background color changes to red |
|----|--------------------------------------------------|

#### HINT:

- In the CAN bus check, it is possible to confirm the communication status of ECUs connected to the V bus after connecting the Techstream to the DLC3. As for sub buses, it is possible to confirm which sub bus connected ECUs can communicate with a gateway function equipped ECU on the V bus.
- If a gateway function equipped ECU has a communication error, ECUs connected to the gateway function equipped ECU are also affected, and communication stops will be indicated.
- The CAN Bus Check screen in the illustration shows that ECU C has a gateway function and a communication stop in ECU C is suspected.



- (e) If the CAN Bus Check screen indicates a communication stop only in the sub bus, a communication stop in the sub bus is suspected.

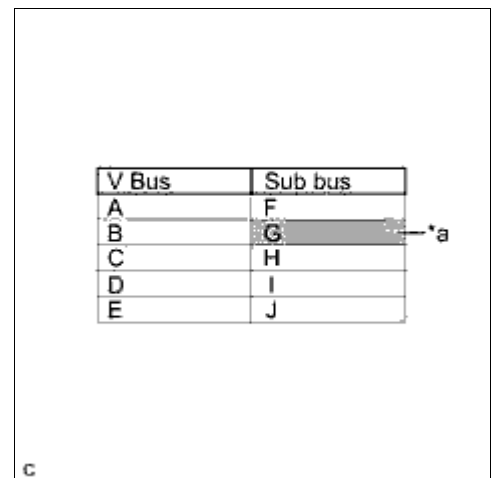
Example: Open in both CAN branch lines of ECU G on the sub bus

#### Text in Illustration

|    |                                 |
|----|---------------------------------|
| *a | Background color changes to red |
|----|---------------------------------|

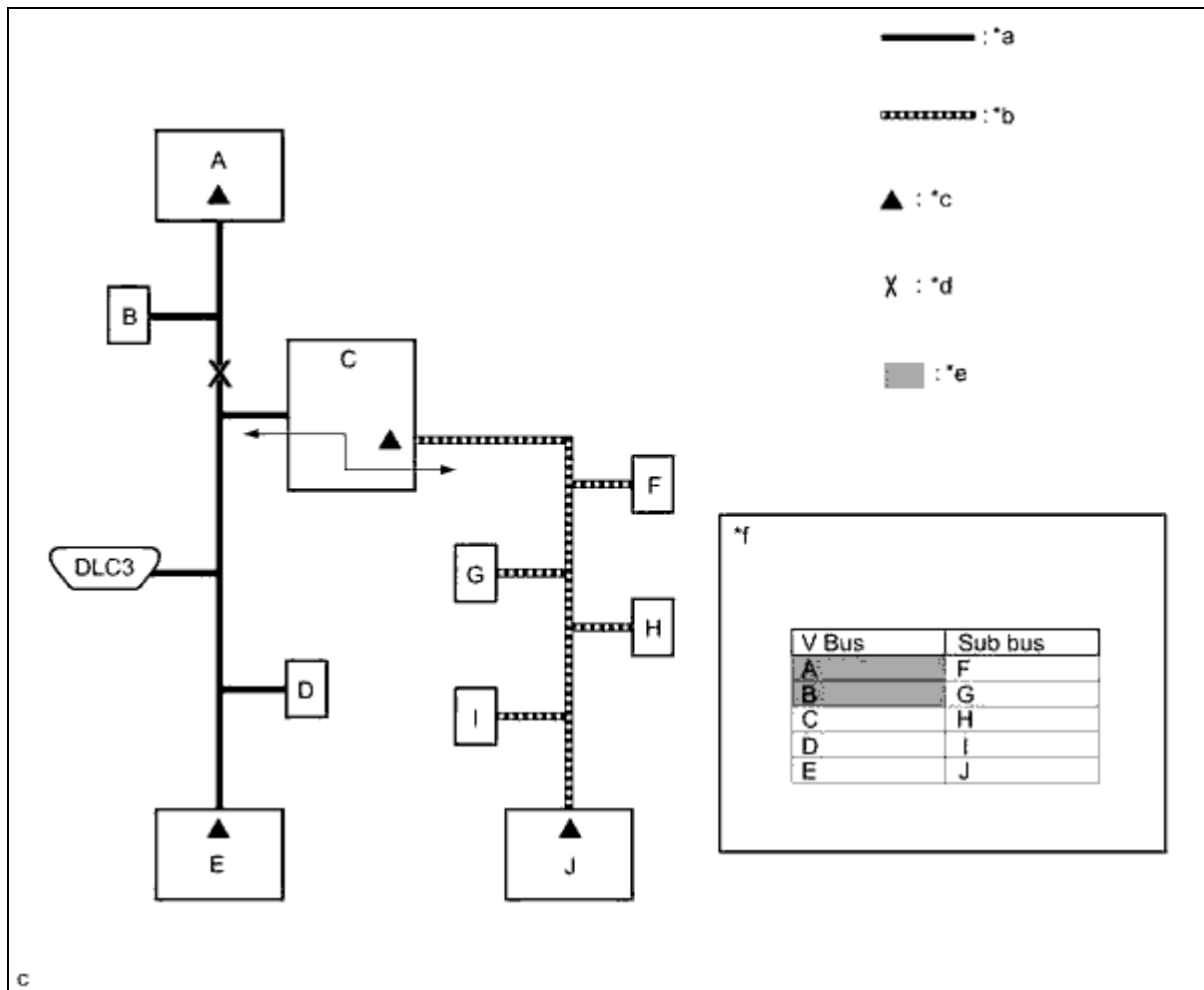
#### HINT:

- A communication error in a sub bus does not affect the V bus or other buses.
- When a gateway function equipped ECU has memorized the ECUs that are connected to the sub bus, if any of the ECUs connected to the gateway function equipped ECU has a communication error, the background color changes to yellow or red. (The displayed name will not disappear.)



- (f) If both of the V bus main bus lines are open, ECUs or sensors that are located farther away from the DLC3 than the open part will be displayed as a communication stop on the CAN Bus Check screen.

(In this case, ECU A and B are not displayed or their background color changes to red.)



### Text in Illustration

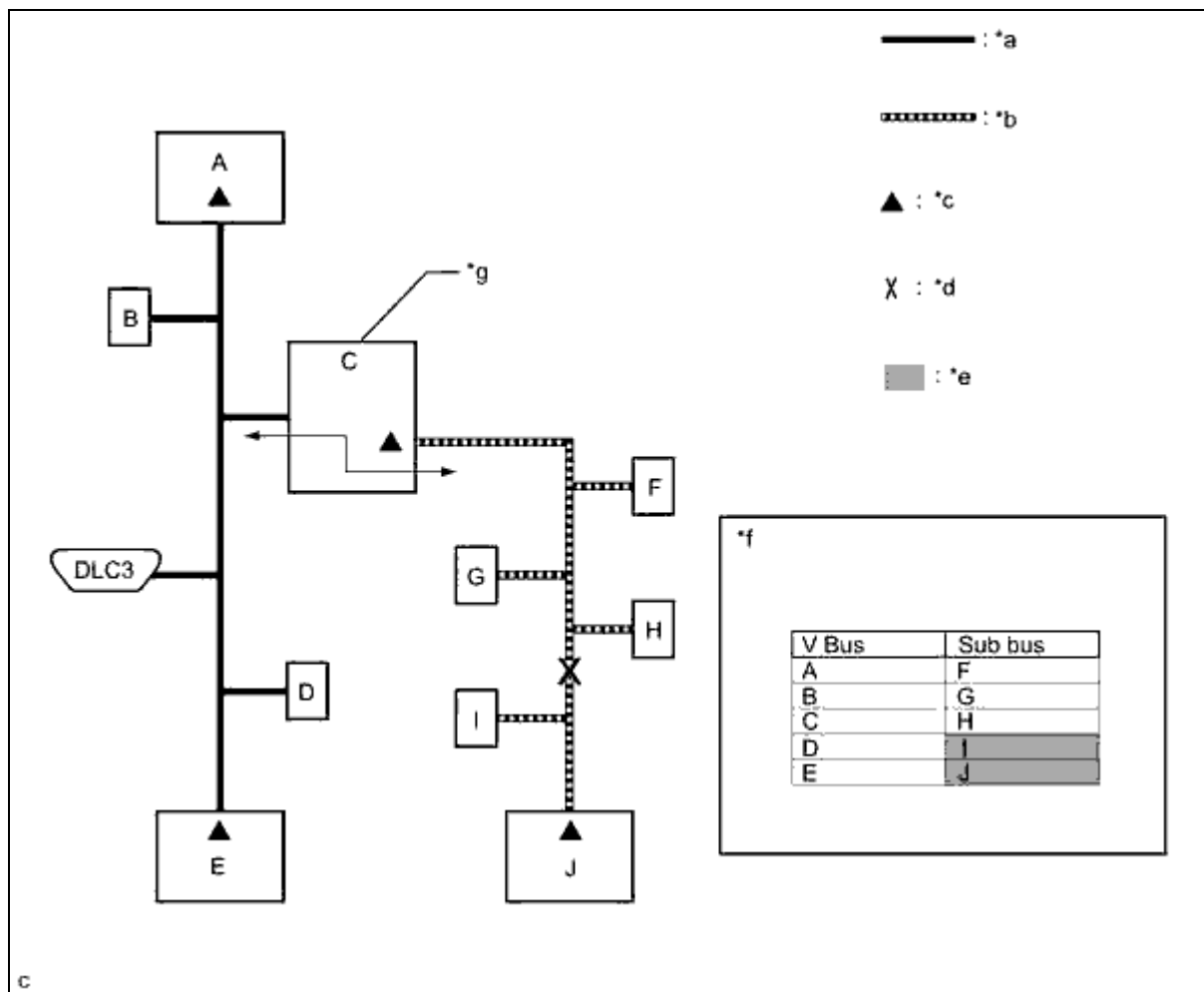
|    |                                          |    |                         |
|----|------------------------------------------|----|-------------------------|
| *a | V Bus                                    | *b | Sub Bus                 |
| *c | Terminating Resistor                     | *d | Location of Malfunction |
| *e | Not displayed or background color is red | *f | CAN Bus Check Screen    |

### HINT:

If a communication error occurs in an ECU, it is not displayed on the CAN Bus Check screen even though the ECU is present.

(g) If both of the sub bus main bus lines are open, ECUs that are located farther away from the gateway function equipped ECU than the open part will be displayed as a communication stop on the CAN Bus Check screen.

(In this case, ECU I and J are not displayed or their background color changes to red.)



**Text in Illustration**

|    |                                          |    |                         |
|----|------------------------------------------|----|-------------------------|
| *a | V Bus                                    | *b | Sub Bus                 |
| *c | Terminating Resistor                     | *d | Location of Malfunction |
| *e | Not displayed or background color is red | *f | CAN Bus Check Screen    |
| *g | Gateway Function Equipped ECU            | -  | -                       |

- (h) When any of the following malfunctions occur, CAN communication cannot be established and almost all ECUs and sensors on the bus show a communication error on the CAN Bus Check screen.

#### Text in Illustration

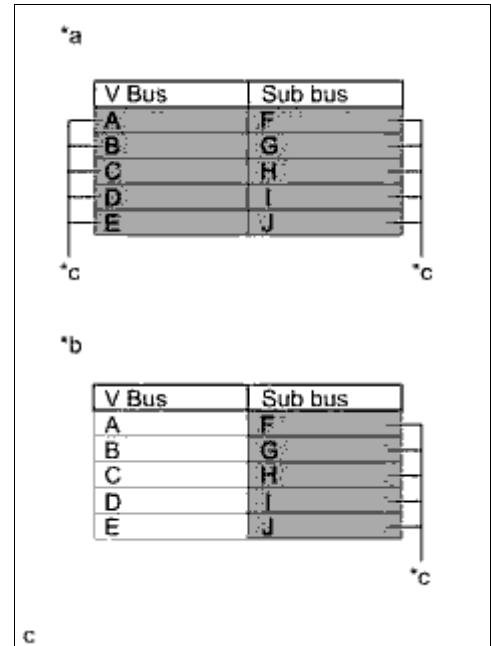
|    |                                                           |
|----|-----------------------------------------------------------|
| *a | When any of the following malfunctions occur on the V bus |
| *b | When any of the following malfunctions occur on a sub bus |
| *c | Not displayed                                             |

#### Details of Malfunction

|                                                    |
|----------------------------------------------------|
| Short between CAN lines (CANH and CANL)            |
| Short between a CAN line (CANH or CANL) and +B     |
| Short between a CAN line (CANH or CANL) and ground |
| Open in a CAN main bus line                        |

#### HINT:

- When a malfunction occurs on the V bus, almost all ECUs and sensors on the V bus and sub bus indicate a communication error (almost all ECUs are not displayed). As communication with the gateway function equipped ECU that is connected to the V bus stops, communication from the ECUs connected to the sub bus that is monitored by the gateway function equipped ECU also stops (these ECUs are not displayed).
- When a malfunction occurs in a sub bus, almost all ECUs connected to the sub bus indicate a communication error.
- A communication error in a sub bus does not affect the V bus or other buses.
- The malfunctioning part can be determined by checking for a short circuit between CAN bus lines or between a CAN bus line and ground or +B short using an electrical tester.



## 5. HOW TO INTERPRET COMMUNICATION DTCS (DTCS THAT START WITH U)

- (a) If a CAN communication error cannot be reproduced, determine the suspected malfunctioning part using the DTCS stored in ECUs that are connected to the CAN buses by following the procedure below.

#### HINT:

Communication DTCS (DTCS that start with U) indicate a communication error between the ECU that stores the DTC and the ECU that is indicated by the DTC.

- (1) If multiple ECUs store a communication DTC for a particular ECU, a communication stop of the ECU is suspected.

| Output from                      | Output DTC | Tester display                                                        |
|----------------------------------|------------|-----------------------------------------------------------------------|
| Hybrid Control                   | U0140      | Lost Communication with Body Control Module                           |
| Advanced Parking Guidance System | C1657      | Hybrid Powertrain Control Module                                      |
|                                  | C1659      | Brake System Malfunction                                              |
| ABS/VSC/TRAC                     | U0140      | Lost Communication with Main Body ECU                                 |
|                                  | U0073      | Control Module Communication Bus OFF                                  |
|                                  | U0100      | Lost Communication with ECM/ PCM "A"                                  |
|                                  | U0101      | Lost Communication with TCM                                           |
|                                  | U0151      | Lost Communication with Restraints Control Module                     |
|                                  | U0155      | Lost Communication with Instrument Panel Cluster (IPC) Control Module |
|                                  | U0164      | Lost Communication with HVAC Control Module                           |
|                                  | U0293      | Lost Communication with Hybrid Powertrain Control Module              |
|                                  | U0327      | Software Incompatibility with Vehicle Security                        |
|                                  | U1133      | Lost Communication with PMN Module                                    |
|                                  | U0142      | Lost Communication with Body Control Module "B"                       |
| Smart Key                        |            |                                                                       |
| Pre-Collision                    | B2060      | ABS Malfunction                                                       |
| Pre-Collision 2                  | B2090      | Driving Support System Malfunction                                    |
| Transmission Control             | C1A40      | ENG / EHV Device                                                      |
|                                  | U0146      | Lost Communication with Body ECU                                      |

#### Text in Illustration

|    |                     |   |   |
|----|---------------------|---|---|
| *a | Items to be checked | - | - |
|----|---------------------|---|---|

#### NOTICE:

- This DTC table is from another model, and is only used here to show an example of DTCs that are output when there is an open in a CAN branch line for the main body ECU. This table does not show DTCs applicable to this vehicle.
- Even though a DTC title may indicate a communication error with a specific ECU, the ECU name used in the DTC name on the Techstream may differ depending on the ECU that stores the DTC. (Regarding output DTCs, refer to step 6 and the DTC chart for each ECU.)

#### HINT:

As multiple ECUs indicate a communication stop with the main body ECU, the possibility of a communication stop of the main body ECU is high.

- (2) If almost all of the communication DTCs of an ECU are stored, a communication stop of the ECU is suspected.

| Output from                      | Output DTC | Tester display                                                        |
|----------------------------------|------------|-----------------------------------------------------------------------|
| Hybrid Control                   | U0140      | Lost Communication with Body Control Module                           |
| Advanced Parking Guidance System | C1657      | Hybrid Powertrain Control Module                                      |
|                                  | C1659      | Brake System Malfunction                                              |
| Main Body                        | U0140      | Lost Communication with Main Body ECU                                 |
|                                  | U0073      | Control Module Communication Bus OFF                                  |
|                                  | U0100      | Lost Communication with ECM/ PCM "A"                                  |
|                                  | U0101      | Lost Communication with TCM                                           |
|                                  | U0151      | Lost Communication with Restraints Control Module                     |
|                                  | U0155      | Lost Communication with Instrument Panel Cluster (IPC) Control Module |
|                                  | U0164      | Lost Communication with HVAC Control Module                           |
|                                  | U0293      | Lost Communication with Hybrid Powertrain Control Module              |
|                                  | U0327      | Software Incompatibility with Vehicle Security                        |
|                                  | U1133      | Lost Communication with PMN Module                                    |
|                                  | U0142      | Lost Communication with Body Control Module "B"                       |
| Smart Key                        |            |                                                                       |
| Pre-Collision                    | B2060      | ABS Malfunction                                                       |
| Pre-Collision 2                  | B2090      | Driving Support System Malfunction                                    |
| Transmission Control             | C1A40      | ENG / EHV Device                                                      |
|                                  | U0146      | Lost Communication with Body ECU                                      |

#### Text in Illustration

|    |                     |   |   |
|----|---------------------|---|---|
| *a | Items to be checked | - | - |
|----|---------------------|---|---|

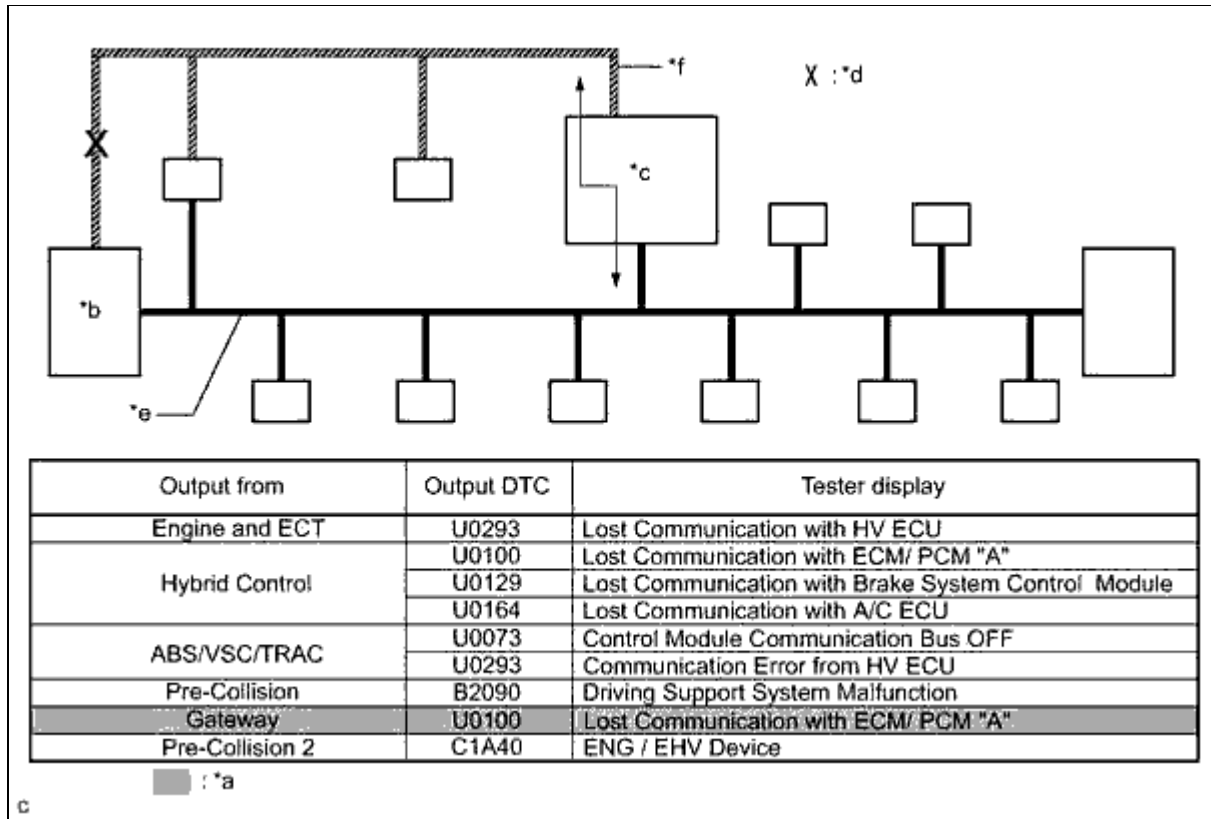
#### NOTICE:

This DTC table is from another model, and is only used here to show an example of DTCs that are output when there is an open in a CAN branch line for the main body ECU. This table does not show DTCs applicable to this vehicle.

### HINT:

- If almost all of the DTCs of the main body ECU are stored, the possibility of a communication stop of the main body ECU is high.
- When a CAN communication error occurs, many DTCs are output. DTCs other than communication error DTCs (such as DTCs that start with C or B) and communication DTCs for the ABS system are important DTCs, however it may be easier to determine the malfunctioning part by examining the overall situation without considering these DTCs.

(b) To help determine the part of the sub bus that has a communication error, prioritize the communication stop DTCs stored in the gateway function equipped ECU.



### Text in Illustration

|    |                               |    |                         |
|----|-------------------------------|----|-------------------------|
| *a | Items to be Checked           | *b | ECM                     |
| *c | Gateway Function Equipped ECU | *d | Location of Malfunction |
| *e | V Bus                         | *f | Sub Bus                 |

### NOTICE:

This DTC table is from another model, and is only used here to show the ECUs connected to both a V bus and a sub bus. It shows DTCs output when there is an open in the main bus lines for the ECM on the sub bus. This table does not show DTCs applicable to this vehicle.

### HINT:

- As gateway function equipped ECUs (sub bus monitor ECU) monitor signals from all ECUs that are connected to sub buses, gateway function equipped ECUs can detect ECUs with a communication stop more accurately.
- When there is a communication stop for the gateway function equipped ECU (gateway), communication with ECUs connected to other buses such as the V bus stops. Therefore, communication DTCs for ECUs connected to other buses are also stored.

(c) When any of the following malfunctions occurs, many DTCs are likely to be output from many ECUs. Because of this, it may be difficult to determine the probable malfunctioning part.

- Short between CAN lines (CANH and CANL)
- Short between a CAN line (CANH or CANL) and ground
- Short between a CAN line (CANH or CANL) and +B
- Open in a CAN branch line (CANH or CANL) of an ECU or sensor
- Open in a CAN main bus line (CANH or CANL) between 2 ECUs that have a terminating resistor

## 6. DTC TABLE BY ECU

### HINT:

- In the CAN communication system, the CAN communication DTCs of each ECU can be displayed using the Techstream.
- If CAN communication system DTCs are output, the malfunction cannot be determined only by the DTCs. Perform troubleshooting according to How to Proceed with Troubleshooting [INFO](#).
- If system function temporarily returns to normal, DTCs may not be output again even though the following DTC check procedures are used.

(a) ECM / Techstream Display "Engine"

### HINT:

- This ECU uses the CAN communication system for DTC communication.
- \*: Refer to SFI System (for 2GR-FKS) [INFO](#).

### ECM / Techstream Display "Engine"

| DTC    | DETECTION ITEM              | DTC DETECTION CONDITION                                              | DTC DETECTION PRE-CONDITION                                                                                                                                               | DTC CHECK PROCEDURE                                         | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|--------|-----------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0101* | Lost Communication with TCM | The ECM does not receive data from the ECM for 1.25 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON.</li> <li>• The power source voltage of the ECM is 10.5 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 5 seconds. | MIL illuminates.            | DTC is stored until it is cleared using the Techstream. |

(b) ECM / Techstream Display "Transmission"

### HINT:

- This ECU uses the CAN communication system for DTC communication.
- \*: Refer to Automatic Transmission System (for 2GR-FKS) [INFO](#).

### ECM / Techstream Display "Transmission"

| DTC    | DETECTION ITEM                    | DTC DETECTION CONDITION                | DTC DETECTION PRE-CONDITION | DTC CHECK PROCEDURE                     | WARNING INDICATION IN METER | DTC STORAGE METHOD                      |
|--------|-----------------------------------|----------------------------------------|-----------------------------|-----------------------------------------|-----------------------------|-----------------------------------------|
| U0100* | Lost Communication with ECM / PCM | The ECM does not receive data from the | Both conditions are met:    | Turn the ignition switch to ON and wait | MIL illuminates.            | DTC is stored until it is cleared using |

| DTC | DETECTION ITEM | DTC DETECTION CONDITION       | DTC DETECTION PRE-CONDITION                                                                                                                  | DTC CHECK PROCEDURE | WARNING INDICATION IN METER | DTC STORAGE METHOD |
|-----|----------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------|--------------------|
|     | "A"            | ECM for 1.25 seconds or more. | <ul style="list-style-type: none"> <li>The ignition switch is ON.</li> <li>The power source voltage of the ECM is 10.5 V or more.</li> </ul> | at least 5 seconds. |                             | the Techstream.    |

(c) Brake Booster Assembly (Skid Control ECU) / Techstream Display "ABS/VSC/TRAC"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Brake Booster Assembly (Skid Control ECU) / Techstream Display "ABS/VSC/TRAC"**

| DTC   | DETECTION ITEM                       | DTC DETECTION CONDITION                    | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                            | DTC CHECK PROCEDURE                                                                                                             | WARNING INDICATION IN METER                                                                                                                                           | DTC STORAGE METHOD                                      |
|-------|--------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| U0073 | Control Module Communication Bus OFF | Bus off is judged for 0.1 seconds or more. | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>The ignition switch is ON for 1 second or more.</li> <li>The power source voltage of the brake booster assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.</li> </ul> | Turn the ignition switch to ON and check that the initial light check illumination turns off, and then wait at least 3 seconds. | <ul style="list-style-type: none"> <li>ABS warning light illuminates.</li> <li>Slip indicator light illuminates.</li> <li>Brake warning light illuminates.</li> </ul> | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                                 | DTC DETECTION CONDITION                                                                                                         | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                                                                   | DTC CHECK PROCEDURE                                                                                                                                                                                             | WARNING INDICATION IN METER       | DTC STORAGE METHOD                                      |
|-------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------|
| U0100 | Lost Communication with ECM / PCM                              | The brake booster assembly (skid control ECU) does not receive data from the ECM for 2.5 seconds or more.                       | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle speed is 6 km/h (4 mph) or more.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the brake booster assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.</li> </ul> | Turn the ignition switch to ON and drive the vehicle at a speed of 6 km/ h (4 mph) or more for 6 seconds or more. Check that the warning light remains off after turning off following the initial light check. | Slip indicator light illuminates. | DTC is stored until it is cleared using the Techstream. |
| U0114 | Lost Communication with Four-Wheel Drive Clutch Control Module | The brake booster assembly (skid control ECU) does not receive data from the 4 wheel drive control ECU for 1.1 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle speed is 6 km/h (4 mph) or more.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of</li> </ul>                                                                                                 | Turn the ignition switch to ON and drive the vehicle at a speed of 6 km/ h (4 mph) or more for 3 seconds or more. Check that the warning light remains off after turning off following the initial              | Slip indicator light illuminates. | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                 | DTC DETECTION CONDITION                                                                                                      | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                                                                   | DTC CHECK PROCEDURE                                                                                                                                                                                             | WARNING INDICATION IN METER       | DTC STORAGE METHOD                                      |
|-------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------|
|       |                                                |                                                                                                                              | the brake booster assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.                                                                                                                                                                                                                               | light check.                                                                                                                                                                                                    |                                   |                                                         |
| U0123 | Lost Communication with Yaw Rate Sensor Module | The brake booster assembly (skid control ECU) does not receive data from the airbag sensor assembly for 1.1 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle speed is 6 km/h (4 mph) or more.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the brake booster assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.</li> </ul> | Turn the ignition switch to ON and drive the vehicle at a speed of 6 km/ h (4 mph) or more for 3 seconds or more. Check that the warning light remains off after turning off following the initial light check. | Slip indicator light illuminates. | DTC is stored until it is cleared using the Techstream. |
| U0124 | Lost Communication with Lateral                | The brake booster assembly                                                                                                   | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle</li> </ul>                                                                                                                                                                                                                                    | Turn the ignition switch to ON                                                                                                                                                                                  | Slip indicator light illuminates. | DTC is stored until it is cleared                       |

| DTC   | DETECTION ITEM                                       | DTC DETECTION CONDITION                                                                                                                     | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                         | DTC CHECK PROCEDURE                                                                                                                                                                                             | WARNING INDICATION IN METER       | DTC STORAGE METHOD                                      |
|-------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------|
|       | Acceleration Sensor Module                           | (skid control ECU) does not receive data from the spiral cable with sensor sub-assembly for 1.1 seconds or more.                            | <p>speed is 6 km/ h (4 mph) or more.</p> <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the brake booster assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.</li> </ul> | and drive the vehicle at a speed of 6 km/h (4 mph) or more for 3 seconds or more. Check that the warning light remains off after turning off following the initial light check.                                 |                                   | using the Techstream.                                   |
| U0126 | Lost Communication with Steering Angle Sensor Module | The brake booster assembly (skid control ECU) does not receive data from the spiral cable with sensor sub-assembly for 1.1 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle speed is 6 km/h (4 mph) or more.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the brake booster assembly</li> </ul>                            | Turn the ignition switch to ON and drive the vehicle at a speed of 6 km/ h (4 mph) or more for 3 seconds or more. Check that the warning light remains off after turning off following the initial light check. | Slip indicator light illuminates. | DTC is stored until it is cleared using the Techstream. |

| DTC | DETECTION ITEM | DTC DETECTION CONDITION | DTC DETECTION PRE-CONDITION                                          | DTC CHECK PROCEDURE | WARNING INDICATION IN METER | DTC STORAGE METHOD |
|-----|----------------|-------------------------|----------------------------------------------------------------------|---------------------|-----------------------------|--------------------|
|     |                |                         | (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V. |                     |                             |                    |

(d) Brake Actuator Assembly (Skid Control ECU) / Techstream Display "ABS/VSC/TRAC"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Brake Actuator Assembly (Skid Control ECU) / Techstream Display "ABS/VSC/TRAC"**

| DTC   | DETECTION ITEM                       | DTC DETECTION CONDITION                    | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                 | DTC CHECK PROCEDURE                                                                                                             | WARNING INDICATION IN METER                                                                                                                                                 | DTC STORAGE METHOD                                      |
|-------|--------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| U0073 | Control Module Communication Bus OFF | Bus off is judged for 0.1 seconds or more. | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the brake actuator assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.</li> </ul> | Turn the ignition switch to ON and check that the initial light check illumination turns off, and then wait at least 3 seconds. | <ul style="list-style-type: none"> <li>• ABS warning light illuminates.</li> <li>• Slip indicator light illuminates.</li> <li>• Brake warning light illuminates.</li> </ul> | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                             | DTC DETECTION CONDITION                                                                                                                      | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                                                                    | DTC CHECK PROCEDURE                                                                                                                                                                                             | WARNING INDICATION IN METER       | DTC STORAGE METHOD                                      |
|-------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------|
| U0100 | Lost Communication with ECM / PCM                          | The brake actuator assembly (skid control ECU) does not receive data from the ECM for 2.5 seconds or more.                                   | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle speed is 6 km/h (4 mph) or more.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the brake actuator assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.</li> </ul> | Turn the ignition switch to ON and drive the vehicle at a speed of 6 km/ h (4 mph) or more for 6 seconds or more. Check that the warning light remains off after turning off following the initial light check. | Slip indicator light illuminates. | DTC is stored until it is cleared using the Techstream. |
| U0124 | Lost Communication with Lateral Acceleration Sensor Module | The brake actuator assembly (skid control ECU) does not receive data from the spiral cable with sensor sub-assembly for 1.1 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle speed is 6 km/h (4 mph) or more.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of</li> </ul>                                                                                                  | Turn the ignition switch to ON and drive the vehicle at a speed of 6 km/ h (4 mph) or more for 3 seconds or more. Check that the warning light remains off after turning off following the initial              | Slip indicator light illuminates. | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                       | DTC DETECTION CONDITION                                                                                                                      | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                                                                    | DTC CHECK PROCEDURE                                                                                                                                                                                            | WARNING INDICATION IN METER       | DTC STORAGE METHOD                                      |
|-------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------|
|       |                                                      |                                                                                                                                              | the brake actuator assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.                                                                                                                                                                                                                               | light check.                                                                                                                                                                                                   |                                   |                                                         |
| U0126 | Lost Communication with Steering Angle Sensor Module | The brake actuator assembly (skid control ECU) does not receive data from the spiral cable with sensor sub-assembly for 1.1 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Vehicle speed is 6 km/h (4 mph) or more.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the brake actuator assembly (skid control ECU) (+BS terminal voltage) is between 9.6 and 16.5 V.</li> </ul> | Turn the ignition switch to ON and drive the vehicle at a speed of 6 km/h (4 mph) or more for 3 seconds or more. Check that the warning light remains off after turning off following the initial light check. | Slip indicator light illuminates. | DTC is stored until it is cleared using the Techstream. |

(e) Main Body ECU (Multiplex network body ECU) / Techstream Display "Main Body"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Main Body ECU (Multiplex network body ECU) / Techstream Display "Main Body"**

| DTC   | DETECTION ITEM                                             | DTC DETECTION CONDITION                                                                                                                    | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                  | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0100 | Lost Communication with ECM / PCM "A"                      | The main body ECU (multiplex network body ECU) does not receive data from the ECM for 10 seconds or more.                                  | Both conditions are met: <ul style="list-style-type: none"> <li>• 10 seconds have elapsed after connection of the battery.</li> <li>• The power source voltage of the main body ECU (multiplex network body ECU) is 10 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0101 | Lost Communication with TCM                                | The main body ECU (multiplex network body ECU) does not receive data from the ECM for 10 seconds or more.                                  | Both conditions are met: <ul style="list-style-type: none"> <li>• 10 seconds have elapsed after connection of the battery.</li> <li>• The power source voltage of the main body ECU (multiplex network body ECU) is 10 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0120 | Lost Communication with Starter / Generator Control Module | The main body ECU (multiplex network body ECU) does not receive data from the certification ECU (smart key ECU assembly) for 10 seconds or | Both conditions are met: <ul style="list-style-type: none"> <li>• 10 seconds have elapsed after connection of the battery.</li> <li>• The power source voltage of</li> </ul>                                                                 | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                                        | DTC DETECTION CONDITION                                                                                                          | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                  | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
|       |                                                                       | more.                                                                                                                            | the main body ECU (multiplex network body ECU) is 10 V or more.                                                                                                                                                                              |                                                              |                             |                                                         |
| U0151 | Lost Communication with Restraints Control Module                     | The main body ECU (multiplex network body ECU) does not receive data from the airbag sensor assembly for 10 seconds or more.     | Both conditions are met: <ul style="list-style-type: none"> <li>• 10 seconds have elapsed after connection of the battery.</li> <li>• The power source voltage of the main body ECU (multiplex network body ECU) is 10 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0155 | Lost Communication with Instrument Panel Cluster (IPC) Control Module | The main body ECU (multiplex network body ECU) does not receive data from the combination meter assembly for 10 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• 10 seconds have elapsed after connection of the battery.</li> <li>• The power source voltage of the main body ECU (multiplex network body ECU) is 10 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0327 | Software Incompatibility with Vehicle Security Control Module         | The main body ECU (multiplex network body ECU) does not receive data from the certification ECU                                  | Both conditions are met: <ul style="list-style-type: none"> <li>• 10 seconds have elapsed after connection of</li> </ul>                                                                                                                     | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC | DETECTION ITEM | DTC DETECTION CONDITION                          | DTC DETECTION PRE-CONDITION                                                                                                                                       | DTC CHECK PROCEDURE | WARNING INDICATION IN METER | DTC STORAGE METHOD |
|-----|----------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------|--------------------|
|     |                | (smart key ECU assembly) for 10 seconds or more. | <p>the battery.</p> <ul style="list-style-type: none"> <li>The power source voltage of the main body ECU (multiplex network body ECU) is 10 V or more.</li> </ul> |                     |                             |                    |

(f) Certification ECU (Smart Key ECU Assembly) / Techstream Display "Smart Key"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Certification ECU (Smart Key ECU Assembly) / Techstream Display "Smart Key"**

| DTC   | DETECTION ITEM                              | DTC DETECTION CONDITION                                                                                               | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                                                                                             | DTC CHECK PROCEDURE                                             | WARNING INDICATION IN METER | DTC STORAGE METHOD                                               |
|-------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------|------------------------------------------------------------------|
| U0100 | Lost Communication With ECM/PCM "A"         | The certification ECU (smart key ECU assembly) is unable to receive certain data from the ECM for 10 seconds or more. | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>10 seconds or more elapse after a power source mode change is detected (+B changes from off to on, ACC changes between on and off, or IG changes between on and off).</li> <li>The certification ECU (smart key ECU assembly) power supply voltage is 10 V or higher.</li> </ul> | Wait 20 seconds after turning the ignition switch to ACC or ON. | -                           | The DTC remains stored until it is cleared using the Techstream. |
| U0142 | Lost Communication with Body Control Module | The certification ECU (smart key ECU assembly)                                                                        | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>10 seconds or more elapse</li> </ul>                                                                                                                                                                                                                                             | Wait 20 seconds after turning the ignition                      | -                           | The DTC remains stored until it is cleared                       |

| DTC   | DETECTION ITEM                                                        | DTC DETECTION CONDITION                                                                                                                      | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                                                                                                             | DTC CHECK PROCEDURE                                             | WARNING INDICATION IN METER | DTC STORAGE METHOD                                               |
|-------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------|------------------------------------------------------------------|
|       | "B"                                                                   | is unable to receive certain data from the main body ECU (multiplex network body ECU) for 10 seconds or more.                                | <p>after a power source mode change is detected (+B changes from off to on, ACC changes between on and off, or IG changes between on and off).</p> <ul style="list-style-type: none"> <li>The certification ECU (smart key ECU assembly) power supply voltage is 10 V or higher.</li> </ul>                                                             | switch to ACC or ON.                                            |                             | using the Techstream.                                            |
| U0155 | Lost Communication with Instrument Panel Cluster (IPC) Control Module | The certification ECU (smart key ECU assembly) is unable to receive certain data from the combination meter assembly for 10 seconds or more. | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>10 seconds or more elapse after a power source mode change is detected (+B changes from off to on, ACC changes between on and off, or IG changes between on and off).</li> <li>The certification ECU (smart key ECU assembly) power supply voltage is 10 V or higher.</li> </ul> | Wait 20 seconds after turning the ignition switch to ACC or ON. | -                           | The DTC remains stored until it is cleared using the Techstream. |

(g) Certification ECU (Smart Key ECU Assembly) / Techstream Display "Power Source Control"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Certification ECU (Smart Key ECU Assembly) / Techstream Display "Power Source Control"**

| DTC   | DETECTION ITEM                                                        | DTC DETECTION CONDITION                                                                                                                                     | DTC DETECTION PRE-CONDITION                                                                                                                                                                                | DTC CHECK PROCEDURE                                           | WARNING INDICATION IN METER | DTC STORAGE METHOD                                               |
|-------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|------------------------------------------------------------------|
| U0100 | ECM Communication                                                     | The certification ECU (smart key ECU assembly) is unable to receive certain data from the ECM for 3.1 seconds or more.                                      | Both conditions are met <ul style="list-style-type: none"> <li>• The ignition switch is ON.</li> <li>• The certification ECU (smart key ECU assembly) power supply voltage is 9.5 V or higher.</li> </ul>  | Turn the ignition switch to ON and wait at least 3.1 seconds. | -                           | The DTC remains stored until it is cleared using the Techstream. |
| U0140 | Lost Communication with Body Control Module                           | The certification ECU (smart key ECU assembly) is unable to receive certain data from the main body ECU (multiplex network body ECU) for 3 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON.</li> <li>• The certification ECU (smart key ECU assembly) power supply voltage is 9.5 V or higher.</li> </ul> | Turn the ignition switch to ON and wait at least 3 seconds.   | -                           | The DTC remains stored until it is cleared using the Techstream. |
| U0155 | Lost Communication with Instrument Panel Cluster (IPC) Control Module | The certification ECU (smart key ECU assembly) is unable to receive certain data from the combination meter assembly for 3.1 seconds or more.               | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON.</li> <li>• The certification ECU (smart key ECU assembly) power supply voltage is 9.5 V or higher.</li> </ul> | Turn the ignition switch to ON and wait at least 3.1 seconds. | -                           | The DTC remains stored until it is cleared using the Techstream. |

(h) Certification ECU (Smart Key ECU Assembly) / Techstream Display "Starting Control"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Certification ECU (Smart Key ECU Assembly) / Techstream Display "Starting Control"**

| DTC | DETECTION ITEM | DTC DETECTION CONDITION | DTC DETECTION PRE-CONDITION | DTC CHECK PROCEDURE | WARNING INDICATION | DTC STORAGE METHOD |
|-----|----------------|-------------------------|-----------------------------|---------------------|--------------------|--------------------|
|-----|----------------|-------------------------|-----------------------------|---------------------|--------------------|--------------------|

|       |                   |                                                                                                                      |                            |                                                             |          |                                                                  |
|-------|-------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------|----------|------------------------------------------------------------------|
|       |                   |                                                                                                                      |                            |                                                             | IN METER |                                                                  |
| U0100 | ECM Communication | The certification ECU (smart key ECU assembly) is unable to receive certain data from the ECM for 2 seconds or more. | The ignition switch is ON. | Turn the ignition switch to ON and wait at least 2 seconds. | -        | The DTC remains stored until it is cleared using the Techstream. |

(i) Air Conditioning Amplifier Assembly / Techstream Display "Air Conditioner"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Air Conditioning Amplifier Assembly / Techstream Display "Air Conditioner"**

| DTC   | DETECTION ITEM                            | DTC DETECTION CONDITION                                                                                                                  | DTC DETECTION PRE-CONDITION                                                                                                                                                                         | DTC CHECK PROCEDURE                                         | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0100 | Lost Communication with ECM               | The air conditioning amplifier assembly does not receive data from the ECM for 5 seconds or more.                                        | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the air conditioning amplifier assembly is 10 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 5 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0142 | Lost Communication with Main Body ECU     | The air conditioning amplifier assembly does not receive data from the main body ECU (multiplex network body ECU) for 5 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the air conditioning amplifier assembly is 10 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 5 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0155 | Lost Communication with Combination Meter | The air conditioning amplifier assembly does not receive data from the combination meter assembly for 5 seconds or                       | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the air conditioning amplifier</li> </ul>                           | Turn the ignition switch to ON and wait at least 5 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC | DETECTION ITEM | DTC DETECTION CONDITION | DTC DETECTION PRE-CONDITION | DTC CHECK PROCEDURE | WARNING INDICATION IN METER | DTC STORAGE METHOD |
|-----|----------------|-------------------------|-----------------------------|---------------------|-----------------------------|--------------------|
|     |                | more.                   | assembly is 10 V or more.   |                     |                             |                    |

(j) Combination Meter Assembly / Techstream Display "Combination Meter"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Combination Meter Assembly / Techstream Display "Combination Meter"**

| DTC   | DETECTION ITEM                                      | DTC DETECTION CONDITION                                                                                                                                                      | DTC DETECTION PRE-CONDITION                                                                                                                                                                          | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0100 | Lost Communication with ECM / PCM "A"               | The combination meter assembly does not receive data from the ECM for 2 seconds or more.                                                                                     | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the combination meter assembly is between 9.5 and 11.5 V.</li> </ul> | Turn the ignition switch to ON and wait at least 2 seconds.  | -                           | DTC is stored until it is cleared using the Techstream. |
| U0129 | Lost Communication with Brake System Control Module | The combination meter assembly does not receive data from the brake booster assembly (skid control ECU) or brake actuator assembly (skid control ECU) for 3 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the combination meter assembly is between 9.5 and 11.5 V.</li> </ul> | Turn the ignition switch to ON and wait at least 3 seconds.  | -                           | DTC is stored until it is cleared using the Techstream. |
| U0142 | Lost Communication with Body Control Module "B"     | The combination meter assembly does not receive data from the main body ECU (multiplex network body ECU) for 10 seconds or more.                                             | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the combination meter assembly is between 9.5</li> </ul>             | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                    | DTC DETECTION CONDITION                                                                                                                                   | DTC DETECTION PRE-CONDITION                                                                                                                                                                          | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER    | DTC STORAGE METHOD                                      |
|-------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------|---------------------------------------------------------|
|       |                                                   |                                                                                                                                                           | and 11.5 V.                                                                                                                                                                                          |                                                              |                                |                                                         |
| U0151 | Lost Communication with Restraints Control Module | The combination meter assembly does not receive data from the airbag sensor assembly for 10 seconds or more.                                              | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the combination meter assembly is between 9.5 and 11.5 V.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | SRS warning light illuminates. | DTC is stored until it is cleared using the Techstream. |
| U0163 | Lost Communication with Navigation Control Module | The combination meter assembly does not receive data from the navigation receiver assembly or radio and display receiver assembly for 10 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• Ignition switch is ON.</li> <li>• The power source voltage of the combination meter assembly is between 9.5 and 11.5 V.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                              | DTC is stored until it is cleared using the Techstream. |

(k) Navigation Receiver Assembly / Techstream Display "Navigation System"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Navigation Receiver Assembly / Techstream Display "Navigation System"**

| DTC   | DETECTION ITEM                           | DTC DETECTION CONDITION                                                             | DTC DETECTION PRE-CONDITION                                                                                                                                              | DTC CHECK PROCEDURE                                           | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0073 | Sending Malfunction (Navigation to APGS) | The navigation receiver assembly does not send/receive data 10 times in succession. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ACC for 1 second or more.</li> <li>• The power source voltage of the</li> </ul> | Turn the ignition switch to ACC and wait at least 11 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                              | DTC DETECTION CONDITION                                                                                                                                                       | DTC DETECTION PRE-CONDITION                                                                                                                                                                                            | DTC CHECK PROCEDURE                                         | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
|       |                                             |                                                                                                                                                                               | navigation receiver assembly is 9.5 V or more.                                                                                                                                                                         |                                                             |                             |                                                         |
| U0100 | Lost Communication with ECM                 | The navigation receiver assembly does not receive data from the ECM for 4 seconds or more.                                                                                    | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the navigation receiver assembly is 9.5 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 5 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0129 | VSC (ECB) ECU Communication                 | The navigation receiver assembly does not receive data from the brake booster assembly (skid control ECU) or brake actuator assembly (skid control ECU) for 1 second or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the navigation receiver assembly is 9.5 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 2 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0140 | Lost Communication with Body Control Module | The navigation receiver assembly does not receive data from the main body ECU (multiplex network body ECU) for 3 seconds or more.                                             | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of</li> </ul>                                                    | Turn the ignition switch to ON and wait at least 4 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                    | DTC DETECTION CONDITION                                                                                                | DTC DETECTION PRE-CONDITION                                                                                                                                                                                            | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
|       |                                   |                                                                                                                        | the navigation receiver assembly is 9.5 V or more.                                                                                                                                                                     |                                                              |                             |                                                         |
| U0155 | Meter ECU Communication           | The navigation receiver assembly does not receive data from the combination meter assembly for 30 seconds or more.     | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the navigation receiver assembly is 9.5 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 31 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U1110 | Clearance Sonar ECU Communication | The navigation receiver assembly does not receive data from the clearance warning ECU assembly for 10 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the navigation receiver assembly is 9.5 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 11 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

(I) Radio and Display Receiver Assembly / Techstream Display "Navigation System"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Radio and Display Receiver Assembly / Techstream Display "Navigation System"**

| DTC | DETECTION ITEM | DTC DETECTION CONDITION | DTC DETECTION PRE-CONDITION | DTC CHECK PROCEDURE | WARNING INDICATION | DTC STORAGE |
|-----|----------------|-------------------------|-----------------------------|---------------------|--------------------|-------------|
|-----|----------------|-------------------------|-----------------------------|---------------------|--------------------|-------------|

|       |                                          |                                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                               | IN METER | METHOD                                                  |
|-------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------|---------------------------------------------------------|
| U0073 | Sending Malfunction (Navigation to APGS) | The radio and display receiver assembly does not send/receive data 10 times in succession.                                                                                           | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ACC for 1 second or more.</li> <li>• The power source voltage of the radio and display receiver assembly is 9.5 V or more.</li> </ul> | Turn the ignition switch to ACC and wait at least 11 seconds. | -        | DTC is stored until it is cleared using the Techstream. |
| U0100 | Lost Communication with ECM              | The radio and display receiver assembly does not receive data from the ECM for 4 seconds or more.                                                                                    | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the radio and display receiver assembly is 9.5 V or more.</li> </ul>  | Turn the ignition switch to ON and wait at least 5 seconds.   | -        | DTC is stored until it is cleared using the Techstream. |
| U0129 | VSC (ECB) ECU Communication              | The radio and display receiver assembly does not receive data from the brake booster assembly (skid control ECU) or brake actuator assembly (skid control ECU) for 1 second or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the radio and display receiver assembly is 9.5 V or</li> </ul>        | Turn the ignition switch to ON and wait at least 2 seconds.   | -        | DTC is stored until it is cleared using the Techstream. |

|       |                                             |                                                                                                                                          |                                                                                                                                                                                                                                      |                                                              |   |                                                         |
|-------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---|---------------------------------------------------------|
|       |                                             |                                                                                                                                          | more.                                                                                                                                                                                                                                |                                                              |   |                                                         |
| U0140 | Lost Communication with Body Control Module | The radio and display receiver assembly does not receive data from the main body ECU (multiplex network body ECU) for 3 seconds or more. | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the radio and display receiver assembly is 9.5 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 4 seconds.  | - | DTC is stored until it is cleared using the Techstream. |
| U0155 | Meter ECU Communication                     | The radio and display receiver assembly does not receive data from the combination meter assembly for 30 seconds or more.                | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the radio and display receiver assembly is 9.5 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 31 seconds. | - | DTC is stored until it is cleared using the Techstream. |
| U1110 | Clearance Sonar ECU Communication           | The radio and display receiver assembly does not receive data from the clearance warning ECU assembly for 10 seconds or more.            | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the radio and display receiver assembly is 9.5 V or</li> </ul>       | Turn the ignition switch to ON and wait at least 11 seconds. | - | DTC is stored until it is cleared using the Techstream. |

|  |  |  |       |  |  |  |
|--|--|--|-------|--|--|--|
|  |  |  | more. |  |  |  |
|--|--|--|-------|--|--|--|

(m) Network Gateway ECU / Techstream Display "Gateway"

**HINT:**

- This ECU uses the CAN communication system for DTC communication.
- "Gateway" stores DTCs when a communication error is detected in the Sub bus 2.

**Network Gateway ECU / Techstream Display "Gateway"**

| DTC   | DETECTION ITEM                                               | DTC DETECTION CONDITION                                                                                                                       | DTC DETECTION PRE-CONDITION                       | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0233 | Lost Communication with Blind Spot Monitor Master Module     | The network gateway ECU does not receive data from the blind spot monitor sensor LH.                                                          | The ignition switch is ON for 10 seconds or more. | Turn the ignition switch to ON and wait at least 20 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U1002 | Lost Communication with Gateway Module (Network Gateway ECU) | The network gateway ECU detects communication errors between itself and the blind spot monitor sensor LH, and clearance warning ECU assembly. | The ignition switch is ON for 10 seconds or more. | Turn the ignition switch to ON and wait at least 20 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U1110 | Lost Communication with Clearance Warning ECU                | The network gateway ECU does not receive data from the clearance warning ECU assembly.                                                        | The ignition switch is ON for 10 seconds or more. | Turn the ignition switch to ON and wait at least 20 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

(n) Clearance Warning ECU Assembly / Techstream Display "Intuitive P/A"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Clearance Warning ECU Assembly / Techstream Display "Intuitive P/A"**

| DTC   | DETECTION ITEM                        | DTC DETECTION CONDITION                                                                      | DTC DETECTION PRE-CONDITION                                                                                                   | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|---------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0100 | Lost Communication with ECM / PCM "A" | The clearance warning ECU assembly does not receive data from the ECM for 5 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 5 seconds or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                  | DTC DETECTION CONDITION                                                                                                             | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                   | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
|       |                                                 |                                                                                                                                     | <ul style="list-style-type: none"> <li>The power source voltage of the clearance warning ECU assembly is 10.2 V or more.</li> </ul>                                                                                           |                                                              |                             |                                                         |
| U0101 | Lost Communication with TCM                     | The clearance warning ECU assembly does not receive data from the ECM for 5 seconds or more.                                        | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>The ignition switch is ON for 5 seconds or more.</li> <li>The power source voltage of the clearance warning ECU assembly is 10.2 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |
| U0142 | Lost Communication with Body Control Module "B" | The clearance warning ECU assembly does not receive data from the main body ECU (multiplex network body ECU) for 5 seconds or more. | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>The ignition switch is ON for 5 seconds or more.</li> <li>The power source voltage of the clearance warning ECU assembly is 10.2 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                            | DTC DETECTION CONDITION                                                                                             | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0155 | Lost Communication with Combination Meter | The clearance warning ECU assembly does not receive data from the combination meter assembly for 5 seconds or more. | Both conditions are met: <ul style="list-style-type: none"> <li>• The ignition switch is ON for 5 seconds or more.</li> <li>• The power source voltage of the clearance warning ECU assembly is 10.2 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 10 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

(o) Blind Spot Monitor Sensor LH / Techstream Display "Blind Spot Monitor Master"

**HINT:**

- This ECU uses the CAN communication system for DTC communication.
- \*: Refer to Blind Spot Monitor System INFO.

**Blind Spot Monitor Sensor LH / Techstream Display "Blind Spot Monitor Master"**

| DTC   | DETECTION ITEM                        | DTC DETECTION CONDITION                                                                        | DTC DETECTION PRE-CONDITION                                                                                                                                                                                   | DTC CHECK PROCEDURE                                                                                                                                          | WARNING INDICATION IN METER                         | DTC STORAGE METHOD                                      |
|-------|---------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|
| U0100 | Lost Communication with ECM / PCM "A" | The blind spot monitor sensor LH does not receive data from the ECM for 10.84 seconds or more. | All conditions are met: <ul style="list-style-type: none"> <li>• Blind spot monitor main switch on.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage</li> </ul> | Turn the ignition switch to ON, turn the blind spot monitor system on using the blind spot monitor main switch (ON/OFF switch), wait at least 11.84 seconds. | Displays messages on the multi-information display. | DTC is stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                       | DTC DETECTION CONDITION                                                                                                                                                            | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                               | DTC CHECK PROCEDURE                                                                                                                                          | WARNING INDICATION IN METER                         | DTC STORAGE METHOD                                      |
|-------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|
|       |                                                      |                                                                                                                                                                                    | of the blind spot monitor sensor LH is 10 V or more.                                                                                                                                                                                                                      |                                                                                                                                                              |                                                     |                                                         |
| U0126 | Lost Communication with Steering Angle Sensor Module | The blind spot monitor sensor LH does not receive data from the spiral cable with sensor sub-assembly for 10.68 seconds or more.                                                   | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Blind spot monitor main switch on.</li> <li>• The ignition switch is ON for 1 second or more.</li> <li>• The power source voltage of the blind spot monitor sensor LH is 10 V or more.</li> </ul> | Turn the ignition switch to ON, turn the blind spot monitor system on using the blind spot monitor main switch (ON/OFF switch), wait at least 11.68 seconds. | Displays messages on the multi-information display. | DTC is stored until it is cleared using the Techstream. |
| U0129 | Lost Communication with Brake System Control Module  | The blind spot monitor sensor LH does not receive data from the brake booster assembly (skid control ECU) or brake actuator assembly (skid control ECU) for 2.334 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• Blind spot monitor main switch on.</li> <li>• The ignition switch is ON for 1</li> </ul>                                                                                                          | Turn the ignition switch to ON, turn the blind spot monitor system on using the blind spot monitor main switch (ON/OFF switch), wait at least 4.334 seconds. | Displays messages on the multi-information display. | DTC is stored until it is cleared using the Techstream. |

| DTC    | DETECTION ITEM                                          | DTC DETECTION CONDITION                                                                                                              | DTC DETECTION PRE-CONDITION                                                                                                                                                                                                                                         | DTC CHECK PROCEDURE                                                                                                                                         | WARNING INDICATION IN METER                         | DTC STORAGE METHOD                                      |
|--------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|
|        |                                                         |                                                                                                                                      | <p>second or more.</p> <ul style="list-style-type: none"> <li>The power source voltage of the blind spot monitor sensor LH is 10 V or more.</li> </ul>                                                                                                              |                                                                                                                                                             |                                                     |                                                         |
| U0142  | Lost Communication with Body Control Module "B"         | The blind spot monitor sensor LH does not receive data from the main body ECU (multiplex network body ECU) for 10.6 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>Blind spot monitor main switch on.</li> <li>The ignition switch is ON for 1 second or more.</li> <li>The power source voltage of the blind spot monitor sensor LH is 10 V or more.</li> </ul> | Turn the ignition switch to ON, turn the blind spot monitor system on using the blind spot monitor main switch (ON/OFF switch), wait at least 11.6 seconds. | Displays messages on the multi-information display. | DTC is stored until it is cleared using the Techstream. |
| U0232* | Lost Communication with Blind Spot Monitor Slave Module | The blind spot monitor sensor LH does not receive data from the blind spot monitor sensor                                            | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>Blind spot monitor main</li> </ul>                                                                                                                                                            | Turn the ignition switch to ON, turn the blind spot monitor system on using the                                                                             | Displays messages on the multi-information display. | DTC is stored until it is cleared using the Techstream. |

| DTC    | DETECTION ITEM                                        | DTC DETECTION CONDITION                                                                                                  | DTC DETECTION PRE-CONDITION                                                                                                                                                                             | DTC CHECK PROCEDURE                                                                                                                                     | WARNING INDICATION IN METER                         | DTC STORAGE METHOD                                      |
|--------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|
|        |                                                       | RH for 10.6 seconds or more.                                                                                             | switch on.<br>• The ignition switch is ON for 1 second or more.<br>• The power source voltage of the blind spot monitor sensor LH is 10 V or more.                                                      | blind spot monitor main switch (ON/OFF switch), wait at least 11.6 seconds.                                                                             |                                                     |                                                         |
| U1331* | Software Incompatibility with Body Control Module "B" | Destination information of the main body ECU (multiplex network body ECU) and blind spot monitor sensor LH do not match. | All conditions are met:<br>• Blind spot monitor main switch on.<br>• The ignition switch is ON for 1 second or more.<br>• The power source voltage of the blind spot monitor sensor LH is 10 V or more. | Turn the ignition switch to ON, turn the blind spot monitor system on using the blind spot monitor main switch (ON/OFF switch), wait at least 1 second. | Displays messages on the multi-information display. | DTC is stored until it is cleared using the Techstream. |

(p) Tire Pressure Monitoring System Receiver Assembly / Techstream Display "Tire Pressure Monitor"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**Tire Pressure Monitoring System Receiver Assembly / Techstream Display "Tire Pressure Monitor"**

| DTC   | DETECTION ITEM                                      | DTC DETECTION CONDITION                                                                                                                                                                                            | DTC DETECTION PRE-CONDITION                                                                                                                                                                                         | DTC CHECK PROCEDURE                                          | WARNING INDICATION IN METER | DTC STORAGE METHOD                                      |
|-------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|---------------------------------------------------------|
| U0129 | Lost Communication with Brake System Control Module | The door control and tire pressure monitoring system receiver assembly does not receive data from the brake booster assembly (skid control ECU) brake actuator assembly (skid control ECU) for 60 seconds or more. | <p>All conditions are met:</p> <ul style="list-style-type: none"> <li>• The ignition switch is ON.</li> <li>• The power source voltage of the brake booster assembly (skid control ECU) is 10 V or more.</li> </ul> | Turn the ignition switch to ON and wait at least 60 seconds. | -                           | DTC is stored until it is cleared using the Techstream. |

(q) 4 Wheel Drive Control ECU / Techstream Display "Four Wheel Drive"

**HINT:**

This ECU uses the CAN communication system for DTC communication.

**4 Wheel Drive Control ECU / Techstream Display "Four Wheel Drive"**

| DTC   | DETECTION ITEM                      | DTC DETECTION CONDITION                                                                                                                                                   | DTC DETECTION PRE-CONDITION                                                                                                                                                                | DTC CHECK PROCEDURE                                            | WARNING INDICATION IN METER                                                                                                                                                  | DTC STORAGE METHOD                                               |
|-------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| U0100 | Lost Communication with ECM/PCM "A" | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• The 4 wheel drive control ECU is unable to receive certain data from the ECM for 1.85</li> </ul> | <p>Both conditions are met:</p> <ul style="list-style-type: none"> <li>• 3 seconds or more elapse after turning the ignition switch to ON.</li> <li>• The 4 wheel drive control</li> </ul> | Turn the ignition switch to ON and wait at least 8.12 seconds. | <ul style="list-style-type: none"> <li>• The low speed four-wheel drive indicator light blinks.</li> <li>• The message is displayed on multi-information display.</li> </ul> | The DTC remains stored until it is cleared using the Techstream. |

| DTC   | DETECTION ITEM                                          | DTC DETECTION CONDITION                                                                                                                                                                    | DTC DETECTION PRE-CONDITION                                                                                                                                                | DTC CHECK PROCEDURE                                            | WARNING INDICATION IN METER                                                                                                                                                                                                          | DTC STORAGE METHOD                                               |
|-------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|       |                                                         | seconds or more.<br>• The 4 wheel drive control ECU is unable to receive certain data from the ECM for 5.12 seconds or more.                                                               | ECU power supply voltage is 10 V or higher.                                                                                                                                |                                                                |                                                                                                                                                                                                                                      |                                                                  |
| U0122 | Lost Communication With Vehicle Dynamics Control Module | The 4 wheel drive control ECU is unable to receive certain data from the brake booster assembly (skid control ECU) or brake actuator assembly (skid control ECU) for 0.72 seconds or more. | Both conditions are met:<br>• 3 seconds or more elapse after turning the ignition switch to ON.<br>• The 4 wheel drive control ECU power supply voltage is 10 V or higher. | Turn the ignition switch to ON and wait at least 3.72 seconds. | <ul style="list-style-type: none"> <li>• The low speed four-wheel drive indicator light blinks.</li> <li>• The rear differential lock indicator blinks.</li> <li>• The message is displayed on multi-information display.</li> </ul> | The DTC remains stored until it is cleared using the Techstream. |

(r) Airbag Sensor Assembly

**HINT:**

The airbag sensor assembly is connected to the CAN communication system, but the airbag sensor assembly does not store or output CAN communication DTCs.

(s) Spiral Cable with Sensor Sub-assembly

#### HINT:

The spiral cable with sensor sub-assembly is connected to the CAN communication system, but the spiral cable with sensor sub-assembly does not store or output CAN communication DTCs.

### 7. DTC COMBINATION TABLE (OPEN IN CAN BRANCH OF V BUS, PAST COMMUNICATION ERROR)

(a) Regarding a past communication error of ECU and sensor connected to the V bus (in this case, normal is displayed when performing the CAN bus check, but communication DTCs are output), the probable CAN branch that had a malfunction can be determined based on the following DTC combination table.

#### HINT:

- Based on the table below and DTCs output from ECUs connected via CAN communication, the probable part for which communication stop occurred can be determined.
- Regarding an open in a CAN branch and a communication stop that is currently occurring, the malfunctioning part can be confirmed easily by performing the CAN bus check using the Techstream because the ECU or sensor connected to the CAN branch does not respond (the ECU or sensor name will not be displayed on the screen).
- If an open in a CAN main bus line, a short between the CAN bus lines (CANH and CANL) or a +B or ground short in the CAN bus occurs, DTCs of almost all ECUs (or sensors) on the CAN bus may be output, or a message indicating a communication error may be displayed on the Techstream screen. In this case, check the resistance of the CAN bus (steps 7 to 9) first [INFO](#).
- If an open occurs in just one of the lines of a CAN branch, DTCs which are not related to malfunctioning parts may be output (DTCs may be displayed randomly), or a message indicating a communication error may be displayed.

| -          |                                     | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE) |                                                                   |                                                                         |                                                                           |                                                                      |
|------------|-------------------------------------|--------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------|
|            |                                     | V BUS                                      |                                                                   |                                                                         |                                                                           |                                                                      |
| OUTPUT ECU |                                     | OUTPUT DTC                                 | CENTER AIRBAG SENSOR COMMUNICATION STOP MODE <a href="#">INFO</a> | AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE <a href="#">INFO</a> | NAVIGATION RECEIVER ASSEMBLY COMMUNICATION STOP MODE <a href="#">INFO</a> | RADIO RECEIVER ASSEMBLY COMMUNICATION STOP MODE <a href="#">INFO</a> |
| V Bus      | Airbag Sensor Assembly              | -                                          | -                                                                 | -                                                                       | -                                                                         | -                                                                    |
|            | Air Conditioning Amplifier Assembly | U0100                                      | ▲                                                                 | X                                                                       | ▲                                                                         | ▲                                                                    |
|            |                                     | U0142                                      | ▲                                                                 | X                                                                       | ▲                                                                         | ▲                                                                    |
|            |                                     | U0155                                      | ▲                                                                 | X                                                                       | ▲                                                                         | ▲                                                                    |
|            | Navigation Receiver Assembly*1      | U0100                                      | ▲                                                                 | ▲                                                                       | X                                                                         | X                                                                    |
|            |                                     | U0129                                      | ▲                                                                 | ▲                                                                       | X                                                                         | X                                                                    |
|            |                                     | U0140                                      | ▲                                                                 | ▲                                                                       | X                                                                         | X                                                                    |
|            |                                     | U0155                                      | ▲                                                                 | ▲                                                                       | X                                                                         | X                                                                    |
|            |                                     | U1110                                      | ▲                                                                 | ▲                                                                       | X                                                                         | X                                                                    |
|            | Radio and Display                   | U0100                                      | ▲                                                                 | ▲                                                                       | X                                                                         | X                                                                    |
|            |                                     | U0129                                      | ▲                                                                 | ▲                                                                       | X                                                                         | X                                                                    |

| -          |                                                                              | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE) |                                                                  |                                                                        |                                                                          |                                                                     |
|------------|------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|
|            |                                                                              | V BUS                                      |                                                                  |                                                                        |                                                                          |                                                                     |
| OUTPUT ECU |                                                                              | OUTPUT DTC                                 | CENTER AIRBAG SENSOR COMMUNICATION STOP MODE <small>INFO</small> | AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE <small>INFO</small> | NAVIGATION RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> | RADIO RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> |
|            | Receiver Assembly*1                                                          | U0140                                      | ▲                                                                | ▲                                                                      | X                                                                        | X                                                                   |
|            |                                                                              | U0155                                      | ▲                                                                | ▲                                                                      | X                                                                        | X                                                                   |
|            |                                                                              | U1110                                      | ▲                                                                | ▲                                                                      | X                                                                        | X                                                                   |
|            | Main Body ECU (Multiplex Network Body ECU)                                   | U0100                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0101                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0120                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0151                                      | X                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0155                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0327                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Network Gateway ECU*2                                                        | -                                          | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            | ECM                                                                          | -                                          | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            | 4 Wheel Drive Control ECU                                                    | U0100                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0122                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Certification ECU (Smart Key ECU Assembly) (Entry Function)                  | U0100                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0142                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0155                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0140                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0155                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
| V Bus      | Combination Meter Assembly                                                   | U0100                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0129                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                              | U0142                                      | ▲                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |

| -          |                                                                    | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE)                       |                                                                        |                                                                          |                                                                     |
|------------|--------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|
|            |                                                                    | V BUS                                                            |                                                                        |                                                                          |                                                                     |
| OUTPUT ECU | OUTPUT DTC                                                         | CENTER AIRBAG SENSOR COMMUNICATION STOP MODE <small>INFO</small> | AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE <small>INFO</small> | NAVIGATION RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> | RADIO RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> |
| Sub Bus 2  | U0151                                                              | X                                                                | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | U0163                                                              | ▲                                                                | ▲                                                                      | X                                                                        | X                                                                   |
|            | Spiral Cable with Sensor Sub-assembly                              | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            | Door Control and Tire Pressure Monitoring System Receiver Assembly | U0129                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Brake Booster Assembly (Skid Control ECU)*1                        | U0100                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0114                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0123                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0124                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0126                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Brake Actuator Assembly (Skid Control ECU)*1                       | U0100                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0114                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0123                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0124                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0126                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Blind Spot Monitor Sensor LH                                       | U0100                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0126                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0129                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0142                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            | Network Gateway ECU*2                                              | U0233                                                            | -                                                                      | -                                                                        | -                                                                   |
|            |                                                                    | U1002                                                            | -                                                                      | -                                                                        | -                                                                   |
|            |                                                                    | U1110                                                            | -                                                                      | -                                                                        | -                                                                   |
|            | Clearance Warning ECU Assembly                                     | U0100                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0101                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0142                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |
|            |                                                                    | U0155                                                            | ▲                                                                      | ▲                                                                        | ▲                                                                   |

**HINT:**

- X: DTC is likely to be output.
- ▲: DTC is unlikely to be output.
- -: DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                            | OUTPUT DTC | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE)            |                                                     |                                                         |                                                           |
|------------|--------------------------------------------|------------|-------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
|            |                                            |            | V BUS                                                 |                                                     |                                                         |                                                           |
| OUTPUT ECU |                                            |            | MAIN BODY ECU COMMUNICATION STOP MODE <div>INFO</div> | GATEWAY ECU COMMUNICATION STOP MODE <div>INFO</div> | 4WD CONTROL ECU COMMUNICATION STOP MODE <div>INFO</div> | CERTIFICATION ECU COMMUNICATION STOP MODE <div>INFO</div> |
| V Bus      | Airbag Sensor Assembly                     | -          | -                                                     | -                                                   | -                                                       | -                                                         |
|            | Air Conditioning Amplifier Assembly        | U0100      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0142      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0155      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            | Navigation Receiver Assembly*1             | U0100      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0129      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0140      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0155      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U1110      | ▲                                                     | X                                                   | ▲                                                       | ▲                                                         |
|            | Radio and Display Receiver Assembly*1      | U0100      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0129      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0140      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0155      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U1110      | ▲                                                     | X                                                   | ▲                                                       | ▲                                                         |
|            | Main Body ECU (Multiplex Network Body ECU) | U0100      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0101      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0120      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0151      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0155      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                            | U0327      | X                                                     | ▲                                                   | ▲                                                       | X                                                         |
|            | Network Gateway ECU*2                      | -          | -                                                     | -                                                   | -                                                       | -                                                         |
|            | ECM                                        | -          | -                                                     | -                                                   | -                                                       | -                                                         |
|            | 4 Wheel Drive Control ECU                  | U0100      | ▲                                                     | ▲                                                   | X                                                       | ▲                                                         |
|            |                                            | U0122      | ▲                                                     | ▲                                                   | X                                                       | ▲                                                         |
|            | Certification                              | U0100      | ▲                                                     | ▲                                                   | ▲                                                       | X                                                         |

| -          |                                                                                 | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE) |                                                       |                                                     |                                                         |                                                           |
|------------|---------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
|            |                                                                                 | V BUS                                      |                                                       |                                                     |                                                         |                                                           |
| OUTPUT ECU |                                                                                 | OUTPUT DTC                                 | MAIN BODY ECU COMMUNICATION STOP MODE <div>INFO</div> | GATEWAY ECU COMMUNICATION STOP MODE <div>INFO</div> | 4WD CONTROL ECU COMMUNICATION STOP MODE <div>INFO</div> | CERTIFICATION ECU COMMUNICATION STOP MODE <div>INFO</div> |
|            | ECU (Smart Key ECU Assembly)<br>(Entry Function)                                | U0142                                      | X                                                     | ▲                                                   | ▲                                                       | X                                                         |
|            |                                                                                 | U0155                                      | ▲                                                     | ▲                                                   | ▲                                                       | X                                                         |
|            | Certification ECU (Smart Key ECU Assembly)<br>(Power Source Switching Function) | U0100                                      | ▲                                                     | ▲                                                   | ▲                                                       | X                                                         |
|            |                                                                                 | U0140                                      | X                                                     | ▲                                                   | ▲                                                       | X                                                         |
|            |                                                                                 | U0155                                      | ▲                                                     | ▲                                                   | ▲                                                       | X                                                         |
|            | Certification ECU (Smart Key ECU Assembly)<br>(Start Function)                  | U0100                                      | ▲                                                     | ▲                                                   | ▲                                                       | X                                                         |
| V Bus      | Combination Meter Assembly                                                      | U0100                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0129                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0142                                      | X                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0151                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0163                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            | Spiral Cable with Sensor Sub-assembly                                           | -                                          | -                                                     | -                                                   | -                                                       | -                                                         |
|            | Door Control and Tire Pressure Monitoring System Receiver Assembly              | U0129                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            | Brake Booster Assembly (Skid Control ECU)*1                                     | U0100                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0114                                      | ▲                                                     | ▲                                                   | X                                                       | ▲                                                         |
|            |                                                                                 | U0123                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0124                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0126                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            | Brake Actuator Assembly (Skid Control ECU)*1                                    | U0100                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0114                                      | ▲                                                     | ▲                                                   | X                                                       | ▲                                                         |
|            |                                                                                 | U0123                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |
|            |                                                                                 | U0124                                      | ▲                                                     | ▲                                                   | ▲                                                       | ▲                                                         |

|            |                                | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE)                |                                                         |                                                             |                                                               |
|------------|--------------------------------|-----------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|
|            |                                | V BUS                                                     |                                                         |                                                             |                                                               |
| OUTPUT ECU | OUTPUT DTC                     | MAIN BODY ECU COMMUNICATION STOP MODE <small>INFO</small> | GATEWAY ECU COMMUNICATION STOP MODE <small>INFO</small> | 4WD CONTROL ECU COMMUNICATION STOP MODE <small>INFO</small> | CERTIFICATION ECU COMMUNICATION STOP MODE <small>INFO</small> |
| Sub Bus 2  |                                | U0126 ▲                                                   | ▲                                                       | ▲                                                           | ▲                                                             |
|            | Blind Spot Monitor Sensor LH   | U0100 ▲                                                   | X                                                       | ▲                                                           | ▲                                                             |
|            |                                | U0126 ▲                                                   | X                                                       | ▲                                                           | ▲                                                             |
|            |                                | U0129 ▲                                                   | X                                                       | ▲                                                           | ▲                                                             |
|            |                                | U0142 X                                                   | X                                                       | ▲                                                           | ▲                                                             |
|            | Network Gateway ECU*2          | U0233 -                                                   | -                                                       | -                                                           | -                                                             |
|            |                                | U1002 -                                                   | -                                                       | -                                                           | -                                                             |
|            |                                | U1110 -                                                   | -                                                       | -                                                           | -                                                             |
|            | Clearance Warning ECU Assembly | U0100 ▲                                                   | X                                                       | ▲                                                           | ▲                                                             |
|            |                                | U0101 ▲                                                   | X                                                       | ▲                                                           | ▲                                                             |
|            |                                | U0142 X                                                   | X                                                       | ▲                                                           | ▲                                                             |
|            |                                | U0155 ▲                                                   | X                                                       | ▲                                                           | ▲                                                             |

#### HINT:

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|            |                                     | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE)                        |                                                              |      |                                                                       |
|------------|-------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|------|-----------------------------------------------------------------------|
|            |                                     | V BUS                                                             |                                                              |      |                                                                       |
| OUTPUT ECU | OUTPUT DTC                          | STEERING ANGLE SENSOR COMMUNICATION STOP MODE <small>INFO</small> | SKID CONTROL ECU COMMUNICATION STOP MODE <small>INFO</small> | DLC3 | TIRE PRESSURE MONITOR ECU COMMUNICATION STOP MODE <small>INFO</small> |
| V Bus      | Airbag Sensor Assembly              | -                                                                 | -                                                            | -    | -                                                                     |
|            | Air Conditioning Amplifier Assembly | U0100 ▲                                                           | ▲                                                            | ▲    | ▲                                                                     |
|            |                                     | U0142 ▲                                                           | ▲                                                            | ▲    | ▲                                                                     |
|            |                                     | U0155 ▲                                                           | ▲                                                            | ▲    | ▲                                                                     |
|            | Navigation Receiver Assembly*1      | U0100 ▲                                                           | ▲                                                            | ▲    | ▲                                                                     |
|            |                                     | U0129 ▲                                                           | X                                                            | ▲    | ▲                                                                     |
|            |                                     | U0140 ▲                                                           | ▲                                                            | ▲    | ▲                                                                     |
|            |                                     | U0155 ▲                                                           | ▲                                                            | ▲    | ▲                                                                     |

| -          |                                                                              | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE)                        |                                                              |      |                                                                       |
|------------|------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|------|-----------------------------------------------------------------------|
|            |                                                                              | V BUS                                                             |                                                              |      |                                                                       |
| OUTPUT ECU | OUTPUT DTC                                                                   | STEERING ANGLE SENSOR COMMUNICATION STOP MODE <small>INFO</small> | SKID CONTROL ECU COMMUNICATION STOP MODE <small>INFO</small> | DLC3 | TIRE PRESSURE MONITOR ECU COMMUNICATION STOP MODE <small>INFO</small> |
|            | U1110                                                                        | ▲                                                                 | ▲                                                            | ▲    | ▲                                                                     |
|            | Radio and Display Receiver Assembly*1                                        | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0129                                                             | ▲                                                            | X    | ▲                                                                     |
|            |                                                                              | U0140                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0155                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U1110                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            | Main Body ECU (Multiplex Network Body ECU)                                   | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0101                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0120                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0151                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0155                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0327                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            | Network Gateway ECU*2                                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            | ECM                                                                          | -                                                                 | -                                                            | -    | -                                                                     |
|            | 4 Wheel Drive Control ECU                                                    | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0122                                                             | ▲                                                            | X    | ▲                                                                     |
|            | Certification ECU (Smart Key ECU Assembly) (Entry Function)                  | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0142                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0155                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            | Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0140                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0155                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            | Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
| V Bus      | Combination Meter Assembly                                                   | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0129                                                             | ▲                                                            | X    | ▲                                                                     |
|            |                                                                              | U0142                                                             | ▲                                                            | ▲    | ▲                                                                     |
|            |                                                                              | U0151                                                             | ▲                                                            | ▲    | ▲                                                                     |

| -                                                                  |                                | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE)                        |                                                              |      |                                                                       |
|--------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|------|-----------------------------------------------------------------------|
|                                                                    |                                | V BUS                                                             |                                                              |      |                                                                       |
| OUTPUT ECU                                                         | OUTPUT DTC                     | STEERING ANGLE SENSOR COMMUNICATION STOP MODE <small>INFO</small> | SKID CONTROL ECU COMMUNICATION STOP MODE <small>INFO</small> | DLC3 | TIRE PRESSURE MONITOR ECU COMMUNICATION STOP MODE <small>INFO</small> |
|                                                                    | U0163                          | ▲                                                                 | ▲                                                            | ▲    | ▲                                                                     |
| Spiral Cable with Sensor Sub-assembly                              | -                              | -                                                                 | -                                                            | -    | ▲                                                                     |
| Door Control and Tire Pressure Monitoring System Receiver Assembly | U0129                          | ▲                                                                 | X                                                            | ▲    | X                                                                     |
| Brake Booster Assembly (Skid Control ECU)*1                        | U0100                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0114                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0123                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0124                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0126                          | X                                                                 | X                                                            | ▲    | ▲                                                                     |
| Brake Actuator Assembly (Skid Control ECU)*1                       | U0100                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0114                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0123                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0124                          | ▲                                                                 | X                                                            | ▲    | ▲                                                                     |
|                                                                    | U0126                          | X                                                                 | X                                                            | ▲    | ▲                                                                     |
| Sub Bus 2                                                          | Blind Spot Monitor Sensor LH   | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|                                                                    |                                | U0126                                                             | X                                                            | ▲    | ▲                                                                     |
|                                                                    |                                | U0129                                                             | ▲                                                            | ▲    | ▲                                                                     |
|                                                                    |                                | U0142                                                             | ▲                                                            | ▲    | ▲                                                                     |
|                                                                    | Network Gateway ECU*2          | U0233                                                             | -                                                            | -    | -                                                                     |
|                                                                    |                                | U1002                                                             | -                                                            | -    | -                                                                     |
|                                                                    |                                | U1110                                                             | -                                                            | -    | -                                                                     |
|                                                                    | Clearance Warning ECU Assembly | U0100                                                             | ▲                                                            | ▲    | ▲                                                                     |
|                                                                    |                                | U0101                                                             | ▲                                                            | ▲    | ▲                                                                     |
|                                                                    |                                | U0142                                                             | ▲                                                            | ▲    | ▲                                                                     |
|                                                                    |                                | U0155                                                             | ▲                                                            | ▲    | ▲                                                                     |

#### HINT:

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- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                            | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)                     |                                                                        |                                                                          |                                                                     |   |
|------------|--------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|---|
|            |                                            | V BUS                                                            |                                                                        |                                                                          |                                                                     |   |
| OUTPUT ECU | OUTPUT DTC                                 | CENTER AIRBAG SENSOR COMMUNICATION STOP MODE <small>INFO</small> | AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE <small>INFO</small> | NAVIGATION RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> | RADIO RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> |   |
| V Bus      | Airbag Sensor Assembly                     | -                                                                | -                                                                      | -                                                                        | -                                                                   |   |
|            | Air Conditioning Amplifier Assembly        | U0100                                                            | -                                                                      | ○                                                                        | -                                                                   |   |
|            |                                            | U0142                                                            | -                                                                      | ○                                                                        | -                                                                   |   |
|            |                                            | U0155                                                            | -                                                                      | ○                                                                        | -                                                                   |   |
|            | Navigation Receiver Assembly*1             | U0100                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U0129                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U0140                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U0155                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U1110                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            | Radio and Display Receiver Assembly*1      | U0100                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U0129                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U0140                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U0155                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            |                                            | U1110                                                            | -                                                                      | -                                                                        | ○                                                                   | ○ |
|            | Main Body ECU (Multiplex Network Body ECU) | U0100                                                            | -                                                                      | -                                                                        | -                                                                   | - |
|            |                                            | U0101                                                            | -                                                                      | -                                                                        | -                                                                   | - |
|            |                                            | U0120                                                            | -                                                                      | -                                                                        | -                                                                   | - |
|            |                                            | U0151                                                            | ○                                                                      | -                                                                        | -                                                                   | - |
|            |                                            | U0155                                                            | -                                                                      | -                                                                        | -                                                                   | - |
|            |                                            | U0327                                                            | -                                                                      | -                                                                        | -                                                                   | - |
|            | Network Gateway ECU*2                      | -                                                                | -                                                                      | -                                                                        | -                                                                   |   |
|            | ECM                                        | -                                                                | -                                                                      | -                                                                        | -                                                                   |   |
|            | 4 Wheel Drive Control ECU                  | U0100                                                            | -                                                                      | -                                                                        | -                                                                   |   |
|            |                                            | U0122                                                            | -                                                                      | -                                                                        | -                                                                   |   |
|            | Certification ECU (Smart Key ECU)          | U0100                                                            | -                                                                      | -                                                                        | -                                                                   |   |
|            |                                            | U0142                                                            | -                                                                      | -                                                                        | -                                                                   |   |

| -          |                                                                              | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)                   |                                                                      |                                                                        |                                                                   |   |
|------------|------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------|---|
|            |                                                                              | V BUS                                                          |                                                                      |                                                                        |                                                                   |   |
| OUTPUT ECU | OUTPUT DTC                                                                   | CENTER AIRBAG SENSOR COMMUNICATION STOP MODE <span>INFO</span> | AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE <span>INFO</span> | NAVIGATION RECEIVER ASSEMBLY COMMUNICATION STOP MODE <span>INFO</span> | RADIO RECEIVER ASSEMBLY COMMUNICATION STOP MODE <span>INFO</span> |   |
| V Bus      | Assembly) (Entry Function)                                                   | U0155                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            | Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0140                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0155                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            | Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            | Combination Meter Assembly                                                   | U0100                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0129                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0142                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0151                                                          | ○                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0163                                                          | -                                                                    | -                                                                      | ○                                                                 | ○ |
|            | Spiral Cable with Sensor Sub-assembly                                        | -                                                              | -                                                                    | -                                                                      | -                                                                 | - |
|            | Door Control and Tire Pressure Monitoring System Receiver Assembly           | U0129                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            | Brake Booster Assembly (Skid Control ECU)*1                                  | U0100                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0114                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0123                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0124                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0126                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            | Brake Actuator Assembly (Skid                                                | U0100                                                          | -                                                                    | -                                                                      | -                                                                 | - |
|            |                                                                              | U0114                                                          | -                                                                    | -                                                                      | -                                                                 | - |

|            |                                |       | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)                     |                                                                        |                                                                          |                                                                     |
|------------|--------------------------------|-------|------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|
|            |                                |       | V BUS                                                            |                                                                        |                                                                          |                                                                     |
| OUTPUT ECU | OUTPUT DTC                     |       | CENTER AIRBAG SENSOR COMMUNICATION STOP MODE <small>INFO</small> | AIR CONDITIONING AMPLIFIER COMMUNICATION STOP MODE <small>INFO</small> | NAVIGATION RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> | RADIO RECEIVER ASSEMBLY COMMUNICATION STOP MODE <small>INFO</small> |
|            | Control ECU)*1                 | U0123 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0124 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0126 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
| Sub Bus 2  | Blind Spot Monitor Sensor LH   | U0100 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0126 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0129 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0142 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            | Network Gateway ECU*2          | U0233 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U1002 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U1110 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            | Clearance Warning ECU Assembly | U0100 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0101 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0142 | -                                                                | -                                                                      | -                                                                        | -                                                                   |
|            |                                | U0155 | -                                                                | -                                                                      | -                                                                        | -                                                                   |

#### HINT:

- : DTC is output.
- : DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

|            |                                     |       | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)              |                                                         |                                                             |                                                               |
|------------|-------------------------------------|-------|-----------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|
|            |                                     |       | V BUS                                                     |                                                         |                                                             |                                                               |
| OUTPUT ECU | OUTPUT DTC                          |       | MAIN BODY ECU COMMUNICATION STOP MODE <small>INFO</small> | GATEWAY ECU COMMUNICATION STOP MODE <small>INFO</small> | 4WD CONTROL ECU COMMUNICATION STOP MODE <small>INFO</small> | CERTIFICATION ECU COMMUNICATION STOP MODE <small>INFO</small> |
| V Bus      | Airbag Sensor Assembly              | -     | -                                                         | -                                                       | -                                                           | -                                                             |
|            | Air Conditioning Amplifier Assembly | U0100 | -                                                         | -                                                       | -                                                           | -                                                             |
|            |                                     | U0142 | ○                                                         | -                                                       | -                                                           | -                                                             |
|            |                                     | U0155 | -                                                         | -                                                       | -                                                           | -                                                             |
|            | Navigation Receiver                 | U0100 | -                                                         | -                                                       | -                                                           | -                                                             |
|            |                                     | U0129 | -                                                         | -                                                       | -                                                           | -                                                             |

| -                                                                            |            | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)              |                                                         |                                                             |                                                               |
|------------------------------------------------------------------------------|------------|-----------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|
|                                                                              |            | V BUS                                                     |                                                         |                                                             |                                                               |
| OUTPUT ECU                                                                   | OUTPUT DTC | MAIN BODY ECU COMMUNICATION STOP MODE <small>INFO</small> | GATEWAY ECU COMMUNICATION STOP MODE <small>INFO</small> | 4WD CONTROL ECU COMMUNICATION STOP MODE <small>INFO</small> | CERTIFICATION ECU COMMUNICATION STOP MODE <small>INFO</small> |
| Assembly*1                                                                   | U0140      | ○                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0155      | -                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U1110      | -                                                         | ○                                                       | -                                                           | -                                                             |
| Radio and Display Receiver Assembly*1                                        | U0100      | -                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0129      | -                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0140      | ○                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0155      | -                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U1110      | -                                                         | ○                                                       | -                                                           | -                                                             |
| Main Body ECU (Multiplex Network Body ECU)                                   | U0100      | ○                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0101      | ○                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0120      | ○                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0151      | ○                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0155      | ○                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0327      | ○                                                         | -                                                       | -                                                           | ○                                                             |
| Network Gateway ECU*2                                                        | -          | -                                                         | -                                                       | -                                                           | -                                                             |
| ECM                                                                          | -          | -                                                         | -                                                       | -                                                           | -                                                             |
| 4 Wheel Drive Control ECU                                                    | U0100      | -                                                         | -                                                       | ○                                                           | -                                                             |
|                                                                              | U0122      | -                                                         | -                                                       | ○                                                           | -                                                             |
| Certification ECU (Smart Key ECU Assembly) (Entry Function)                  | U0100      | -                                                         | -                                                       | -                                                           | ○                                                             |
|                                                                              | U0142      | ○                                                         | -                                                       | -                                                           | ○                                                             |
|                                                                              | U0155      | -                                                         | -                                                       | -                                                           | ○                                                             |
| Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100      | -                                                         | -                                                       | -                                                           | ○                                                             |
|                                                                              | U0140      | ○                                                         | -                                                       | -                                                           | ○                                                             |
|                                                                              | U0155      | -                                                         | -                                                       | -                                                           | ○                                                             |
| Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100      | -                                                         | -                                                       | -                                                           | ○                                                             |
| Combination Meter Assembly                                                   | U0100      | -                                                         | -                                                       | -                                                           | -                                                             |
|                                                                              | U0129      | -                                                         | -                                                       | -                                                           | -                                                             |

| -                              |                                                                    | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES) |                                                       |                                                     |                                                         |                                                           |   |
|--------------------------------|--------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|---|
|                                |                                                                    | V BUS                                        |                                                       |                                                     |                                                         |                                                           |   |
| OUTPUT ECU                     |                                                                    | OUTPUT DTC                                   | MAIN BODY ECU COMMUNICATION STOP MODE <div>INFO</div> | GATEWAY ECU COMMUNICATION STOP MODE <div>INFO</div> | 4WD CONTROL ECU COMMUNICATION STOP MODE <div>INFO</div> | CERTIFICATION ECU COMMUNICATION STOP MODE <div>INFO</div> |   |
|                                |                                                                    | U0142                                        | ○                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0151                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0163                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
| V Bus                          | Spiral Cable with Sensor Sub-assembly                              | -                                            | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                | Door Control and Tire Pressure Monitoring System Receiver Assembly | U0129                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                | Brake Booster Assembly (Skid Control ECU)*1                        | U0100                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0114                                        | -                                                     | -                                                   | ○                                                       | -                                                         |   |
|                                |                                                                    | U0123                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0124                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0126                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                | Brake Actuator Assembly (Skid Control ECU)*1                       | U0100                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0114                                        | -                                                     | -                                                   | ○                                                       | -                                                         |   |
|                                |                                                                    | U0123                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0124                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0126                                        | -                                                     | -                                                   | -                                                       | -                                                         |   |
|                                | Sub Bus 2                                                          | Blind Spot Monitor Sensor LH                 | U0100                                                 | -                                                   | ○                                                       | -                                                         | - |
|                                |                                                                    |                                              | U0126                                                 | -                                                   | ○                                                       | -                                                         | - |
|                                |                                                                    |                                              | U0129                                                 | -                                                   | ○                                                       | -                                                         | - |
|                                |                                                                    |                                              | U0142                                                 | ○                                                   | ○                                                       | -                                                         | - |
|                                |                                                                    | Network Gateway ECU*2                        | U0233                                                 | -                                                   | -                                                       | -                                                         | - |
|                                |                                                                    |                                              | U1002                                                 | -                                                   | -                                                       | -                                                         | - |
|                                |                                                                    |                                              | U1110                                                 | -                                                   | -                                                       | -                                                         | - |
| Clearance Warning ECU Assembly |                                                                    | U0100                                        | -                                                     | ○                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0101                                        | -                                                     | ○                                                   | -                                                       | -                                                         |   |
|                                |                                                                    | U0142                                        | ○                                                     | ○                                                   | -                                                       | -                                                         |   |

| -          |            | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)                                                                            |                                                                                                                       |                                                                                                                             |                                                                                                                               |
|------------|------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
|            |            | V BUS                                                                                                                   |                                                                                                                       |                                                                                                                             |                                                                                                                               |
| OUTPUT ECU | OUTPUT DTC | MAIN BODY ECU COMMUNICATION STOP MODE  | GATEWAY ECU COMMUNICATION STOP MODE  | 4WD CONTROL ECU COMMUNICATION STOP MODE  | CERTIFICATION ECU COMMUNICATION STOP MODE  |
|            | U0155      | -                                                                                                                       | ○                                                                                                                     | -                                                                                                                           | -                                                                                                                             |

#### HINT:

- : DTC is output.
- : DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                            | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)                                                                                    |                                                                                                                              |      |                                                                                                                                       |
|------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------|
|            |                                            | V BUS                                                                                                                           |                                                                                                                              |      |                                                                                                                                       |
| OUTPUT ECU | OUTPUT DTC                                 | STEERING ANGLE SENSOR COMMUNICATION STOP MODE  | SKID CONTROL ECU COMMUNICATION STOP MODE  | DLC3 | TIRE PRESSURE MONITOR ECU COMMUNICATION STOP MODE  |
| V Bus      | Airbag Sensor Assembly                     | -                                                                                                                               | -                                                                                                                            | -    | -                                                                                                                                     |
|            | Air Conditioning Amplifier Assembly        | U0100                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0142                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0155                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            | Navigation Receiver Assembly*1             | U0100                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0129                                                                                                                           | ○                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0140                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0155                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U1110                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            | Radio and Display Receiver Assembly*1      | U0100                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0129                                                                                                                           | ○                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0140                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0155                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U1110                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            | Main Body ECU (Multiplex Network Body ECU) | U0100                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0101                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0120                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0151                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0155                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |
|            |                                            | U0327                                                                                                                           | -                                                                                                                            | -    | -                                                                                                                                     |

| -          |                                                                              | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES) |                                                                 |                                                            |      |                                                                     |
|------------|------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------|------|---------------------------------------------------------------------|
|            |                                                                              | V BUS                                        |                                                                 |                                                            |      |                                                                     |
| OUTPUT ECU |                                                                              | OUTPUT DTC                                   | STEERING ANGLE SENSOR COMMUNICATION STOP MODE <span>INFO</span> | SKID CONTROL ECU COMMUNICATION STOP MODE <span>INFO</span> | DLC3 | TIRE PRESSURE MONITOR ECU COMMUNICATION STOP MODE <span>INFO</span> |
|            | Network Gateway ECU*2                                                        | -                                            | -                                                               | -                                                          | -    | -                                                                   |
|            | ECM                                                                          | -                                            | -                                                               | -                                                          | -    | -                                                                   |
|            | 4 Wheel Drive Control ECU                                                    | U0100                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0122                                        | -                                                               | ○                                                          | -    | -                                                                   |
|            | Certification ECU (Smart Key ECU Assembly) (Entry Function)                  | U0100                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0142                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0155                                        | -                                                               | -                                                          | -    | -                                                                   |
|            | Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0140                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0155                                        | -                                                               | -                                                          | -    | -                                                                   |
|            | Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100                                        | -                                                               | -                                                          | -    | -                                                                   |
|            | Combination Meter Assembly                                                   | U0100                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0129                                        | -                                                               | ○                                                          | -    | -                                                                   |
|            |                                                                              | U0142                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0151                                        | -                                                               | -                                                          | -    | -                                                                   |
|            |                                                                              | U0163                                        | -                                                               | -                                                          | -    | -                                                                   |
| V Bus      | Spiral Cable with Sensor Sub-assembly                                        | -                                            | -                                                               | -                                                          | -    | -                                                                   |
|            | Door Control and Tire Pressure Monitoring System Receiver Assembly           | U0129                                        | -                                                               | ○                                                          | -    | ○                                                                   |
|            | Brake Booster Assembly (Skid Control ECU)*1                                  | U0100                                        | -                                                               | ○                                                          | -    | -                                                                   |
|            |                                                                              | U0114                                        | -                                                               | ○                                                          | -    | -                                                                   |
|            |                                                                              | U0123                                        | -                                                               | ○                                                          | -    | -                                                                   |
|            |                                                                              | U0124                                        | -                                                               | ○                                                          | -    | -                                                                   |
|            |                                                                              | U0126                                        | ○                                                               | ○                                                          | -    | -                                                                   |
|            | Brake Actuator                                                               | U0100                                        | -                                                               | ○                                                          | -    | -                                                                   |

| -          |                                | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES) |                                                                   |                                                              |      |                                                                       |
|------------|--------------------------------|----------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|------|-----------------------------------------------------------------------|
|            |                                | V BUS                                        |                                                                   |                                                              |      |                                                                       |
| OUTPUT ECU |                                | OUTPUT DTC                                   | STEERING ANGLE SENSOR COMMUNICATION STOP MODE <small>INFO</small> | SKID CONTROL ECU COMMUNICATION STOP MODE <small>INFO</small> | DLC3 | TIRE PRESSURE MONITOR ECU COMMUNICATION STOP MODE <small>INFO</small> |
|            | Assembly (Skid Control ECU)*1  | U0114                                        | -                                                                 | ○                                                            | -    | -                                                                     |
|            |                                | U0123                                        | -                                                                 | ○                                                            | -    | -                                                                     |
|            |                                | U0124                                        | -                                                                 | ○                                                            | -    | -                                                                     |
|            |                                | U0126                                        | ○                                                                 | ○                                                            | -    | -                                                                     |
| Sub Bus 2  | Blind Spot Monitor Sensor LH   | U0100                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            |                                | U0126                                        | ○                                                                 | -                                                            | -    | -                                                                     |
|            |                                | U0129                                        | -                                                                 | ○                                                            | -    | -                                                                     |
|            |                                | U0142                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            | Network Gateway ECU*2          | U0233                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            |                                | U1002                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            |                                | U1110                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            | Clearance Warning ECU Assembly | U0100                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            |                                | U0101                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            |                                | U0142                                        | -                                                                 | -                                                            | -    | -                                                                     |
|            |                                | U0155                                        | -                                                                 | -                                                            | -    | -                                                                     |

#### HINT:

- : DTC is output.
- : DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                     | TROUBLE MODE (OPEN IN ONE CAN MAIN BUS LINE) |                                                                   |                                                              |                                                 |
|------------|-------------------------------------|----------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------|
|            |                                     | V BUS                                        |                                                                   |                                                              |                                                 |
| OUTPUT ECU |                                     | OUTPUT DTC                                   | COMBINATION METER ECU COMMUNICATION STOP MODE <small>INFO</small> | NO. 1 CAN JUNCTION CONNECTOR TO NO. 2 CAN JUNCTION CONNECTOR | ECM COMMUNICATION STOP MODE <small>INFO</small> |
| V Bus      | Airbag Sensor Assembly              | -                                            | -                                                                 | -                                                            | -                                               |
|            | Air Conditioning Amplifier Assembly | U0100                                        | ▲                                                                 | ▲                                                            | X                                               |
|            |                                     | U0142                                        | ▲                                                                 | X                                                            | ▲                                               |
|            |                                     | U0155                                        | X                                                                 | X                                                            | ▲                                               |
|            | Navigation Receiver Assembly*1      | U0100                                        | ▲                                                                 | ▲                                                            | X                                               |
|            |                                     | U0129                                        | ▲                                                                 | ▲                                                            | ▲                                               |

| -          |                                                                                          | TROUBLE MODE (OPEN IN ONE CAN MAIN BUS LINE)                            |                                                                       |                                                       |
|------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------|
|            |                                                                                          | V BUS                                                                   |                                                                       |                                                       |
| OUTPUT ECU | OUTPUT DTC                                                                               | COMBINATION METER<br>ECU COMMUNICATION<br>STOP MODE <small>INFO</small> | NO. 1 CAN JUNCTION<br>CONNECTOR TO NO.<br>2 CAN JUNCTION<br>CONNECTOR | ECM<br>COMMUNICATION<br>STOP MODE <small>INFO</small> |
|            | U0140                                                                                    | ▲                                                                       | X                                                                     | ▲                                                     |
|            | U0155                                                                                    | X                                                                       | X                                                                     | ▲                                                     |
|            | U1110                                                                                    | ▲                                                                       | ▲                                                                     | ▲                                                     |
|            | Radio and Display<br>Receiver Assembly*1                                                 | U0100                                                                   | ▲                                                                     | X                                                     |
|            |                                                                                          | U0129                                                                   | ▲                                                                     | ▲                                                     |
|            |                                                                                          | U0140                                                                   | X                                                                     | ▲                                                     |
|            |                                                                                          | U0155                                                                   | X                                                                     | ▲                                                     |
|            |                                                                                          | U1110                                                                   | ▲                                                                     | ▲                                                     |
|            | Main Body ECU<br>(Multiplex Network<br>Body ECU)                                         | U0100                                                                   | ▲                                                                     | X                                                     |
|            |                                                                                          | U0101                                                                   | X                                                                     | X                                                     |
|            |                                                                                          | U0120                                                                   | ▲                                                                     | ▲                                                     |
|            |                                                                                          | U0151                                                                   | X                                                                     | ▲                                                     |
|            |                                                                                          | U0155                                                                   | X                                                                     | ▲                                                     |
|            |                                                                                          | U0327                                                                   | ▲                                                                     | ▲                                                     |
|            | Network Gateway<br>ECU*2                                                                 | -                                                                       | -                                                                     | -                                                     |
|            | ECM                                                                                      | -                                                                       | -                                                                     | -                                                     |
|            | 4 Wheel Drive Control<br>ECU                                                             | U0100                                                                   | ▲                                                                     | X                                                     |
|            |                                                                                          | U0122                                                                   | ▲                                                                     | ▲                                                     |
|            | Certification ECU<br>(Smart Key ECU<br>Assembly) (Entry<br>Function)                     | U0100                                                                   | X                                                                     | X                                                     |
|            |                                                                                          | U0142                                                                   | ▲                                                                     | ▲                                                     |
|            |                                                                                          | U0155                                                                   | X                                                                     | ▲                                                     |
|            | Certification ECU<br>(Smart Key ECU<br>Assembly) (Power<br>Source Switching<br>Function) | U0100                                                                   | X                                                                     | X                                                     |
|            |                                                                                          | U0140                                                                   | ▲                                                                     | ▲                                                     |
|            |                                                                                          | U0155                                                                   | X                                                                     | ▲                                                     |
|            | Certification ECU<br>(Smart Key ECU<br>Assembly) (Start<br>Function)                     | U0100                                                                   | ▲                                                                     | X                                                     |
| V<br>Bus   | Combination Meter<br>Assembly                                                            | U0100                                                                   | X                                                                     | X                                                     |
|            |                                                                                          | U0129                                                                   | X                                                                     | ▲                                                     |

| -                                                                           |                                   | TROUBLE MODE (OPEN IN ONE CAN MAIN BUS LINE)                            |                                                                       |                                                       |
|-----------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------|
|                                                                             |                                   | V BUS                                                                   |                                                                       |                                                       |
| OUTPUT ECU                                                                  | OUTPUT DTC                        | COMBINATION METER<br>ECU COMMUNICATION<br>STOP MODE <small>INFO</small> | NO. 1 CAN JUNCTION<br>CONNECTOR TO NO.<br>2 CAN JUNCTION<br>CONNECTOR | ECM<br>COMMUNICATION<br>STOP MODE <small>INFO</small> |
|                                                                             | U0142                             | X                                                                       | ▲                                                                     | ▲                                                     |
|                                                                             | U0151                             | X                                                                       | X                                                                     | ▲                                                     |
|                                                                             | U0163                             | X                                                                       | X                                                                     | ▲                                                     |
| Spiral Cable with<br>Sensor Sub-assembly                                    | -                                 | -                                                                       | -                                                                     | -                                                     |
| Door Control and Tire<br>Pressure Monitoring<br>System Receiver<br>Assembly | U0129                             | ▲                                                                       | X                                                                     | ▲                                                     |
| Brake Booster Assembly<br>(Skid Control ECU)*1                              | U0100                             | ▲                                                                       | ▲                                                                     | X                                                     |
|                                                                             | U0114                             | ▲                                                                       | ▲                                                                     | ▲                                                     |
|                                                                             | U0123                             | ▲                                                                       | ▲                                                                     | ▲                                                     |
|                                                                             | U0124                             | ▲                                                                       | ▲                                                                     | ▲                                                     |
|                                                                             | U0126                             | ▲                                                                       | X                                                                     | ▲                                                     |
| Brake Actuator<br>Assembly (Skid Control<br>ECU)*1                          | U0100                             | ▲                                                                       | ▲                                                                     | X                                                     |
|                                                                             | U0114                             | ▲                                                                       | ▲                                                                     | ▲                                                     |
|                                                                             | U0123                             | ▲                                                                       | ▲                                                                     | ▲                                                     |
|                                                                             | U0124                             | ▲                                                                       | ▲                                                                     | ▲                                                     |
|                                                                             | U0126                             | ▲                                                                       | X                                                                     | ▲                                                     |
| Sub<br>Bus<br>2                                                             | Blind Spot Monitor<br>Sensor LH   | U0100                                                                   | ▲                                                                     | ▲                                                     |
|                                                                             |                                   | U0126                                                                   | ▲                                                                     | ▲                                                     |
|                                                                             |                                   | U0129                                                                   | ▲                                                                     | ▲                                                     |
|                                                                             |                                   | U0142                                                                   | X                                                                     | ▲                                                     |
|                                                                             | Network Gateway<br>ECU*2          | U0233                                                                   | -                                                                     | -                                                     |
|                                                                             |                                   | U1002                                                                   | -                                                                     | -                                                     |
|                                                                             |                                   | U1110                                                                   | -                                                                     | -                                                     |
|                                                                             | Clearance Warning ECU<br>Assembly | U0100                                                                   | ▲                                                                     | X                                                     |
|                                                                             |                                   | U0101                                                                   | ▲                                                                     | X                                                     |
|                                                                             |                                   | U0142                                                                   | X                                                                     | ▲                                                     |
|                                                                             |                                   | U0155                                                                   | X                                                                     | ▲                                                     |

#### HINT:

- X: DTC is likely to be output.
- ▲: DTC is unlikely to be output.

- -: DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                                             | TROUBLE MODE (OPEN IN BOTH CAN MAIN BUS LINES) |                                                                   |                                                              |                                                 |
|------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------|
|            |                                                             | V BUS                                          |                                                                   |                                                              |                                                 |
| OUTPUT ECU |                                                             | OUTPUT DTC                                     | COMBINATION METER ECU COMMUNICATION STOP MODE <small>INFO</small> | NO. 1 CAN JUNCTION CONNECTOR TO NO. 2 CAN JUNCTION CONNECTOR | ECM COMMUNICATION STOP MODE <small>INFO</small> |
| V Bus      | Airbag Sensor Assembly                                      | -                                              | -                                                                 | -                                                            | -                                               |
|            | Air Conditioning Amplifier Assembly                         | U0100                                          | -                                                                 | -                                                            | ○                                               |
|            |                                                             | U0142                                          | -                                                                 | ○                                                            | -                                               |
|            |                                                             | U0155                                          | ○                                                                 | ○                                                            | -                                               |
|            | Navigation Receiver Assembly*1                              | U0100                                          | -                                                                 | -                                                            | ○                                               |
|            |                                                             | U0129                                          | -                                                                 | -                                                            | -                                               |
|            |                                                             | U0140                                          | -                                                                 | ○                                                            | -                                               |
|            |                                                             | U0155                                          | ○                                                                 | ○                                                            | -                                               |
|            |                                                             | U1110                                          | -                                                                 | -                                                            | -                                               |
|            | Radio and Display Receiver Assembly*1                       | U0100                                          | -                                                                 | -                                                            | ○                                               |
|            |                                                             | U0129                                          | -                                                                 | -                                                            | -                                               |
|            |                                                             | U0140                                          | -                                                                 | ○                                                            | -                                               |
|            |                                                             | U0155                                          | ○                                                                 | ○                                                            | -                                               |
|            |                                                             | U1110                                          | -                                                                 | -                                                            | -                                               |
|            | Main Body ECU (Multiplex Network Body ECU)                  | U0100                                          | -                                                                 | ○                                                            | ○                                               |
|            |                                                             | U0101                                          | -                                                                 | ○                                                            | ○                                               |
|            |                                                             | U0120                                          | -                                                                 | -                                                            | -                                               |
|            |                                                             | U0151                                          | -                                                                 | ○                                                            | -                                               |
|            |                                                             | U0155                                          | ○                                                                 | -                                                            | -                                               |
|            |                                                             | U0327                                          | -                                                                 | -                                                            | -                                               |
|            | Network Gateway ECU*2                                       | -                                              | -                                                                 | -                                                            | -                                               |
|            | ECM                                                         | -                                              | -                                                                 | -                                                            | -                                               |
|            | 4 Wheel Drive Control ECU                                   | U0100                                          | -                                                                 | -                                                            | ○                                               |
|            |                                                             | U0122                                          | -                                                                 | -                                                            | -                                               |
|            | Certification ECU (Smart Key ECU Assembly) (Entry Function) | U0100                                          | -                                                                 | ○                                                            | ○                                               |
|            |                                                             | U0142                                          | -                                                                 | -                                                            | -                                               |
|            |                                                             | U0155                                          | ○                                                                 | -                                                            | -                                               |
|            | Certification ECU                                           | U0100                                          | -                                                                 | ○                                                            | ○                                               |

| -          |                                                                    | TROUBLE MODE (OPEN IN BOTH CAN MAIN BUS LINES) |                                                                    |                                                              |                                                  |
|------------|--------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------|
|            |                                                                    | V BUS                                          |                                                                    |                                                              |                                                  |
| OUTPUT ECU |                                                                    | OUTPUT DTC                                     | COMBINATION METER ECU COMMUNICATION STOP MODE <a href="#">INFO</a> | NO. 1 CAN JUNCTION CONNECTOR TO NO. 2 CAN JUNCTION CONNECTOR | ECM COMMUNICATION STOP MODE <a href="#">INFO</a> |
|            | (Smart Key ECU Assembly) (Power Source Switching Function)         | U0140                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0155                                          | ○                                                                  | -                                                            | -                                                |
|            | Certification ECU (Smart Key ECU Assembly) (Start Function)        | U0100                                          | -                                                                  | ○                                                            | ○                                                |
|            | Combination Meter Assembly                                         | U0100                                          | ○                                                                  | ○                                                            | ○                                                |
|            |                                                                    | U0129                                          | ○                                                                  | ○                                                            | -                                                |
|            |                                                                    | U0142                                          | ○                                                                  | -                                                            | -                                                |
|            |                                                                    | U0151                                          | ○                                                                  | ○                                                            | -                                                |
|            |                                                                    | U0163                                          | ○                                                                  | ○                                                            | -                                                |
|            | Spiral Cable with Sensor Sub-assembly                              | -                                              | -                                                                  | -                                                            | -                                                |
|            | Door Control and Tire Pressure Monitoring System Receiver Assembly | U0129                                          | -                                                                  | ○                                                            | -                                                |
| V Bus      | Brake Booster Assembly (Skid Control ECU)*1                        | U0100                                          | -                                                                  | -                                                            | ○                                                |
|            |                                                                    | U0114                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0123                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0124                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0126                                          | -                                                                  | ○                                                            | -                                                |
|            | Brake Actuator Assembly (Skid Control ECU)*1                       | U0100                                          | -                                                                  | -                                                            | ○                                                |
|            |                                                                    | U0114                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0123                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0124                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0126                                          | -                                                                  | ○                                                            | -                                                |
| Sub Bus 2  | Blind Spot Monitor Sensor LH                                       | U0100                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0126                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0129                                          | -                                                                  | -                                                            | -                                                |
|            |                                                                    | U0142                                          | -                                                                  | ○                                                            | -                                                |
|            | Network Gateway                                                    | U0233                                          | -                                                                  | -                                                            | -                                                |

| -                                 |            | TROUBLE MODE (OPEN IN BOTH CAN MAIN BUS LINES)                                                                                        |                                                                       |                                                                                                                       |
|-----------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                                   |            | V BUS                                                                                                                                 |                                                                       |                                                                                                                       |
| OUTPUT ECU                        | OUTPUT DTC | COMBINATION METER<br>ECU COMMUNICATION<br>STOP MODE  | NO. 1 CAN JUNCTION<br>CONNECTOR TO NO.<br>2 CAN JUNCTION<br>CONNECTOR | ECM<br>COMMUNICATION<br>STOP MODE  |
| ECU*2                             | U1002      | -                                                                                                                                     | -                                                                     | -                                                                                                                     |
|                                   | U1110      | -                                                                                                                                     | -                                                                     | -                                                                                                                     |
| Clearance Warning ECU<br>Assembly | U0100      | -                                                                                                                                     | -                                                                     | ○                                                                                                                     |
|                                   | U0101      | -                                                                                                                                     | -                                                                     | ○                                                                                                                     |
|                                   | U0142      | -                                                                                                                                     | ○                                                                     | -                                                                                                                     |
|                                   | U0155      | ○                                                                                                                                     | ○                                                                     | -                                                                                                                     |

#### HINT:

- : DTC is output.
- : DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                               | TROUBLE MODE (CAN BUS LINES SHORT<br>CIRCUIT OR SHORT TO GND) |                 |                         |                         |
|------------|-----------------------------------------------|---------------------------------------------------------------|-----------------|-------------------------|-------------------------|
|            |                                               | V BUS                                                         |                 |                         |                         |
| OUTPUT ECU |                                               | OUTPUT DTC                                                    | CANH TO<br>CANL | CANH TO<br>GROUND SHORT | CANL TO<br>GROUND SHORT |
| V Bus      | Airbag Sensor Assembly                        | -                                                             | -               | -                       | -                       |
|            | Air Conditioning Amplifier Assembly           | U0100                                                         | ○               | ○                       | ○                       |
|            |                                               | U0142                                                         | ○               | ○                       | ○                       |
|            |                                               | U0155                                                         | ○               | ○                       | ○                       |
|            | Navigation Receiver Assembly*1                | U0100                                                         | ○               | ○                       | ○                       |
|            |                                               | U0129                                                         | ○               | ○                       | ○                       |
|            |                                               | U0140                                                         | ○               | ○                       | ○                       |
|            |                                               | U0155                                                         | ○               | ○                       | ○                       |
|            | Radio and Display Receiver Assembly*1         | U1110                                                         | ○               | ○                       | ○                       |
|            |                                               | U0100                                                         | ○               | ○                       | ○                       |
|            |                                               | U0129                                                         | ○               | ○                       | ○                       |
|            |                                               | U0140                                                         | ○               | ○                       | ○                       |
|            |                                               | U0155                                                         | ○               | ○                       | ○                       |
|            |                                               | U1110                                                         | ○               | ○                       | ○                       |
|            | Main Body ECU (Multiplex Network Body<br>ECU) | U0100                                                         | ○               | ○                       | ○                       |
|            |                                               | U0101                                                         | ○               | ○                       | ○                       |

| -                                                                               |                                                                       | TROUBLE MODE (CAN BUS LINES SHORT<br>CIRCUIT OR SHORT TO GND) |                         |                         |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------|-------------------------|-------------------------|
|                                                                                 |                                                                       | V BUS                                                         |                         |                         |
| OUTPUT ECU                                                                      | OUTPUT<br>DTC                                                         | CANH TO<br>CANL                                               | CANH TO<br>GROUND SHORT | CANL TO<br>GROUND SHORT |
|                                                                                 | U0120                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0151                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0155                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0327                                                                 | ○                                                             | ○                       | ○                       |
| Network Gateway ECU*2                                                           | -                                                                     | -                                                             | -                       | -                       |
| ECM                                                                             | -                                                                     | -                                                             | -                       | -                       |
| 4 Wheel Drive Control ECU                                                       | U0100                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0122                                                                 | ○                                                             | ○                       | ○                       |
| Certification ECU (Smart Key ECU Assembly)<br>(Entry Function)                  | U0100                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0142                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0155                                                                 | ○                                                             | ○                       | ○                       |
| Certification ECU (Smart Key ECU Assembly)<br>(Power Source Switching Function) | U0100                                                                 | X                                                             | X                       | X                       |
|                                                                                 | U0140                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0155                                                                 | X                                                             | X                       | X                       |
| Certification ECU (Smart Key ECU Assembly)<br>(Start Function)                  | U0100                                                                 | ○                                                             | ○                       | ○                       |
| Combination Meter Assembly                                                      | U0100                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0129                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0142                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0151                                                                 | ○                                                             | ○                       | ○                       |
|                                                                                 | U0163                                                                 | ○                                                             | ○                       | ○                       |
| V Bus                                                                           | Spiral Cable with Sensor Sub-assembly                                 | -                                                             | -                       | -                       |
|                                                                                 | Door Control and Tire Pressure Monitoring<br>System Receiver Assembly | U0129                                                         | ○                       | ○                       |
|                                                                                 | Brake Booster Assembly (Skid Control<br>ECU)*1                        | U0100                                                         | ○                       | ○                       |
|                                                                                 |                                                                       | U0114                                                         | ○                       | ○                       |
|                                                                                 |                                                                       | U0123                                                         | ○                       | ○                       |
|                                                                                 |                                                                       | U0124                                                         | ○                       | ○                       |
|                                                                                 |                                                                       | U0126                                                         | ○                       | ○                       |
|                                                                                 | Brake Actuator Assembly (Skid Control<br>ECU)*1                       | U0100                                                         | ○                       | ○                       |
|                                                                                 |                                                                       | U0114                                                         | ○                       | ○                       |
|                                                                                 |                                                                       | U0123                                                         | ○                       | ○                       |

| -          |                                | TROUBLE MODE (CAN BUS LINES SHORT CIRCUIT OR SHORT TO GND) |              |                      |                      |
|------------|--------------------------------|------------------------------------------------------------|--------------|----------------------|----------------------|
|            |                                | V BUS                                                      |              |                      |                      |
| OUTPUT ECU |                                | OUTPUT DTC                                                 | CANH TO CANL | CANH TO GROUND SHORT | CANL TO GROUND SHORT |
|            |                                | U0124                                                      | ○            | ○                    | ○                    |
|            |                                | U0126                                                      | ○            | ○                    | ○                    |
| Sub Bus 2  | Blind Spot Monitor Sensor LH   | U0100                                                      | ○            | ○                    | ○                    |
|            |                                | U0126                                                      | ○            | ○                    | ○                    |
|            |                                | U0129                                                      | ○            | ○                    | ○                    |
|            |                                | U0142                                                      | ○            | ○                    | ○                    |
|            | Network Gateway ECU*2          | U0233                                                      | -            | -                    | -                    |
|            |                                | U1002                                                      | -            | -                    | -                    |
|            |                                | U1110                                                      | -            | -                    | -                    |
|            | Clearance Warning ECU Assembly | U0100                                                      | ○            | ○                    | ○                    |
|            |                                | U0101                                                      | ○            | ○                    | ○                    |
|            |                                | U0142                                                      | ○            | ○                    | ○                    |
| U0155      |                                | ○                                                          | ○            | ○                    |                      |

#### HINT:

- : DTC is output.
- : DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

### 8. DTC COMBINATION TABLE (OPEN IN CAN BRANCH OF SUB BUS, PAST COMMUNICATION ERROR)

(a) Regarding a past communication error of ECU and sensor connected to the sub bus 2 (in this case, normal is displayed when performing the CAN bus check, but communication DTCs are output), determine the part that had a malfunction based on DTCs output from the network gateway ECU.

#### HINT:

- As gateway function equipped ECUs (sub bus monitor ECUs) monitor signals from all ECUs that are connected to sub buses, gateway function equipped ECUs can detect ECUs with a communication stop more accurately.
- DTCs output from ECUs other than the network gateway ECU (gateway function equipped ECU) are shown only as a reference.
- Regarding a communication stop that is currently occurring in the sub bus 2, the malfunctioning part can be confirmed easily by performing the CAN Bus Check using the Techstream.
- If an open occurs in just one of the lines of a CAN branch, DTCs which are not related to malfunctioning parts may be output (DTCs may be displayed randomly), or a message indicating a communication error may be displayed.

|  | TROUBLE MODE (OPEN IN ONE CAN BRANCH LINE) |
|--|--------------------------------------------|
|  | SUB BUS 2                                  |

| OUTPUT ECU |                                                                              | OUTPUT DTC | BLIND SPOT MONITOR SENSOR LH <small>INFO</small> | CLEARANCE WARNING ECU ASSEMBLY <small>INFO</small> |
|------------|------------------------------------------------------------------------------|------------|--------------------------------------------------|----------------------------------------------------|
| V Bus      | Airbag Sensor Assembly                                                       | U0126      | -                                                | -                                                  |
|            | Air Conditioning Amplifier Assembly                                          | U0100      | -                                                | -                                                  |
|            |                                                                              | U0142      | -                                                | -                                                  |
|            |                                                                              | U0155      | -                                                | -                                                  |
|            | Navigation Receiver Assembly*1                                               | U0100      | -                                                | -                                                  |
|            |                                                                              | U0129      | -                                                | -                                                  |
|            |                                                                              | U0140      | -                                                | -                                                  |
|            |                                                                              | U0155      | -                                                | -                                                  |
|            |                                                                              | U1110      | ▲                                                | X                                                  |
|            | Radio and Display Receiver Assembly*1                                        | U0100      | -                                                | -                                                  |
|            |                                                                              | U0129      | -                                                | -                                                  |
|            |                                                                              | U0140      | -                                                | -                                                  |
|            |                                                                              | U0155      | -                                                | -                                                  |
|            |                                                                              | U1110      | ▲                                                | X                                                  |
|            | Main Body ECU (Multiplex Network Body ECU)                                   | U0100      | -                                                | -                                                  |
|            |                                                                              | U0101      | -                                                | -                                                  |
|            |                                                                              | U0120      | -                                                | -                                                  |
|            |                                                                              | U0151      | -                                                | -                                                  |
|            |                                                                              | U0155      | -                                                | -                                                  |
|            |                                                                              | U0327      | -                                                | -                                                  |
|            | Network Gateway ECU*2                                                        | -          | -                                                | -                                                  |
|            | ECM                                                                          | -          | -                                                | -                                                  |
|            | 4 Wheel Drive Control ECU                                                    | U0100      | -                                                | -                                                  |
|            |                                                                              | U0122      | -                                                | -                                                  |
|            | Certification ECU (Smart Key ECU Assembly) (Entry Function)                  | U0100      | -                                                | -                                                  |
|            |                                                                              | U0142      | -                                                | -                                                  |
|            |                                                                              | U0155      | -                                                | -                                                  |
|            | Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100      | -                                                | -                                                  |
|            |                                                                              | U0140      | -                                                | -                                                  |
|            |                                                                              | U0155      | -                                                | -                                                  |
|            | Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100      | -                                                | -                                                  |
|            | Combination Meter Assembly                                                   | U0100      | -                                                | -                                                  |
|            |                                                                              | U0129      | -                                                | -                                                  |
|            |                                                                              | U0142      | -                                                | -                                                  |

|           |                                                                    |       |   |   |
|-----------|--------------------------------------------------------------------|-------|---|---|
|           |                                                                    | U0151 | - | - |
|           |                                                                    | U0163 | - | - |
|           | Spiral Cable with Sensor Sub-assembly                              | -     | - | - |
|           | Door Control and Tire Pressure Monitoring System Receiver Assembly | U0129 | - | - |
|           |                                                                    |       |   |   |
| V Bus     | Brake Booster Assembly (Skid Control ECU)*1                        | U0100 | - | - |
|           |                                                                    | U0114 | - | - |
|           |                                                                    | U0123 | - | - |
|           |                                                                    | U0124 | - | - |
|           |                                                                    | U0126 | - | - |
|           | Brake Actuator Assembly (Skid Control ECU)*1                       | U0100 | - | - |
|           |                                                                    | U0114 | - | - |
|           |                                                                    | U0123 | - | - |
|           |                                                                    | U0124 | - | - |
|           |                                                                    | U0126 | - | - |
| Sub Bus 2 | Blind Spot Monitor Sensor LH                                       | U0100 | X | ▲ |
|           |                                                                    | U0126 | X | ▲ |
|           |                                                                    | U0129 | X | ▲ |
|           |                                                                    | U0142 | X | ▲ |
|           | Network Gateway ECU*2                                              | U0233 | X | ▲ |
|           |                                                                    | U1002 | ▲ | ▲ |
|           |                                                                    | U1110 | ▲ | X |
|           | Clearance Warning ECU Assembly                                     | U0100 | ▲ | X |
|           |                                                                    | U0101 | ▲ | X |
|           |                                                                    | U0142 | X | ▲ |
|           |                                                                    | U0155 | ▲ | X |

#### HINT:

- X: DTC is likely to be output.
- ▲: DTC is unlikely to be output.
- -: DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

|            |                        |                                                   |                                                     |
|------------|------------------------|---------------------------------------------------|-----------------------------------------------------|
| -          |                        | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)      |                                                     |
|            |                        | SUB BUS 2                                         |                                                     |
| OUTPUT ECU |                        | OUTPUT DTC                                        |                                                     |
|            |                        | BLIND SPOT MONITOR SENSOR LH <a href="#">INFO</a> | CLEARANCE WARNING ECU ASSEMBLY <a href="#">INFO</a> |
| V Bus      | Airbag Sensor Assembly | U0126                                             | -                                                   |

| -                                                                            |            | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)                                                                     |                                                                                                                    |
|------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                                                              |            | SUB BUS 2                                                                                                        |                                                                                                                    |
| OUTPUT ECU                                                                   | OUTPUT DTC | BLIND SPOT MONITOR SENSOR LH  | CLEARANCE WARNING ECU ASSEMBLY  |
| Air Conditioning Amplifier Assembly                                          | U0100      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0142      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0155      | -                                                                                                                | -                                                                                                                  |
| Navigation Receiver Assembly*1                                               | U0100      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0129      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0140      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0155      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U1110      | -                                                                                                                | ○                                                                                                                  |
| Radio and Display Receiver Assembly*1                                        | U0100      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0129      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0140      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0155      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U1110      | -                                                                                                                | ○                                                                                                                  |
| Main Body ECU (Multiplex Network Body ECU)                                   | U0100      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0101      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0120      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0151      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0155      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0327      | -                                                                                                                | -                                                                                                                  |
| Network Gateway ECU*2                                                        | -          | -                                                                                                                | -                                                                                                                  |
| ECM                                                                          | -          | -                                                                                                                | -                                                                                                                  |
| 4 Wheel Drive Control ECU                                                    | U0100      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0122      | -                                                                                                                | -                                                                                                                  |
| Certification ECU (Smart Key ECU Assembly) (Entry Function)                  | U0100      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0142      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0155      | -                                                                                                                | -                                                                                                                  |
| Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0140      | -                                                                                                                | -                                                                                                                  |
|                                                                              | U0155      | -                                                                                                                | -                                                                                                                  |
| Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100      | -                                                                                                                | -                                                                                                                  |
| Combination Meter Assembly                                                   | U0100      | -                                                                                                                | -                                                                                                                  |

| -          |                                                                    | TROUBLE MODE (OPEN IN BOTH CAN BRANCH LINES)                                                                     |                                                                                                                    |
|------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|            |                                                                    | SUB BUS 2                                                                                                        |                                                                                                                    |
| OUTPUT ECU | OUTPUT DTC                                                         | BLIND SPOT MONITOR SENSOR LH  | CLEARANCE WARNING ECU ASSEMBLY  |
|            | U0129                                                              | -                                                                                                                | -                                                                                                                  |
|            | U0142                                                              | -                                                                                                                | -                                                                                                                  |
|            | U0151                                                              | -                                                                                                                | -                                                                                                                  |
|            | U0163                                                              | -                                                                                                                | -                                                                                                                  |
|            | Spiral Cable with Sensor Sub-assembly                              | -                                                                                                                | -                                                                                                                  |
|            | Door Control and Tire Pressure Monitoring System Receiver Assembly | U0129                                                                                                            | -                                                                                                                  |
| V Bus      | Brake Booster Assembly (Skid Control ECU)*1                        | U0100                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0114                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0123                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0124                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0126                                                                                                            | -                                                                                                                  |
|            | Brake Actuator Assembly (Skid Control ECU)*1                       | U0100                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0114                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0123                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0124                                                                                                            | -                                                                                                                  |
|            |                                                                    | U0126                                                                                                            | -                                                                                                                  |
| Sub Bus 2  | Blind Spot Monitor Sensor LH                                       | U0100                                                                                                            | ○                                                                                                                  |
|            |                                                                    | U0126                                                                                                            | ○                                                                                                                  |
|            |                                                                    | U0129                                                                                                            | ○                                                                                                                  |
|            |                                                                    | U0142                                                                                                            | ○                                                                                                                  |
|            | Network Gateway ECU*2                                              | U0233                                                                                                            | ○                                                                                                                  |
|            |                                                                    | U1002                                                                                                            | -                                                                                                                  |
|            |                                                                    | U1110                                                                                                            | -                                                                                                                  |
|            | Clearance Warning ECU Assembly                                     | U0100                                                                                                            | ○                                                                                                                  |
|            |                                                                    | U0101                                                                                                            | ○                                                                                                                  |
|            |                                                                    | U0142                                                                                                            | ○                                                                                                                  |
|            |                                                                    | U0155                                                                                                            | ○                                                                                                                  |
|            |                                                                    |                                                                                                                  |                                                                                                                    |

#### HINT:

- : DTC is output.
- : DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

|            |                                                                              | -          | TROUBLE MODE (OPEN IN ONE CAN MAIN BUS LINE) |                                                              |                             |
|------------|------------------------------------------------------------------------------|------------|----------------------------------------------|--------------------------------------------------------------|-----------------------------|
|            |                                                                              |            | SUB BUS 2                                    |                                                              |                             |
| OUTPUT ECU |                                                                              | OUTPUT DTC | NETWORK GATEWAY ECU<br>INFO                  | NO. 3 CAN JUNCTION CONNECTOR TO NO. 4 CAN JUNCTION CONNECTOR | NO. 1 CAN JUNCTION TERMINAL |
| V Bus      | Airbag Sensor Assembly                                                       | U0126      | -                                            | -                                                            | -                           |
|            | Air Conditioning Amplifier Assembly                                          | U0100      | -                                            | -                                                            | -                           |
|            |                                                                              | U0142      | -                                            | -                                                            | -                           |
|            |                                                                              | U0155      | -                                            | -                                                            | -                           |
|            | Navigation Receiver Assembly*1                                               | U0100      | -                                            | -                                                            | -                           |
|            |                                                                              | U0129      | -                                            | -                                                            | -                           |
|            |                                                                              | U0140      | -                                            | -                                                            | -                           |
|            |                                                                              | U0155      | -                                            | -                                                            | -                           |
|            |                                                                              | U1110      | X                                            | ▲                                                            | ▲                           |
|            | Radio and Display Receiver Assembly*1                                        | U0100      | -                                            | -                                                            | -                           |
|            |                                                                              | U0129      | -                                            | -                                                            | -                           |
|            |                                                                              | U0140      | -                                            | -                                                            | -                           |
|            |                                                                              | U0155      | -                                            | -                                                            | -                           |
|            |                                                                              | U1110      | X                                            | ▲                                                            | ▲                           |
|            | Main Body ECU (Multiplex Network Body ECU)                                   | U0100      | -                                            | -                                                            | -                           |
|            |                                                                              | U0101      | -                                            | -                                                            | -                           |
|            |                                                                              | U0120      | -                                            | -                                                            | -                           |
|            |                                                                              | U0151      | -                                            | -                                                            | -                           |
|            |                                                                              | U0155      | -                                            | -                                                            | -                           |
|            |                                                                              | U0327      | -                                            | -                                                            | -                           |
|            | Network Gateway ECU*2                                                        | -          | -                                            | -                                                            | -                           |
|            | ECM                                                                          | -          | -                                            | -                                                            | -                           |
|            | 4 Wheel Drive Control ECU                                                    | U0100      | -                                            | -                                                            | -                           |
|            |                                                                              | U0122      | -                                            | -                                                            | -                           |
|            | Certification ECU (Smart Key ECU Assembly) (Entry Function)                  | U0100      | -                                            | -                                                            | -                           |
|            |                                                                              | U0142      | -                                            | -                                                            | -                           |
|            |                                                                              | U0155      | -                                            | -                                                            | -                           |
|            | Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100      | -                                            | -                                                            | -                           |
|            |                                                                              | U0140      | -                                            | -                                                            | -                           |
|            |                                                                              | U0155      | -                                            | -                                                            | -                           |
|            | Certification ECU (Smart Key ECU Assembly) (Start                            | U0100      | -                                            | -                                                            | -                           |

| -          |                                                                    | TROUBLE MODE (OPEN IN ONE CAN MAIN BUS LINE) |                             |                                                              |                             |
|------------|--------------------------------------------------------------------|----------------------------------------------|-----------------------------|--------------------------------------------------------------|-----------------------------|
|            |                                                                    | SUB BUS 2                                    |                             |                                                              |                             |
| OUTPUT ECU |                                                                    | OUTPUT DTC                                   | NETWORK GATEWAY ECU<br>INFO | NO. 3 CAN JUNCTION CONNECTOR TO NO. 4 CAN JUNCTION CONNECTOR | NO. 1 CAN JUNCTION TERMINAL |
|            | Function)                                                          |                                              |                             |                                                              |                             |
|            | Combination Meter Assembly                                         | U0100                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0129                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0142                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0151                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0163                                        | -                           | -                                                            | -                           |
| V Bus      | Spiral Cable with Sensor Sub-assembly                              | -                                            | -                           | -                                                            | -                           |
|            | Door Control and Tire Pressure Monitoring System Receiver Assembly | U0129                                        | -                           | -                                                            | -                           |
|            | Brake Booster Assembly (Skid Control ECU)*1                        | U0100                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0114                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0123                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0124                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0126                                        | -                           | -                                                            | -                           |
|            | Brake Actuator Assembly (Skid Control ECU)*1                       | U0100                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0114                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0123                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0124                                        | -                           | -                                                            | -                           |
|            |                                                                    | U0126                                        | -                           | -                                                            | -                           |
| Sub Bus 2  | Blind Spot Monitor Sensor LH                                       | U0100                                        | X                           | X                                                            | X                           |
|            |                                                                    | U0126                                        | X                           | X                                                            | X                           |
|            |                                                                    | U0129                                        | X                           | X                                                            | X                           |
|            |                                                                    | U0142                                        | X                           | X                                                            | X                           |
|            | Network Gateway ECU*2                                              | U0233                                        | X                           | X                                                            | X                           |
|            |                                                                    | U1002                                        | ▲                           | ▲                                                            | ▲                           |
|            |                                                                    | U1110                                        | X                           | ▲                                                            | ▲                           |
|            | Clearance Warning ECU Assembly                                     | U0100                                        | X                           | ▲                                                            | ▲                           |
|            |                                                                    | U0101                                        | X                           | ▲                                                            | ▲                           |
|            |                                                                    | U0142                                        | X                           | X                                                            | X                           |
|            |                                                                    | U0155                                        | X                           | ▲                                                            | ▲                           |

**HINT:**

- X: DTC is likely to be output.
- ▲: DTC is unlikely to be output.
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- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                                             |            | TROUBLE MODE (OPEN IN BOTH CAN MAIN BUS LINES) |                                                              |                             |
|------------|-------------------------------------------------------------|------------|------------------------------------------------|--------------------------------------------------------------|-----------------------------|
|            |                                                             |            | SUB BUS 2                                      |                                                              |                             |
| OUTPUT ECU |                                                             | OUTPUT DTC | NETWORK GATEWAY ECU<br>INFO                    | NO. 3 CAN JUNCTION CONNECTOR TO NO. 4 CAN JUNCTION CONNECTOR | NO. 1 CAN JUNCTION TERMINAL |
| V Bus      | Airbag Sensor Assembly                                      | U0126      | -                                              | -                                                            | -                           |
|            | Air Conditioning Amplifier Assembly                         | U0100      | -                                              | -                                                            | -                           |
|            |                                                             | U0142      | -                                              | -                                                            | -                           |
|            |                                                             | U0155      | -                                              | -                                                            | -                           |
|            | Navigation Receiver Assembly*1                              | U0100      | -                                              | -                                                            | -                           |
|            |                                                             | U0129      | -                                              | -                                                            | -                           |
|            |                                                             | U0140      | -                                              | -                                                            | -                           |
|            |                                                             | U0155      | -                                              | -                                                            | -                           |
|            |                                                             | U1110      | ○                                              | -                                                            | -                           |
|            | Radio and Display Receiver Assembly*1                       | U0100      | -                                              | -                                                            | -                           |
|            |                                                             | U0129      | -                                              | -                                                            | -                           |
|            |                                                             | U0140      | -                                              | -                                                            | -                           |
|            |                                                             | U0155      | -                                              | -                                                            | -                           |
|            |                                                             | U1110      | ○                                              | -                                                            | -                           |
|            | Main Body ECU (Multiplex Network Body ECU)                  | U0100      | -                                              | -                                                            | -                           |
|            |                                                             | U0101      | -                                              | -                                                            | -                           |
|            |                                                             | U0120      | -                                              | -                                                            | -                           |
|            |                                                             | U0151      | -                                              | -                                                            | -                           |
|            |                                                             | U0155      | -                                              | -                                                            | -                           |
|            |                                                             | U0327      | -                                              | -                                                            | -                           |
|            | Network Gateway ECU*2                                       | -          | -                                              | -                                                            | -                           |
|            | ECM                                                         | -          | -                                              | -                                                            | -                           |
|            | 4 Wheel Drive Control ECU                                   | U0100      | -                                              | -                                                            | -                           |
|            |                                                             | U0122      | -                                              | -                                                            | -                           |
|            | Certification ECU (Smart Key ECU Assembly) (Entry Function) | U0100      | -                                              | -                                                            | -                           |
|            |                                                             | U0142      | -                                              | -                                                            | -                           |
|            |                                                             | U0155      | -                                              | -                                                            | -                           |

| -          |                                                                              | TROUBLE MODE (OPEN IN BOTH CAN MAIN BUS LINES) |                             |                                                              |                             |
|------------|------------------------------------------------------------------------------|------------------------------------------------|-----------------------------|--------------------------------------------------------------|-----------------------------|
|            |                                                                              | SUB BUS 2                                      |                             |                                                              |                             |
| OUTPUT ECU |                                                                              | OUTPUT DTC                                     | NETWORK GATEWAY ECU<br>INFO | NO. 3 CAN JUNCTION CONNECTOR TO NO. 4 CAN JUNCTION CONNECTOR | NO. 1 CAN JUNCTION TERMINAL |
|            | Certification ECU (Smart Key ECU Assembly) (Power Source Switching Function) | U0100                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0140                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0155                                          | -                           | -                                                            | -                           |
|            | Certification ECU (Smart Key ECU Assembly) (Start Function)                  | U0100                                          | -                           | -                                                            | -                           |
|            | Combination Meter Assembly                                                   | U0100                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0129                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0142                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0151                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0163                                          | -                           | -                                                            | -                           |
|            | Spiral Cable with Sensor Sub-assembly                                        | -                                              | -                           | -                                                            | -                           |
| V Bus      | Door Control and Tire Pressure Monitoring System Receiver Assembly           | U0129                                          | -                           | -                                                            | -                           |
|            | Brake Booster Assembly (Skid Control ECU)*1                                  | U0100                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0114                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0123                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0124                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0126                                          | -                           | -                                                            | -                           |
|            | Brake Actuator Assembly (Skid Control ECU)*1                                 | U0100                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0114                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0123                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0124                                          | -                           | -                                                            | -                           |
|            |                                                                              | U0126                                          | -                           | -                                                            | -                           |
| Sub Bus 2  | Blind Spot Monitor Sensor LH                                                 | U0100                                          | ○                           | ○                                                            | ○                           |
|            |                                                                              | U0126                                          | ○                           | ○                                                            | ○                           |
|            |                                                                              | U0129                                          | ○                           | ○                                                            | ○                           |
|            |                                                                              | U0142                                          | ○                           | ○                                                            | ○                           |
|            | Network Gateway ECU*2                                                        | U0233                                          | ○                           | ○                                                            | ○                           |
|            |                                                                              | U1002                                          | -                           | -                                                            | -                           |
|            |                                                                              | U1110                                          | ○                           | -                                                            | -                           |

| -          |                                | TROUBLE MODE (OPEN IN BOTH CAN MAIN BUS LINES) |                             |                                                              |                             |
|------------|--------------------------------|------------------------------------------------|-----------------------------|--------------------------------------------------------------|-----------------------------|
|            |                                | SUB BUS 2                                      |                             |                                                              |                             |
| OUTPUT ECU |                                | OUTPUT DTC                                     | NETWORK GATEWAY ECU<br>INFO | NO. 3 CAN JUNCTION CONNECTOR TO NO. 4 CAN JUNCTION CONNECTOR | NO. 1 CAN JUNCTION TERMINAL |
|            | Clearance Warning ECU Assembly | U0100                                          | ○                           | -                                                            | -                           |
|            |                                | U0101                                          | ○                           | -                                                            | -                           |
|            |                                | U0142                                          | ○                           | ○                                                            | ○                           |
|            |                                | U0155                                          | ○                           | -                                                            | -                           |

#### HINT:

- : DTC is output.
- : DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

| -          |                                            |            | TROUBLE MODE (CAN BUS LINES SHORT CIRCUIT OR SHORT TO GND) |                      |                      |
|------------|--------------------------------------------|------------|------------------------------------------------------------|----------------------|----------------------|
|            |                                            |            | SUB BUS 2                                                  |                      |                      |
| OUTPUT ECU |                                            | OUTPUT DTC | CANH TO CANL                                               | CANH TO GROUND SHORT | CANL TO GROUND SHORT |
| V Bus      | Airbag Sensor Assembly                     | U0126      | -                                                          | -                    | -                    |
|            | Air Conditioning Amplifier Assembly        | U0100      | -                                                          | -                    | -                    |
|            |                                            | U0142      | -                                                          | -                    | -                    |
|            |                                            | U0155      | -                                                          | -                    | -                    |
|            | Navigation Receiver Assembly*1             | U0100      | -                                                          | -                    | -                    |
|            |                                            | U0129      | -                                                          | -                    | -                    |
|            |                                            | U0140      | -                                                          | -                    | -                    |
|            |                                            | U0155      | -                                                          | -                    | -                    |
|            |                                            | U1110      | ○                                                          | ○                    | ○                    |
|            | Radio and Display Receiver Assembly*1      | U0100      | -                                                          | -                    | -                    |
|            |                                            | U0129      | -                                                          | -                    | -                    |
|            |                                            | U0140      | -                                                          | -                    | -                    |
|            |                                            | U0155      | -                                                          | -                    | -                    |
|            |                                            | U1110      | ○                                                          | ○                    | ○                    |
|            | Main Body ECU (Multiplex Network Body ECU) | U0100      | -                                                          | -                    | -                    |
|            |                                            | U0101      | -                                                          | -                    | -                    |
|            |                                            | U0120      | -                                                          | -                    | -                    |
|            |                                            | U0151      | -                                                          | -                    | -                    |
|            |                                            | U0155      | -                                                          | -                    | -                    |

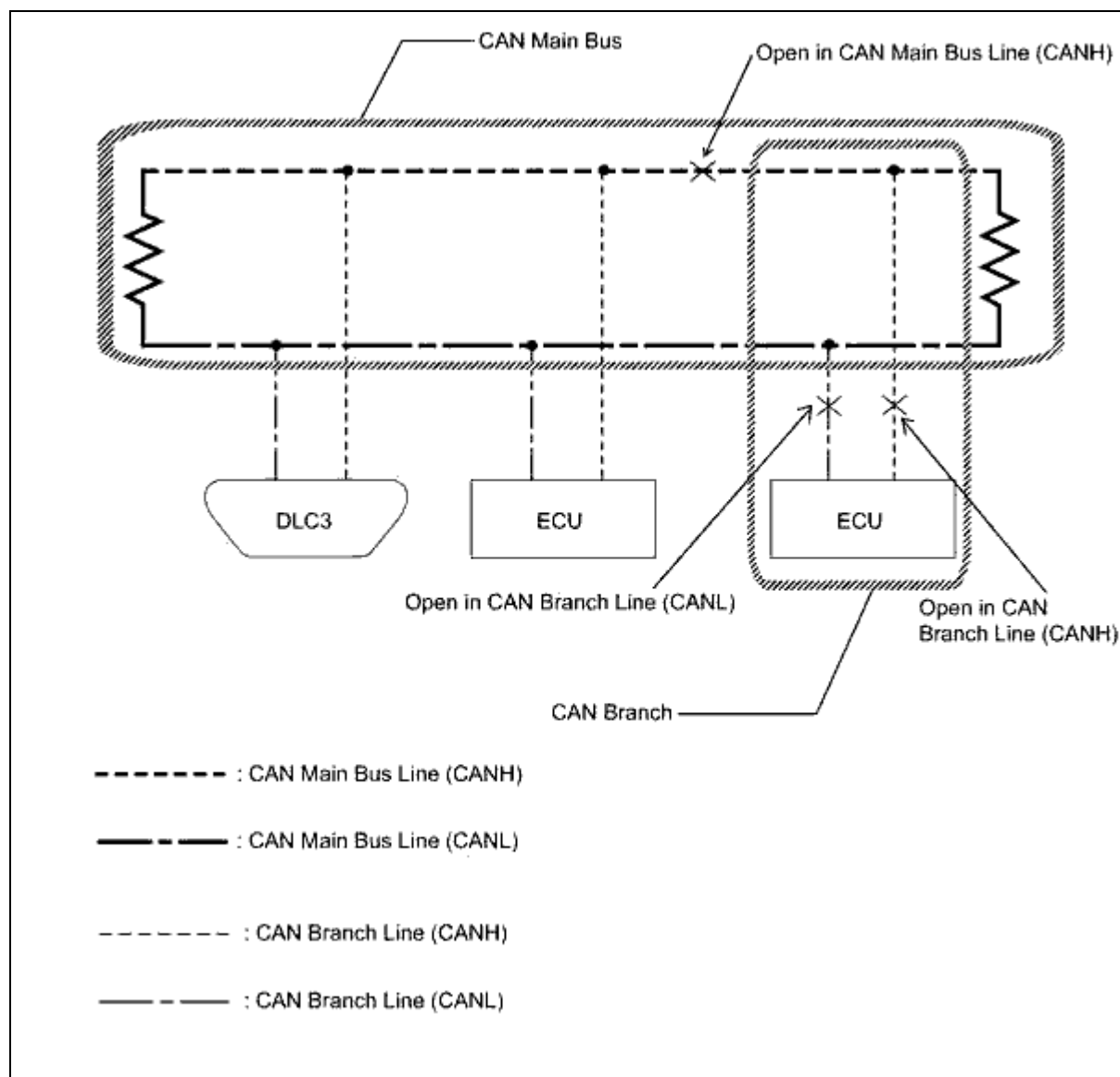
| -                                                                               |                                                                       | TROUBLE MODE (CAN BUS LINES SHORT<br>CIRCUIT OR SHORT TO GND) |                 |                         |                         |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------|-----------------|-------------------------|-------------------------|
|                                                                                 |                                                                       | SUB BUS 2                                                     |                 |                         |                         |
| OUTPUT ECU                                                                      |                                                                       | OUTPUT<br>DTC                                                 | CANH TO<br>CANL | CANH TO<br>GROUND SHORT | CANL TO<br>GROUND SHORT |
|                                                                                 |                                                                       | U0327                                                         | -               | -                       | -                       |
| Network Gateway ECU*2                                                           |                                                                       | -                                                             | -               | -                       | -                       |
| ECM                                                                             |                                                                       | -                                                             | -               | -                       | -                       |
| 4 Wheel Drive Control ECU                                                       |                                                                       | U0100                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0122                                                         | -               | -                       | -                       |
| Certification ECU (Smart Key ECU Assembly)<br>(Entry Function)                  |                                                                       | U0100                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0142                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0155                                                         | -               | -                       | -                       |
| Certification ECU (Smart Key ECU Assembly)<br>(Power Source Switching Function) |                                                                       | U0100                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0140                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0155                                                         | -               | -                       | -                       |
| Certification ECU (Smart Key ECU Assembly)<br>(Start Function)                  |                                                                       | U0100                                                         | -               | -                       | -                       |
| Combination Meter Assembly                                                      |                                                                       | U0100                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0129                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0142                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0151                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0163                                                         | -               | -                       | -                       |
| V Bus                                                                           | Spiral Cable with Sensor Sub-assembly                                 | -                                                             | -               | -                       | -                       |
|                                                                                 | Door Control and Tire Pressure Monitoring<br>System Receiver Assembly | U0129                                                         | -               | -                       | -                       |
|                                                                                 | Brake Booster Assembly (Skid Control<br>ECU)*1                        | U0100                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0114                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0123                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0124                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0126                                                         | -               | -                       | -                       |
|                                                                                 | Brake Actuator Assembly (Skid Control<br>ECU)*1                       | U0100                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0114                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0123                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0124                                                         | -               | -                       | -                       |
|                                                                                 |                                                                       | U0126                                                         | -               | -                       | -                       |
| Sub                                                                             | Blind Spot Monitor Sensor LH                                          | U0100                                                         | ○               | ○                       | ○                       |

| -          |                                | TROUBLE MODE (CAN BUS LINES SHORT<br>CIRCUIT OR SHORT TO GND) |                 |                         |                         |
|------------|--------------------------------|---------------------------------------------------------------|-----------------|-------------------------|-------------------------|
|            |                                | SUB BUS 2                                                     |                 |                         |                         |
| OUTPUT ECU |                                | OUTPUT<br>DTC                                                 | CANH TO<br>CANL | CANH TO<br>GROUND SHORT | CANL TO<br>GROUND SHORT |
| Bus 2      |                                | U0126                                                         | ○               | ○                       | ○                       |
|            |                                | U0129                                                         | ○               | ○                       | ○                       |
|            |                                | U0142                                                         | ○               | ○                       | ○                       |
|            | Network Gateway ECU*2          | U0233                                                         | ○               | ○                       | ○                       |
|            |                                | U1002                                                         | ○               | ○                       | ○                       |
|            |                                | U1110                                                         | ○               | ○                       | ○                       |
|            | Clearance Warning ECU Assembly | U0100                                                         | ○               | ○                       | ○                       |
|            |                                | U0101                                                         | ○               | ○                       | ○                       |
|            |                                | U0142                                                         | ○               | ○                       | ○                       |
|            |                                | U0155                                                         | ○               | ○                       | ○                       |

#### HINT:

- ○: DTC is output.
- -: DTC is not output.
- \*1: DTC U0073 may be stored when communication is lost.
- \*2: Gateway function equipped ECUs relay signals between the ECUs connected to the different buses.

## 9. CAN BUS WAVEFORMS

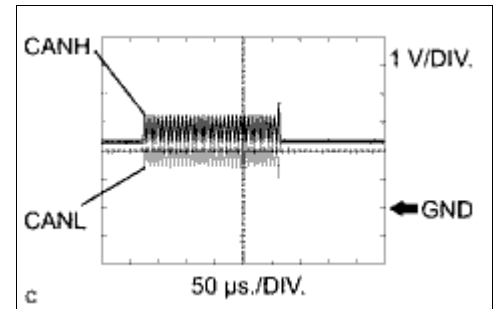


# HINT:

- This waveform is measured between terminals CANH and GND, and terminals CANL and GND of the DLC3. (Use this as a reference for diagnosis of CAN communication lines.)
- When malfunctions in multiple ECUs are suspected based on the CAN bus check and DTCs checked using the Techstream, check the resistance of the CAN bus using an ohmmeter first **INFO** . If no problems are found, check the following waveforms.
- If a waveform is not similar to one of the following 3 patterns (Group 1), then an open in a CAN main bus line, an open in a CAN branch line, or a short between a CAN line (CANH or CANL) and ground is suspected (Group 2).
- Wiggle the connector and wire harness to check if the waveform changes.

(a) CAN bus waveforms (Group 1)

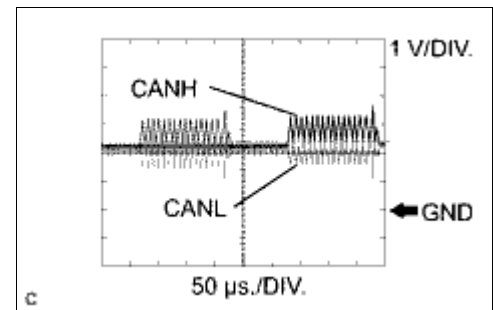
(1) Normal waveform



(2) Open in both of the lines (CANH and CANL) of a CAN branch

**HINT:**

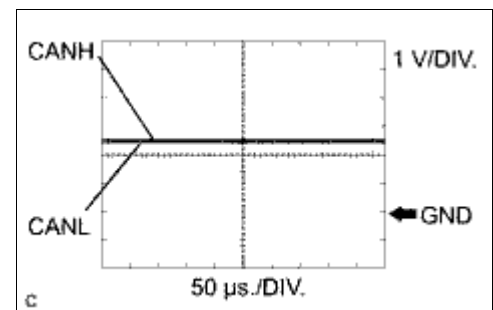
- Waveforms (waveforms shown using dotted lines) are not present from an ECU or sensor connected to a CAN branch with an open circuit in both lines. (Waveforms from other ECUs or sensors are normal.)
- Because this waveform is similar to a normal waveform, instead of using the waveform, the malfunctioning part can be narrowed down by performing a CAN bus check.



(3) Short between the CAN bus lines (CANH and CANL)

**HINT:**

- Waveforms disappear.
- If the malfunction is in an ECU, disconnecting the ECU will change the waveform. If the waveform does not change, a malfunction in the wire harness is suspected.



(b) CAN bus waveforms (reference) (Group 2)

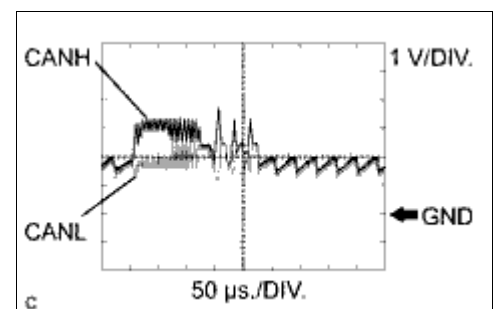
**NOTICE:**

The following CAN bus waveforms can be used only as reference. The actual measured waveform may differ significantly depending on the location of the open or short circuit.

(1) Open in a CAN branch line (CANH)

**HINT:**

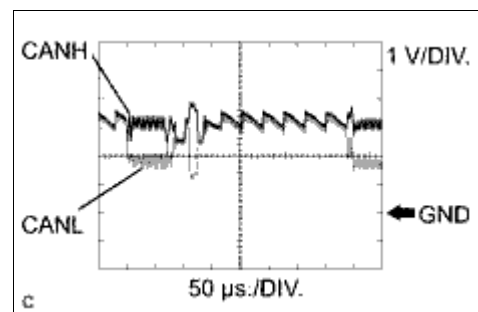
- An abnormal waveform is output from an ECU with an open in one of its CAN branch lines. Because this abnormal output interferes with the signals from other ECUs, the output of other ECUs will also appear abnormal.
- Narrow down the malfunctioning part by checking DTCs or performing a CAN bus check, or by checking waveform changes when ECUs or sensors are disconnected. The waveform will change to one for an open in both sides of a CAN branch when the ECU or sensor with an open CAN branch line is disconnected.



(2) Open in a CAN branch line (CANL)

**HINT:**

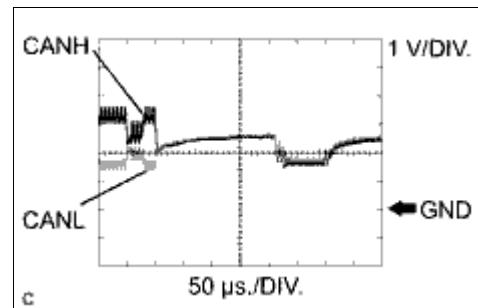
- An abnormal waveform is output from an ECU with an open in one of its CAN branch lines. Because this abnormal output interferes with the signals from other ECUs, the output of other ECUs will also appear abnormal.
- Narrow down the malfunctioning part by checking DTCs or performing a CAN bus check, or by checking waveform changes when ECUs or sensors are disconnected. The waveform will change to one for an open in both sides of a CAN branch when the ECU or sensor with an open CAN branch line is disconnected.



(3) Open in a CAN main bus line (CANH)

**HINT:**

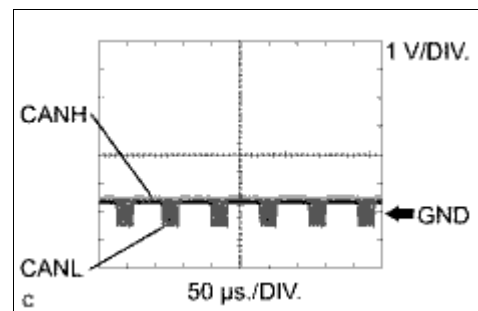
- Waveforms of ECUs or sensors that are closer to the DLC3 than the open part are almost normal.
- Waveforms of ECUs or sensors that are on the opposite side of the DLC3 from the open part are abnormal.
- An open in a CAN main bus line can be confirmed by measuring the resistance between the CANH and CANL terminals of any CAN branch.



(4) Short between a CAN bus line (CANH) and ground

**HINT:**

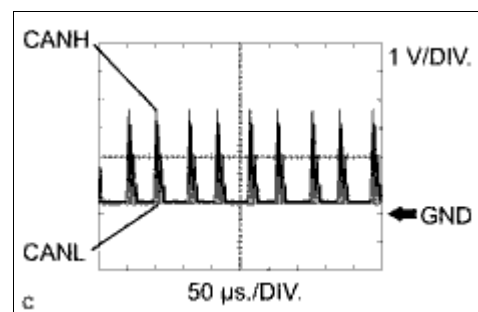
- Narrow down the shorted part by checking for waveform changes when disconnecting connectors from the CAN junction connectors or when disconnecting ECUs or sensors.
- A short to ground in the CANH line can be confirmed by measuring the resistance between CANH and ground using an ohmmeter.



(5) Short between a CAN bus line (CANL) and ground

**HINT:**

- Narrow down the shorted part by checking for waveform changes when disconnecting connectors from the CAN junction connectors or when disconnecting ECUs or sensors.
- A short to ground in the CANL line can be confirmed by measuring the resistance between CANL and ground using an ohmmeter.



## 10. DATA SENDING/RECEIVING TABLE

(a) Data sending/receiving table

**HINT:**

If Data List items related to sent/received data are not displayed properly, the part for which communication is interrupted can be determined using the table below.

| DATA CONTENT | DATA DETECTED AND SENT BY | DATA RECEIVED BY (CAN BE CHECKED IN | DATA RECEIVED BY (CANNOT BE CHECKED | RELEVANT DATA LIST ITEM |
|--------------|---------------------------|-------------------------------------|-------------------------------------|-------------------------|
|--------------|---------------------------|-------------------------------------|-------------------------------------|-------------------------|

|                            |                                                                   | THE DATA LIST)                                                                                                                                                                                                                                  | IN THE DATA LIST)                                                                                                                                                                                                                                                      | [SELECTED SYSTEM]                                                                                                                                                                                                                                    |
|----------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accelerator position       | ECM                                                               | <ul style="list-style-type: none"> <li>• Brake booster assembly (skid control ECU)</li> <li>• Brake actuator assembly (skid control ECU)</li> </ul>                                                                                             | <ul style="list-style-type: none"> <li>• Navigation receiver assembly</li> <li>• Radio and display receiver assembly</li> <li>• 4 wheel drive control ECU</li> </ul>                                                                                                   | <ul style="list-style-type: none"> <li>• Accelerator Position [Engine]</li> <li>• Accelerator Position [Engine and ECT]</li> <li>• Accelerator Opening Angle % [ABS/VSC/TRAC]</li> </ul>                                                             |
| Engine speed               | ECM                                                               | <ul style="list-style-type: none"> <li>• Brake booster assembly (skid control ECU)</li> <li>• Brake actuator assembly (skid control ECU)</li> <li>• Combination meter assembly</li> <li>• Certification ECU (smart key ECU assembly)</li> </ul> | <ul style="list-style-type: none"> <li>• Airbag sensor assembly</li> <li>• Air conditioning amplifier assembly</li> <li>• Navigation receiver assembly</li> <li>• Radio and display receiver assembly</li> <li>• Main body ECU (multiplex network body ECU)</li> </ul> | <ul style="list-style-type: none"> <li>• Engine Speed [Engine]</li> <li>• Engine Speed [Engine and ECT]</li> <li>• Engine Revolutions [ABS/VSC/TRAC]</li> <li>• Engine Rpm [Combination Meter]</li> <li>• Engine Speed [Starting Control]</li> </ul> |
| Engine coolant temperature | ECM                                                               | <ul style="list-style-type: none"> <li>• Air conditioning amplifier assembly</li> <li>• Combination meter assembly</li> </ul>                                                                                                                   | <ul style="list-style-type: none"> <li>• Navigation receiver assembly</li> <li>• Radio and display receiver assembly</li> </ul>                                                                                                                                        | <ul style="list-style-type: none"> <li>• Coolant Temperature [Engine]</li> <li>• Coolant Temp [Engine and ECT]</li> <li>• Engine Coolant Temp [Air Conditioner]</li> <li>• Coolant Temperature [Combination Meter]</li> </ul>                        |
| Vehicle speed              | <ul style="list-style-type: none"> <li>• Brake booster</li> </ul> | <ul style="list-style-type: none"> <li>• ECM</li> <li>• Combination</li> </ul>                                                                                                                                                                  | Airbag sensor assembly                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Vehicle Speed [ABS/</li> </ul>                                                                                                                                                                              |

|             |                                                                                             |                                                                                                                                                              |                                                                                       |                                                                                                                                                                                                                                                    |
|-------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | assembly (skid control ECU)<br>• Brake actuator assembly (skid control ECU)                 | meter assembly*3<br>• Blind spot monitor sensor LH<br>• Navigation receiver assembly<br>• Radio and display receiver assembly<br>• 4 wheel drive control ECU |                                                                                       | VSC/TRAC]<br>• Vehicle Speed [Engine]<br>• Vehicle Speed [Engine and ECT]<br>• Vehicle Speed Meter [Combination Meter]<br>• Vehicle Speed [Blind Spot Monitor Master]<br>• Vehicle Speed [Navigation System]<br>• Vehicle Speed [Four Wheel Drive] |
|             | Combination meter assembly *3                                                               | • Clearance warning ECU assembly<br>• Certification ECU (smart key ECU assembly)<br>• Door control and tire pressure monitoring system receiver assembly     | • Air conditioning amplifier assembly<br>• Main body ECU (multiplex network body ECU) | • Vehicle Speed Meter [Combination Meter]<br>• Vehicle Speed Info [Intuitive P/A]<br>• Vehicle Speed Signal [Power Source Control]<br>• Vehicle Speed [Tire Pressure Monitor]                                                                      |
| Wheel speed | • Brake booster assembly (skid control ECU)<br>• Brake actuator assembly (skid control ECU) | 4 wheel drive control ECU                                                                                                                                    | • ECM<br>• Blind spot monitor sensor LH                                               | • FR Wheel Speed [ABS/VSC /TRAC]<br>• FL Wheel Speed [ABS/VSC /TRAC]<br>• RR Wheel Speed [ABS/VSC /TRAC]<br>• RL Wheel Speed [ABS/VSC                                                                                                              |

|                     |                                     |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                     |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                        | / TRAC]<br>• FR Wheel Speed [Four Wheel Drive]<br>• FL Wheel Speed [Four Wheel Drive]<br>• RR Wheel Speed [Four Wheel Drive]<br>• RL Wheel Speed [Four Wheel Drive]                                                                                                                                                                                                                                                       |
| Shift position      | ECM                                 | <ul style="list-style-type: none"> <li>• Clearance warning ECU assembly</li> <li>• Navigation receiver assembly</li> <li>• Radio and display receiver assembly</li> <li>• Certification ECU (smart key ECU assembly)</li> <li>• Brake booster assembly (skid control ECU)</li> <li>• Brake actuator assembly (skid control ECU)</li> <li>• Blind spot monitor sensor LH</li> </ul> | <ul style="list-style-type: none"> <li>• Airbag sensor assembly</li> <li>• Combination meter assembly*2</li> <li>• Main body ECU (multiplex network body ECU)</li> <li>• Door control and tire pressure monitoring system receiver assembly</li> </ul> | <ul style="list-style-type: none"> <li>• Neutral Position SW [Engine]</li> <li>• Neutral Position SW Signal [Engine and ECT]</li> <li>• Parking Signal [Intuitive P/A]</li> <li>• Reverse Signal [Intuitive P/A]</li> <li>• Reverse Signal [Navigation System]</li> <li>• Shift P Signal [Power Source Control]</li> <li>• Shift Lever Position [ABS/VSC /TRAC]</li> <li>• Reverse [Blind Spot Monitor Master]</li> </ul> |
| Ambient temperature | Air conditioning amplifier assembly | <ul style="list-style-type: none"> <li>• ECM</li> <li>• Combination meter assembly</li> </ul>                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Main body ECU (multiplex network body ECU)</li> <li>• Navigation receiver assembly</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>• Ambient Temp for A/C [Engine]</li> <li>• Ambient Temp for A/C [Engine and ECT]</li> <li>• Ambient</li> </ul>                                                                                                                                                                                                                                                                     |

|                             |                                            |                                                                                                                                                                                             |                                                                                                                                                                                                                                |                                                                                                                                                |
|-----------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |                                            |                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Radio and display receiver assembly</li> </ul>                                                                                                                                        | Temperature [Combination Meter]<br><ul style="list-style-type: none"> <li>• Ambient Temp Sensor [Air Conditioner]</li> </ul>                   |
| Driver door courtesy switch | Main body ECU (multiplex network body ECU) | -                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Certification ECU (smart key ECU assembly)</li> <li>• Combination meter assembly *2</li> <li>• Navigation receiver assembly</li> <li>• Radio and display receiver assembly</li> </ul> | FL Door Courtesy [Main Body]                                                                                                                   |
| Steering angle sensor       | Steering sensor                            | <ul style="list-style-type: none"> <li>• Brake booster assembly (skid control ECU)</li> <li>• Brake actuator assembly (skid control ECU)</li> <li>• Blind spot monitor sensor LH</li> </ul> | <ul style="list-style-type: none"> <li>• Airbag sensor assembly</li> <li>• Navigation receiver assembly</li> <li>• Radio and display receiver assembly</li> </ul>                                                              | <ul style="list-style-type: none"> <li>• Steering Angle Sensor [ABS/VSC/TRAC]</li> <li>• Steering Angle [Blind Spot Monitor Master]</li> </ul> |
| Yaw rate sensor             | Airbag sensor assembly                     | <ul style="list-style-type: none"> <li>• Brake booster assembly (skid control ECU)</li> <li>• Brake actuator assembly (skid control ECU)</li> </ul>                                         | -                                                                                                                                                                                                                              | Yaw Rate Sensor [ABS/VSC/TRAC]                                                                                                                 |
| Deceleration sensor         | Airbag sensor assembly                     | <ul style="list-style-type: none"> <li>• Brake booster assembly (skid control ECU)</li> <li>• Brake actuator</li> </ul>                                                                     | ECM                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Deceleration Sensor [ABS/VSC/TRAC]</li> <li>• Deceleration Sensor2</li> </ul>                         |

|                                                   |                                              |                                |                                                                                                                                  |                                                                                                                                                                                                                      |
|---------------------------------------------------|----------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                   |                                              | assembly<br>(skid control ECU) |                                                                                                                                  | [ABS/VSC /TRAC]                                                                                                                                                                                                      |
| Driver side buckle switch signal                  | Airbag sensor assembly                       | -                              | Main body ECU (multiplex network body ECU)                                                                                       | Left Side Buckle SW [SRS Airbag]                                                                                                                                                                                     |
|                                                   | Main body ECU (multiplex network body ECU)*4 | -                              | Combination meter assembly                                                                                                       | -                                                                                                                                                                                                                    |
| Passenger side buckle switch signal               | Airbag sensor assembly                       | Combination meter assembly     | -                                                                                                                                | <ul style="list-style-type: none"> <li>• Right Side Buckle SW [SRS Airbag]</li> <li>• P-Seatbelt Buckle SW [Combination Meter]</li> </ul>                                                                            |
| Side turn signal                                  | Combination meter assembly                   | Blind spot monitor sensor LH   | -                                                                                                                                | <ul style="list-style-type: none"> <li>• Turn Signal Switch (Left) [Combination Meter]</li> <li>• Turn Signal Switch (Right) [Combination Meter]</li> <li>• Turn Switch State [Blind Spot Monitor Master]</li> </ul> |
| Ignition switch condition                         | Main body ECU (multiplex network body ECU)   | -                              | Certification ECU (smart key ECU assembly)                                                                                       | IG SW [Main Body]                                                                                                                                                                                                    |
| Headlight (high beam)                             | Main body ECU (multiplex network body ECU)   | -                              | <ul style="list-style-type: none"> <li>• Combination meter assembly *2</li> <li>• Air conditioning amplifier assembly</li> </ul> | Dimmer SW [Main Body]                                                                                                                                                                                                |
| Combination meter assembly power source voltage*1 | Combination meter assembly                   | -                              | -                                                                                                                                | +B Voltage Value [Combination Meter]                                                                                                                                                                                 |
| Solar sensor*1                                    | Air conditioning amplifier assembly          | -                              | -                                                                                                                                | Solar Sensor (D side) [Air Conditioner]                                                                                                                                                                              |

|                                                            |                                            |   |   |                                                                                                                          |
|------------------------------------------------------------|--------------------------------------------|---|---|--------------------------------------------------------------------------------------------------------------------------|
| Driver door touch sensor*1                                 | Certification ECU (smart key ECU assembly) | - | - | D-Door Touch Sensor [Smart Key]                                                                                          |
| Clearance sonar main switch*1                              | Clearance warning ECU assembly             | - | - | Main Switch [Intuitive P/A]                                                                                              |
| ECM power source voltage*1                                 | ECM                                        | - | - | <ul style="list-style-type: none"> <li>• Battery Voltage [Engine]</li> <li>• Battery Voltage [Engine and ECT]</li> </ul> |
| Navigation receiver assembly power source voltage*1        | Radio and display receiver assembly        | - | - | Battery Voltage [Navigation System]                                                                                      |
| Radio and display receiver assembly power source voltage*1 | Radio and display receiver assembly        | - | - | Battery Voltage [Navigation System]                                                                                      |
| Blind spot monitor sensor LH power source voltage*1        | Blind spot monitor sensor LH               | - | - | Power Supply Voltage [Blind Spot Monitor Master]                                                                         |

\*1: Whether the ECU that sends data is functioning or not can be judged by using the Techstream to check items such as switches or sensors that send signals to the ECU via direct lines.

\*2: Although the received contents cannot be checked in the Data List, whether or not the data is received normally can be checked by observing the combination meter.

\*3: The combination meter assembly receives a vehicle speed signal from the brake actuator assembly (skid control ECU) and sends the signal to other ECUs.

\*4: The main body ECU (multiplex network body ECU) receives a driver seat buckle switch signal from the airbag sensor assembly and sends the signal to other ECUs.

(b) Details of relevant Data List items (Selected system: Engine)

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

**HINT:**

Normal Condition: If no conditions are specifically stated for "idling", the shift lever should be in N or P, the A/C switch should be off and all accessory switches should be off.

- (1) Warm up the engine.
- (2) Turn the A/C switch off.
- (3) Turn the ignition switch off.
- (4) Connect the Techstream to the DLC3.
- (5) Turn the ignition switch to ON.
- (6) Turn the Techstream on.
- (7) Enter the following menus: Powertrain / Engine / Data List.
- (8) According to the display on the Techstream, read the "Data List".

**Engine**

| TESTER DISPLAY      | MEASUREMENT ITEM/RANGE                                           | NORMAL CONDITION                                                                                                                                                                                                                                                                         | DIAGNOSTIC NOTE                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vehicle Speed       | Vehicle speed/<br>Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph) | Actual vehicle speed                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• This is the current vehicle speed.</li> <li>• The vehicle speed is detected using the wheel speed sensors. <ul style="list-style-type: none"> <li>◦ Vehicle speed data is delayed when it is displayed. Therefore, even if the vehicle speed listed in the freeze frame data is 0 km/h (0 mph), this does not always mean that the malfunction occurred when the vehicle was stopped.</li> </ul> </li> </ul> |
| Engine Speed        | Engine speed/<br>Min.: 0 rpm, Max.: 16383 rpm                    | <ul style="list-style-type: none"> <li>• 550 to 650 rpm:<br/>Idling (shift lever in P or N, engine warmed up and A/C off) (for Automatic Transmission)</li> <li>• 500 to 600 rpm:<br/>Idling (shift lever in Neutral, engine warmed up and A/C off) (for Manual Transmission)</li> </ul> | When the crankshaft position sensor is malfunctioning, "Engine Speed" is approximately 0 rpm or varies greatly from the actual engine speed.                                                                                                                                                                                                                                                                                                          |
| Coolant Temperature | Coolant temperature/<br>Min.: -40°C (-40°F), Max.:               | 75 to 100°C (167 to 212°F):<br>After warming up                                                                                                                                                                                                                                          | <p>This is the engine coolant temperature.</p> <p><b>HINT:</b></p> <ul style="list-style-type: none"> <li>• After warming up the engine, the engine</li> </ul>                                                                                                                                                                                                                                                                                        |

| TESTER DISPLAY       | MEASUREMENT ITEM/RANGE                                                   | NORMAL CONDITION                  | DIAGNOSTIC NOTE                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------|--------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | 140°C (284°F)                                                            |                                   | <p>coolant temperature is 75 to 100°C (167 to 212°F).</p> <ul style="list-style-type: none"> <li>• After a long soak, the engine coolant temperature, intake air temperature and ambient air temperature are approximately equal.</li> <li>• If the value is -40°C (-40°F) or higher than 140°C (286°F), the sensor circuit is open or shorted.</li> <li>• Check if the engine overheats when the value indicates higher than 140°C (286°F).</li> </ul> |
| Battery Voltage      | Battery voltage/<br>Min.: 0 V, Max.: 65.5 V                              | 11 to 14 V: Idling                | If 11 V or less, characteristics of some electrical components may change.                                                                                                                                                                                                                                                                                                                                                                              |
| Accelerator Position | Accelerator pedal position/<br>Min.: 0%, Max.: 399.9%                    | Actual accelerator pedal position | This is the accelerator pedal position defined using the learned fully released position (sensor output) of accelerator pedal position sensor No. 1 as 0% and the fully depressed position as 100%.                                                                                                                                                                                                                                                     |
| Neutral Position SW  | Park/neutral position switch status/<br>ON or OFF                        | ON: Shift lever in P or N         | This item is displayed only for automatic transmission.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Ambient Temp for A/C | Ambient temperature for A/C/<br>Min.: -40°C (-40°F), Max.: 215°C (419°F) | -                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

(c) Details of relevant Data List items (Selected system: Engine and ECT)

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

#### HINT:

Normal Condition: If no conditions are specifically stated for "idling", the shift lever should be in N or P, the A/C switch should be off and all accessory switches should be off.

- (1) Warm up the engine.
- (2) Turn the A/C switch off.
- (3) Turn the ignition switch off.
- (4) Connect the Techstream to the DLC3.

- (5) Turn the ignition switch to ON.
- (6) Turn the Techstream on.
- (7) Enter the following menus: Powertrain / Engine and ECT / Data List.
- (8) According to the display on the Techstream, read the "Data List".

### Engine and ECT

| TESTER DISPLAY  | MEASUREMENT ITEM/RANGE                                           | NORMAL CONDITION                                                                                                                                                    | DIAGNOSTIC NOTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vehicle Speed   | Vehicle speed/<br>Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph) | Actual vehicle speed                                                                                                                                                | <ul style="list-style-type: none"> <li>• This is the current vehicle speed.</li> <li>• The vehicle speed is detected using the wheel speed sensors. <ul style="list-style-type: none"> <li>◦ Vehicle speed data is delayed when it is displayed. Therefore, even if the vehicle speed listed in the freeze frame data is 0 km/h (0 mph), this does not always mean that the malfunction occurred when the vehicle was stopped.</li> </ul> </li> </ul>                                                                                                                  |
| Engine Speed    | Engine speed/<br>Min.: 0 rpm, Max.: 16383 rpm                    | <ul style="list-style-type: none"> <li>• 700 to 800 rpm: Idling (for Automatic Transmission)</li> <li>• 600 to 700 rpm: Idling (for Manual Transmission)</li> </ul> | When the crankshaft position sensor is malfunctioning, "Engine Speed" is approximately 0 rpm or varies greatly from the actual engine speed.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Coolant Temp    | Coolant temperature/<br>Min.: -40°C (-40°F), Max.: 140°C (284°F) | 75 to 100°C (167 to 212°F): After warming up                                                                                                                        | <p>This is the engine coolant temperature.</p> <p><b>HINT:</b></p> <ul style="list-style-type: none"> <li>• After warming up the engine, the engine coolant temperature is 75 to 100°C (167 to 212°F).</li> <li>• After a long soak, the engine coolant temperature, intake air temperature and ambient air temperature are approximately equal.</li> <li>• If the value is -40°C (-40°F) or higher than 140°C (286°F), the sensor circuit is open or shorted.</li> <li>• Check if the engine overheats when the value indicates higher than 140°C (286°F).</li> </ul> |
| Battery Voltage | Battery voltage/<br>Min.: 0 V, Max.: 65.535 V                    | 11 to 14 V: Idling                                                                                                                                                  | If 11 V or less, characteristics of some electrical components may change.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| TESTER DISPLAY             | MEASUREMENT ITEM/RANGE                                                   | NORMAL CONDITION                  | DIAGNOSTIC NOTE                                                                                                                                                                                     |
|----------------------------|--------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accelerator Position       | Accelerator pedal position/<br>Min.: 0%, Max.: 399.9%                    | Actual accelerator pedal position | This is the accelerator pedal position defined using the learned fully released position (sensor output) of accelerator pedal position sensor No. 1 as 0% and the fully depressed position as 100%. |
| Neutral Position SW Signal | Park/neutral position switch status/<br>ON or OFF                        | ON: Shift lever in P or N         | This item is displayed only for automatic transmission.                                                                                                                                             |
| Ambient Temp for A/C       | Ambient temperature for A/C/<br>Min.: -40°C (-40°F), Max.: 215°C (419°F) | -                                 | -                                                                                                                                                                                                   |

(d) Details of relevant Data List items (Selected system: ABS/VSC/TRAC)

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Warm up the engine.
- (2) Turn the ignition switch off.
- (3) Connect the Techstream to the DLC3.
- (4) Turn the ignition switch to ON.
- (5) Turn the Techstream on.
- (6) Enter the following menus: Chassis / ABS/VSC/TRAC / Data List.
- (7) According to the display on the Techstream, read the "Data List".

#### ABS/VSC/TRAC

| TESTER DISPLAY       | MEASUREMENT ITEM/RANGE                                                                            | NORMAL CONDITION            | DIAGNOSTIC NOTE                                           |
|----------------------|---------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------|
| Shift Lever Position | Shift lever position information / P,N, R, D/M, 1st-6th/B or Fail                                 | Actual shift lever position | -                                                         |
| Deceleration Sensor  | Acceleration sensor reading /<br>Min.: -18.525 m/s <sup>2</sup> , Max.: 18.387 m/s <sup>2</sup>   | -                           | During deceleration/acceleration:<br>Changes continuously |
| Deceleration Sensor2 | Acceleration sensor 2 reading /<br>Min.: -18.525 m/s <sup>2</sup> , Max.: 18.387 m/s <sup>2</sup> | -                           | During deceleration/acceleration:<br>Changes continuously |

| TESTER DISPLAY              | MEASUREMENT ITEM/RANGE                                                               | NORMAL CONDITION                                                                  | DIAGNOSTIC NOTE                                                                   |
|-----------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Yaw Rate Sensor             | Yaw rate sensor / Min.: -128°/s, Max.: 127°/s                                        | Vehicle stopped: 0°/s<br>Turning right: -128 to 0°/s<br>Turning left: 0 to 127°/s | -                                                                                 |
| Steering Angle Sensor       | Steering angle sensor / Min.: -3276.8°, Max.: 3276.7°                                | Turning left: Increases<br>Turning right: Decreases                               | -                                                                                 |
| FR Wheel Speed              | Front wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326 km/h (202 mph) | Vehicle stopped: 0 km/h (0 mph)                                                   | When driving at constant speed: No large fluctuations                             |
| FL Wheel Speed              | Front wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326 km/h (202 mph) | Vehicle stopped: 0 km/h (0 mph)                                                   | When driving at constant speed: No large fluctuations                             |
| RR Wheel Speed              | Rear wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326 km/h (202 mph)  | Vehicle stopped: 0 km/h (0 mph)                                                   | When driving at constant speed: No large fluctuations                             |
| RL Wheel Speed              | Rear wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326 km/h (202 mph)  | Vehicle stopped: 0 km/h (0 mph)                                                   | When driving at constant speed: No large fluctuations                             |
| Vehicle Speed               | Maximum wheel speed sensor reading / Min.: 0 km/h (0 mph), Max.: 326 km/h (202 mph)  | Vehicle stopped: 0 km/h (0 mph)                                                   | When driving at constant speed: No large fluctuations                             |
| Engine Revolutions          | Engine speed / Min.: 0 rpm, Max.: 65535 rpm                                          | Engine stopped: 0 rpm                                                             | When engine speed is constant: No large fluctuations                              |
| Accelerator Opening Angle % | Percentage of accelerator pedal opening angle/ Min.: 0.0%, Max.: 128.0%              | When the accelerator pedal is released: 0.0%                                      | During accelerator pedal operation: Changes in proportion with the pedal movement |

(e) Details of relevant Data List items (Selected system: Navigation System)

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.

(5) Enter the following menus: Body Electrical / Navigation System / Data List.

(6) According to the display on the Techstream, read the "Data List".

### Navigation System

| TESTER DISPLAY  | MEASUREMENT ITEM/RANGE                                                            | NORMAL CONDITION                                                      | DIAGNOSTIC NOTE                                       |
|-----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------|
| Battery Voltage | Battery voltage/ Min.: 0 V, Max.:24 V                                             | 11 to 14 V                                                            | -                                                     |
| Reverse Signal  | Reverse Signal/ON or OFF                                                          | ON: Shift lever in R<br>OFF: Shift lever in any position other than R | -                                                     |
| Vehicle Speed   | Maximum wheel speed sensor reading/Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph) | Vehicle stopped: 0 km/h (0 mph)                                       | When driving at constant speed: No large fluctuations |

(f) Details of relevant Data List items (Selected system: Intuitive P/A)

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

(1) Turn the ignition switch off.

(2) Connect the Techstream to the DLC3.

(3) Turn the ignition switch to ON.

(4) Turn the clearance sonar main switch on.

(5) Turn the Techstream on.

(6) Enter the following menus: Body Electrical / Intuitive P/A / Data List.

(7) According to the display on the Techstream, read the "Data List".

### Intuitive P/A

| TESTER DISPLAY     | MEASUREMENT ITEM/RANGE                    | NORMAL CONDITION                                                                                                       | DIAGNOSTIC NOTE |
|--------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------|
| Main Switch        | Clearance sonar main switch/OFF or ON     | OFF: Clearance sonar main switch off<br>ON: Clearance sonar main switch on                                             | -               |
| Parking Signal*1   | Parking signal/OFF or ON                  | OFF: Shift lever in any position except P<br>ON: Shift lever in P                                                      | -               |
| Reverse Signal*1   | Reverse signal/OFF or ON                  | OFF: Shift lever in any position except R<br>ON: Shift lever in R                                                      | -               |
| Vehicle Speed Info | Vehicle speed signal/Snr Stop or Snr Work | Snr Stop: Vehicle speed 15 km/h (9.3 mph) or more (when accelerating) or 10 km/h (6.2 mph) or more (when decelerating) | -               |

| TESTER DISPLAY | MEASUREMENT ITEM/RANGE | NORMAL CONDITION                                                                                                           | DIAGNOSTIC NOTE |
|----------------|------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------|
|                |                        | Snr Work: Vehicle speed less than 15 km/h (9.3 mph) (when accelerating) or less than 10 km/h (6.2 mph) (when decelerating) |                 |

\*1: for Automatic Transmission

(g) Details of relevant Data List items (Selected system: Blind Spot Monitor Master)

**NOTICE:**

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

**HINT:**

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Body Electrical / Blind Spot Monitor Master / Data List.
- (6) According to the display on the Techstream, read the "Data List".

**Blind Spot Monitor Master**

| TESTER DISPLAY       | MEASUREMENT ITEM/RANGE                                                                              | NORMAL CONDITION                                                                                                                              | DIAGNOSTIC NOTE |
|----------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Turn Switch State    | State of the headlight dimmer switch assembly (turn signal light switch) / Left ON, Right ON or OFF | Left ON: Left side of turn signal light switch on<br>Right ON: Right side of turn signal light switch on<br>OFF: Turn signal light switch off | -               |
| Reverse              | State of the Shift Position R Signal / OFF or ON                                                    | ON: Shift lever in R<br>OFF: Shift lever in any position except R                                                                             | -               |
| Vehicle Speed        | Vehicle speed signal / Min.: 0 km/h (0 mph), Max.: 326 km/h (203 mph)                               | Vehicle stopped: 0 km/h (0 mph)                                                                                                               | -               |
| Steering Angle       | Steering angle sensor / Min.: -3072°, Max.: 3070.5°                                                 | Left turn: Increases<br>Right turn: Decreases                                                                                                 | -               |
| Power Supply Voltage | Power supply voltage / Min.: 0 V, Max.: 50 V                                                        | Always: 11 to 14 V                                                                                                                            | -               |

(h) Details of relevant Data List items (Selected system: Smart Key)

**NOTICE:**

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

**HINT:**

- Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.
- When using the Techstream with the ignition switch off to troubleshoot:

Connect the Techstream to the DLC3 and turn a courtesy light switch on and off at 1.5-seconds intervals until communication between the Techstream and vehicle begins.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Body Electrical / Smart Key / Data List.
- (6) According to the display on the Techstream, read the "Data List".

**Smart Key**

| TESTER DISPLAY      | MEASUREMENT ITEM/RANGE                                | NORMAL CONDITION                                                                                                  | DIAGNOSTIC NOTE                                                                                                                                                                                                                                                                                                                                |
|---------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D-Door Touch Sensor | Driver door touch sensor (unlock sensor)* / ON or OFF | ON: Driver door touch sensor (unlock sensor) touched<br>OFF: Driver door touch sensor (unlock sensor) not touched | <ul style="list-style-type: none"><li>• Displays whether the unlock sensor is on or off (even if the sensor is touched and contact is maintained, "ON" is displayed only momentarily).</li><li>• Use this Data List item to help determine if there is an unlock sensor malfunction when the entry unlock function does not operate.</li></ul> |

\*: Data from an actual vehicle provided for reference.

- (i) Details of relevant Data List items (Selected system: Power Source Control)

**HINT:**

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

**NOTICE:**

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Body Electrical / Power Source Control / Data List.

(6) According to the display on the Techstream, read the "Data List".

### Power Source Control

| TESTER DISPLAY       | MEASUREMENT ITEM/RANGE                      | NORMAL CONDITION                                                             | DIAGNOSTIC NOTE                                                                                                                                                                              |
|----------------------|---------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shift P Signal       | Shift position (P)/ON or OFF                | ON: Shift lever in P<br>OFF: Shift lever not in P                            | <ul style="list-style-type: none"><li>• Use this item to determine if the shift position switch is malfunctioning.</li><li>• The engine cannot be started when this item is "OFF".</li></ul> |
| Vehicle Speed Signal | Vehicle being driven or stopped/Stop or Run | Stop: Vehicle stopped<br>Run: Vehicle being driven at 5 km/h (3 mph) or more | -                                                                                                                                                                                            |

(j) Details of relevant Data List items (Selected system: Starting Control)

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Body Electrical / Starting Control / Data List.
- (6) According to the display on the Techstream, read the "Data List".

### Starting Control

| TESTER DISPLAY | MEASUREMENT ITEM/RANGE        | NORMAL CONDITION                           | DIAGNOSTIC NOTE |
|----------------|-------------------------------|--------------------------------------------|-----------------|
| Engine Speed   | Engine speed/0 to 16383 r/min | Fluctuates in accordance with engine speed | -               |

(k) Details of relevant Data List items (Selected system: Combination Meter)

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Warm up the engine.
- (2) Turn the ignition switch off.
- (3) Connect the Techstream to the DLC3.
- (4) Turn the ignition switch to ON.
- (5) Turn the Techstream on.
- (6) Enter the following menus: Body Electrical / Combination Meter / Data List.
- (7) According to the display on the Techstream, read the "Data List".

#### Combination Meter

| TESTER DISPLAY             | MEASUREMENT ITEM/RANGE                                          | NORMAL CONDITION                                                                                                           | DIAGNOSTIC NOTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| P-Seatbelt Buckle SW       | Front passenger seat belt buckle switch/OFF or ON               | OFF: Front passenger seat belt fastened (warning light off)<br>ON: Front passenger seat belt unfastened (warning light on) | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Vehicle Speed Meter        | Vehicle speed/Min.: 0 km/h (0 mph), Max.: 255 km/h (158 mph)    | Almost the same as actual vehicle speed                                                                                    | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Engine Rpm                 | Engine speed/Min.: 0 rpm, Max.: 12750 rpm                       | 600 to 700 rpm:<br>Idling                                                                                                  | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Coolant Temperature        | Engine coolant temperature/0 to 127.5°C (0 to 261.5°F)          | After warming up: 75 to 100°C (167 to 212°F)                                                                               | <ul style="list-style-type: none"> <li>• After warming up the engine, the engine coolant temperature is 75 to 100°C (167 to 212°F).</li> <li>• After a long soak, the engine coolant temperature, intake air temperature and ambient air temperature are approximately equal.</li> <li>• If the value is -40°C (-40°F), or higher than 135°C (275°F), the sensor circuit is open or shorted.</li> <li>• Check if the engine overheats when the value indicates higher than 135°C (275°F).</li> </ul> |
| +B Voltage Value           | Battery voltage/Min.: 0 V, Max.: 25.5 V                         | 11 to 14 V                                                                                                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Ambient Temperature        | Outside temperature/Min.: -40°C (-40°F), Max.: 87.5°C (189.5°F) | Almost the same as actual outside temperature                                                                              | The temperature displayed on the multi-information display is -40 to 50°C (-40 to 122°F)                                                                                                                                                                                                                                                                                                                                                                                                             |
| Turn Signal Switch (Right) | Turn RH signal switch/OFF or ON                                 | OFF: Turn RH switch off                                                                                                    | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| TESTER DISPLAY            | MEASUREMENT ITEM/RANGE          | NORMAL CONDITION                                 | DIAGNOSTIC NOTE |
|---------------------------|---------------------------------|--------------------------------------------------|-----------------|
|                           |                                 | ON: Turn RH switch on                            |                 |
| Turn Signal Switch (Left) | Turn LH signal switch/OFF or ON | OFF: Turn LH switch off<br>ON: Turn LH switch on | -               |

(l) Details of relevant Data List items (Selected system: Air Conditioner)

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Body Electrical / Air Conditioner / Data List.
- (6) According to the display on the Techstream, read the "Data List".

#### Air Conditioner

| TESTER DISPLAY        | MEASUREMENT ITEM/RANGE                                                                                     | NORMAL CONDITION                                                                                  | DIAGNOSTIC NOTE |
|-----------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------|
| Ambient Temp Sensor   | Ambient temperature sensor (thermistor assembly) /<br>Min.: -23.30°C (-9.94°F)<br>Max.: 65.95°C (150.71°F) | Actual ambient temperature displayed                                                              | -               |
| Solar Sensor (D Side) | Driver side solar sensor (automatic light control sensor) /<br>Min.: 0<br>Max.: 255                        | Driver side solar sensor (automatic light control sensor) value increases as brightness increases | -               |
| Engine Coolant Temp   | Engine coolant temperature sensor /<br>Min.: 1.30°C (34.34°F)<br>Max.: 90.55°C (194.99°F)                  | Actual engine coolant temperature displayed                                                       | -               |

(m) Details of relevant Data List items (Selected system: Main Body)

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because

intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

**NOTICE:**

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Body Electrical / Main Body / Data List.
- (6) According to the display on the Techstream, read the "Data List".

**Main Body**

| TESTER DISPLAY      | MEASUREMENT ITEM/RANGE                            | NORMAL CONDITION                                                                                     | DIAGNOSTIC NOTE |
|---------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------|
| FL Door Courtesy SW | Driver door courtesy switch condition / ON or OFF | ON: Door courtesy switch on (driver door open)<br>OFF: Door courtesy switch off (driver door closed) | -               |
| IG SW               | Ignition switch status / ON or OFF                | ON: Ignition switch ON<br>OFF: Ignition switch off                                                   | -               |

(n) Details of relevant Data List items (Selected system: SRS Airbag)

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

**NOTICE:**

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Body Electrical / SRS Airbag / Data List.
- (6) According to the display on the Techstream, read the "Data List".

**SRS Airbag**

| TESTER DISPLAY      | MEASUREMENT ITEM/RANGE                                                                                                     | NORMAL CONDITION | DIAGNOSTIC NOTE |
|---------------------|----------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| Left Side Buckle SW | LH Side Buckle SW/<br>Unset: The seat belt is not fastened<br>Set: The seat belt is fastened<br>NG: Data is not determined | Unset/Set        | -               |

| TESTER DISPLAY       | MEASUREMENT ITEM/RANGE                                                                                                     | NORMAL CONDITION | DIAGNOSTIC NOTE |
|----------------------|----------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| Right Side Buckle SW | RH Side Buckle SW/<br>Unset: The seat belt is not fastened<br>Set: The seat belt is fastened<br>NG: Data is not determined | Unset/Set        | -               |

\*: w/ Occupant Classification System

(o) Details of relevant Data List items (Selected system: Tire Pressure Monitor)

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Chassis / Tire Pressure Monitor / Data List.
- (6) According to the display on the Techstream, read the Data List.

#### Tire Pressure Monitor

| TESTER DISPLAY | MEASUREMENT ITEM/RANGE                                                   | NORMAL CONDITION     | DIAGNOSTIC NOTE                                   |
|----------------|--------------------------------------------------------------------------|----------------------|---------------------------------------------------|
| Vehicle Speed  | Vehicle speed reading/<br>min.: 0 km/h (0 mph), max.: 255 km/h (158 mph) | Actual vehicle speed | Speed indicated on the combination meter assembly |

(p) Details of relevant Data List items (Selected system: Four Wheel Drive)

#### NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

#### HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

- (1) Turn the ignition switch off.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the ignition switch to ON.
- (4) Turn the Techstream on.
- (5) Enter the following menus: Powertrain / Four Wheel Drive / Data List.

(6) According to the display on the Techstream, read the Data List.

#### Four Wheel Drive

| TESTER DISPLAY | MEASUREMENT ITEM                    | RANGE                                                        | NORMAL CONDITION                      | DIAGNOSTIC NOTE                                         |
|----------------|-------------------------------------|--------------------------------------------------------------|---------------------------------------|---------------------------------------------------------|
| FR Wheel Speed | Front wheel speed sensor RH reading | Min.: 0.00 km/h (0.00 mph)<br>Max.: 327.67 km/h (203.61 mph) | Vehicle stopped: 0.00 km/h (0.00 mph) | No large fluctuations when driving at a constant speed. |
| FL Wheel Speed | Front wheel speed sensor LH reading | Min.: 0.00 km/h (0.00 mph)<br>Max.: 327.67 km/h (203.61 mph) | Vehicle stopped: 0.00 km/h (0.00 mph) | No large fluctuations when driving at a constant speed. |
| RR Wheel Speed | Rear wheel speed sensor RH reading  | Min.: 0.00 km/h (0.00 mph)<br>Max.: 327.67 km/h (203.61 mph) | Vehicle stopped: 0.00 km/h (0.00 mph) | No large fluctuations when driving at a constant speed. |
| RL Wheel Speed | Rear wheel speed sensor LH reading  | Min.: 0.00 km/h (0.00 mph)<br>Max.: 327.67 km/h (203.61 mph) | Vehicle stopped: 0.00 km/h (0.00 mph) | No large fluctuations when driving at a constant speed. |
| Vehicle Speed  | Maximum wheel speed sensor reading  | Min.: 0.00 km/h (0.00 mph)<br>Max.: 327.67 km/h (203.61 mph) | Vehicle stopped: 0.00 km/h (0.00 mph) | No large fluctuations when driving at a constant speed. |



|                                                                                                                           |                      |                                          |
|---------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
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| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: DIAGNOSTIC TROUBLE CODE CHART; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## DIAGNOSTIC TROUBLE CODE CHART

### Diagnostic Trouble Code Chart

| DTC CODE | DETECTION ITEM                                               | SEE PAGE             |
|----------|--------------------------------------------------------------|----------------------|
| U0233    | Lost Communication with Blind Spot Monitor Master Module     | <a href="#">INFO</a> |
| U1002    | Lost Communication with Gateway Module (Network Gateway ECU) | <a href="#">INFO</a> |
| U1110    | Lost Communication with Clearance Warning ECU                | <a href="#">INFO</a> |



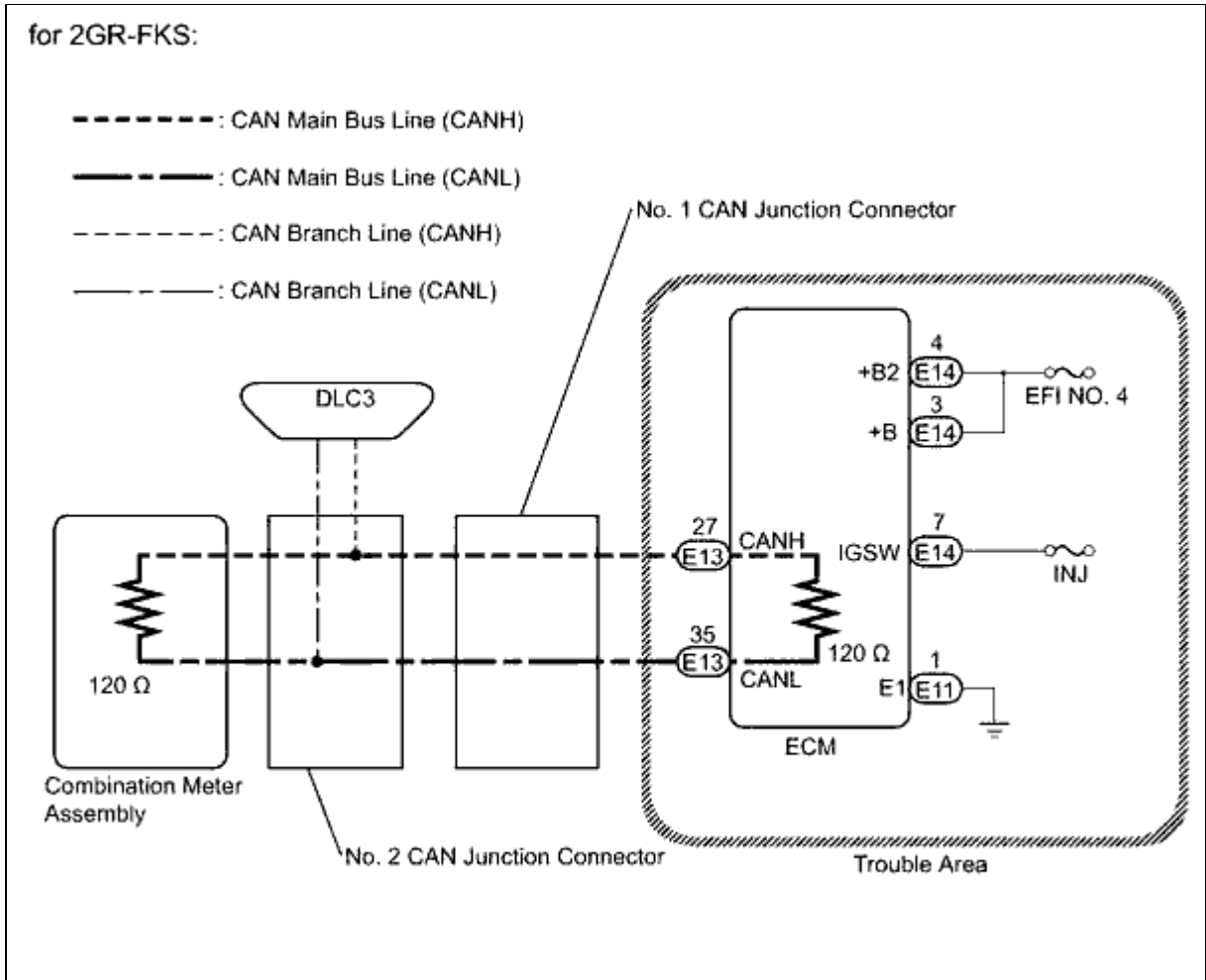
|                                                                                                                         |                      |                                          |
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| <b>Last Modified:</b> 11-13-2015                                                                                        | 6.6 J                | <b>Doc ID:</b> RM000000WIP0HVX           |
| <b>Model Year Start:</b> 2016                                                                                           | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: ECM Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

ECM Communication Stop Mode

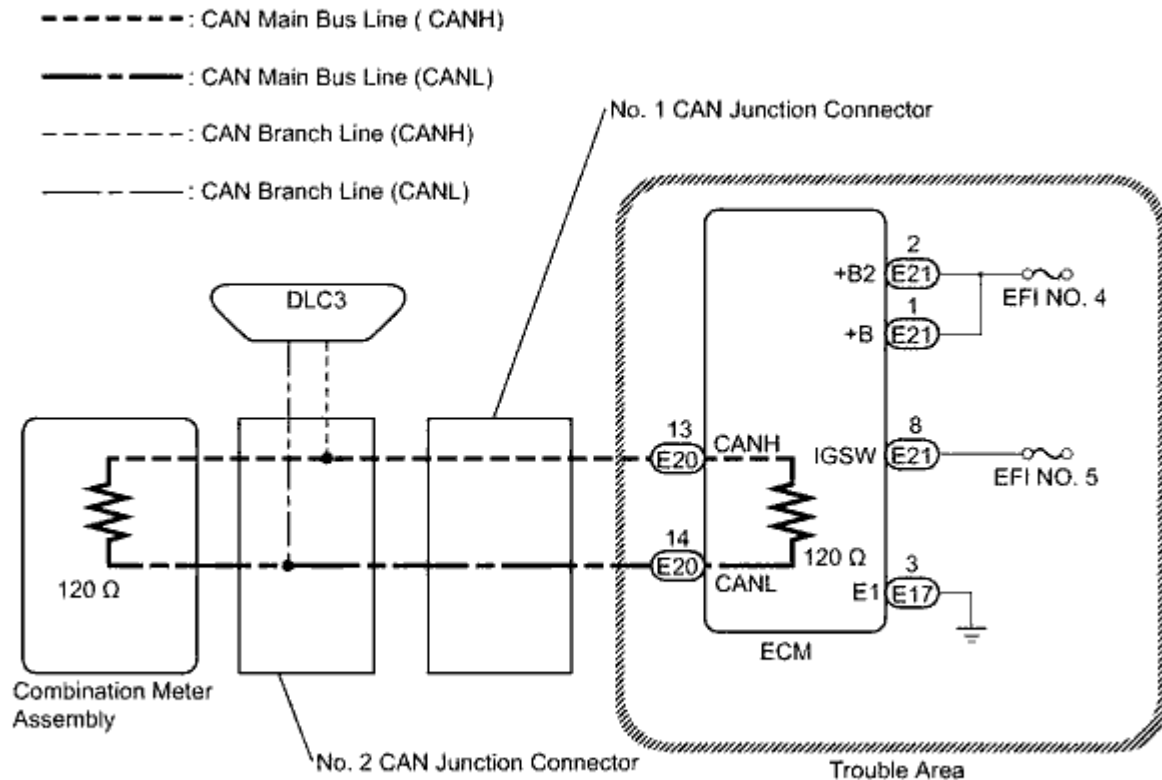
DESCRIPTION

| DETECTION ITEM              | SYMPTOM                                                                                                                                                                                                                                                                                                                                                | TROUBLE AREA                                                                                                                                               |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECM Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>"ECM (Engine)" is not displayed on the CAN Bus Check screen of the Techstream <span>INFO</span></li> <li>Communication system DTCs (DTCs that start with U) that correspond to "ECM Communication Stop Mode" in "DTC Combination Table" are output <span>INFO</span></li> </ul> | <ul style="list-style-type: none"> <li>Power source circuit of ECM</li> <li>ECM main line or connector</li> <li>ECM ground circuit</li> <li>ECM</li> </ul> |

WIRING DIAGRAM



for 2TR-FE:



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work **INFO**.
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, and wait at least 20 seconds.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

### 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 may help determine the cause of the malfunction.

## PROCEDURE

### 1. SYSTEM CHECK

(a) Check the vehicle specifications.

#### Result

| RESULT      | PROCEED TO |
|-------------|------------|
| for 2GR-FKS | A          |
| for 2TR-FE  | B          |

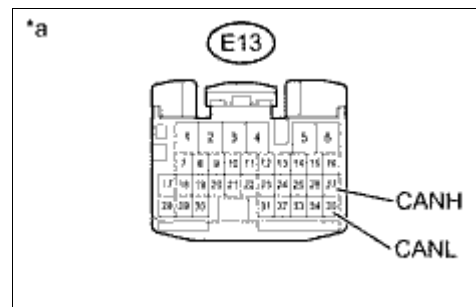
**B** ► GO TO STEP 4

**A**

### 2. CHECK FOR OPEN IN CAN BUS LINES (ECM MAIN LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the ECM connector.



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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| E13-27 (CANH) - E13-35 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

#### Text in Illustration

|    |                                               |
|----|-----------------------------------------------|
| *a | Front view of wire harness connector (to ECM) |
|----|-----------------------------------------------|

**NG** ▶ REPAIR OR REPLACE CAN MAIN BUS LINE OR CONNECTOR (ECM MAIN LINE)

**OK**  
▼

|    |                                |
|----|--------------------------------|
| 3. | CHECK ECM POWER SOURCE CIRCUIT |
|----|--------------------------------|

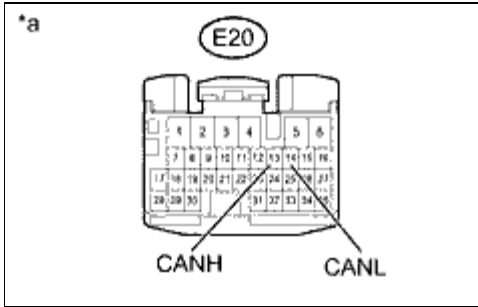
(a) Check the ECM power source circuit **INFO** .

**NG** ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)

**OK** ▶ REPLACE ECM

|    |                                                 |
|----|-------------------------------------------------|
| 4. | CHECK FOR OPEN IN CAN BUS LINES (ECM MAIN LINE) |
|----|-------------------------------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.



(b) Disconnect the ECM connector.

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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| E20-13 (CANH) - E20-14 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 Ω        |

**Text in Illustration**

|    |                                               |
|----|-----------------------------------------------|
| *a | Front view of wire harness connector (to ECM) |
|----|-----------------------------------------------|

**NG** ▶ REPAIR OR REPLACE CAN MAIN BUS LINE OR CONNECTOR (ECM MAIN LINE)

**OK**



|           |                                       |
|-----------|---------------------------------------|
| <b>5.</b> | <b>CHECK ECM POWER SOURCE CIRCUIT</b> |
|-----------|---------------------------------------|

(a) Check the ECM power source circuit  .

**NG**  **REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)**

**OK**  **REPLACE ECM**



|                                                                                                         |                      |                                      |
|---------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|
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| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: FAIL-SAFE CHART; 2016 MY Tacoma [08/2015 - ] |                      |                                      |

## **FAIL-SAFE CHART**

### **1. FAIL-SAFE FUNCTION**

(a) When communication fails in any of the CAN bus lines (communication lines), a fail-safe function(s) will operate. The fail-safe function that is specified for each system operates to prevent those systems from malfunctioning.

(b) The following table shows the effects on each system when communication is impossible. (For further details, see the pages for each system.)

| FUNCTION                                                                                                                                                                                                                                                                                 | BEHAVIOR DURING CAN FAILURE                                                                                                                                                |                                                                                                                                                                                                      |                                                                                                                                                                                                                   |                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                                                                                                                                                                                                                                                          | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                                                                                     | VEHICLE BEHAVIOR                                                                                                                                                                                     | DTC<br>(DRIVER DETECTABLE)                                                                                                                                                                                        | DIAGNOSTIC TROUBLE CODE |
| VDM Control<br>(Calculates torque level desired by driver based on accelerator pedal operation and controls torque according to this and other conditions in order to achieve smoother driving performance and improved stability, startability, reacceleration, and acceleration feel.) | 1. ECM<br>2. Brake booster assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU),<br>Airbag sensor assembly,<br>Spiral cable with sensor sub-assembly | Does not calculate desired torque based on accelerator pedal operation, and does not provide smoother driving performance or improved stability, startability, reacceleration, or acceleration feel. | Nothing<br>(Does not calculate desired torque based on accelerator pedal operation, and does not provide smoother driving performance or improved stability, startability, reacceleration, or acceleration feel.) | Nothing                 |
| ECT indicator in meter<br>(Shift position, switch, mode, etc.)                                                                                                                                                                                                                           | 1. ECM<br>2. Combination meter assembly                                                                                                                                    | Indicators do not turn on.                                                                                                                                                                           | Nothing<br>(Indicators do not turn on.)                                                                                                                                                                           | Nothing                 |
| AI-SHIFT control<br>(Control the A/T in order to improve engine braking power and acceleration feeling.)                                                                                                                                                                                 | 1. ECM<br>2. Brake booster assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU)                                                                      | AI-SHIFT control does not operate.                                                                                                                                                                   | Nothing<br>(AI-SHIFT control does not operate.)                                                                                                                                                                   | Nothing                 |
| Cruise control<br>(Adjusts the engine throttle valve opening                                                                                                                                                                                                                             | 1. ECM<br>2. Brake booster                                                                                                                                                 | Cruise control does not operate.                                                                                                                                                                     | Nothing<br>(Indicator light blinks.)                                                                                                                                                                              | Nothing                 |

| FUNCTION                                                             | BEHAVIOR DURING CAN FAILURE                                                                                                                                             |                       |                            |                                           |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------|-------------------------------------------|
|                                                                      | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                                                                                  | VEHICLE BEHAVIOR      | DTC<br>(DRIVER DETECTABLE) | DIAGNOSTIC TROUBLE CODE                   |
| amount automatically to control the vehicle.)                        | assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU),<br>Combination meter assembly                                                               |                       |                            |                                           |
| VSC control<br>(Prevent skid when cornering)                         | 1. Brake booster assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU)<br>2. ECM, Airbag sensor assembly,<br>Spiral cable with sensor sub-assembly | VSC does not operate. | (Light turns on.)          | U0073<br>U0100<br>U0123<br>U0124<br>U0126 |
| TRC control<br>(Stabilize vehicle start.)                            | 1. Brake booster assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU)<br>2. ECM, Airbag sensor assembly,<br>Spiral cable with sensor sub-assembly | TRC does not operate. | (Light turns on.)          | U0073<br>U0100<br>U0123<br>U0124<br>U0126 |
| ABS control<br>(Prevents wheels from locking during sudden braking.) | 1. Brake booster assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU)<br>2. Airbag sensor assembly                                                | ABS does not operate. | (Light turns on.)          | U0073<br>U0123<br>U0124                   |

| FUNCTION                                                                                                                                                                                                | BEHAVIOR DURING CAN FAILURE                                                                                                                                                  |                                                                                                   |                                                                                               |                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------|
|                                                                                                                                                                                                         | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                                                                                       | VEHICLE BEHAVIOR                                                                                  | DTC<br>(DRIVER DETECTABLE)                                                                    | DIAGNOSTIC TROUBLE CODE                   |
| Event data recorder<br>(Records conditions such as the vehicle speed, the amount the accelerator is depressed, and the shift lever position when the event data recorder recording conditions are met.) | 1. Airbag sensor assembly<br>2. ECM, Combination meter assembly                                                                                                              | An invalid value is stored.                                                                       | Nothing<br>(Cannot be detected.)                                                              | Nothing                                   |
| Collision detection signal<br>(Notifies the system of a collision in order to perform a fuel cut at the time when a vehicle collision occurs.)                                                          | 1. ECM<br>2. Airbag sensor assembly                                                                                                                                          | In the event of a collision, fuel cut is not performed.                                           | Nothing<br>(Cannot be detected.)                                                              | Nothing                                   |
| Steering sensor<br>(Detects the steering wheel angle.)                                                                                                                                                  | 1. Spiral cable with sensor sub-assembly<br>2. Brake booster assembly (skid control ECU), Brake actuator assembly (skid control ECU)                                         | Nothing                                                                                           | Nothing<br>(VSC Indicator light turns on.)                                                    | Nothing                                   |
| Blind Spot Monitor Control<br>(Detects vehicle in blind spot of adjacent lane and informs driver.)                                                                                                      | 1. Blind spot monitor sensor LH<br>2. Brake booster assembly (skid control ECU), Brake actuator assembly (skid control ECU), ECM, Main body ECU (multiplex network body ECU) | Blind spot monitor control is prohibited.                                                         | Blind spot monitor system warning light on the combination meter turns on.                    | U0100<br>U0126<br>U0129<br>U0142<br>U0232 |
| Air Conditioning Control<br>(Air conditioning control controls air conditioning functions such as set                                                                                                   | 1. Navigation receiver assembly, Radio and                                                                                                                                   | <ul style="list-style-type: none"> <li>When set temperature is shown on multi-display,</li> </ul> | A message indicating to check air conditioning amplifier connection appears on multi-display. | U0073<br>U0164                            |

| FUNCTION                                                                                                                                                                                                   | BEHAVIOR DURING CAN FAILURE                                                                                 |                                                                                                                                                                                                                                                                                                 |                            |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------|
|                                                                                                                                                                                                            | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                      | VEHICLE BEHAVIOR                                                                                                                                                                                                                                                                                | DTC<br>(DRIVER DETECTABLE) | DIAGNOSTIC TROUBLE CODE          |
| temperature adjustment, air outlet selection, etc. using the remote touch.)                                                                                                                                | display receiver assembly<br>2. Air conditioning amplifier assembly                                         | set temperature display turns off.<br>• Air conditioning function(s) are prohibited.                                                                                                                                                                                                            |                            |                                  |
| Intuitive Parking Assist System Setting/Notification (Controls settings for clearance sonar screen notifications which are set by operating Remote Touch, displays sonar status and plays voice warnings.) | 1. Navigation receiver assembly, Radio and display receiver assembly<br>2. Clearance warning ECU assembly   | Display updating is stopped.                                                                                                                                                                                                                                                                    | -                          | U0073<br>U0100<br>U1110          |
| Door Lock (Controls key linked and automatic door lock/unlock function, key confinement prevention function, etc.)                                                                                         | 1. Main body ECU (Multiplex network body ECU)<br>2. Airbag sensor assembly, Combination meter assembly, ECM | <ul style="list-style-type: none"> <li>• Speed sensitive automatic lock control does not occur.</li> <li>• Shift linked automatic lock control does not occur.</li> <li>• Shift linked automatic unlock control does not occur.</li> <li>• Automatic lock/ unlock cannot be changed.</li> </ul> | Nothing                    | U0100<br>U0101<br>U0151<br>U0155 |
| Alarm Control (Sounds various warnings.)                                                                                                                                                                   | 1. Main body ECU (multiplex network body ECU)<br>2. ECM                                                     | Nothing                                                                                                                                                                                                                                                                                         | Nothing                    | U0100                            |

| FUNCTION                                                                                                                                                                   | BEHAVIOR DURING CAN FAILURE                                                                            |                                                                                        |                                                                                                                                                                                                               |                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                                                                                                                                            | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                 | VEHICLE BEHAVIOR                                                                       | DTC<br>(DRIVER DETECTABLE)                                                                                                                                                                                    | DIAGNOSTIC TROUBLE CODE |
| Display Automatic Dimming<br>(Display dimming control.)                                                                                                                    | 1. Main body ECU (Multiplex network body ECU)<br>2. Combination meter assembly                         | Automatic dimming control for displays does not operate when taillights are turned on. | Nothing                                                                                                                                                                                                       | U0155                   |
| Illumination Control                                                                                                                                                       | 1. Main body ECU (Multiplex network body ECU)<br>2. Certification ECU (smart key ECU assembly)         | Interior lights turn off.                                                              | When communication with certification ECU (smart key ECU assembly) is interrupted:<br><ul style="list-style-type: none"><li>Interior lights do not turn off right after getting out of the vehicle.</li></ul> | U0327                   |
| Entry Function/Wireless Control                                                                                                                                            | 1. Certification ECU (Smart key ECU assembly)<br>2. Main body ECU (multiplex network body ECU)         | Entry lock/unlock control is not possible.                                             | Nothing                                                                                                                                                                                                       | U0327                   |
| Daytime Running Light Control                                                                                                                                              | 1. Main body ECU (Multiplex network body ECU)<br>2. ECM                                                | Daytime running light control does not operate.                                        | Nothing                                                                                                                                                                                                       | U0100                   |
| Tire Pressure Monitoring System<br>(Monitors tire pressure, vehicle speed, etc., and illuminates indicator lights or displays a message on the multi-information display.) | 1. Door control and tire pressure monitoring system receiver assembly<br>2. Combination meter assembly | Nothing                                                                                | Tire pressure warning light blinks and then illuminates.                                                                                                                                                      | U0155                   |
| Entry and Start Function<br><ul style="list-style-type: none"><li>Entry lock/unlock</li></ul>                                                                              | 1. Main body ECU (multiplex network body ECU),                                                         | An entry unlock retry is performed.                                                    | When transmission is abnormal:<br><ul style="list-style-type: none"><li>The entry lock/</li></ul>                                                                                                             | U0142<br>U0155          |

| FUNCTION                                                                                                                         | BEHAVIOR DURING CAN FAILURE                                                                                                |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                                                                                                  | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                                     | VEHICLE BEHAVIOR | DTC<br>(DRIVER DETECTABLE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DIAGNOSTIC TROUBLE CODE |
| unlatch<br>• Entry and start warnings<br>• Entry illumination (dome light illumination, etc.)<br>• Engine start possible display | Certification ECU (smart key ECU assembly)<br>2. Main body ECU (multiplex network body ECU),<br>Combination meter assembly |                  | unlock do not operate.<br>• The entry and start warnings (the key lock-in prevention warning, the leaving with the key warning, key reminder, etc.) and the key lock-in prevention function do not operate.<br>• Entry illumination does not operate.<br><br>When there is a reception stop:<br><br>• The entry and start warnings (the key lock-in prevention warning, the leaving with the key warning, key reminder, etc.), the ignition switch to ON possible display, and the key lock-in prevention function do not operate.<br>• The answer back function repeats a maximum of 3 times when an unlock operation is performed. |                         |

| FUNCTION                                                                                                                                                                                                                                  | BEHAVIOR DURING CAN FAILURE                                                                                                                |                                   |                                                                                                                                                                                                                                                                                        |                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                                                                                                                                                                                                           | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                                                     | VEHICLE BEHAVIOR                  | DTC<br>(DRIVER DETECTABLE)                                                                                                                                                                                                                                                             | DIAGNOSTIC TROUBLE CODE |
|                                                                                                                                                                                                                                           |                                                                                                                                            |                                   | <p>However, this only occurs when the main body ECU (multiplex network body ECU) can receive requests from the certification ECU (smart key ECU assembly).</p> <ul style="list-style-type: none"> <li>When the ignition switch to ON, the entry lock/unlock do not operate.</li> </ul> |                         |
| Entry and Start Function <ul style="list-style-type: none"> <li>Entry lock/unlock unlatch</li> <li>Entry and start warnings</li> <li>Entry illumination (dome light illumination, etc.)</li> <li>Engine start possible display</li> </ul> | 1. Certification ECU (smart key ECU assembly)<br>2. ECM, Combination meter assembly                                                        | The previous value is maintained. | Incorrect entry and start warnings are output.                                                                                                                                                                                                                                         | U0100                   |
| Wireless Function<br>(Operates the wireless lock/unlock functions, etc.)                                                                                                                                                                  | 1. Main body ECU (multiplex network body ECU)<br>2. Certification ECU (smart key ECU assembly), Main body ECU (multiplex network body ECU) | Nothing                           | <ul style="list-style-type: none"> <li>Wireless lock/unlock and trunk functions do not operate.</li> <li>When the ignition switch to ON, the wireless lock/unlock functions do not operate.</li> </ul>                                                                                 | U0142                   |

| FUNCTION                                                                                                                                                  | BEHAVIOR DURING CAN FAILURE                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                                                                                                                           | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                                                                                 | VEHICLE BEHAVIOR                                                                                                                                                                                                                                                                                                                                     | DTC<br>(DRIVER DETECTABLE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DIAGNOSTIC TROUBLE CODE |
| Engine Switch Lettering Illumination Control<br>(Operates the engine switch lettering illumination in conjunction with the dome light illumination, etc.) | 1. Certification ECU (smart key ECU assembly)<br>2. Combination meter assembly, Certification ECU (smart key ECU assembly), Main body ECU (multiplex network body ECU) | <ul style="list-style-type: none"> <li>• If the engine switch letters are illuminated due to the dome light, the illumination turns off.</li> <li>• When the DC cut fuse is removed and the engine switch letters are illuminated due to the panel illumination, the illumination turns off.</li> <li>• The previous value is maintained.</li> </ul> | <ul style="list-style-type: none"> <li>• If the engine switch letters are not illuminated, they do not illuminate.</li> <li>• If the engine switch letters are illuminated due to the panel illumination, the illumination does not turn off.</li> <li>• If the engine switch letters are illuminated due to the dome light, the illumination turns off.</li> <li>• When the DC cut fuse is removed and the engine switch letters are illuminated due to the panel illumination, the illumination turns off.</li> </ul> | U0142                   |
| Security Indicator Display Function<br>(Displays the immobiliser security condition.)                                                                     | 1. Certification ECU (smart key ECU assembly)<br>2. Certification ECU (smart key ECU assembly), Main body ECU (multiplex network body ECU)                             | Nothing                                                                                                                                                                                                                                                                                                                                              | Security condition cannot display normally (illuminates during security warning preparation/security warning).                                                                                                                                                                                                                                                                                                                                                                                                          | U0142                   |

| FUNCTION                                                                                                                                  | BEHAVIOR DURING CAN FAILURE                                                                                                  |                                      |                                                                                                                                                                              |                         |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                                                                                                           | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                                       | VEHICLE BEHAVIOR                     | DTC<br>(DRIVER DETECTABLE)                                                                                                                                                   | DIAGNOSTIC TROUBLE CODE |
| Vehicle Speed Display<br>(Displays the vehicle speed on the speedometer according to the vehicle speed signal from the skid control ECU.) | 1. Combination meter assembly<br>2. Brake booster assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU) | Signal is considered to be 0.        | <ul style="list-style-type: none"> <li>• The speedometer displays 0 km/h (0 mph).</li> <li>• The drive monitor stops calculating.</li> </ul>                                 | U0129                   |
| Tachometer<br>(Displays information on the tachometer.)                                                                                   | 1. Combination meter assembly<br>2. ECM                                                                                      | Signal is considered to be 0.        | <ul style="list-style-type: none"> <li>• The tachometer displays 0 rpm.</li> <li>• The drive monitor stops calculating.</li> </ul>                                           | U0100                   |
| ECT/ENG System Display<br>(Turns the temperature gauge command high engine coolant temperature warning display on and off.)               | 1. Combination meter assembly<br>2. ECM                                                                                      | Signal is considered to be 0.        | <ul style="list-style-type: none"> <li>• The engine coolant temperature warning light illuminates.</li> <li>• Displays messages on the multi-information display.</li> </ul> | -                       |
| Airbag<br>(Turns the SRS warning light on and off.)                                                                                       | 1. Combination meter assembly<br>2. Airbag sensor assembly                                                                   | Signal is considered to be "Active". | The airbag warning light illuminates.                                                                                                                                        | U0151                   |
| SLIP Warning<br>(Turns the SLIP warning light on and off.)                                                                                | 1. Combination meter assembly<br>2. Brake booster assembly (skid control ECU),<br>Brake actuator assembly (skid control ECU) | Signal is considered to be "Active". | The SLIP indicator illuminates.                                                                                                                                              | -                       |

| FUNCTION                                                   | BEHAVIOR DURING CAN FAILURE                                                                            |                                      |                                     |                         |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|-------------------------|
|                                                            | 1. CONTROL MASTER<br>2. SYSTEM RELATED                                                                 | VEHICLE BEHAVIOR                     | DTC<br>(DRIVER DETECTABLE)          | DIAGNOSTIC TROUBLE CODE |
| TPMS<br>(Turns the tire pressure warning light on and off) | 1. Combination meter assembly<br>2. Door control and tire pressure monitoring system receiver assembly | Signal is considered to be "Active". | The TPMS warning light illuminates. | Nothing                 |
| DRL Request<br>(Controls bulb DRL)                         | 1. Combination meter assembly<br>2. Main body ECU (multiplex network body ECU)                         | Keep last receive state.             | Nothing                             | U0142                   |
| Popular Name<br>(Vehicle body type description)            | 1. Combination meter assembly<br>2. Main body ECU (multiplex network body ECU)                         | Keep initial value                   | Nothing                             | Nothing                 |



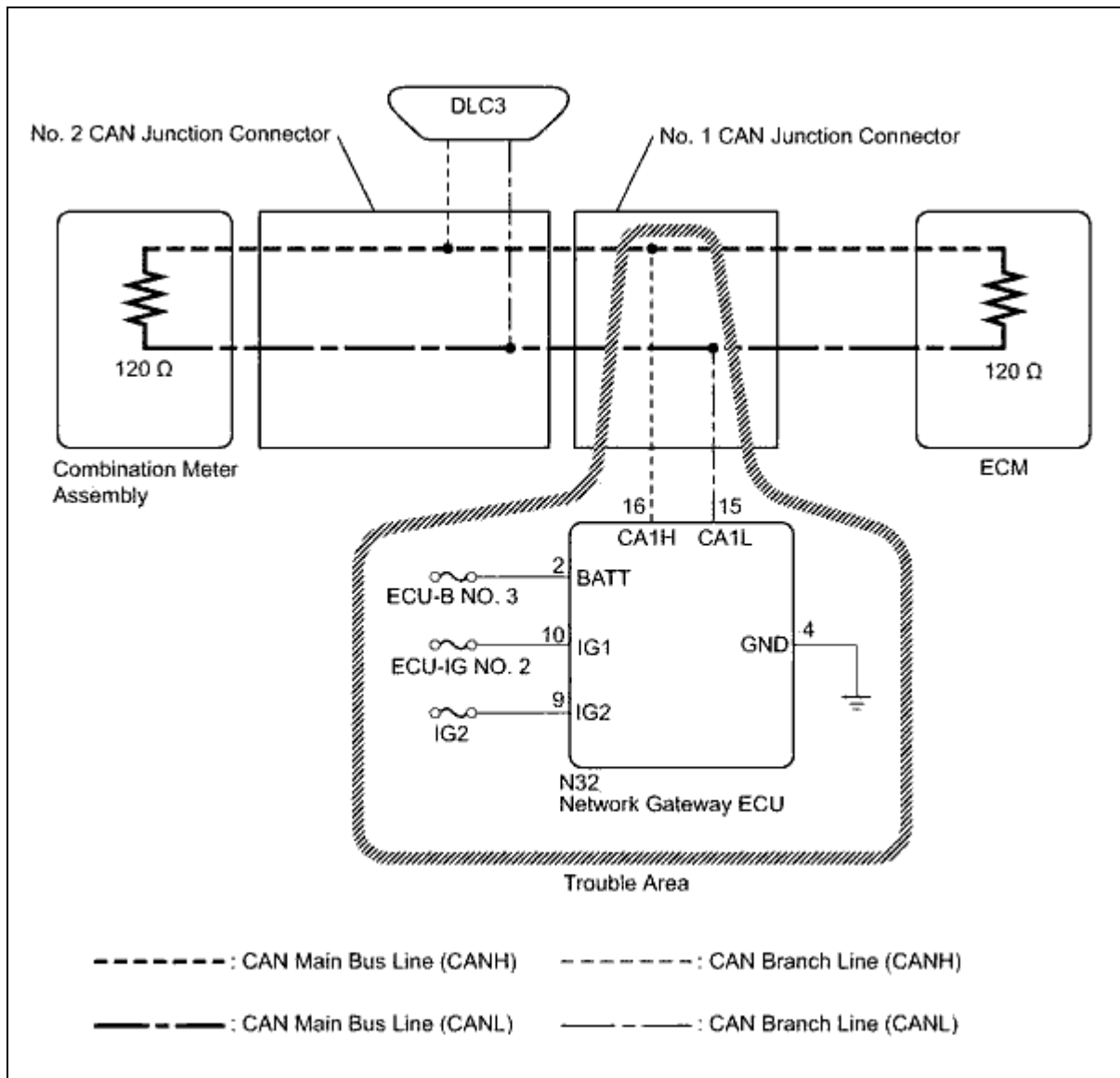
|                                                                                                                                 |                      |                                          |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                | 6.6 J                | <b>Doc ID:</b> RM000002G5B05ZX           |
| <b>Model Year Start:</b> 2016                                                                                                   | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Gateway ECU Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Gateway ECU Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                      | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                  | TROUBLE AREA                                                                                                                                                                                                                 |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gateway ECU Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>"CAN Gateway1" is not displayed on the CAN Bus<br/>Check screen of the Techstream <a href="#">INFO</a></li> <li>Communication system DTCs (DTCs that start with U) that correspond to "Gateway ECU Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>Network gateway ECU branch line or connector</li> <li>Power source circuit of network gateway ECU</li> <li>Network gateway ECU ground circuit</li> <li>Network gateway ECU</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notice before proceeding with work [INFO](#).
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output [INFO](#).
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, and wait at least 21 seconds.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed [INFO](#).

### HINT:

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

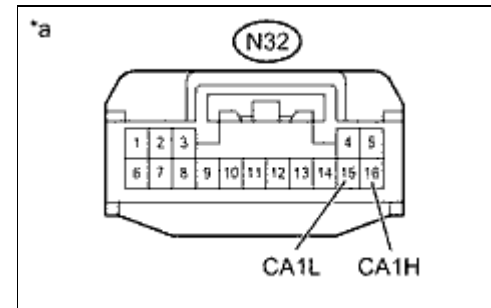
on the CAN. This communication will cause the resistance value to change.

- 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 may help determine the cause of the malfunction.

## PROCEDURE

### 1. CHECK FOR OPEN IN CAN BUS LINES (NETWORK GATEWAY ECU BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.



(b) Disconnect the network gateway ECU connector.

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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED VALUE   |
|-------------------------------|-------------------------------------------------------|-------------------|
| N32-16 (CA1H) - N32-15 (CA1L) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$ |

#### Text in Illustration

|    |                                                                  |
|----|------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Network Gateway ECU) |
|----|------------------------------------------------------------------|

**NG** REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (NETWORK GATEWAY ECU)

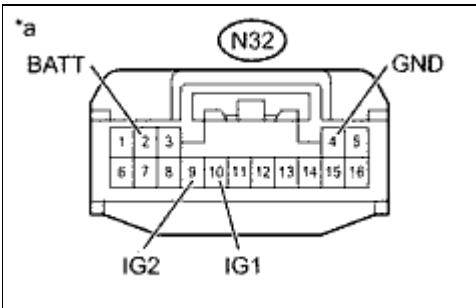
**OK**  
▼

### 2. CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)

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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED VALUE |
|---------------------------|-------------------------------------------------------|-----------------|
| N32-4 (GND) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 Ω       |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION          | SWITCH CONDITION   | SPECIFIED VALUE |
|----------------------------|--------------------|-----------------|
| N32-2 (BATT) - Body ground | Always             | 11 to 14 V      |
| N32-9 (IG2) - Body ground  | Ignition switch ON | 11 to 14 V      |
| N32-10 (IG1) - Body ground | Ignition switch ON | 11 to 14 V      |

Text in Illustration

|    |                                                                  |
|----|------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Network Gateway ECU) |
|----|------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ► REPLACE NETWORK GATEWAY ECU



|                                                                                                                             |                      |                                      |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                            | 6.6 D                | <b>Doc ID:</b> RM000004TIQ022X       |
| <b>Model Year Start:</b> 2016                                                                                               | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 - ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING; 2016 MY Tacoma [08/2015 - ] |                      |                                      |

## **HOW TO PROCEED WITH TROUBLESHOOTING**

### **1. PRECAUTIONS WHEN TROUBLESHOOTING**

#### **NOTICE:**

- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output.
- If the CAN communication system is malfunctioning, check the contact pressure of the terminals in connectors, as insufficient terminal contact pressure may be the cause INFO.
- Refer to Diagnosis System for CAN communication system DTCs.
- Refer to troubleshooting of each system if DTCs regarding the CAN communication system are not output.
- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work INFO.

- (a) CAN communication DTCs are output for CAN main bus and CAN branch malfunctions as well as for internal malfunctions or power source malfunctions of ECUs or sensors for systems using CAN communication. Therefore, when DTCs for internal malfunctions or power source malfunctions of corresponding systems are output at the same time as CAN communication DTCs, troubleshoot according to the internal malfunction and power source malfunction DTCs.
- (b) The DLC3 branch and V bus main bus circuits can be checked for malfunctions by inspecting at the DLC3 terminals using an electrical tester.

#### **NOTICE:**

- When inspecting at the DLC3 connector, do not connect the tester directly to the terminals. Instead, connect using service wires.
  - Inspections for an open in an ECU or sensor branch, or inspections for buses other than the V bus cannot be performed from the DLC3.
- (c) An open in a branch for ECUs or sensors that are connected to the CAN main bus can be checked by performing a CAN bus check using the Techstream. (This inspection is possible when the DLC3 branch and V bus main bus lines are normal.)
- (d) If the V bus had a communication error, the probable ECU or sensor for which communication stopped can be determined using the combination of communication DTCs (DTCs that start with U) that are output.
- (e) If a sub bus has a communication error, the gateway function equipped ECU (sub bus monitor ECU) detects it and stores DTCs related to the error.

#### **HINT:**

On the Techstream, gateway function equipped ECUs display DTCs for ECUs connected to the sub bus.

- (f) When an open circuit is detected, before disconnecting related connectors for inspection, push in on the connector body to check that the connector is not loose or disconnected.
- (g) When a connector is disconnected, check that the terminals and connector body are not cracked, deformed or corroded.

## 1. VEHICLE BROUGHT TO WORKSHOP

### HINT:

- If the ignition switch can be turned to ON (the power source mode can be changed to ON) when the vehicle is brought in for repair, check for DTCs and check the illumination condition of the indicators in the combination meter assembly and the basic operation of the vehicle (such as steering operation) promptly.
- Do not turn the ignition switch off until the inspection of the vehicle is finished, as some fail-safe functions are canceled when the ignition switch is turned off.
- If the ignition switch cannot be turned to ON (the power source mode cannot be changed to ON) when the vehicle is brought in, measure the voltage of the battery. If the voltage is below 11 V, recharge or replace the battery before performing troubleshooting.
- If the ignition switch cannot be turned to ON even though the battery voltage is normal, repair this malfunction before performing troubleshooting INFO.

## NEXT



## 2. CUSTOMER PROBLEM ANALYSIS

### HINT:

- When troubleshooting, confirm that the problem symptoms have been accurately identified. Preconceptions should be discarded in order to make an accurate judgment. To clearly understand what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time the malfunction occurred.
- Ask the customer if the vehicle is/was equipped with additional devices such as a theft deterrent device or monitor. (If equipped, explain to the customer that the additional devices will be removed before performing troubleshooting as the malfunction cannot be checked properly.)

(a) It is useful to confirm the symptoms and the conditions in which the vehicle was operating at the time when a malfunction occurred. This helps to narrow down the malfunctioning part.

### HINT:

- What was affected (system, part or meter warning indicators)
- What happened (details of the malfunction)
- When (occurrence date and time, frequency and if it recurs or not)
- Under what kind of situation did the problem occur (driving and operating condition at the occurrence and weather)
- Road type or condition (city, suburb, paved road, unpaved road, highway, etc.)
- Return conditions (what made the vehicle return to normal, for example, the ignition switch was turned off)

### Points to be confirmed

|         |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Symptom | <ul style="list-style-type: none"><li>○ Electric power steering<ul style="list-style-type: none"><li>- Normal</li><li>- A little heavier than usual</li><li>- There was no assist</li></ul></li><li>○ Air conditioning<ul style="list-style-type: none"><li>- Whether the air conditioning system operated</li><li>- Whether the blower fan operated</li></ul></li><li>○ Multi-information display items</li></ul> |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <ul style="list-style-type: none"> <li>- Whether the update of multi-information display items stopped</li> <li>- Whether the numeric part of drivable distance was not displayed</li> <li>o Auto lock and unlock operation <ul style="list-style-type: none"> <li>- Whether the speed linked auto-lock function operated while driving</li> <li>- Whether the unlock function operated when the shift lever was moved to P</li> </ul> </li> <li>o Wireless door lock function and smart entry function <ul style="list-style-type: none"> <li>- Whether the lock/unlock function operated</li> <li>- Whether the illumination was turned on when the key was brought into a smart detection area</li> </ul> </li> <li>o Operation of other systems of concern</li> </ul> |
| Meter warning lights | <ul style="list-style-type: none"> <li>o Illumination of warning lights and the order in which they illuminated <ul style="list-style-type: none"> <li>- Check engine (MIL)</li> <li>- ABS</li> <li>- SRS</li> <li>- SLIP</li> <li>- Master</li> <li>- Brake</li> <li>- Tire pressure</li> <li>- Others</li> </ul> </li> <li>o Needle movement <ul style="list-style-type: none"> <li>- Speedometer</li> <li>- Tachometer</li> </ul> </li> <li>o Content displayed on the multi-information display</li> </ul>                                                                                                                                                                                                                                                            |

## NEXT



|    |                                   |
|----|-----------------------------------|
| 3. | <b>CHECK TECHSTREAM OPERATION</b> |
|----|-----------------------------------|

### HINT:

Read the Techstream operators manual before use [INFO](#) .

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Check that the Techstream and ECUs can communicate with the ignition switch ON.

### HINT:

- If communication is not possible, the Techstream screen will indicate an error.
- If communication between the Techstream and ECUs is not possible, either the Techstream or vehicle has a malfunction.
- When communication between the Techstream and the vehicle is not possible, but communication is possible when the Techstream is connected to another vehicle, the vehicle has the malfunction. Inspect the

CANH and CANL branch lines of the DLC3 and the ECU power source circuits (in this case perform steps 7 to 9 first). In addition, check that the BAT terminal of the DLC3 receives battery voltage (11 V or more).

- If communication between the Techstream and ECUs is still not possible even when the Techstream is connected to another vehicle, the Techstream has a malfunction. Perform the self tests described in the Techstream operators manual. (The Techstream may be malfunctioning or its battery may be discharged.)

| RESULT                                                                                                                                     | PROCEED TO |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------|
| OK (Communication between the Techstream and the vehicle is possible.)                                                                     | A          |
| OK (Communication between the Techstream and the vehicle is not possible but communication is possible when connected to another vehicle.) | B          |
| NG (Communication is not possible between the Techstream and the vehicle, nor between the Techstream and another vehicle.)                 | C          |

**B** ▶ Go to step 7

**C** ▶ Refer to Techstream operator's manual

**A**



|           |                  |
|-----------|------------------|
| <b>4.</b> | <b>CHECK DTC</b> |
|-----------|------------------|

(a) Using the Techstream, perform Health Check to read current and history DTCs and record them.

**NOTICE:**

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

**HINT:**

- If an open in a CAN main bus line, a short between the CAN bus lines (CANH and CANL) or a +B or ground short in a CAN bus occurs, DTCs of almost all ECUs and sensors on the CAN bus may be output (or a message indicating a communication error may be displayed on the Techstream screen). In this case, check the resistance of the CAN bus (steps 7 to 9) first.
- If an open occurs in just one of the lines of a CAN branch, DTCs which are not related to malfunctioning parts may be output (DTCs may be displayed randomly), or a message indicating a communication error may be displayed on the Techstream.

(b) Read the freeze frame data using the Techstream and record it.

**NEXT**



5.

**PERFORM COMMUNICATION MALFUNCTION CHECK (CONNECTION STATUS CHECK USING TECHSTREAM)**

- (a) Select "Communication Malfunction Check" from the screen on the Techstream.
- (b) Record all the DTCs stored for ECUs and sensors.

**NEXT**



6.

**PERFORM CAN BUS CHECK (CONNECTION STATUS CHECK USING TECHSTREAM)**

- (a) Based on the vehicle equipment and specifications, confirm the systems that use CAN communication  .
- (b) Select "CAN Bus Check" from the screen on the Techstream.
- (c) Observe the screen for approximately 2 minutes to check the ECUs and sensors displayed on the screen.

**NEXT**



7.

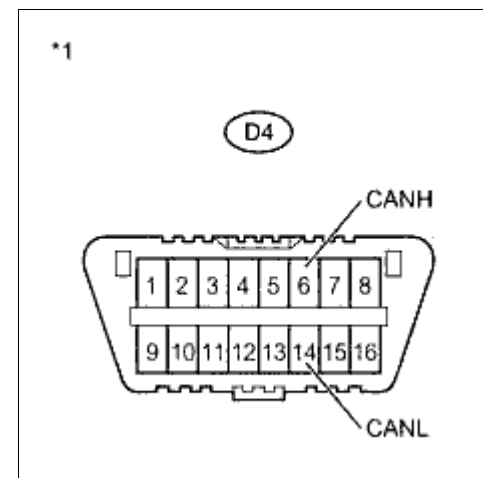
**CHECK DLC3 BRANCH LINE AND V BUS MAIN LINE (CANH - CANL)**

**NOTICE:**

Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.

**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) Disconnect the cable from the negative (-) battery terminal.

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| D4-6 (CANH) - D4-14 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

#### Text in Illustration

|    |      |
|----|------|
| *1 | DLC3 |
|----|------|

| RESULT                     | PROCEED TO |
|----------------------------|------------|
| OK                         | A          |
| NG (70 $\Omega$ or higher) | B          |
| NG (Below 54 $\Omega$ )    | C          |

**B** ► GO TO OPEN IN CAN MAIN BUS LINE

**C** ► GO TO SHORT IN CAN BUS LINES

**A**  
▼

|    |                                                   |
|----|---------------------------------------------------|
| 8. | CHECK FOR SHORT TO GND IN V BUS (CANH, CANL - CG) |
|----|---------------------------------------------------|

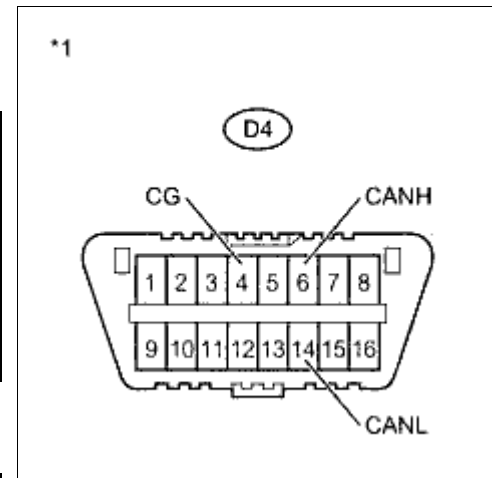
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TESTER CONNECTION        | CONDITION                                             | SPECIFIED CONDITION    |
|--------------------------|-------------------------------------------------------|------------------------|
| D4-6 (CANH) - D4-4 (CG)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |
| D4-14 (CANL) - D4-4 (CG) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |

**Text in Illustration**

|    |      |
|----|------|
| *1 | DLC3 |
|----|------|



**NG** ► GO TO SHORT TO GND IN CAN BUS LINE

**OK**



|           |                                                          |
|-----------|----------------------------------------------------------|
| <b>9.</b> | <b>CHECK FOR SHORT TO +B IN V BUS (CANH, CANL - BAT)</b> |
|-----------|----------------------------------------------------------|

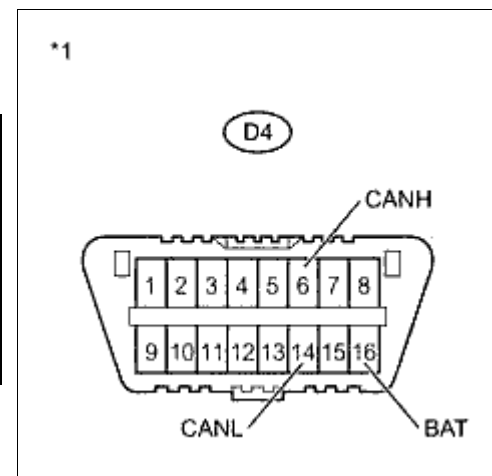
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION    |
|----------------------------|-------------------------------------------------------|------------------------|
| D4-6 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher |
| D4-14 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher |

**Text in Illustration**

|    |      |
|----|------|
| *1 | DLC3 |
|----|------|



**NG** ► GO TO SHORT TO +B IN CAN BUS LINE

**OK**



|     |                                                                                 |
|-----|---------------------------------------------------------------------------------|
| 10. | <b>CHECK RESULT OF CAN BUS CHECK (CONNECTION STATUS CHECK USING TECHSTREAM)</b> |
|-----|---------------------------------------------------------------------------------|

(a) Inspect or repair the probable malfunctioning part based on the check result of step 6 (the step in which CAN bus check was performed).

Result of CAN Bus Check (Connection Status Check Using Techstream):

| RESULT                                                                                                                                                                                                                                                                                                            | PROCEED TO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| All ECUs and sensors connected to the CAN communication system are displayed on the screen.<br>(CAN bus circuit is currently normal.)                                                                                                                                                                             | A          |
| <ul style="list-style-type: none"><li>• All ECUs except the network gateway ECU connected to sub bus 2 are not displayed on the screen.</li><li>• The network gateway ECU (Gateway) outputs DTC U1002.</li></ul><br>(Open or short in sub bus 2 main lines.)                                                      | B          |
| All ECUs connected to sub bus 2 are not displayed on the screen.<br>(Open in network gateway ECU branch lines or network gateway ECU malfunction.)                                                                                                                                                                | C          |
| One of the ECUs and sensors connected to the V Bus is not displayed on the screen.<br>(Open in ECU or sensor branch lines, or communication interrupted.)                                                                                                                                                         | D          |
| One of the ECUs and sensors connected to sub bus 2 is not displayed on the screen.*<br>(Open in ECU or sensor branch lines, or communication interrupted.)                                                                                                                                                        | E          |
| In addition to ECUs and sensors which are connected to the CAN communication system but are not displayed on the screen, there are ECUs or sensors for which the detection status changes (changes between detected and not detected) during the inspection.<br>(Open in one side of ECU or sensor branch lines.) | F          |

#### NOTICE:

- \*: In this case, as the network gateway ECU (Gateway) outputs communication DTCs (DTCs that start with U), the problem area can be determined from those DTCs.
- Non-installed ECUs or sensors will not be displayed. Do not mistake them for being in communication stop mode.
- It may be possible to select buses that do not have ECUs or sensors from the bus selection pull-down menu on the Techstream. This is not a malfunction. (This occurs when optional devices are not on a sub bus that is monitored by a gateway function equipped ECU.)

#### HINT:

- Regarding CAN Bus Check, refer to How to Interpret CAN Bus Check Screen .
- If the detection status of ECUs changes during the inspection, one of the branch lines of a connected ECU or sensor may be open. (Signals from the ECU or sensor that has an open in one of its branch lines create electrical noise, affecting response to the Techstream and whether or not the ECUs and sensors are displayed.)
- Regarding the ECUs connected to sub bus 2, the network gateway ECU displays communicating ECUs on the Techstream. If the communication between the network gateway ECU and an ECU stops for 10 seconds or more, the ECU will no longer be displayed on the Techstream.
- Regarding the communication stop mode for ECUs connected to sub bus 2, refer to the inspection procedure for the DTCs that indicate a communication stop.

**B** ► **GO TO U1002 (Gateway)**

**C** ► **GO TO GATEWAY ECU COMMUNICATION STOP MODE**

**D** ► **GO TO COMMUNICATION STOP MODE TABLE**

**E** ► **GO TO DIAGNOSTIC TROUBLE CODE CHART**

**F** ► **GO TO OPEN IN ONE SIDE OF CAN BRANCH LINE**

**A**



|            |                                                                                        |
|------------|----------------------------------------------------------------------------------------|
| <b>11.</b> | <b>CHECK RESULT OF COMMUNICATION MALFUNCTION CHECK (SELECT THE MALFUNCTIONING BUS)</b> |
|------------|----------------------------------------------------------------------------------------|

(a) Inspect or repair the probable malfunctioning part based on the check result of step 5 (the step in which checking for communication malfunction DTCs was performed).

Check Result of Communication Malfunction Check (Select Malfunctioning Bus):

| RESULT                                                                                                                                                              | PROCEED TO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| The sub bus monitor ECU has not output communication DTCs but ECUs connected to the V bus have stored communication DTCs.<br>(A malfunction occurred in the V Bus.) | A          |
| The network gateway ECU (Gateway) outputs DTC U1002.<br>(A malfunction occurred in sub bus 2.)                                                                      | B          |
| The network gateway ECU outputs DTCs other than DTC U1002.<br>(A malfunction occurred in an ECU branch line connected to sub bus 2.)                                | C          |

**HINT:**

- The term "sub bus monitor ECU" refers to a gateway function equipped ECU that is able to monitor a bus and store DTCs.
- When checking for communication DTCs, refer to How to Interpret Communication DTCs (DTCs that start with U) .
- Because a gateway function equipped ECU (sub bus monitor ECU) monitors signals from all ECUs that are connected to its sub bus, a gateway function equipped ECU can detect ECUs with a communication stop more accurately. In this case, perform troubleshooting by referring to the DTC combination table for the sub bus .
- If communication DTCs are stored, and all ECUs and sensors connected to the CAN communication system are displayed on the CAN Bus Check screen of the Techstream, a past malfunction that is currently not occurring is suspected.
- When a CAN branch of the V bus is malfunctioning, because the ECUs and sensors related to it detect the malfunction, the problem area can be determined using the combination of DTCs that are output.
- When sub bus 2 is malfunctioning, the network gateway ECU detects a communication stop for connected ECUs and a network communication error, and stores DTCs.

- On the Techstream, the Gateway item displays the DTCs for ECUs connected to sub bus 2.
- When both the sub bus monitor ECU and the ECUs connected to the V bus store communication DTCs, check and repair the corresponding sub bus first.

**B** ► **GO TO U1002 (Gateway)**

**C** ► **GO TO DIAGNOSTIC TROUBLE CODE CHART**

**A**



|            |                              |
|------------|------------------------------|
| <b>12.</b> | <b>DTC COMBINATION TABLE</b> |
|------------|------------------------------|

(a) Confirm the problem according to the combination of output DTCs regarding the CAN communication system **INFO** .

| RESULT                                              | PROCEED TO |
|-----------------------------------------------------|------------|
| Combination of DTCs is not in DTC Combination Table | A          |
| Combination of DTCs is in DTC Combination Table     | B          |

**HINT:**

CAN communication system history DTCs may indicate the problem if CAN communication system DTCs are output and all ECUs and sensors connected to the CAN communication system are displayed on CAN Bus Check of the Techstream.

**B** ► **GO TO COMMUNICATION STOP MODE TABLE**

**A**



|            |                                                                          |
|------------|--------------------------------------------------------------------------|
| <b>13.</b> | <b>IDENTIFICATION OF PROBLEM (PAST MALFUNCTION IN MAIN BUS OF V BUS)</b> |
|------------|--------------------------------------------------------------------------|

(a) Connect the cable to the negative (-) battery terminal.

(b) Clear the DTCs using the Techstream.

(c) Perform the tests in Symptom Simulation to check the wire harnesses and connectors including those for V bus main bus lines **INFO** .

(d) Based on the results of the check, inspect the parts that output DTCs to determine the malfunctioning part.

**HINT:**

If DTCs are output, do not turn the ignition switch off.

**NEXT**



|     |                       |
|-----|-----------------------|
| 14. | REPAIR OR REPLACEMENT |
|-----|-----------------------|

**NEXT**



|     |                   |
|-----|-------------------|
| 15. | CONFIRMATION TEST |
|-----|-------------------|

**NEXT**  **END**



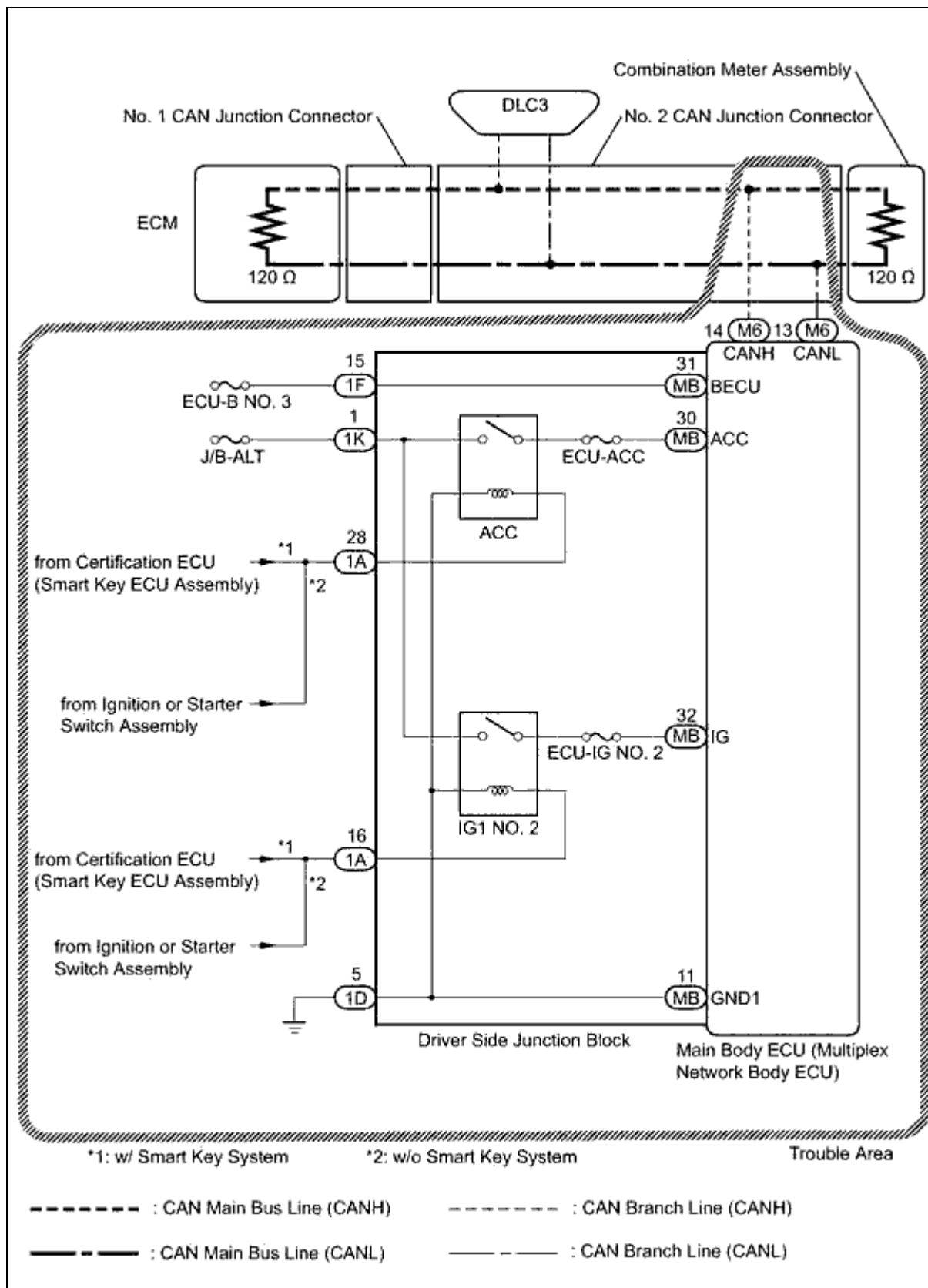
|                                                                                                                                   |                      |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                  | 6.6 J                | <b>Doc ID:</b> RM000001F1V094X           |
| <b>Model Year Start:</b> 2016                                                                                                     | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Main Body ECU Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Main Body ECU Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                        | SYMPTOM                                                                                                                                                                                                                                                                                                                                                   | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Main Body ECU Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>"Main Body" is not displayed on the CAN Bus Check screen of the Techstream<br/><b>INFO</b></li> <li>Communication system DTCs (DTCs that start with U) that correspond to "Main Body ECU Communication Stop Mode" in "DTC Combination Table" are output<br/><b>INFO</b></li> </ul> | <ul style="list-style-type: none"> <li>Main body ECU (multiplex network body ECU) branch line or connector</li> <li>Power source circuit of main body ECU (multiplex network Body ECU) or driver side junction block</li> <li>Main body ECU (multiplex network body ECU) ground circuit or driver side junction block</li> <li>Main body ECU (multiplex network body ECU) or driver side junction block</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect

the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.

- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work **INFO** .
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO** .
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, and wait at least 20 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO** .
- If the main body ECU (multiplex network body ECU) is replaced, refer to Registration **INFO** .

#### 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 may help determine the cause of the malfunction.

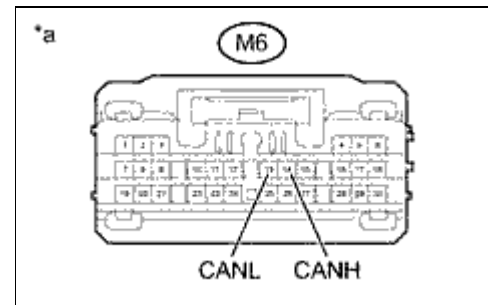
## PROCEDURE

1.

### CHECK FOR OPEN IN CAN BUS LINES (MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU) BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the main body ECU (multiplex network body ECU) connector.



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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| M6-14 (CANH) - M6-13 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 Ω          |

#### Text in Illustration

\*a

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

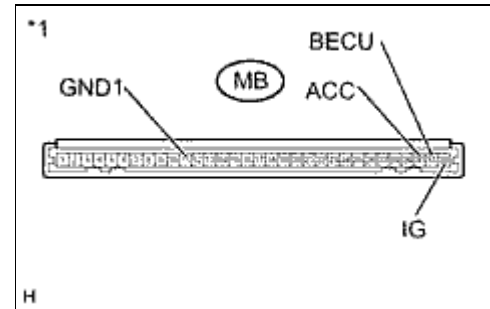
OK



## 2. CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)

(a) Remove the main body ECU (multiplex network body ECU)

INFO



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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| MB-11 (GND1) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |

(c) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION          | SWITCH CONDITION    | SPECIFIED CONDITION |
|----------------------------|---------------------|---------------------|
| MB-30 (ACC) - Body ground  | Ignition switch ACC | 11 to 14 V          |
| MB-31 (BECU) - Body ground | Always              | 11 to 14 V          |
| MB-32 (IG) - Body ground   | Ignition switch ON  | 11 to 14 V          |

### Text in Illustration

|    |                            |
|----|----------------------------|
| *1 | Driver Side Junction Block |
|----|----------------------------|

### Result

| RESULT                | PROCEED TO |
|-----------------------|------------|
| OK                    | A          |
| NG (for BECU circuit) | B          |
| NG (for ACC circuit)  | C          |

| RESULT                | PROCEED TO |
|-----------------------|------------|
| NG (for IG circuit)   | D          |
| NG (for GND1 circuit) | E          |

**B** ► GO TO STEP 3

**C** ► GO TO LIGHTING SYSTEM (ACC SIGNAL CIRCUIT)

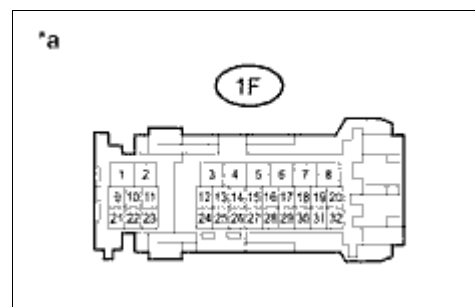
**D** ► GO TO LIGHTING SYSTEM (IG SIGNAL CIRCUIT)

**E** ► GO TO STEP 4

**A** ► REPLACE MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)

|           |                                                   |
|-----------|---------------------------------------------------|
| <b>3.</b> | <b>CHECK HARNESS AND CONNECTOR (BECU CIRCUIT)</b> |
|-----------|---------------------------------------------------|

(a) Disconnect the driver side junction block connector.



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

Standard Voltage:

| TESTER CONNECTION   | CONDITION | SPECIFIED CONDITION |
|---------------------|-----------|---------------------|
| 1F-15 - Body ground | Always    | 11 to 14 V          |

#### Text in Illustration

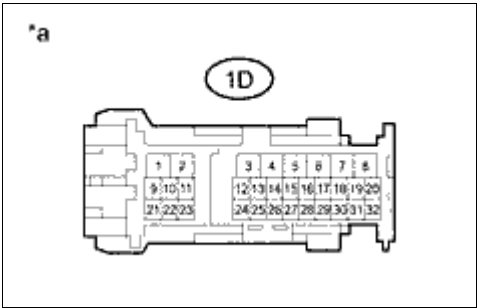
|    |                                                                         |
|----|-------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Driver Side Junction Block) |
|----|-------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR (BECU CIRCUIT)

**OK** ► REPLACE DRIVER SIDE JUNCTION BLOCK

|    |                                            |
|----|--------------------------------------------|
| 4. | CHECK HARNESS AND CONNECTOR (GND1 CIRCUIT) |
|----|--------------------------------------------|

(a) Disconnect the driver side junction block connector.



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

Standard Resistance:

| TESTER CONNECTION  | CONDITION | SPECIFIED CONDITION |
|--------------------|-----------|---------------------|
| 1D-5 - Body ground | Always    | Below 1 Ω           |

Text in Illustration

|    |                                                                         |
|----|-------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Driver Side Junction Block) |
|----|-------------------------------------------------------------------------|

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR (GND1 CIRCUIT)

OK ► REPLACE DRIVER SIDE JUNCTION BLOCK



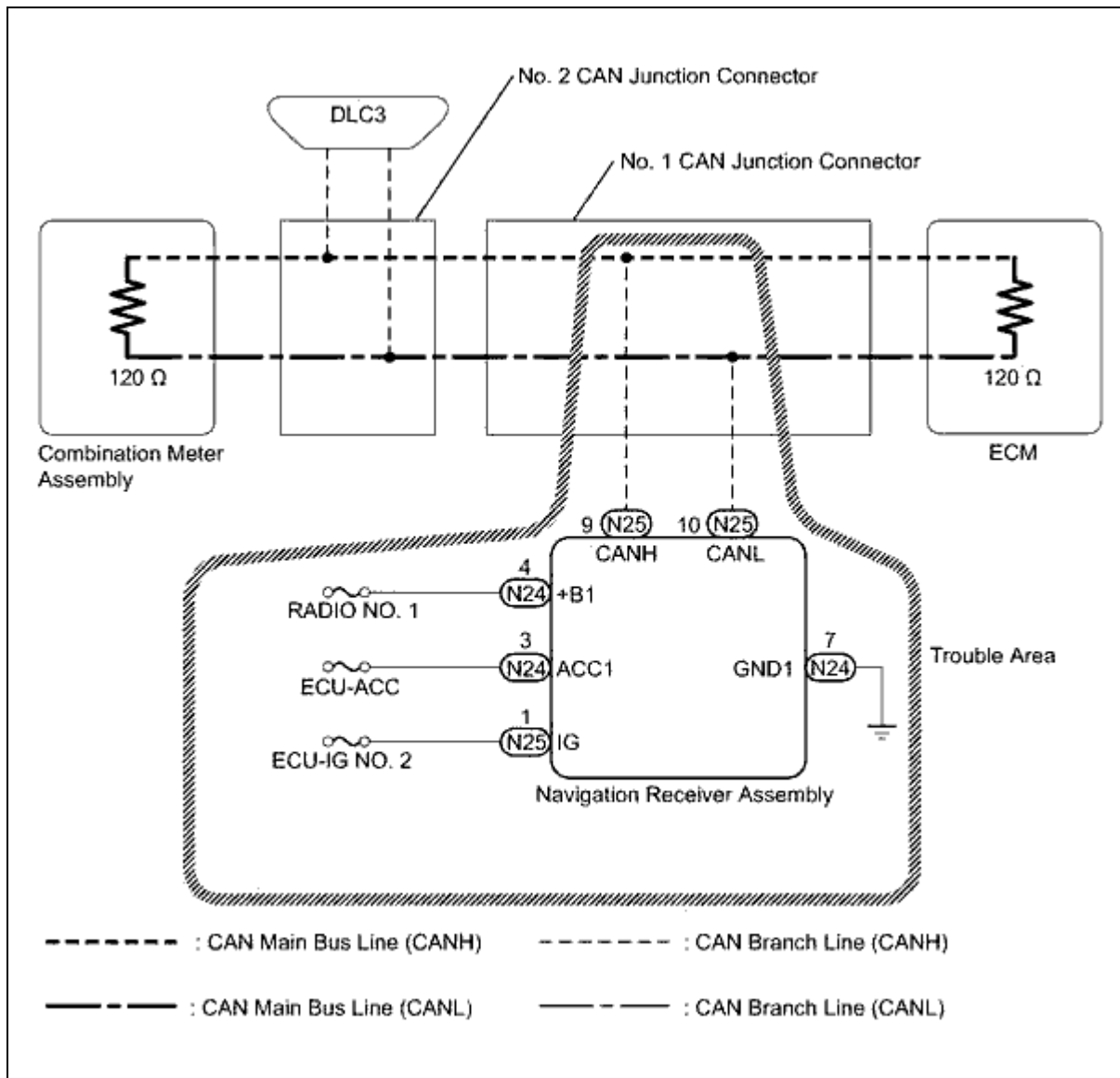
|                                                                                                                                                  |                      |                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                                 | 6.6 J                | <b>Doc ID:</b> RM00000109K0G3X           |
| <b>Model Year Start:</b> 2016                                                                                                                    | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Navigation Receiver Assembly Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Navigation Receiver Assembly Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                                       | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                  | TROUBLE AREA                                                                                                                                                                                                                                                             |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Navigation Receiver Assembly Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• "Display and Navigation (AVN1)" is not displayed on the CAN Bus Check screen of the Techstream <b>INFO</b></li> <li>• Communication system DTCs (DTCs that start with U) that correspond to "Navigation Receiver Assembly Communication Stop Mode" in "DTC Combination Table" are output <b>INFO</b></li> </ul> | <ul style="list-style-type: none"> <li>• Navigation receiver assembly branch line or connector</li> <li>• Power source circuit of navigation receiver assembly</li> <li>• Navigation receiver assembly ground circuit</li> <li>• Navigation receiver assembly</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work [INFO](#).
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output [INFO](#).
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 31 seconds.
- After the repair, perform the CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed [INFO](#).

### 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 may help determine the cause of the malfunction.

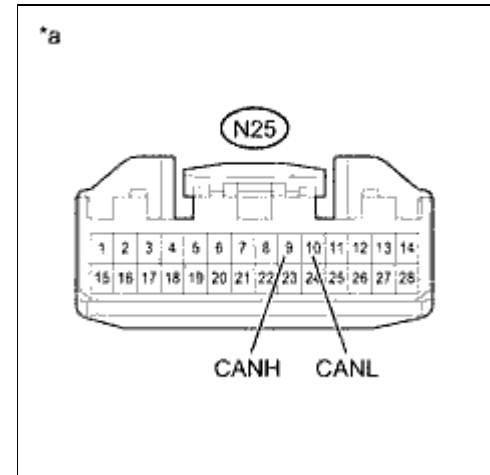
## PROCEDURE

1.

### CHECK FOR OPEN IN CAN BUS LINES (NAVIGATION RECEIVER ASSEMBLY BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the navigation receiver assembly connector.



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

Standard Resistance:

| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION |
|------------------------------|-------------------------------------------------------|---------------------|
| N25-9 (CANH) - N25-10 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

#### Text in Illustration

\*a

Front view of wire harness connector  
(to Navigation Receiver Assembly)

NG

REPAIR OR REPLACE CAN BRANCH LINE OR  
CONNECTOR (NAVIGATION RECEIVER ASSEMBLY)

OK

2.

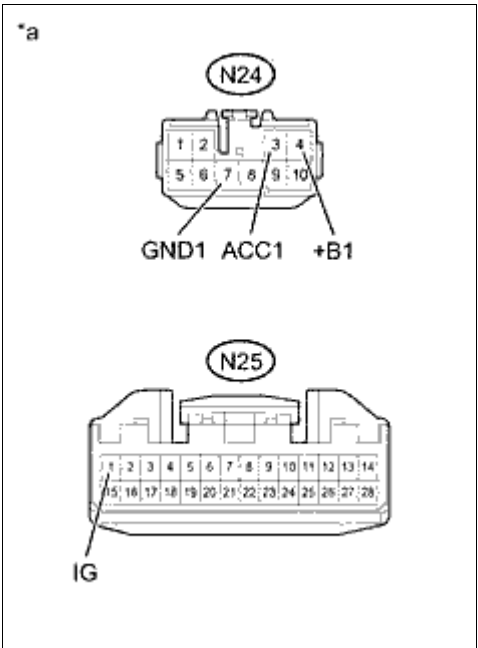
### CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)

(a) Disconnect the navigation receiver assembly connector.

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| N24-7 (GND1) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(c) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION          | SWITCH CONDITION    | SPECIFIED CONDITION |
|----------------------------|---------------------|---------------------|
| N24-3 (ACC1) - Body ground | Ignition switch ACC | 11 to 14 V          |
| N24-4 (+B1) - Body ground  | Always              | 11 to 14 V          |
| N25-1 (IG) - Body ground   | Ignition switch ON  | 11 to 14 V          |

**Text in Illustration**

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Navigation Receiver Assembly) |
|----|---------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ► REPLACE NAVIGATION RECEIVER ASSEMBLY



|                                                                                                                       |                      |                                          |
|-----------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                      | 6.6 J                | <b>Doc ID:</b> RM000001V9P0BEX           |
| <b>Model Year Start:</b> 2016                                                                                         | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Open in CAN Main Bus Line; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

[Open in CAN Main Bus Line](#)

## DESCRIPTION

There may be an open circuit in one of the V bus main lines and/or a DLC3 branch line when the resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is 70  $\Omega$  or higher.

| SYMPTOM                                                                               | TROUBLE AREA                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resistance between terminals 6 (CANH) and 14 (CANL) of DLC3 is 70 $\Omega$ or higher. | <ul style="list-style-type: none"> <li>• DLC3 branch line or connector</li> <li>• CAN main bus line or connector</li> <li>• ECM</li> <li>• Combination meter assembly</li> <li>• No. 1 CAN junction connector</li> <li>• No. 2 CAN junction connector</li> </ul> |

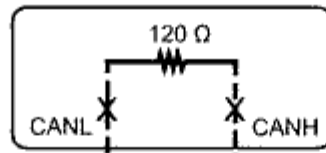
This malfunction is not related to the lines of a CAN main bus branch or to ECUs or sensors connected a CAN main bus branch.

## WIRING DIAGRAM

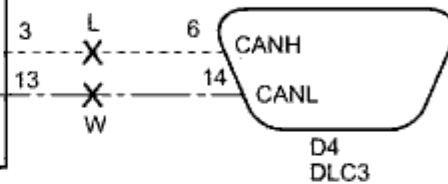
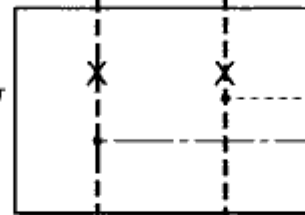
V Bus:

x: Suspected Area

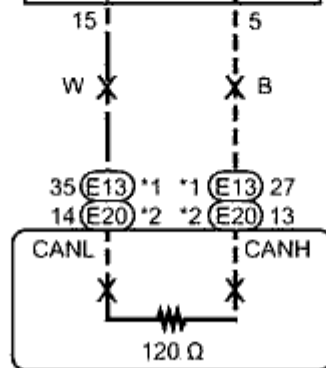
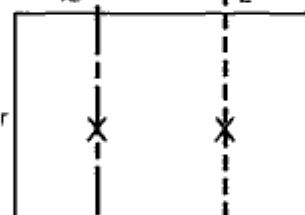
C9  
Combination Meter Assembly



J3  
No. 2 CAN Junction Connector



J16  
No. 1 CAN Junction Connector



ECM

\*1: for 2GR-FKS

\*2: for 2TR-FE

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

- - - - - : CAN Branch Line (CANH)

- - - - : CAN Main Bus Line (CANL)

- - - - - : CAN Branch Line (CANL)

## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work [INFO](#).

- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, and wait at least 60 seconds.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

#### 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 may help determine the cause of the malfunction.

## PROCEDURE

### 1. CHECK FOR OPEN IN CAN BUS LINES (DLC3 BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

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

Standard Resistance:

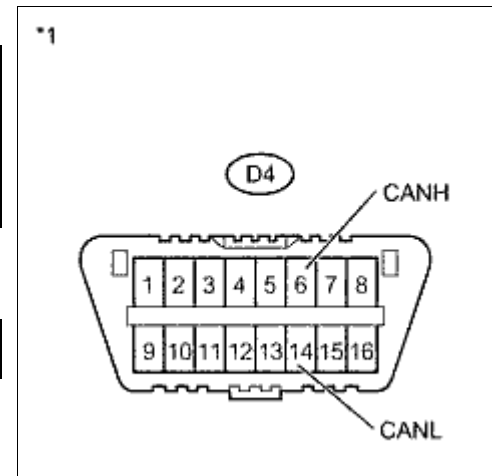
| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| D4-6 (CANH) - D4-14 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

#### Text in Illustration

|    |      |
|----|------|
| *1 | DLC3 |
|----|------|

#### NOTICE:

When the measured value is 133  $\Omega$  or higher and a CAN communication system DTC is output, there may be a fault besides disconnection of the DLC3 branch line. For that reason, troubleshooting should be performed again from How to Proceed with Troubleshooting after repairing the trouble area **INFO**.

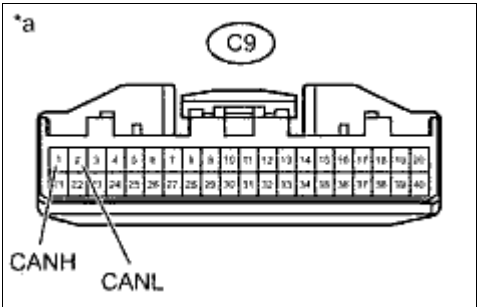


**NG** REPAIR OR REPLACE CAN BRANCH LINE CONNECTED TO DLC3

**OK**

|    |                                                                                                    |
|----|----------------------------------------------------------------------------------------------------|
| 2. | <b>CHECK FOR OPEN IN CAN BUS LINES (COMBINATION METER ASSEMBLY - NO. 2 CAN JUNCTION CONNECTOR)</b> |
|----|----------------------------------------------------------------------------------------------------|

(a) Disconnect the combination meter assembly connector.



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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED CONDITION |
|---------------------------|-------------------------------------------------------|---------------------|
| C9-1 (CANH) - C9-2 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 Ω        |

**Text in Illustration**

|    |                                                                         |
|----|-------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Combination Meter Assembly) |
|----|-------------------------------------------------------------------------|

**NG** ► **GO TO STEP 3**

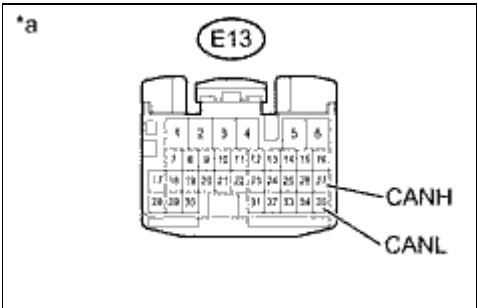
**OK** ► **REPLACE COMBINATION METER ASSEMBLY**

|    |                                                                             |
|----|-----------------------------------------------------------------------------|
| 3. | <b>CHECK FOR OPEN IN CAN BUS LINES (ECM - NO. 1 CAN JUNCTION CONNECTOR)</b> |
|----|-----------------------------------------------------------------------------|

(a) for 2GR-FKS

(1) Reconnect the C9 combination meter assembly connector.

(2) Disconnect the ECM connector.



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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| E13-27 (CANH) - E13-35 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

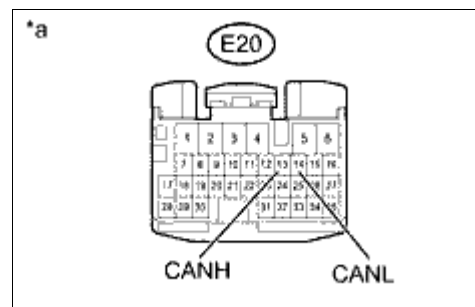
#### Text in Illustration

|    |                                               |
|----|-----------------------------------------------|
| *a | Front view of wire harness connector (to ECM) |
|----|-----------------------------------------------|

(b) for 2TR-FE

(1) Reconnect the C9 combination meter assembly connector.

(2) Disconnect the ECM connector.



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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| E20-13 (CANH) - E20-14 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

#### Text in Illustration

|    |                                               |
|----|-----------------------------------------------|
| *a | Front view of wire harness connector (to ECM) |
|----|-----------------------------------------------|

#### Result

| RESULT           | PROCEED TO |
|------------------|------------|
| OK (for 2GR-FKS) | A          |
| OK (for 2TR-FE)  | B          |
| NG               | C          |

**B** **REPLACE ECM**

**C** **GO TO STEP 4**

## A ▶ REPLACE ECM

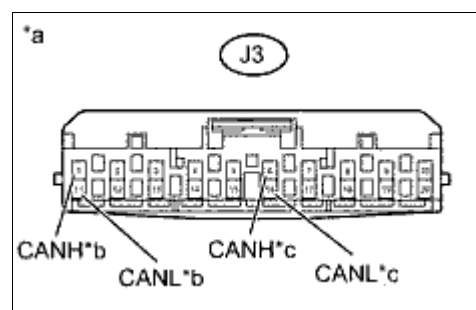
### 4. CHECK FOR OPEN IN CAN BUS LINES (NO. 2 CAN JUNCTION CONNECTOR)

(a) Reconnect the E13\*1 or E20\*2 ECM connector.

\*1: for 2GR-FKS

\*2: for 2TR-FE

(b) Disconnect the No. 2 CAN junction connector.



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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION | CONNECTED TO                 |
|----------------------------|-------------------------------------------------------|---------------------|------------------------------|
| J3-1 (CANH) - J3-11 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ | No. 1 CAN junction connector |
| J3-6 (CANH) - J3-16 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ | Combination meter assembly   |

#### Text in Illustration

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to No. 2 CAN Junction Connector) |
| *b | to No. 1 CAN Junction Connector                                           |
| *c | to Combination Meter Assembly                                             |

#### Result

| RESULT                                      | PROCEED TO |
|---------------------------------------------|------------|
| OK                                          | A          |
| NG (Combination meter assembly main line)   | B          |
| NG (No. 1 CAN Junction Connector main line) | C          |

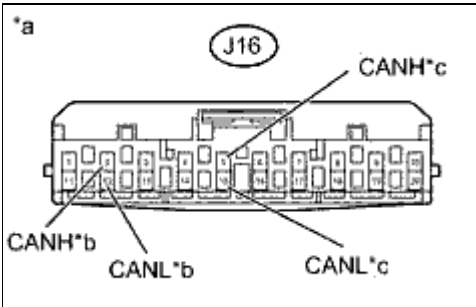
## B ▶ REPAIR OR REPLACE CAN MAIN BUS LINE OR CONNECTOR (NO. 2 CAN JUNCTION CONNECTOR - COMBINATION METER ASSEMBLY)

**C** ► **GO TO STEP 5**

**A** ► **REPLACE NO. 2 CAN JUNCTION CONNECTOR**

|           |                                                                       |
|-----------|-----------------------------------------------------------------------|
| <b>5.</b> | <b>CHECK FOR OPEN IN CAN BUS LINES (NO. 1 CAN JUNCTION CONNECTOR)</b> |
|-----------|-----------------------------------------------------------------------|

(a) Reconnect the J3 No. 2 CAN junction connector.



(b) Disconnect the No. 1 CAN junction connector.

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

Standard Resistance:

| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION | CONNECTED TO                 |
|------------------------------|-------------------------------------------------------|---------------------|------------------------------|
| J16-2 (CANH) - J16-12 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 Ω        | No. 2 CAN junction connector |
| J16-5 (CANH) - J16-15 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 Ω        | ECM                          |

**Text in Illustration**

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to No. 1 CAN Junction Connector) |
| *b | to No. 2 CAN Junction Connector                                           |
| *c | to ECM                                                                    |

**NG** ► **REPAIR OR REPLACE CAN MAIN BUS LINE OR CONNECTOR (NO. 1 CAN JUNCTION CONNECTOR - NO. 2 CAN JUNCTION CONNECTOR)**

**OK** ► **REPLACE NO. 1 CAN JUNCTION CONNECTOR**



|                                                                                                                             |                      |                                      |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                            | 6.6 J                | <b>Doc ID:</b> RM000001ZUR0AEX       |
| <b>Model Year Start:</b> 2016                                                                                               | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 - ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Open in One Side of CAN Branch Line; 2016 MY Tacoma [08/2015 - ] |                      |                                      |

**Open in One Side of CAN Branch Line**

## **DESCRIPTION**

If an ECU or sensor is not displayed on the CAN Bus Check screen of the Techstream and some ECUs and sensors repeatedly appear and disappear from the screen when the CAN main bus lines are normal (there is no open, short, short to +B or short to GND in the main bus lines), there may be an open circuit in either of the lines in a CAN branch.

### **HINT:**

If some ECUs and sensors repeatedly appear and disappear from the CAN Bus Check screen, communication between the normal ECUs (sensors) and the 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 lines. In this case, the CAN branch lines 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 lines).

| SYMPTOM                                                                             | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 or more ECUs and/or sensors do not appear on the Techstream CAN Bus Check screen. | <p>One side of CAN branch line is open, or output signals are incomplete.</p> <ul style="list-style-type: none"> <li>• Main body ECU (Multiplex network body ECU)</li> <li>• Air conditioning amplifier assembly</li> <li>• Airbag sensor assembly</li> <li>• Spiral cable with sensor sub-assembly (Steering sensor)</li> <li>• Certification ECU (Smart key ECU assembly)*1</li> <li>• 4 wheel drive control ECU*2</li> <li>• Navigation receiver assembly*3</li> <li>• Radio and display receiver assembly*4</li> <li>• Network gateway ECU*5</li> <li>• Door control and tire pressure monitoring system receiver assembly*6</li> <li>• Brake booster assembly (Skid control ECU)*7</li> <li>• Brake actuator assembly (Skid control ECU)*8</li> </ul> |

\*1: w/ Smart Key System

\*2: for 4WD

\*3: for Navigation Receiver Type

\*4: for Radio and Display Type

\*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*6: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*7: for Hydraulic Brake Booster

\*8: for Vacuum Brake Booster

## **INSPECTION PROCEDURE**

### **NOTICE:**

- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output .
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 60 seconds, and then drive the vehicle at a speed of 36 km/h (22 mph) or more for 6.2 seconds or more.
- After the repair, perform CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed .

### **HINT:**

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 may help determine the cause of the malfunction.

## **PROCEDURE**

|           |                                                        |
|-----------|--------------------------------------------------------|
| <b>1.</b> | <b>CHECK FOR OPEN IN ONE SIDE OF V BUS BRANCH LINE</b> |
|-----------|--------------------------------------------------------|

- (a) Based on the vehicle equipment and specifications, confirm the systems that use CAN communication .
- (b) Using the Techstream, select and perform the CAN bus check .
- (c) Observe the screen for approximately 2 minutes 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 the applicable communication stop mode for the ECU or sensor that is not displayed on the screen.

**NEXT**  **GO TO CORRESPONDING COMMUNICATION STOP MODE**

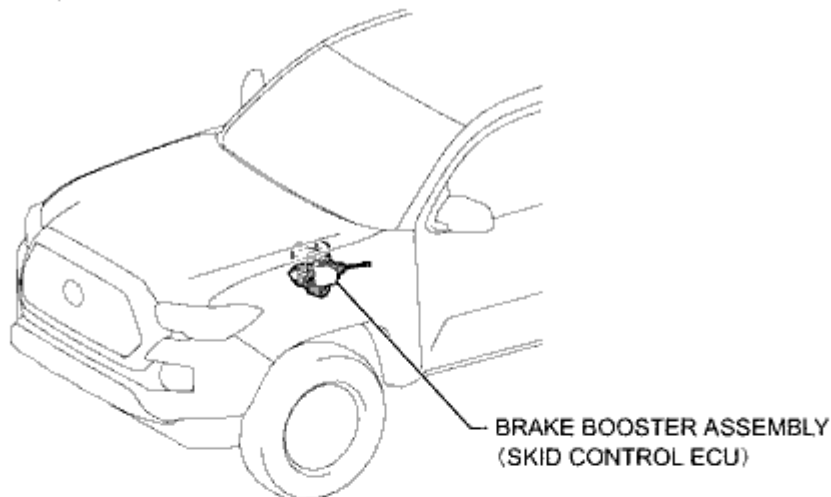


|                                                                                                        |                      |                                      |
|--------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                       | 6.6 R                | <b>Doc ID:</b> RM000004TIN018X       |
| <b>Model Year Start:</b> 2016                                                                          | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 - ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: PARTS LOCATION; 2016 MY Tacoma [08/2015 - ] |                      |                                      |

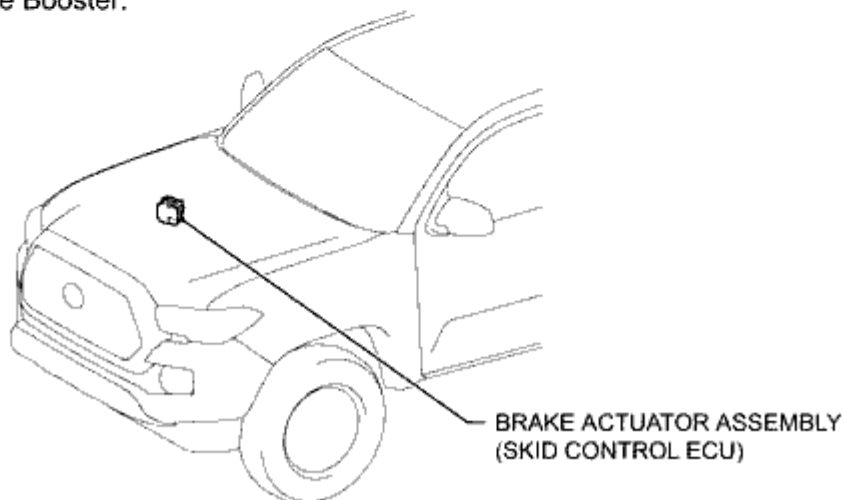
## PARTS LOCATION

### ILLUSTRATION

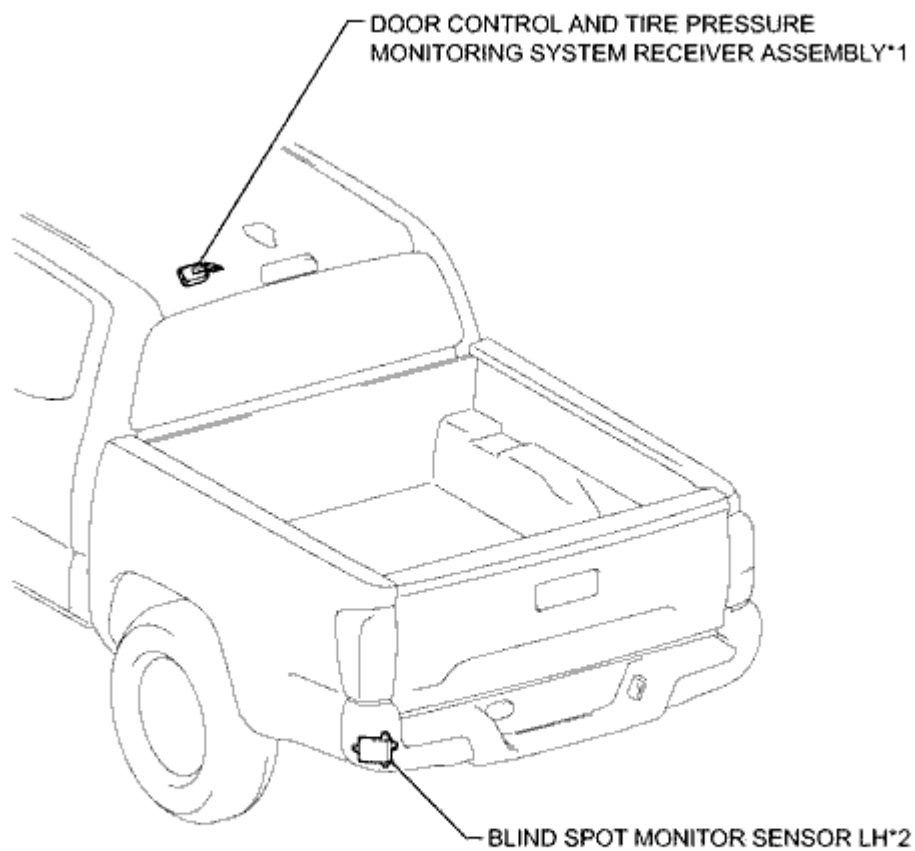
for Hydraulic Brake Booster:



for Vacuum Brake Booster:



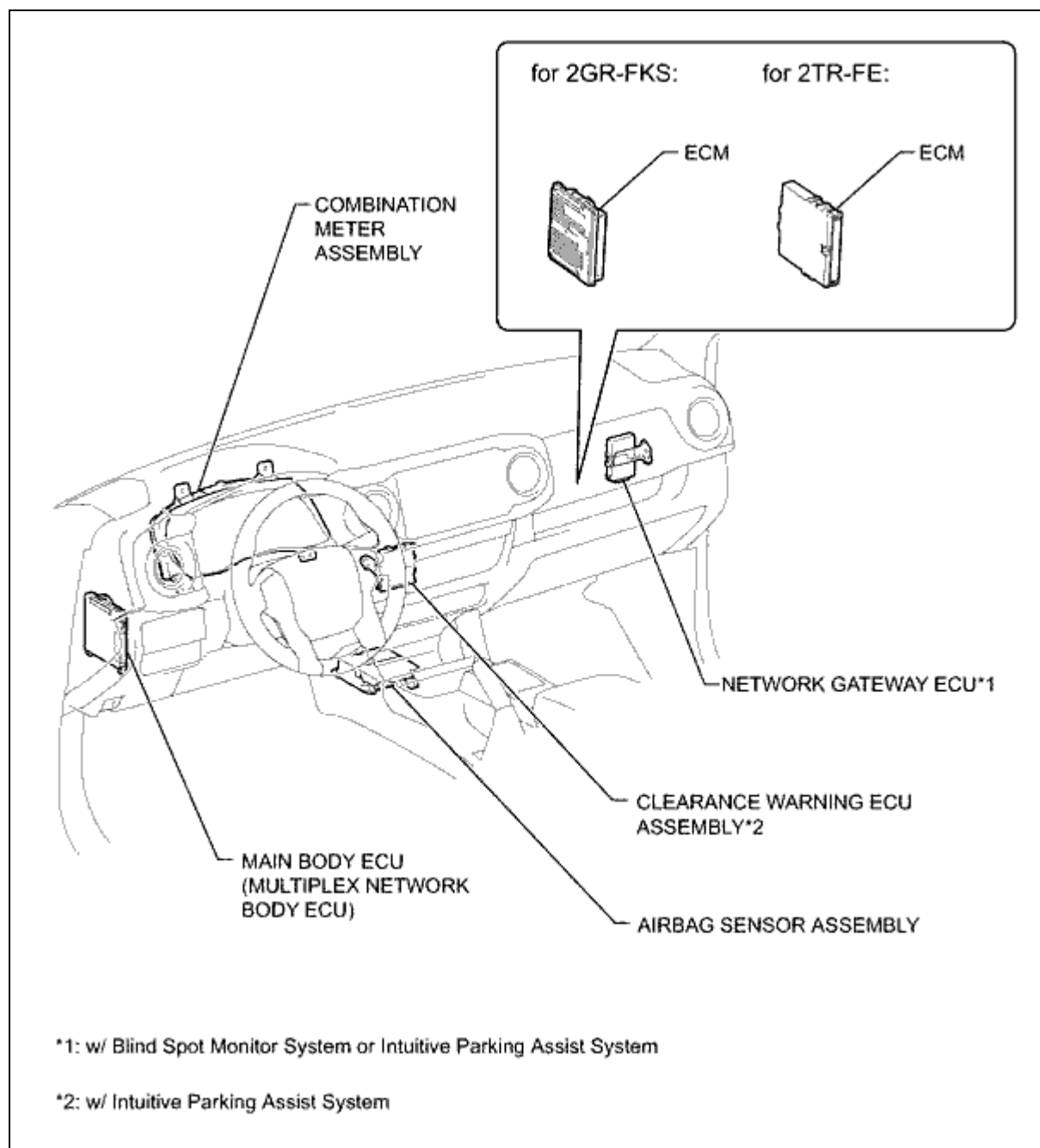
### ILLUSTRATION



\*1: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

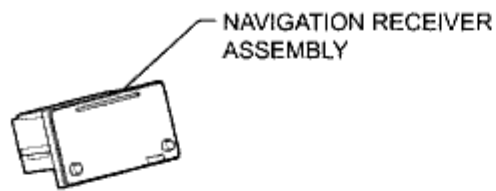
\*2: w/ Blind Spot Monitor System

## **ILLUSTRATION**

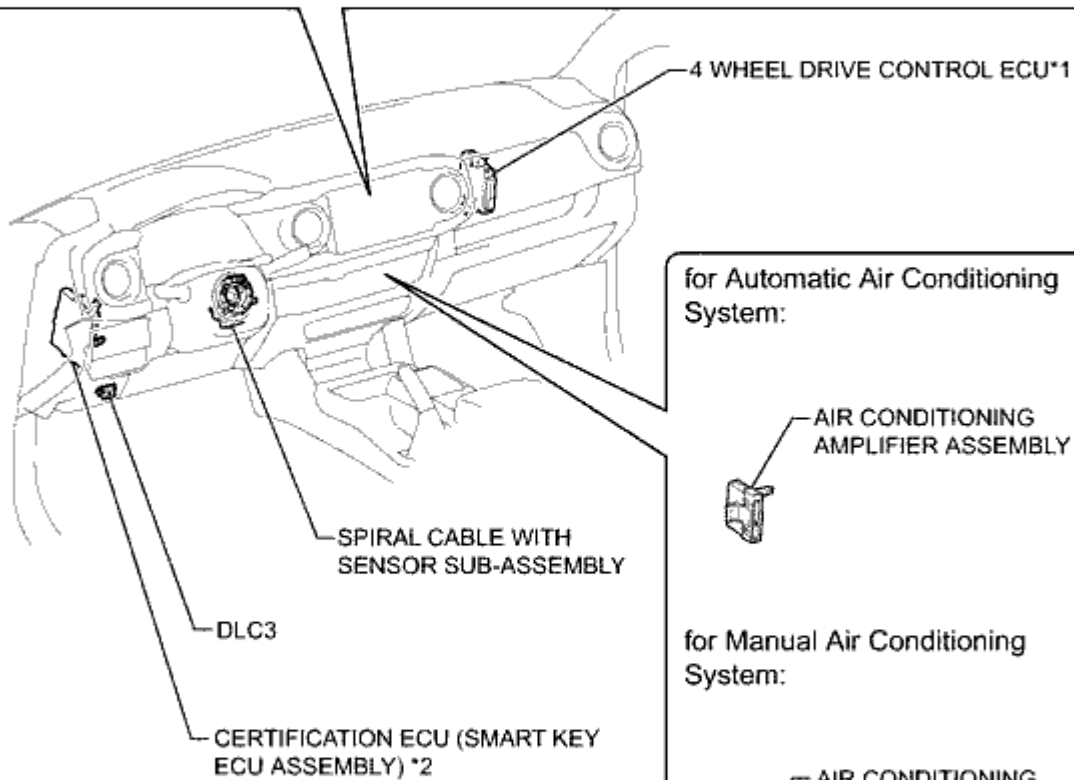
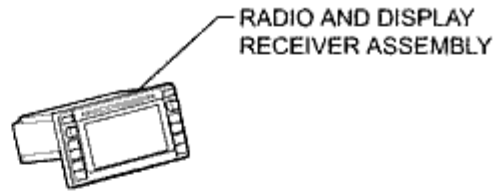


## ILLUSTRATION

for Navigation Receiver Type:



for Radio and Display Type:



for Automatic Air Conditioning System:



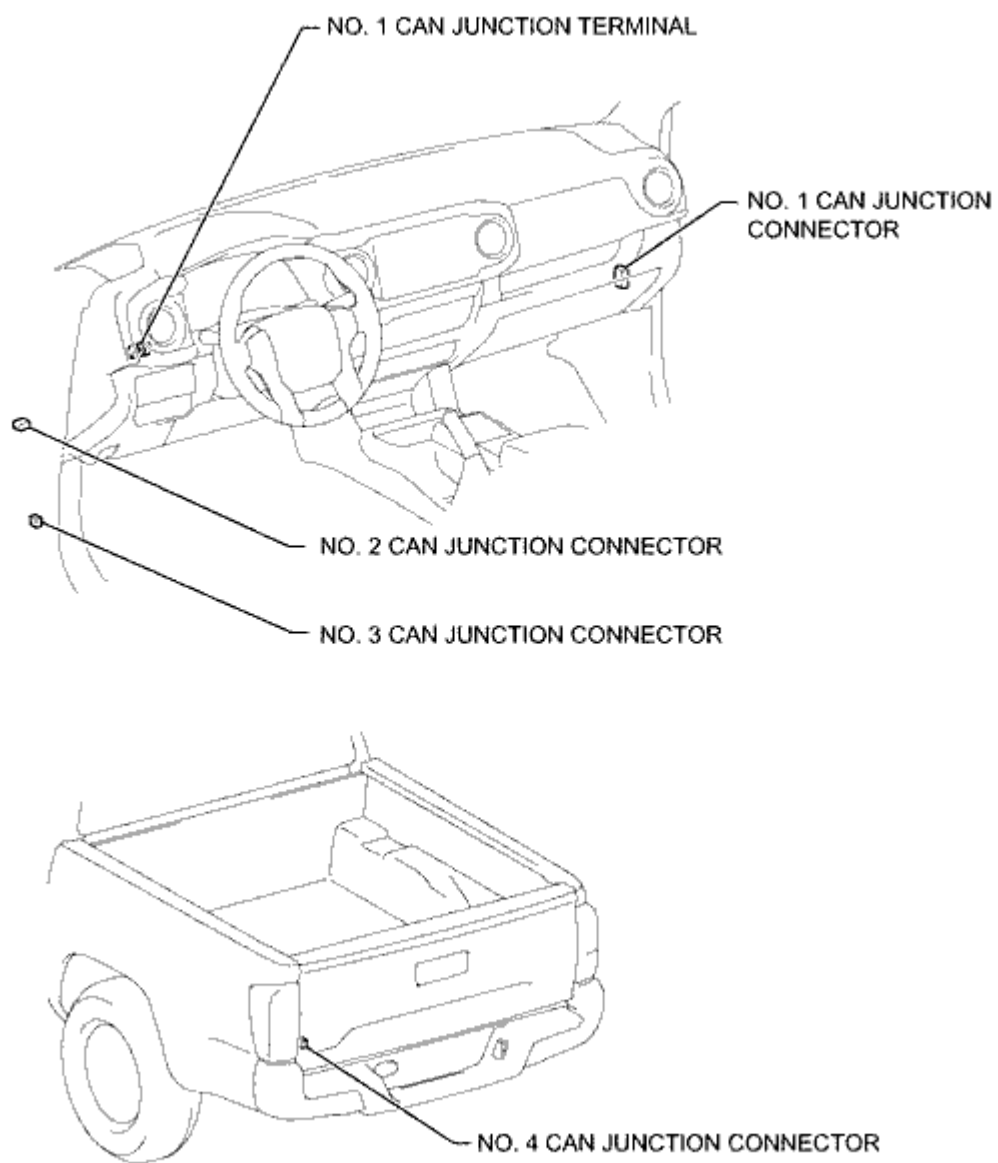
for Manual Air Conditioning System:



\*1: for 4WD

\*2: w/ Smart Key System

## ILLUSTRATION



|                                                                                                    |                      |                                      |
|----------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                   | 6.6 L                | <b>Doc ID:</b> RM000004TIL021X       |
| <b>Model Year Start:</b> 2016                                                                      | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 - ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: PRECAUTION; 2016 MY Tacoma [08/2015 - ] |                      |                                      |

## PRECAUTION

### 1. EXPRESSIONS OF IGNITION SWITCH

#### 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.

| EXPRESSION          | IGNITION SWITCH<br>(POSITION) | ENGINE SWITCH<br>(CONDITION) |
|---------------------|-------------------------------|------------------------------|
| Ignition Switch off | LOCK                          | Off (Lock)                   |
| Ignition Switch ACC | ACC                           | On (ACC)                     |
| Ignition Switch ON  | ON                            | On (IG)                      |
| Engine Start        | START                         | On (Start)                   |

### 2. CAN COMMUNICATION SYSTEM TROUBLESHOOTING

- (a) Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output

INFO

### 3. PRECAUTIONS FOR STEERING SYSTEM HANDLING

- (a) Be careful when replacing parts. Incorrect replacement could affect the performance of the steering system and result in hazardous driving.

### 4. PRECAUTIONS FOR SRS AIRBAG SYSTEM HANDLING

- (a) This vehicle is equipped with a Supplemental Restraint System (SRS) which includes parts such as airbags for the driver and front passenger. Failure to carry out service operations in the correct sequence could cause unexpected SRS deployment during servicing and may cause a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read Precaution for SRS

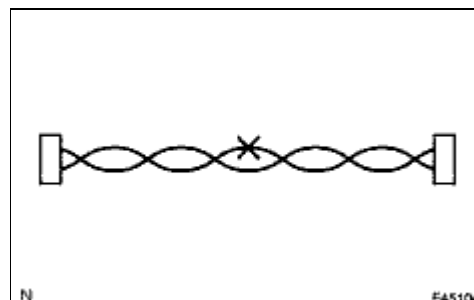
INFO

### 5. BUS LINE REPAIR

- (a) After repairing a bus line with solder, wrap the repaired part with electrical tape.

#### NOTICE:

- The CANL bus line and CANH bus line must be installed together at all times.
- When installing, make sure that these lines are twisted, because CAN bus lines are likely to be influenced by electrical noise if the bus lines are not twisted.
- Leave approximately 80 mm (3.15 in.) loose in the twisted wires around the connector.
- When repairing the CAN bus lines, do not change the length of the lines. (Make sure that the length of the CANH bus line and



CANL bus line are the same.)

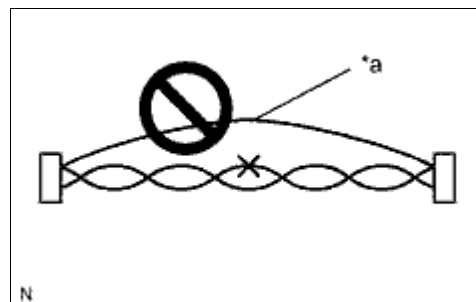
(b) Do not use bypass wiring between connectors.

#### Text in Illustration

|    |             |
|----|-------------|
| *a | Bypass Wire |
|----|-------------|

#### NOTICE:

- The ability of the twisted bus lines to resist interference will be lost if bypass wiring is used.
- Do not use a twisted pair of wires for bypass wiring.

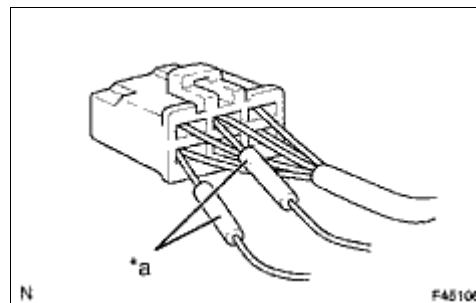


## 6. CONNECTOR HANDLING

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

#### Text in Illustration

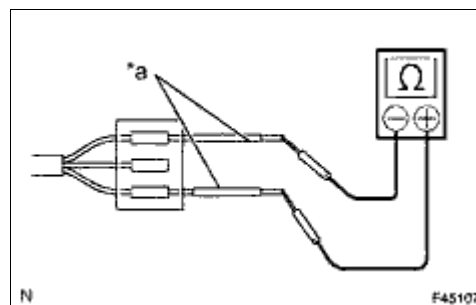
|    |              |
|----|--------------|
| *a | Tester Probe |
|----|--------------|



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

#### Text in Illustration

|    |              |
|----|--------------|
| *a | Service Wire |
|----|--------------|



## 7. PRECAUTIONS FOR INSPECTING OR REPLACING CAN JUNCTION CONNECTOR

(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 clamps.

## 8. PRECAUTIONS WHEN REPLACING A GATEWAY FUNCTION EQUIPPED ECU (SUB BUS MONITOR ECU) WITH A USED ONE FROM ANOTHER VEHICLE

(a) When a gateway function equipped ECU, network gateway ECU that was previously installed on another vehicle is used as a replacement part, it is necessary to initialize the connection information stored in the ECU.

#### NOTICE:

If the connection information stored in a gateway function equipped ECU that was previously installed on another vehicle is different from the actual ECUs and sensors connected to the corresponding bus, communication DTCs will be detected.

#### HINT:

When an ECU is replaced with one from a vehicle with the same options and specifications (the same connections to the corresponding bus), initialization of ECU connection information is not necessary.

- (b) Initialize the connection information of a gateway function equipped ECU (sub bus monitor ECU).
- (c) Connect the Techstream to the DLC3.
- (d) Turn the ignition switch to ON.
- (e) Turn the Techstream on.
- (f) Enter the following menus: Body Electrical / Gateway / Utility
- (g) Select Initialization from Utility to initialize the ECU.

#### **9. PRECAUTIONS FOR WHEN GATEWAY FUNCTION EQUIPPED ECU (SUB BUS MONITOR ECU) DETECTS COMMUNICATION DTCS FOR ECUS NOT CONNECTED TO THE ECU**

- (a) Refer to Precautions When Replacing a Gateway Function Equipped ECU (Sub Bus Monitor ECU) with a Used One from Another Vehicle and initialize the connection information of the ECU.
- (b) Clear the DTCS and check that no DTCS are output.



|                                                                                                                |                      |                                      |
|----------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                               | 6.6 T                | <b>Doc ID:</b> RM000004TIO025X       |
| <b>Model Year Start:</b> 2016                                                                                  | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 - ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: PROBLEM SYMPTOMS TABLE; 2016 MY Tacoma [08/2015 - ] |                      |                                      |

## PROBLEM SYMPTOMS TABLE

### HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output

[INFO](#)

### Result List of How to Proceed with Troubleshooting

| SYMPTOM                                                                                       | SUSPECTED AREA                                                                   | SEE PAGE             |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------|
| The result of "How to Proceed with Troubleshooting" is "Open in CAN Main Bus Line".           | Open in CAN Main Bus Line (Includes DLC3 branch lines and terminating resistors) | <a href="#">INFO</a> |
| The result of "How to Proceed with Troubleshooting" is "Short in CAN Bus Lines".              | Short in CAN Bus Lines                                                           | <a href="#">INFO</a> |
| The result of "How to Proceed with Troubleshooting" is "Short to +B in CAN Bus Line".         | Short to +B in CAN Bus Line                                                      | <a href="#">INFO</a> |
| The result of "How to Proceed with Troubleshooting" is "Short to GND in CAN Bus Line".        | Short to GND in CAN Bus Line                                                     | <a href="#">INFO</a> |
| The result of "How to Proceed with Troubleshooting" is "Open in One Side of CAN Branch Line". | Open in One Side of CAN Branch Line                                              | <a href="#">INFO</a> |

### HINT:

Refer to How to Proceed with Troubleshooting for the V bus check procedure.

### Communication Stop Mode Table

| SYMPTOM                                                                    | SUSPECTED AREA                                     | SEE PAGE             |
|----------------------------------------------------------------------------|----------------------------------------------------|----------------------|
| "Skid Control (ABS/VSC/TRAC)" is not displayed on the Techstream.          | Skid Control ECU Communication Stop Mode           | <a href="#">INFO</a> |
| "Air Conditioning Amplifier" is not displayed on the Techstream.           | Air Conditioning Amplifier Communication Stop Mode | <a href="#">INFO</a> |
| "CAN Gateway1" is not displayed on the Techstream.*1                       | Gateway ECU Communication Stop Mode                | <a href="#">INFO</a> |
| "Spiral cable (Steering Angle Sensor)" is not displayed on the Techstream. | Steering Angle Sensor Communication Stop Mode      | <a href="#">INFO</a> |
| "ECM (Engine)" are not displayed on the Techstream.                        | ECM Communication Stop Mode                        | <a href="#">INFO</a> |
| "Main Body" is not displayed on the Techstream.                            | Main Body ECU Communication Stop Mode              | <a href="#">INFO</a> |

| SYMPTOM                                                               | SUSPECTED AREA                                       | SEE PAGE             |
|-----------------------------------------------------------------------|------------------------------------------------------|----------------------|
| "Combination Meter" is not displayed on the Techstream.               | Combination Meter ECU Communication Stop Mode        | <a href="#">INFO</a> |
| "Certification (Smart)" is not displayed on the Techstream.*2         | Certification ECU Communication Stop Mode            | <a href="#">INFO</a> |
| "Airbag" is not displayed on the Techstream.                          | Center Airbag Sensor Communication Stop Mode         | <a href="#">INFO</a> |
| "Display and Navigation (AVN1)" is not displayed on the Techstream.*3 | Radio Receiver Assembly Communication Stop Mode      | <a href="#">INFO</a> |
| "Display and Navigation (AVN1)" is not displayed on the Techstream.*4 | Navigation Receiver Assembly Communication Stop Mode | <a href="#">INFO</a> |
| "Four Wheel Drive Control" is not displayed on the Techstream.*5      | 4WD Control ECU Communication Stop Mode              | <a href="#">INFO</a> |
| "Tire Pressure2" is not displayed on the Techstream.*6                | Tire Pressure Monitor ECU Communication Stop Mode    | <a href="#">INFO</a> |

\*1: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*2: w/ Smart Key System

\*3: Radio and Display Receiver Assembly

\*4: Navigation Receiver Assembly

\*5: for 4WD

\*6: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

#### DTC Combination Table

| SYMPTOM                                                                                                           | SUSPECTED AREA                                                                                                                                                                           | SEE PAGE             |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Although CAN communication (V bus) is currently normal, ECUs connected to the V bus store CAN communication DTCs. | The probable part for which communication is interrupted can be determined using DTC Combination Table and comparing the DTCs output from ECUs connected to the CAN communication system | <a href="#">INFO</a> |



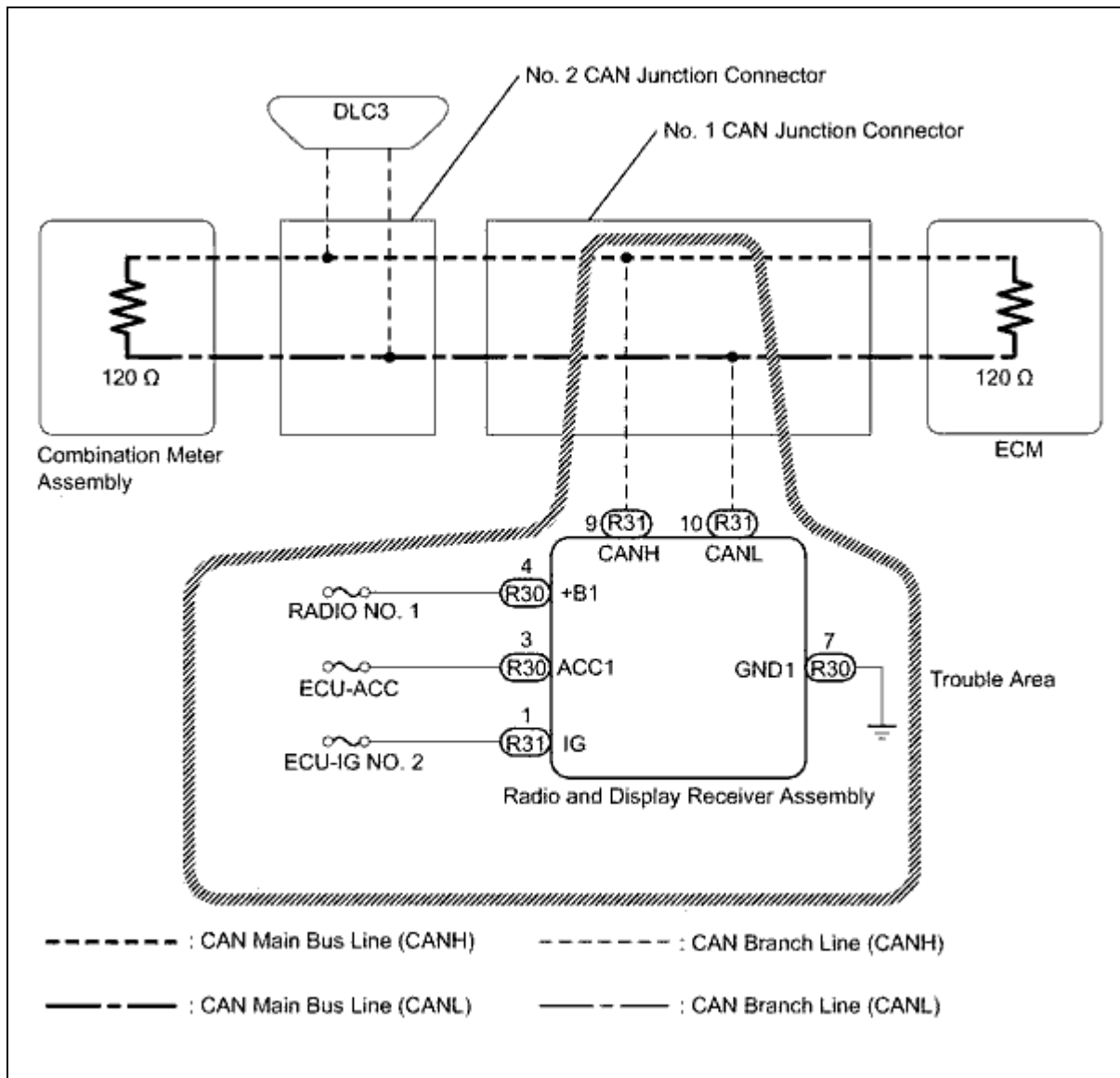
|                                                                                                                                             |                      |                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                            | 6.6 J                | <b>Doc ID:</b> RM00000109K0G2X           |
| <b>Model Year Start:</b> 2016                                                                                                               | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Radio Receiver Assembly Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Radio Receiver Assembly Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                                  | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                           | TROUBLE AREA                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Radio Receiver Assembly Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>"Display and Navigation (AVN1)" is not displayed on the CAN Bus Check screen of the Techstream <a href="#">INFO</a></li> <li>Communication system DTCs (DTCs that start with U) that correspond to "Radio Receiver Assembly Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>Radio and display receiver assembly branch line or connector</li> <li>Power source circuit of radio and display receiver assembly</li> <li>Radio and display receiver assembly ground circuit</li> <li>Radio and display receiver assembly</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work [INFO](#).
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output [INFO](#).
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 31 seconds.
- After the repair, perform the CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed [INFO](#).

### 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 may help determine the cause of the malfunction.

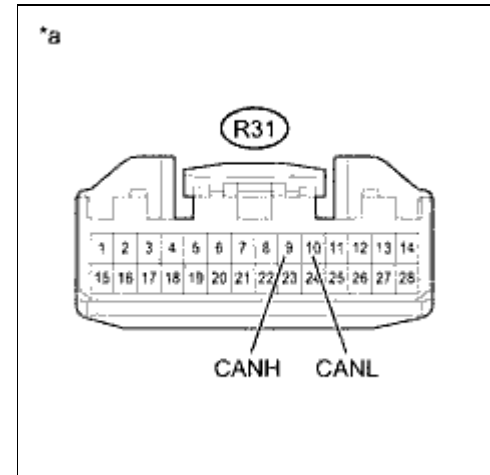
## PROCEDURE

1.

### CHECK FOR OPEN IN CAN BUS LINES (RADIO AND DISPLAY RECEIVER ASSEMBLY BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the radio and display receiver assembly connector.



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

Standard Resistance:

| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION |
|------------------------------|-------------------------------------------------------|---------------------|
| R31-9 (CANH) - R31-10 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

#### Text in Illustration

\*a

Front view of wire harness connector  
(to Radio and Display Receiver Assembly)

NG

REPAIR OR REPLACE CAN BRANCH LINE OR  
CONNECTOR (RADIO AND DISPLAY RECEIVER  
ASSEMBLY)

OK

2.

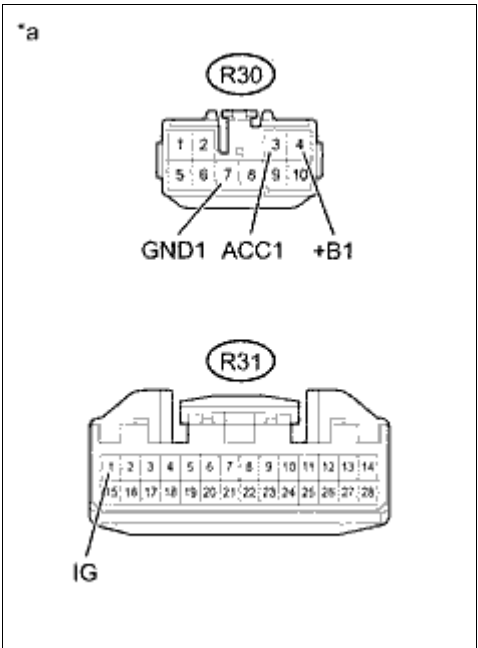
### CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)

(a) Disconnect the radio and display receiver assembly connector.

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| R30-7 (GND1) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(c) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION          | SWITCH CONDITION    | SPECIFIED CONDITION |
|----------------------------|---------------------|---------------------|
| R30-3 (ACC1) - Body ground | Ignition switch ACC | 11 to 14 V          |
| R30-4 (+B1) - Body ground  | Always              | 11 to 14 V          |
| R31-1 (IG) - Body ground   | Ignition switch ON  | 11 to 14 V          |

**Text in Illustration**

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Radio and Display Receiver Assembly) |
|----|----------------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ► REPLACE RADIO AND DISPLAY RECEIVER  
ASSEMBLY

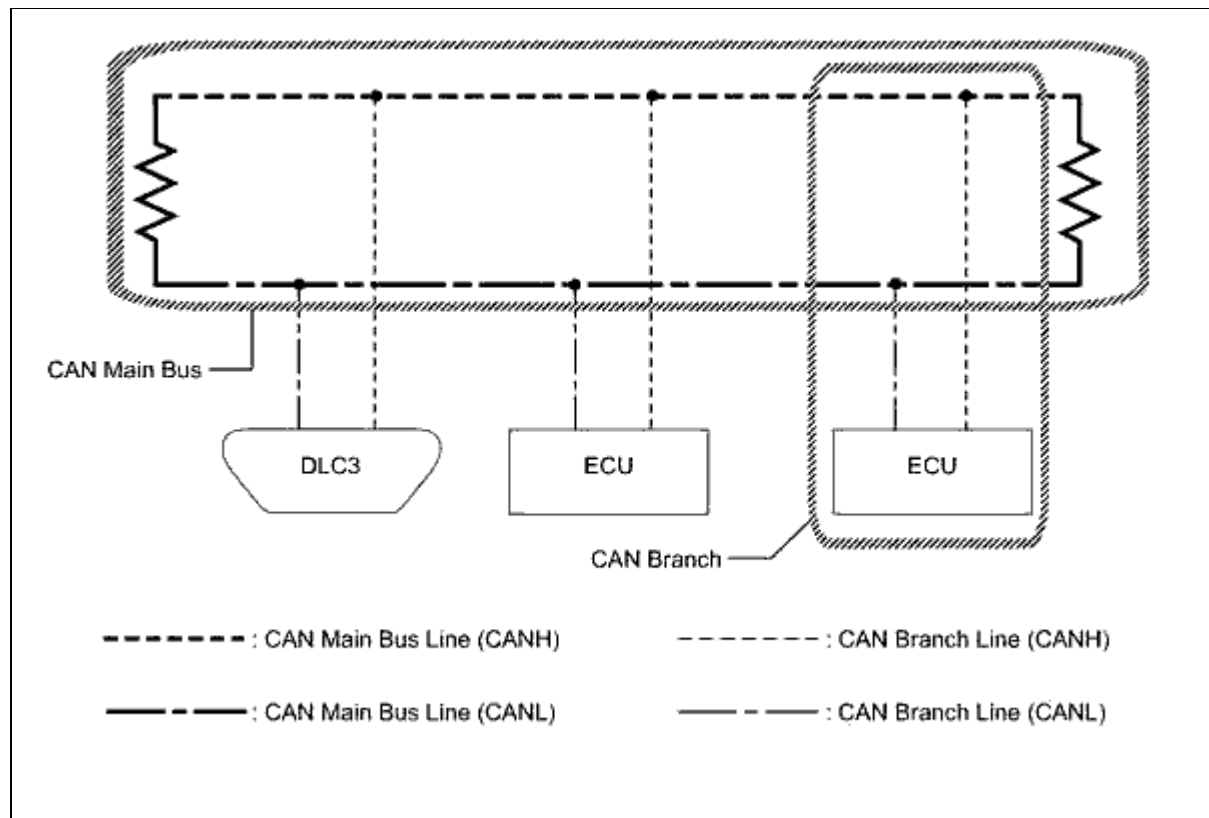


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| <b>Last Modified:</b> 11-13-2015                                                                                  | 6.6 D                | <b>Doc ID:</b> RM000004TIP022X           |
| <b>Model Year Start:</b> 2016                                                                                     | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: SYSTEM DESCRIPTION; 2016 MY Tacoma<br>[08/2015 -     ] |                      |                                          |

## SYSTEM DESCRIPTION

### 1. BRIEF DESCRIPTION

- (a) The Controller Area Network (CAN) is a serial data communication system for real time application. It is a vehicle multiplex communication system which has a high communication speed and the ability to detect malfunctions.



- (b) Using the CANH and CANL bus lines as a pair, CAN communication is performed using a voltage differential. (A base voltage is applied to the pair of lines and a voltage differential is created when communicating.)
- (c) Many ECUs or sensors installed on the vehicle operate by sharing information and communicating with each other.
- (d) The CAN has two resistors of 120  $\Omega$  which are necessary to enable communication.

### 2. DEFINITION OF TERMS

- (a) Main bus
- (1) The main bus is a wire harness between the two terminating resistors on the bus. This is the main bus in the CAN communication system.
- (b) Branch
- (1) A branch is a wire harness which diverges from the main bus to an ECU or sensor.
- (c) Terminating resistors

- (1) Two resistors of 120  $\Omega$  are installed in parallel across the ends of the CAN main bus lines. They are called terminating resistors. These resistors allow the changes of the voltage differential between the CAN bus lines 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, this results in a measurement of approximately 60  $\Omega$ .

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

#### (a) V Bus

- (1) Combination meter assembly
- (2) Main body ECU (Multiplex network body ECU)
- (3) Spiral cable with sensor sub-assembly
- (4) Airbag sensor assembly
- (5) ECM
- (6) Air conditioning amplifier assembly
- (7) Network gateway ECU\*1
- (8) Navigation receiver assembly\*2
- (9) Radio and display receiver assembly\*3
- (10) Certification ECU (Smart key ECU assembly)\*4
- (11) Brake booster assembly (Skid control ECU)\*5
- (12) Brake actuator assembly (Skid control ECU)\*6
- (13) Door control and tire pressure monitoring system receiver assembly\*7
- (14) 4 wheel drive control ECU\*8

#### (b) Sub bus 2\*1

- (1) Network gateway ECU
- (2) Clearance warning ECU assembly\*9
- (3) Blind spot monitor sensor LH\*10

\*1: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*2: for Navigation Receiver Type

\*3: for Radio and Display Type

\*4: w/ Smart Key System

\*5: for Hydraulic Brake Booster

\*6: for Vacuum Brake Booster

\*7: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*8: for 4WD

\*9: w/ Intuitive Parking Assist System

\*10: w/ Blind Spot Monitor System

### 4. CIRCUIT DESCRIPTION

- (a) The V bus and sub bus 2 each have termination circuits with two resistors of 120  $\Omega$ .

### 5. TROUBLESHOOTING REMARKS

- (a) DTCs for the CAN communication system can be checked using the Techstream. The DLC3 is connected to the CAN communication system, but no DTCs exist regarding problems in the DLC3 or the DLC3 branch lines. If there is a malfunction in the DLC3 or the DLC3 branch lines, ECUs on the CAN cannot output DTCs to the Techstream.

(b) Malfunctions in the CAN V bus (communication lines) can be checked by measuring the resistance between terminals of the DLC3. However, an open circuit in a branch line other than the DLC3 branch lines cannot be checked from the DLC3 (except for the DLC3 branch lines).

**NOTICE:**

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

## 6. DIAGNOSTIC TROUBLE CODES FOR CAN COMMUNICATION SYSTEM

**HINT:**

See Diagnosis System  .

## 7. HOW TO DISTINGUISH CONNECTOR OF CAN JUNCTION CONNECTOR

(a) In the CAN communication system, the shape of connectors connected to the CAN junction connector which has a ground terminal are the same. The connectors connected to the CAN junction connector can be distinguished by the colors of the bus lines and the connecting side of the junction connector.

**HINT:**

See Terminals of ECU for bus line color or the shape of connectors  .

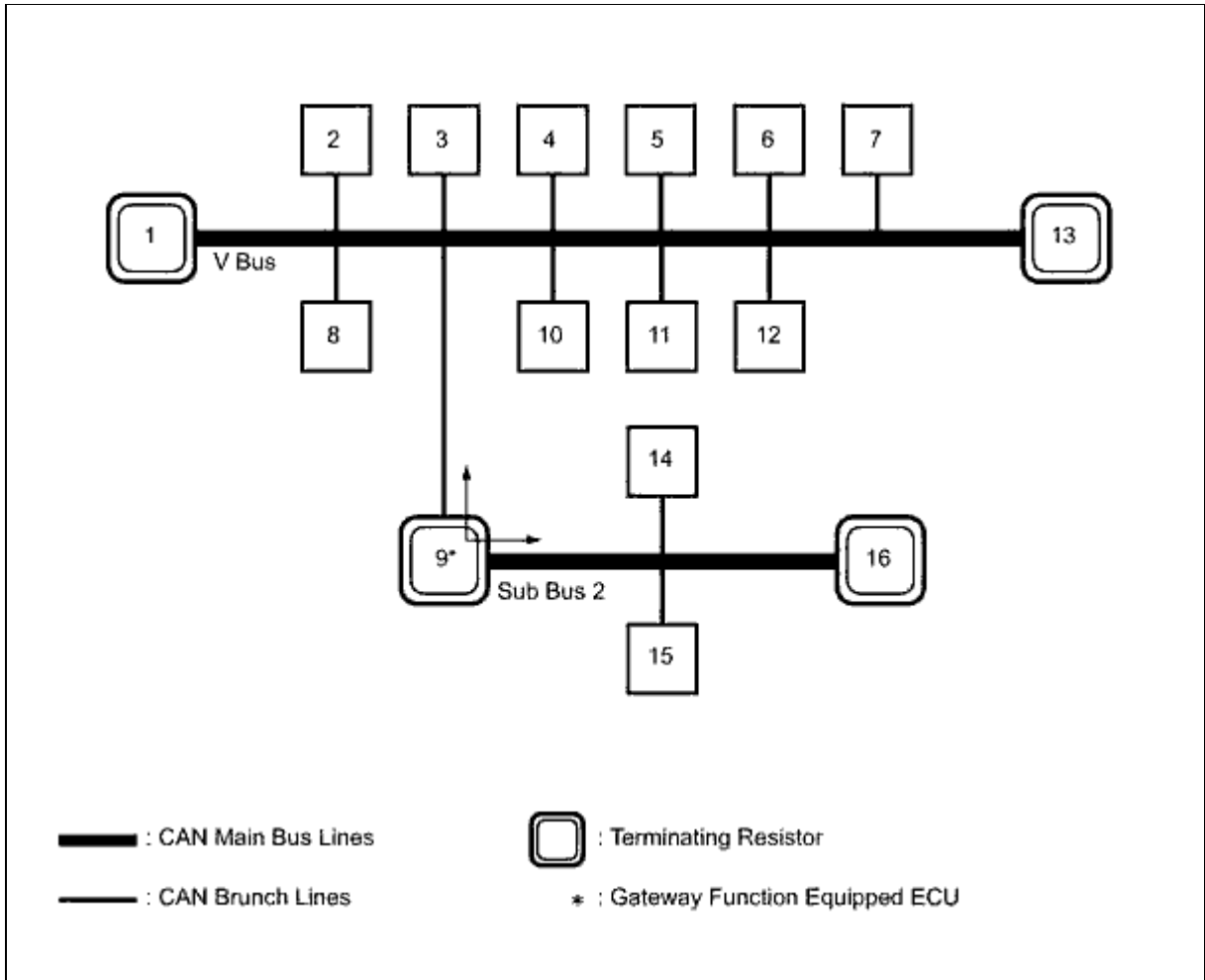


|                                                                                                            |                      |                                          |
|------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                           | 6.6 U                | <b>Doc ID:</b> RM000002DX508PX           |
| <b>Model Year Start:</b> 2016                                                                              | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: SYSTEM DIAGRAM; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## SYSTEM DIAGRAM

### 1. OVERALL CAN BUS DIAGRAM

(a) The CAN communication system is composed of 2 buses.



#### Text in Illustration

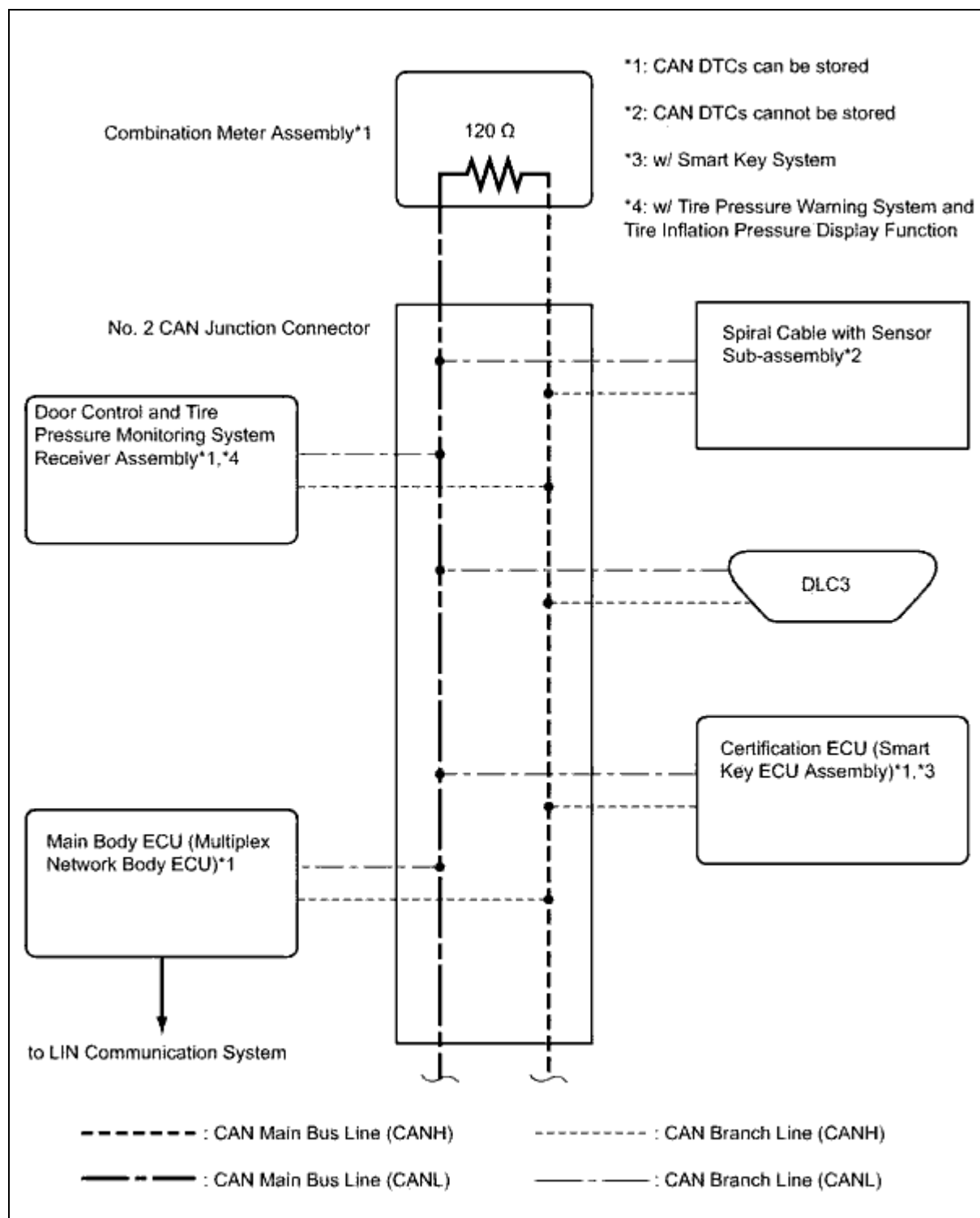
| NO. | ECU/SENSOR NAME                                                                           | NO. | ECU/SENSOR NAME                                                  |
|-----|-------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------|
| 1   | Combination Meter Assembly<br>(for V Bus)                                                 | 2   | 4 Wheel Drive Control ECU (for 4WD)<br>(for V Bus)               |
| 3   | Main Body ECU (Multiplex Network Body ECU)<br>(for V Bus)                                 | 4   | DLC3<br>(for V Bus)                                              |
| 5   | Airbag Sensor Assembly<br>(for V Bus)                                                     | 6   | Spiral Cable with Sensor Sub-assembly<br>(for V Bus)             |
| 7   | Brake Booster Assembly (Skid Control ECU) (for Hydraulic Brake Booster) or Brake Actuator | 8   | Certification ECU (Smart Key ECU Assembly) (w/ Smart Key System) |

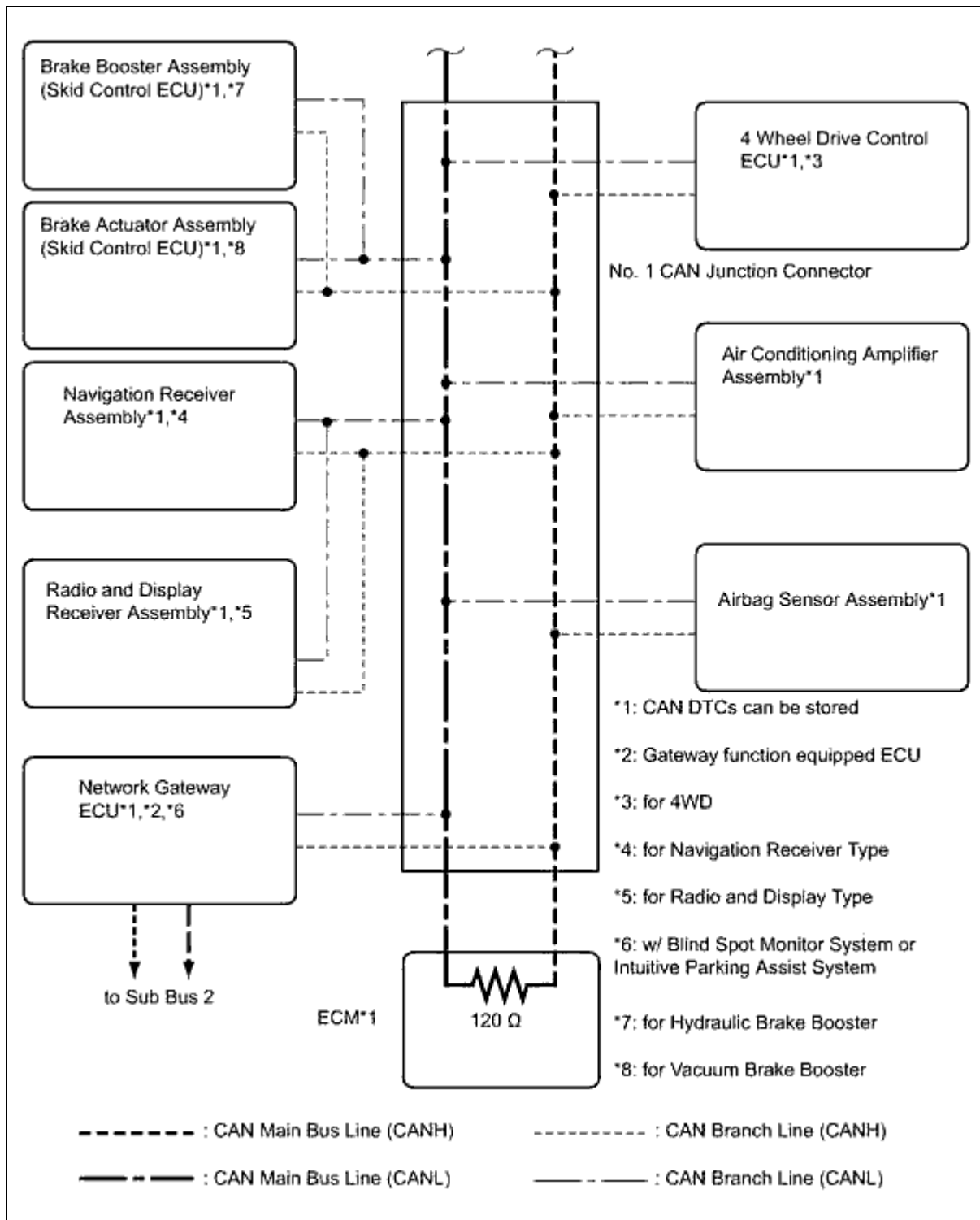
| NO. | ECU/SENSOR NAME                                                                                                                                | NO. | ECU/SENSOR NAME                                                                                                                                                  |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | Assembly (Skid Control ECU) (for Vacuum Brake Booster)<br>(for V Bus)                                                                          |     | (for V Bus)                                                                                                                                                      |
| 9   | Network Gateway ECU (w/ Blind Spot Monitor System or Intuitive Parking Assist System)<br>(for V Bus and Sub Bus 2)                             | 10  | Air Conditioning Amplifier Assembly<br>(for V Bus)                                                                                                               |
| 11  | Navigation Receiver Assembly (for Navigation Receiver Type) or Radio and Display Receiver Assembly (for Radio and Display Type)<br>(for V Bus) | 12  | Door Control and Tire Pressure Monitoring System Receiver Assembly (w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function)<br>(for V Bus) |
| 13  | ECM<br>(for V Bus)                                                                                                                             | 14  | Clearance Warning ECU Assembly (w/ Intuitive Parking Assist System)<br>(for Sub Bus 2)                                                                           |
| 15  | Blind Spot Monitor Sensor LH (w/ Blind Spot Monitor System)<br>(for Sub Bus 2)                                                                 | 16  | No. 1 CAN Junction Terminal<br>(for Sub Bus 2)                                                                                                                   |

**HINT:**

- The network gateway ECU functions as a gateway between the V bus and sub bus 2.
- Refer to the following bus wiring diagrams for details.

**2. V BUS**

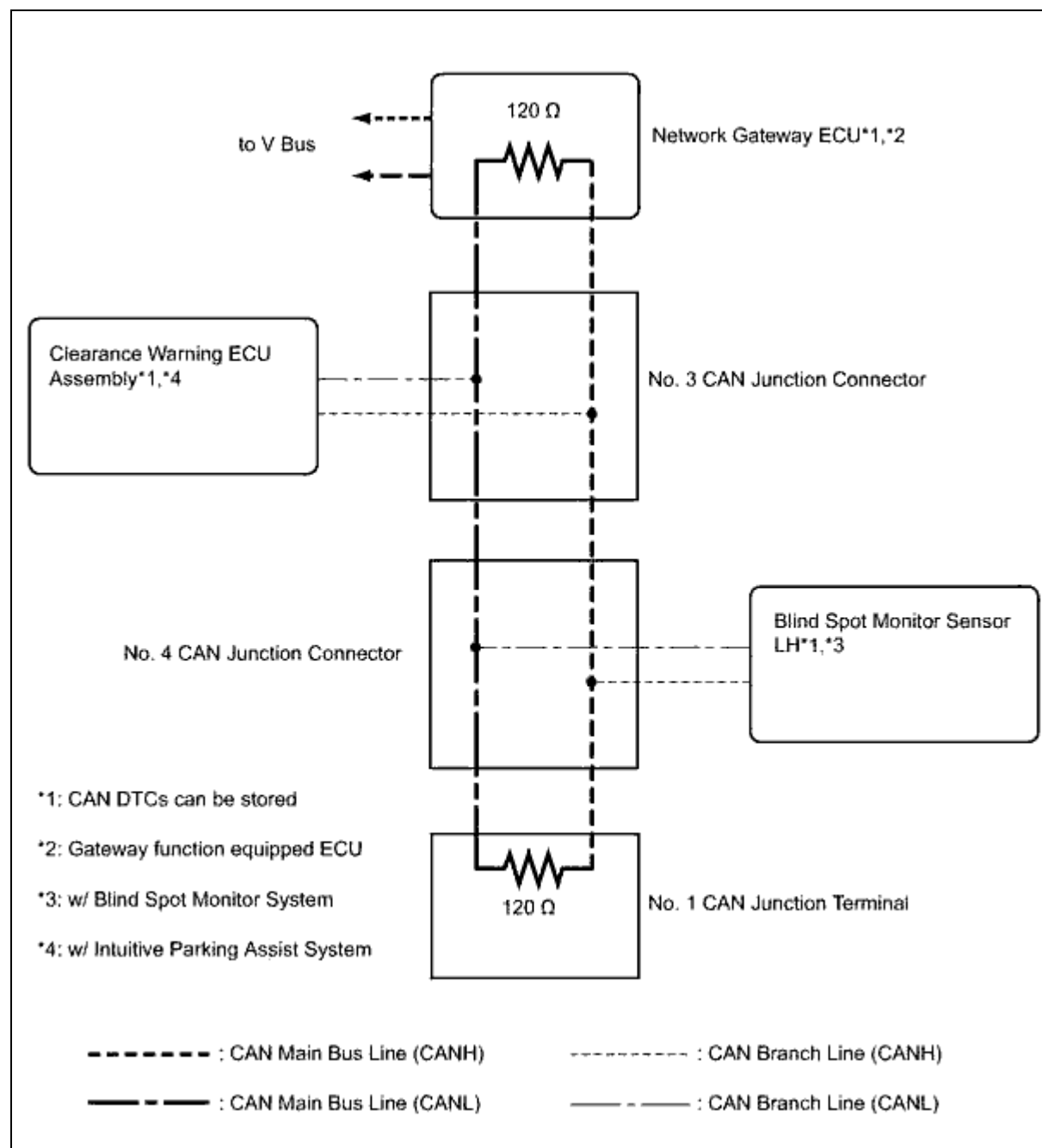




#### HINT:

The CAN communication system connects to other networks via ECUs that function as a gateway INFO.

### 3. SUB BUS 2 (w/ Blind Spot Monitor System or Intuitive Parking Assist System)



|                                                                                                                                         |                      |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                        | 6.6 J                | <b>Doc ID:</b> RM000001V2C08MX           |
| <b>Model Year Start:</b> 2016                                                                                                           | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Skid Control ECU Communication Stop Mode;<br>2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Skid Control ECU Communication Stop Mode

## DESCRIPTION

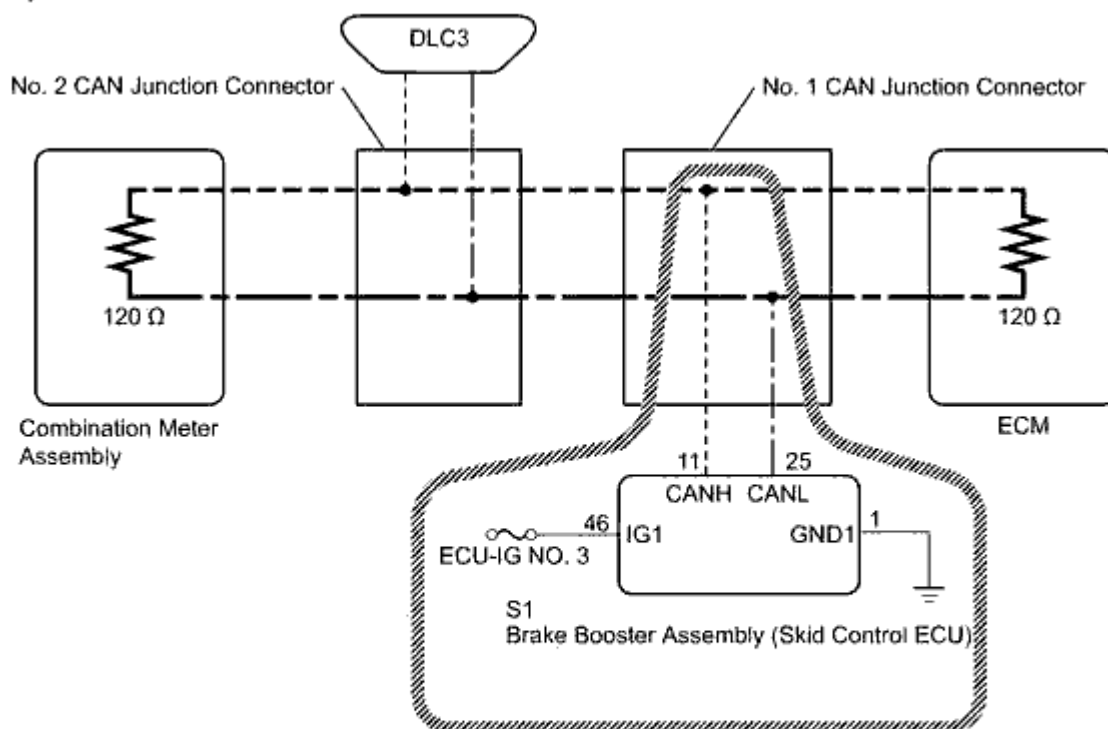
| DETECTION ITEM                           | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                  | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Skid Control ECU Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>"Skid Control (ABS/VSC/TRAC)" is not displayed on the CAN Bus Check screen of the Techstream <a href="#">INFO</a></li> <li>Communication system DTCs (DTCs that start with U) that correspond to "Skid Control ECU Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>Brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2 branch line or connector</li> <li>Power source circuit of brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2</li> <li>Brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2 ground circuit</li> <li>Brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2</li> </ul> |

\*1: for Hydraulic Brake Booster

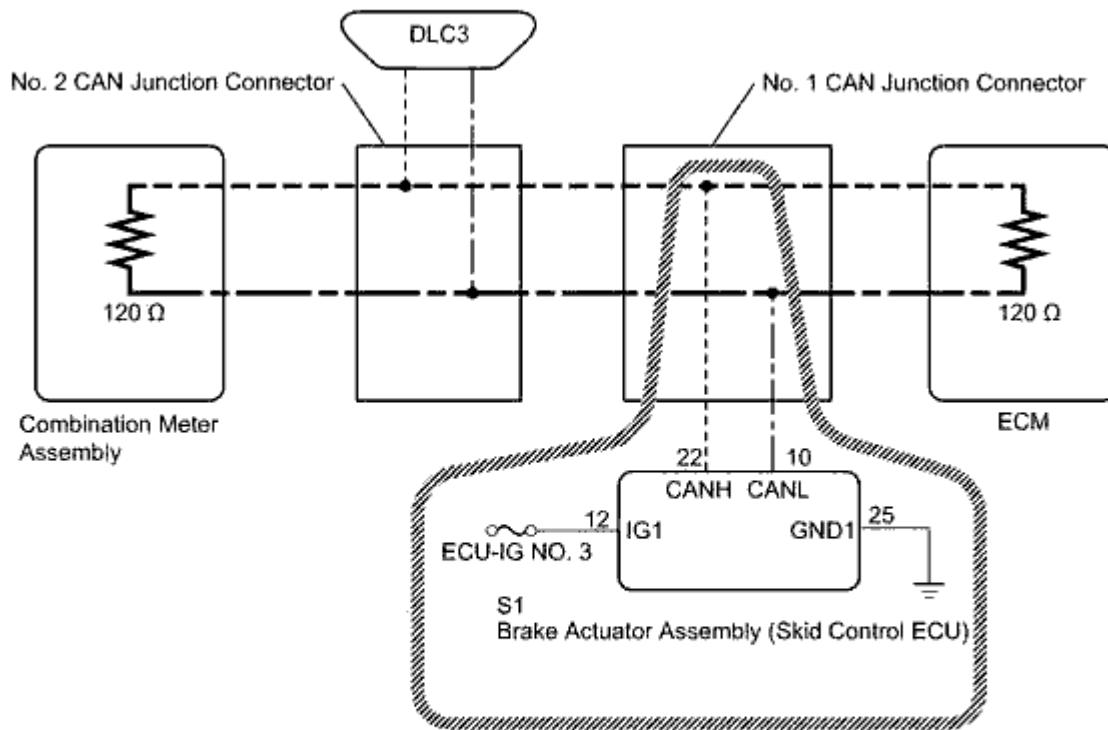
\*2: for Vacuum Brake Booster

## WIRING DIAGRAM

for Hydraulic Brake Booster:



for Vacuum Brake Booster:



----- : CAN Main Bus Line (CANH) ----- : CAN Branch Line (CANH)  
 ----- : CAN Main Bus Line (CANL) ----- : CAN Branch Line (CANL)

## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work **INFO**.
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, and wait at least 60 seconds and then drive the vehicle at a speed of 15 km/h (9 mph) or more at least 6 seconds.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

### 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 may help determine the cause of the malfunction.

## **PROCEDURE**

|           |                     |
|-----------|---------------------|
| <b>1.</b> | <b>SYSTEM CHECK</b> |
|-----------|---------------------|

(a) Check the vehicle specifications.

### **Result**

| RESULT                      | PROCEED TO |
|-----------------------------|------------|
| for Hydraulic Brake Booster | A          |
| for Vacuum Brake Booster    | B          |

**B** ► **GO TO STEP 4**

**A**



|           |                                         |
|-----------|-----------------------------------------|
| <b>2.</b> | <b>CHECK DTC (BRAKE CONTROL SYSTEM)</b> |
|-----------|-----------------------------------------|

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Chassis / ABS/VSC/TRAC / Trouble Codes.

| RESULT                  | PROCEED TO |
|-------------------------|------------|
| DTC C1241 is not output | A          |
| DTC C1241 is output     | B          |

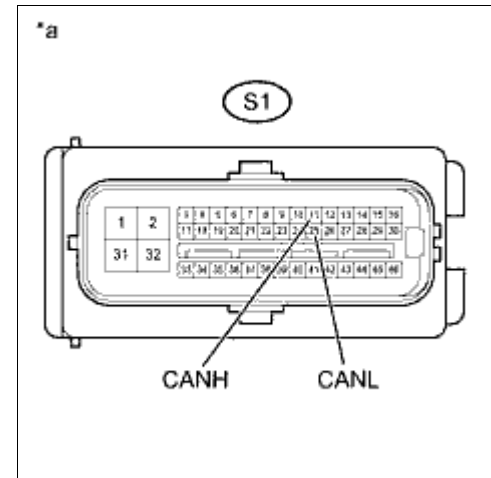
**B** ► **GO TO DIAGNOSIS PROCEDURES INDICATED BY OUTPUT DTC**

**A**



|           |                                                                                                |
|-----------|------------------------------------------------------------------------------------------------|
| <b>3.</b> | <b>CHECK FOR OPEN IN CAN BUS LINES (BRAKE BOOSTER ASSEMBLY (SKID CONTROL ECU) BRANCH LINE)</b> |
|-----------|------------------------------------------------------------------------------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.



(b) Disconnect the brake booster assembly (skid control ECU) connector.

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| S1-11 (CANH) - S1-25 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

#### Text in Illustration

|    |                                                                                        |
|----|----------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Brake Booster Assembly (Skid Control ECU)) |
|----|----------------------------------------------------------------------------------------|

**NG** ► **REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (BRAKE BOOSTER ASSEMBLY (SKID CONTROL ECU))**

**OK** ► **REPLACE BRAKE BOOSTER ASSEMBLY (SKID CONTROL ECU)**

|           |                                         |
|-----------|-----------------------------------------|
| <b>4.</b> | <b>CHECK DTC (BRAKE CONTROL SYSTEM)</b> |
|-----------|-----------------------------------------|

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Chassis / ABS/VSC/TRAC / Trouble Codes.

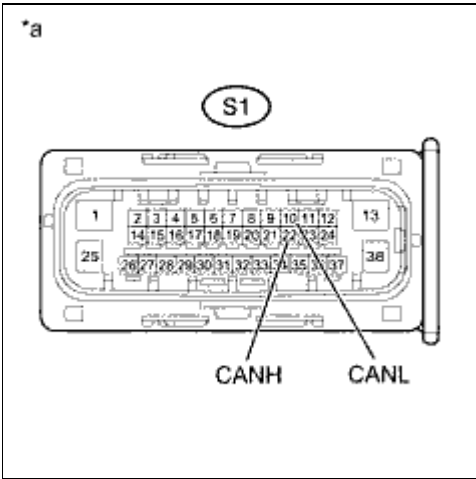
| RESULT                  | PROCEED TO |
|-------------------------|------------|
| DTC C1241 is not output | A          |
| DTC C1241 is output     | B          |

**A**  
▼

|    |                                                                              |
|----|------------------------------------------------------------------------------|
| 5. | <b>CHECK FOR OPEN IN CAN BUS LINES (BRAKE ACTUATOR ASSEMBLY BRANCH LINE)</b> |
|----|------------------------------------------------------------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the brake actuator assembly (skid control ECU) connector.



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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| S1-22 (CANH) - S1-10 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 Ω          |

**Text in Illustration**

|    |                                                                                         |
|----|-----------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Brake Actuator Assembly (Skid Control ECU)) |
|----|-----------------------------------------------------------------------------------------|

**NG ► REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (BRAKE ACTUATOR ASSEMBLY (SKID CONTROL ECU))**

**OK ► REPLACE BRAKE ACTUATOR ASSEMBLY (SKID CONTROL ECU)**



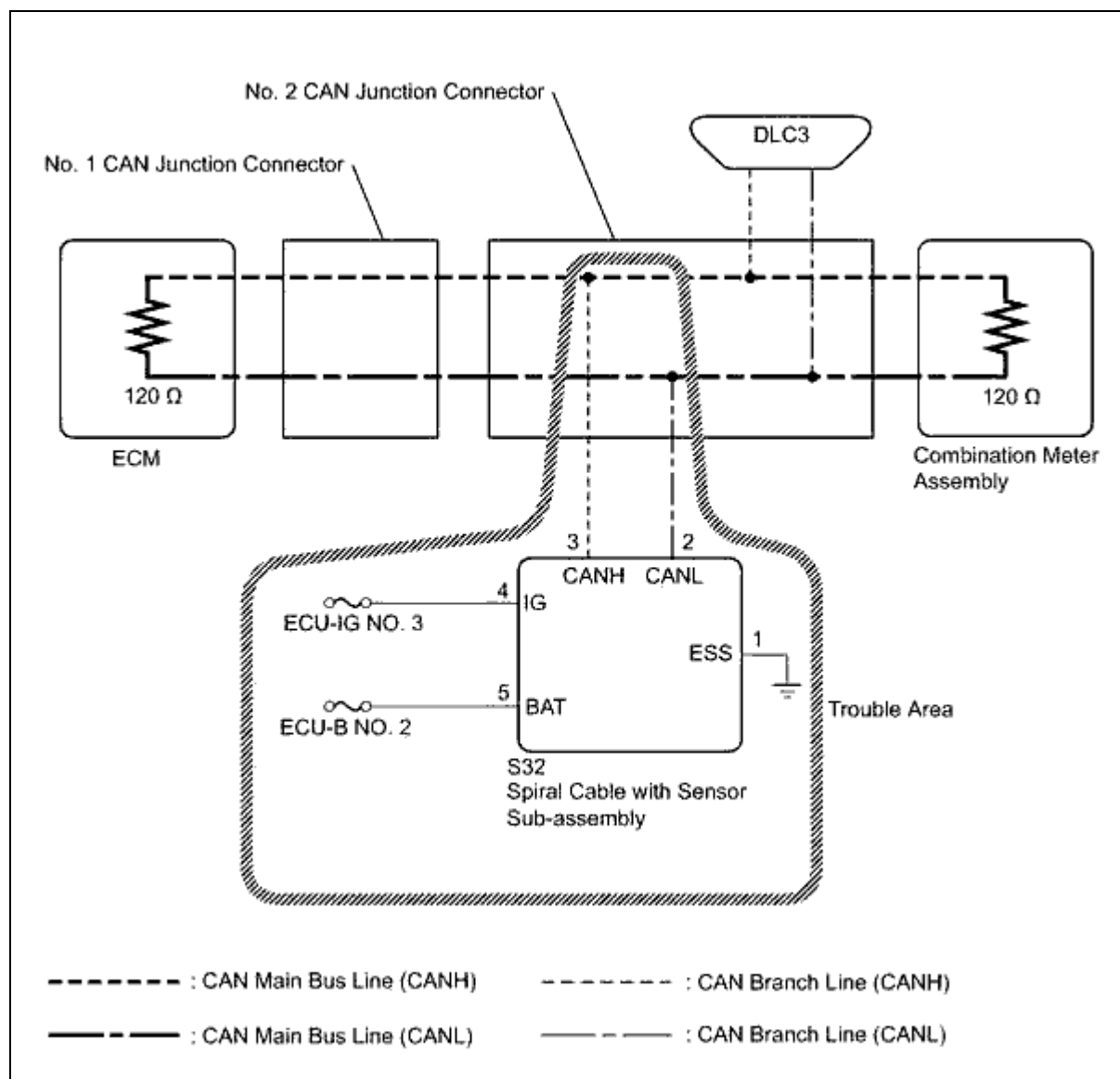
|                                                                                                                                           |                      |                                          |
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| <b>Last Modified:</b> 11-13-2015                                                                                                          | 6.6 J                | <b>Doc ID:</b> RM000000WIH0B4X           |
| <b>Model Year Start:</b> 2016                                                                                                             | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Steering Angle Sensor Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Steering Angle Sensor Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                                | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                                                    | TROUBLE AREA                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Steering Angle Sensor Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• "Spiral cable (Steering Angle Sensor)" is not displayed on the CAN Bus Check screen of the Techstream <a href="#">INFO</a></li> <li>• Communication system DTCs (DTCs that start with U) that correspond to "Steering Angle Sensor Communication Stop Mode" in "DTC Combination Table" are output <a href="#">INFO</a></li> </ul> | <ul style="list-style-type: none"> <li>• Spiral cable with sensor sub-assembly branch line or connector</li> <li>• Power source circuit of spiral cable with sensor sub-assembly</li> <li>• Spiral cable with sensor sub-assembly ground circuit</li> <li>• Spiral cable with sensor sub-assembly</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work [INFO](#).
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output [INFO](#).
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, and wait at least 60 seconds, and then drive the vehicle at a speed of 36 km/h (22 mph) or more for 1.736 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed [INFO](#).

### HINT:

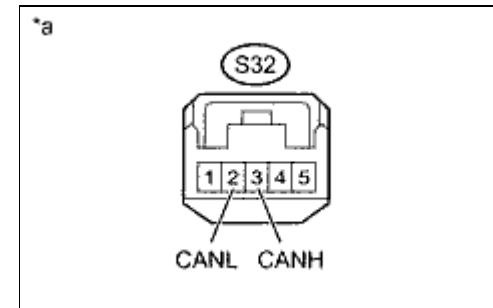
- Operating the ignition switch, any other switches or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring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

## PROCEDURE

1.

### CHECK FOR OPEN IN CAN BUS LINES (SPIRAL CABLE WITH SENSOR SUB-ASSEMBLY BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.



(b) Disconnect the spiral cable with sensor sub-assembly connector.

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| S32-3 (CANH) - S32-2 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

#### Text in Illustration

\*a

Front view of wire harness connector  
(to Spiral Cable with Sensor Sub-assembly)

**NG** REPAIR OR REPLACE CAN BRANCH LINE OR  
CONNECTOR (SPIRAL CABLE WITH SENSOR  
SUB-ASSEMBLY)

**OK**

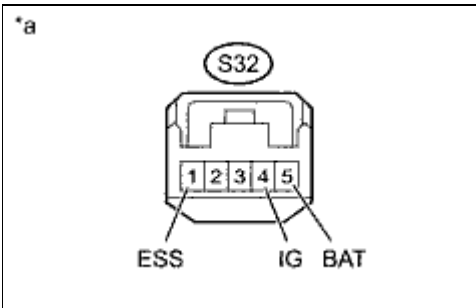
2.

### CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)

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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED CONDITION |
|---------------------------|-------------------------------------------------------|---------------------|
| S32-1 (ESS) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION         | SWITCH CONDITION   | SPECIFIED CONDITION |
|---------------------------|--------------------|---------------------|
| S32-4 (IG) - Body ground  | Ignition switch ON | 11 to 14 V          |
| S32-5 (BAT) - Body ground | Always             | 11 to 14 V          |

Text in Illustration

|    |                                                                                    |
|----|------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Spiral Cable with Sensor Sub-assembly) |
|----|------------------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR  
(POWER SOURCE CIRCUIT)

**OK** ► REPLACE SPIRAL CABLE WITH SENSOR  
SUB-ASSEMBLY



|                                                                                                              |                      |                                          |
|--------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                             | 6.6 U                | <b>Doc ID:</b> RM000000XVK0FHX           |
| <b>Model Year Start:</b> 2016                                                                                | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: TERMINALS OF ECU; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## TERMINALS OF ECU

**NOTICE:**

- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work INFO .
- Turn the ignition switch off before measuring the resistances between CAN main bus lines and between CAN branch lines.
- Turn the ignition switch off before inspecting CAN bus lines for a ground short.
- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- This section describes the standard values for all CAN related components.

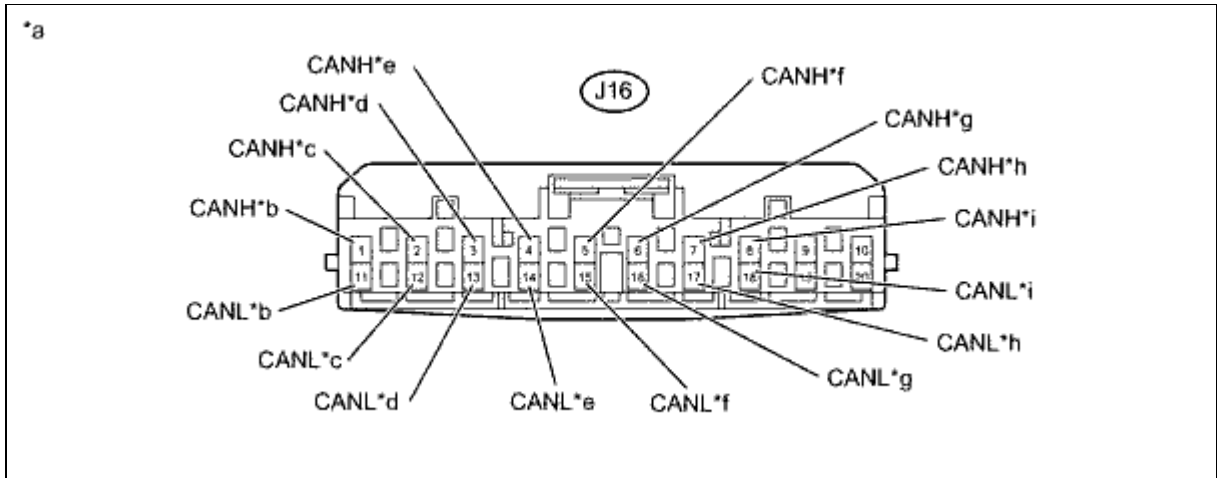
**HINT:**

- 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 may help determine the cause of the malfunction.

**1. NO. 1 CAN JUNCTION CONNECTOR**

(a) Check the No. 1 CAN junction connector.

(1) Connection diagram



**Text in Illustration**

|    |                                                                           |    |                                                                                                                                                                 |
|----|---------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to No. 1 CAN Junction Connector) | *b | to Brake Booster Assembly (Skid Control ECU) (for Hydraulic Brake Booster) or Brake Actuator Assembly (Skid Control ECU) (for Vacuum Brake Booster) (for V Bus) |
| *c | to No. 2 CAN Junction Connector<br>(for V Bus)                            | *d | to Air Conditioning Amplifier Assembly<br>(for V Bus)                                                                                                           |

|    |                                                                                                                                                   |    |                                          |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------|
| *e | to Navigation Receiver Assembly (for Navigation Receiver Type) or Radio and Display Receiver Assembly (for Radio and Display Type)<br>(for V Bus) | *f | to ECM<br>(for V Bus)                    |
| *g | to Network Gateway ECU (w/ Blind Spot Monitor System or Intuitive Parking Assist System)<br>(for V Bus)                                           | *h | to Airbag Sensor Assembly<br>(for V Bus) |
| *i | to 4 Wheel Drive Control ECU (for 4WD)<br>(for V Bus)                                                                                             | -  | -                                        |

(2) Check the connection diagram of the components which are connected to the No. 1 CAN junction connector.

| TERMINAL NO.<br>(SYMBOL) | WIRING<br>COLOR | CONNECTED TO                                                                                               |
|--------------------------|-----------------|------------------------------------------------------------------------------------------------------------|
| J16-1 (CANH)             | P               | Brake booster assembly (skid control ECU)*1 or brake actuator assembly (skid control ECU)*2<br>(for V Bus) |
| J16-11 (CANL)            | W               |                                                                                                            |
| J16-2 (CANH)             | SB              | No. 2 CAN junction connector<br>(for V Bus)                                                                |
| J16-12 (CANL)            | W               |                                                                                                            |
| J16-3 (CANH)             | L               | Air conditioning amplifier assembly<br>(for V Bus)                                                         |
| J16-13 (CANL)            | W               |                                                                                                            |
| J16-4 (CANH)             | V               | Navigation receiver assembly*3 or radio and display receiver assembly*4<br>(for V Bus)                     |
| J16-14 (CANL)            | W               |                                                                                                            |
| J16-5 (CANH)             | B               | ECM<br>(for V Bus)                                                                                         |
| J16-15 (CANL)            | W               |                                                                                                            |
| J16-6 (CANH)             | G               | Network gateway ECU*5<br>(for V Bus)                                                                       |
| J16-16 (CANL)            | W               |                                                                                                            |
| J16-7 (CANH)             | R               | Airbag sensor assembly<br>(for V Bus)                                                                      |
| J16-17 (CANL)            | W               |                                                                                                            |
| J16-8 (CANH)             | BE              | 4 wheel drive control ECU*6<br>(for V Bus)                                                                 |
| J16-18 (CANL)            | W               |                                                                                                            |

\*1: for Hydraulic Brake Booster

\*2: for Vacuum Brake Booster

\*3: for Navigation Receiver Type

\*4: for Radio and Display Type

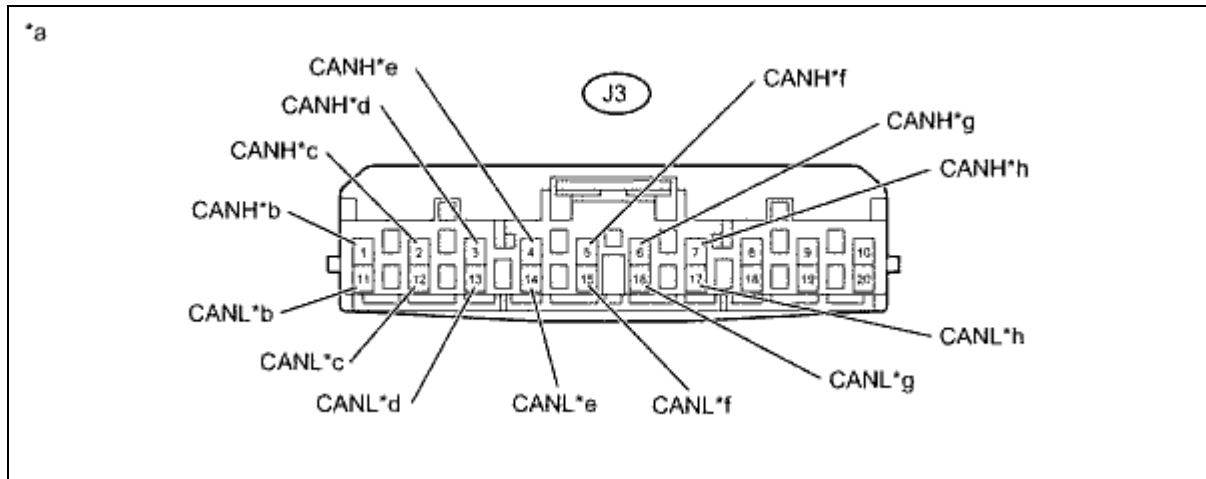
\*5: w/ Blind Spot Monitor System or Intuitive Parking Assist System

\*6: for 4WD

## 2. NO. 2 CAN JUNCTION CONNECTOR

(a) Check the No. 2 CAN junction connector.

(1) Connection diagram



### Text in Illustration

|    |                                                                                                                                                                     |    |                                                                                    |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to No. 2 CAN Junction Connector)                                                                                           | *b | to No. 1 CAN Junction Connector<br>(for V Bus)                                     |
| *c | to Door Control and Tire Pressure Monitoring System Receiver Assembly (w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function)<br>(for V Bus) | *d | to DLC3<br>(for V Bus)                                                             |
| *e | to Main Body ECU (Multiplex Network Body ECU)<br>(for V Bus)                                                                                                        | *f | to Certification ECU (Smart Key ECU Assembly) (w/ Smart Key System)<br>(for V Bus) |
| *g | to Combination Meter Assembly<br>(for V Bus)                                                                                                                        | *h | to Spiral Cable with Sensor Sub-assembly<br>(for V Bus)                            |

(2) Check the connection diagram of the components which are connected to the No. 2 CAN junction connector.

| TERMINAL NO.<br>(SYMBOL) | WIRING<br>COLOR | CONNECTED TO<br>(FOR V BUS)                                                         |
|--------------------------|-----------------|-------------------------------------------------------------------------------------|
| J3-1 (CANH)              | SB              | No. 1 CAN junction connector<br>(for V Bus)                                         |
| J3-11 (CANL)             | W               |                                                                                     |
| J3-2 (CANH)              | LG              | Door control and tire pressure monitoring system receiver assembly*1<br>(for V Bus) |
| J3-12 (CANL)             | W               |                                                                                     |
| J3-3 (CANH)              | L               | DLC3<br>(for V Bus)                                                                 |
| J3-13 (CANL)             | W               |                                                                                     |
| J3-4 (CANH)              | B               | Main body ECU (multiplex network body ECU)<br>(for V Bus)                           |
| J3-14 (CANL)             | W               |                                                                                     |
| J3-5 (CANH)              | P               | Certification ECU (smart key ECU assembly)*2<br>(for V Bus)                         |
| J3-15 (CANL)             | W               |                                                                                     |
| J3-6 (CANH)              | G               | Combination meter assembly                                                          |

| TERMINAL NO.<br>(SYMBOL) | WIRING<br>COLOR | CONNECTED TO<br>(FOR V BUS)                         |
|--------------------------|-----------------|-----------------------------------------------------|
| J3-16 (CANL)             | W               | (for V Bus)                                         |
| J3-7 (CANH)              | Y               | Spiral cable with sensor subassembly<br>(for V Bus) |
| J3-17 (CANL)             | W               |                                                     |

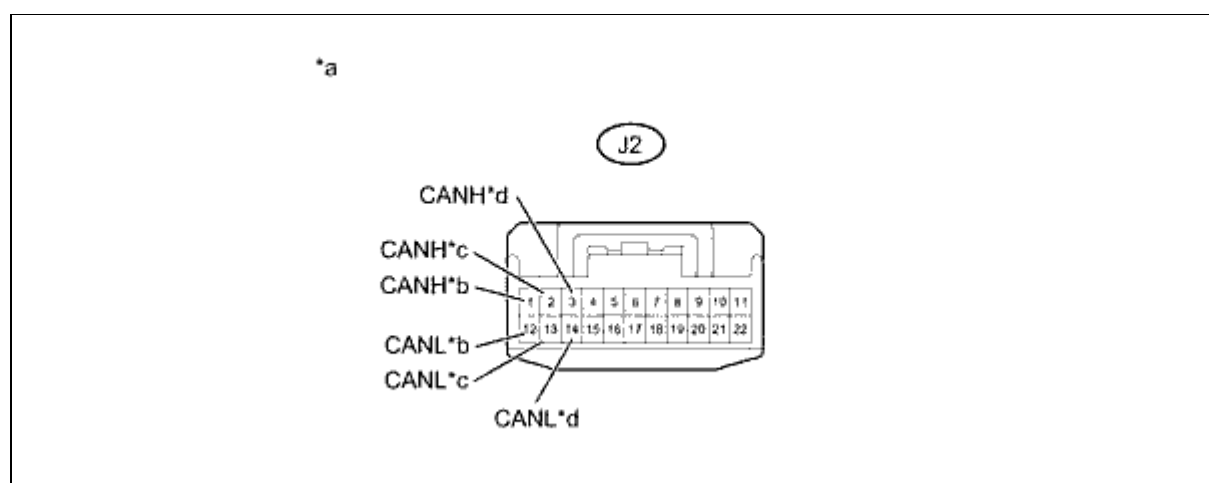
\*1: w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function

\*2: w/ Smart Key System

### 3. NO. 3 CAN JUNCTION CONNECTOR (w/ Blind Spot Monitor System or Intuitive Parking Assist System)

(a) Check the No. 3 CAN junction connector.

(1) Connection diagram



#### Text in Illustration

|    |                                                                           |    |                                                                                           |
|----|---------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------------|
| *1 | DLC3                                                                      | -  | -                                                                                         |
| *a | Front view of wire harness connector<br>(to No. 3 CAN Junction Connector) | *b | to Clearance Warning ECU Assembly (w/ Intuitive Parking Assist System)<br>(for Sub Bus 2) |
| *c | to Network Gateway ECU<br>(for Sub Bus 2)                                 | *d | to No. 4 CAN Junction Connector<br>(for Sub Bus 2)                                        |

(2) Check the connection diagram of the components which are connected to the No. 3 CAN junction connector.

| TERMINAL NO. (SYMBOL) | WIRING COLOR | CONNECTED TO                                        |
|-----------------------|--------------|-----------------------------------------------------|
| J2-1 (CANH)           | Y            | Clearance warning ECU assembly*1<br>(for Sub Bus 2) |
| J2-12 (CANL)          | W            |                                                     |
| J2-2 (CANH)           | V            | Network gateway ECU<br>(for Sub Bus 2)              |
| J2-13 (CANL)          | W            |                                                     |
| J2-3 (CANH)           | P            | No. 4 CAN junction connector                        |

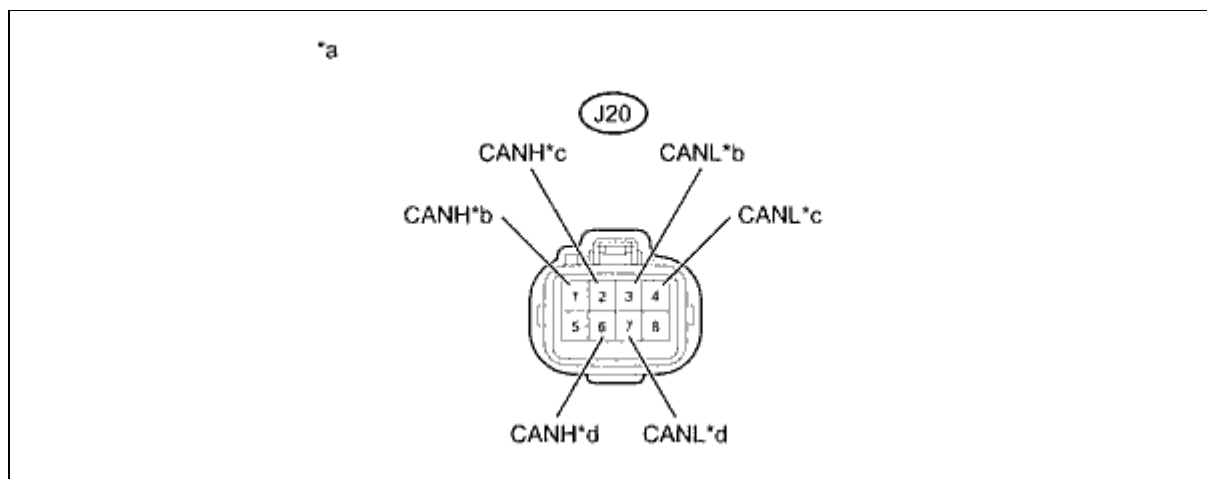
| TERMINAL NO. (SYMBOL) | WIRING COLOR | CONNECTED TO    |
|-----------------------|--------------|-----------------|
| J2-14 (CANL)          | W            | (for Sub Bus 2) |

\*1: w/ Intuitive Parking Assist System

#### 4. NO. 4 CAN JUNCTION CONNECTOR (w/ Blind Spot Monitor System or Intuitive Parking Assist System)

(a) Check the No. 4 CAN junction connector.

(1) Connection diagram



#### Text in Illustration

|    |                                                                           |    |                                                                                   |
|----|---------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------|
| *1 | DLC3                                                                      | -  | -                                                                                 |
| *a | Front view of wire harness connector<br>(to No. 4 CAN Junction Connector) | *b | to No. 3 CAN Junction Connector<br>(for Sub Bus 2)                                |
| *c | to No. 1 CAN Junction Terminal<br>(for Sub Bus 2)                         | *d | to Blind Spot Monitor Sensor LH (w/ Blind Spot Monitor System)<br>(for Sub Bus 2) |

(2) Check the connection diagram of the components which are connected to the No. 4 CAN junction connector.

| TERMINAL NO. (SYMBOL) | WIRING COLOR | CONNECTED TO                                      |
|-----------------------|--------------|---------------------------------------------------|
| J20-1 (CANH)          | P            | No. 3 CAN junction connector<br>(for Sub Bus 2)   |
| J20-3 (CANL)          | W            |                                                   |
| J20-2 (CANH)          | L            | No. 1 CAN junction terminal<br>(for Sub Bus 2)    |
| J20-4 (CANL)          | W            |                                                   |
| J20-6 (CANH)          | B            | Blind Spot Monitor Sensor LH*1<br>(for Sub Bus 2) |
| J20-7 (CANL)          | W            |                                                   |

\*1: w/ Blind Spot Monitor System

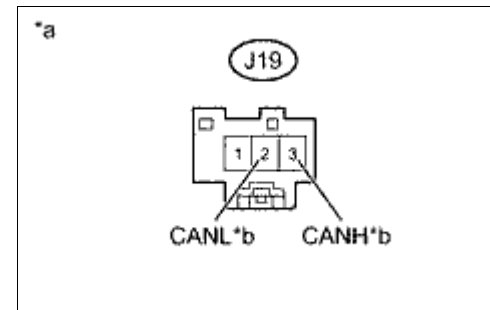
#### 5. NO. 1 CAN JUNCTION TERMINAL (w/ Blind Spot Monitor System or Intuitive Parking Assist System)

(a) Check the No. 1 CAN junction terminal.

(1) Connection diagram

#### Text in Illustration

|    |                                                                          |
|----|--------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to No. 1 CAN Junction Terminal) |
| *b | to No. 4 CAN Junction Connector<br>(for Sub Bus 2)                       |

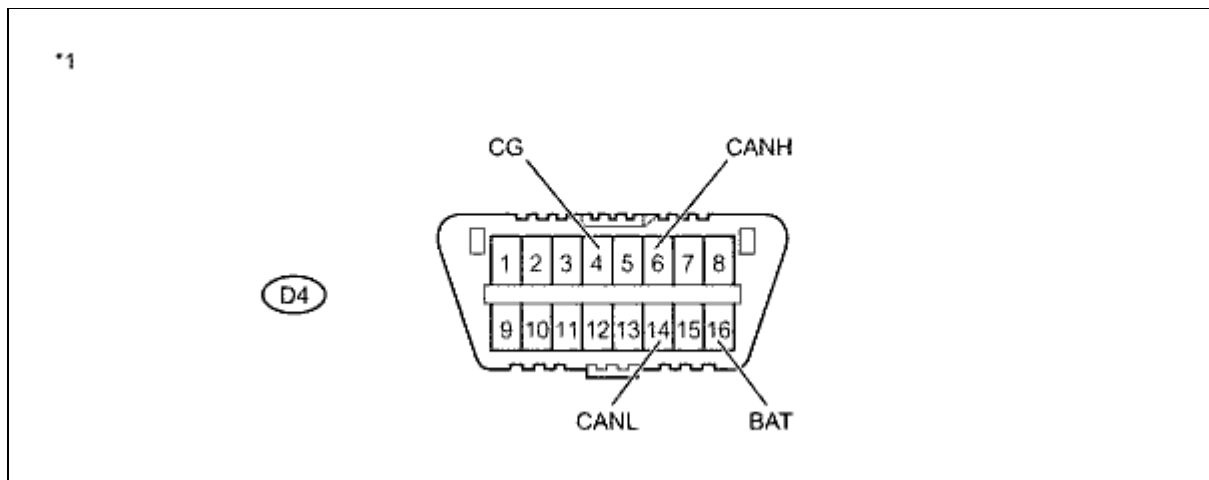


(2) Check the connection diagram of the components which are connected to the No. 1 CAN junction terminal.

| TERMINAL NO. (SYMBOL) | WIRING COLOR | CONNECTED TO                                    |
|-----------------------|--------------|-------------------------------------------------|
| J19-3 (CANH)          | L            | No. 4 CAN junction connector<br>(for Sub bus 2) |
| J19-2 (CANL)          | W            |                                                 |

## 6. DLC3

- (a) Disconnect the cable from the negative (-) battery terminal.
- (b) Measure the resistance according to the value(s) in the table below.



#### Text in Illustration

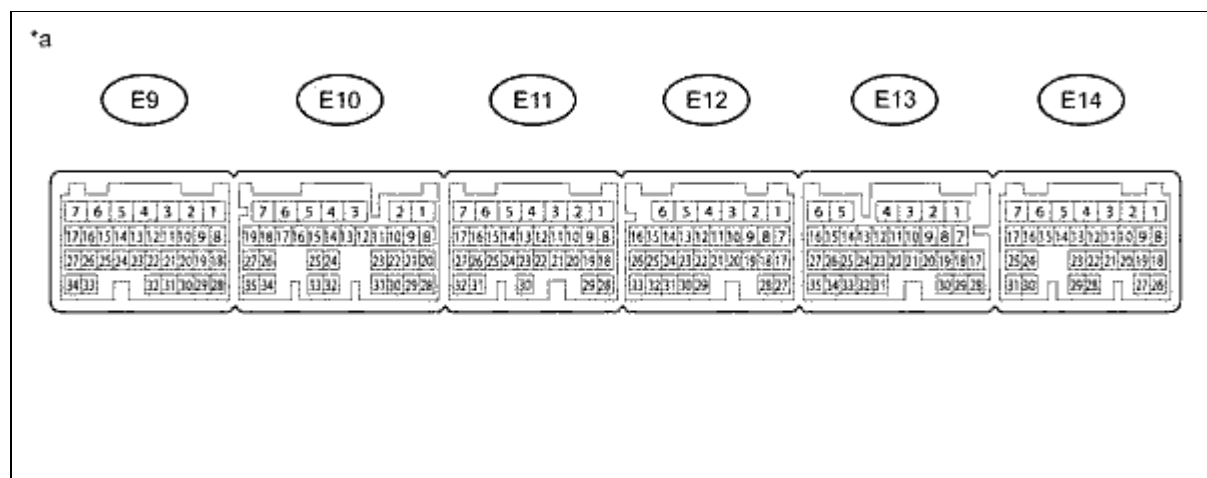
|    |      |   |   |
|----|------|---|---|
| *1 | DLC3 | - | - |
|----|------|---|---|

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)      | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|-------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| D4-6 (CANH) -<br>D4-14 (CANL) | L - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| D4-6 (CANH) -<br>D4-4 (CG)    | L - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| D4-14 (CANL) -<br>D4-4 (CG)   | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |

| TERMINAL NO.<br>(SYMBOL)      | WIRING<br>COLOR | TERMINAL DESCRIPTION                              | CONDITION                                                | SPECIFIED<br>CONDITION |
|-------------------------------|-----------------|---------------------------------------------------|----------------------------------------------------------|------------------------|
| D4-6 (CANH) -<br>D4-16 (BAT)  | L - Y           | HIGH-level CAN bus line -<br>Battery positive (+) | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher         |
| D4-14 (CANL) -<br>D4-16 (BAT) | W - Y           | LOW-level CAN bus line -<br>Battery positive (+)  | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher         |

## 7. ECM (for 2GR-FKS)

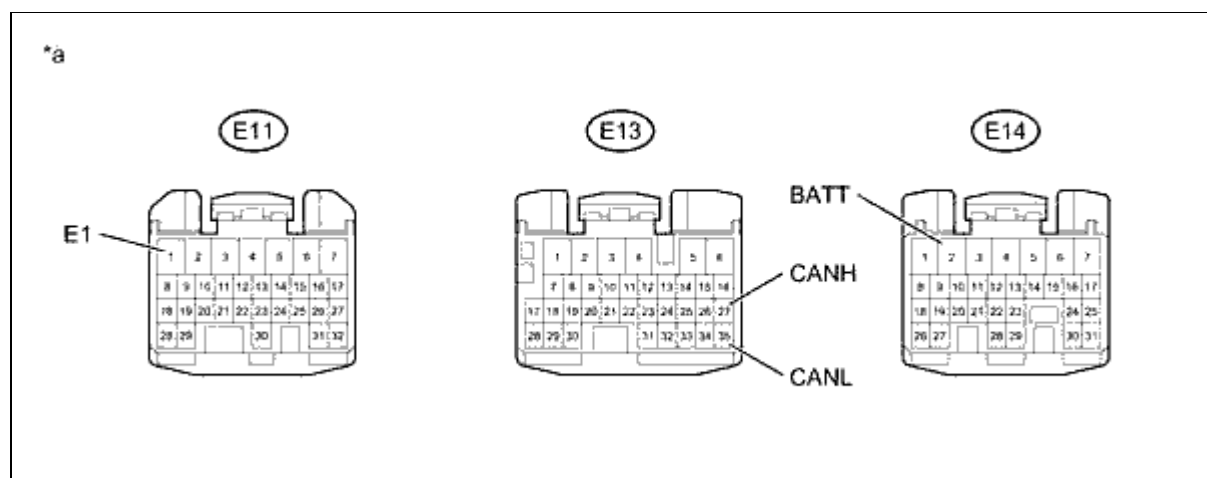


### Text in Illustration

|    |                                              |   |   |
|----|----------------------------------------------|---|---|
| *a | Component without harness connected<br>(ECM) | - | - |
|----|----------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the ECM connectors.



### Text in Illustration

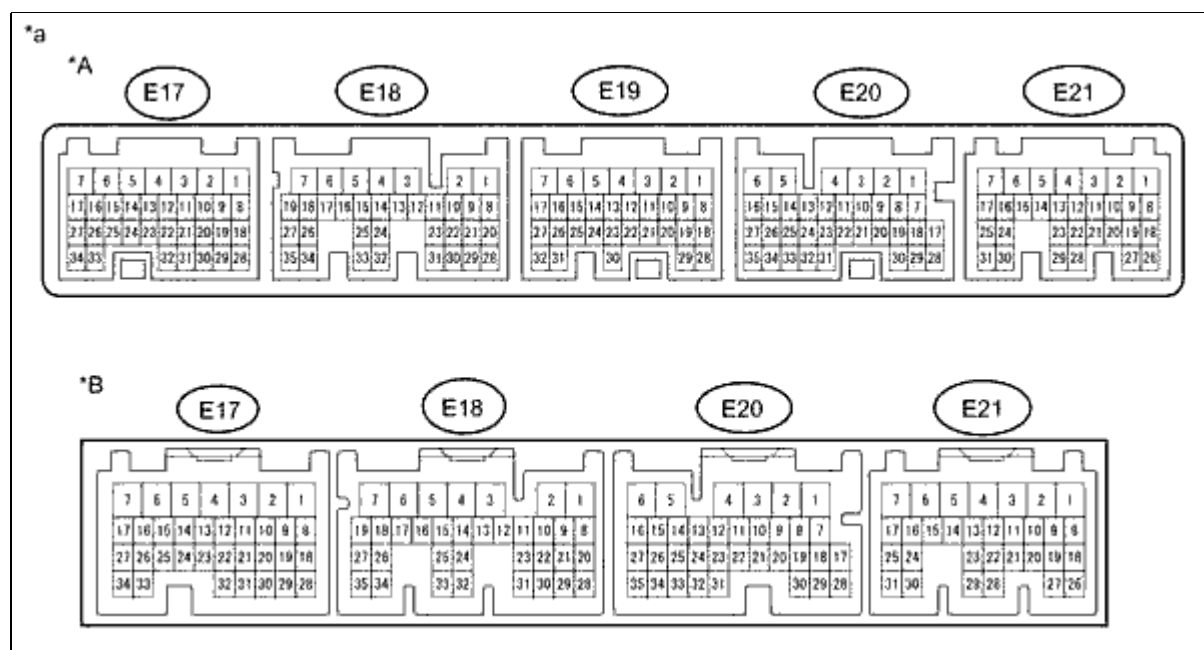
|    |                                                  |   |   |
|----|--------------------------------------------------|---|---|
| *a | Front view of wire harness connector<br>(to ECM) | - | - |
|----|--------------------------------------------------|---|---|

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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)         | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|----------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| E13-27 (CANH) -<br>E13-35 (CANL) | B - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 108 to 132 $\Omega$    |
| E13-27 (CANH) -<br>E11-1 (E1)    | B - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| E13-35 (CANL) -<br>E11-1 (E1)    | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| E13-27 (CANH) -<br>E14-2 (BATT)  | B - L           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| E13-35 (CANL) -<br>E14-2 (BATT)  | W - L           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 8. ECM (for 2TR-FE)

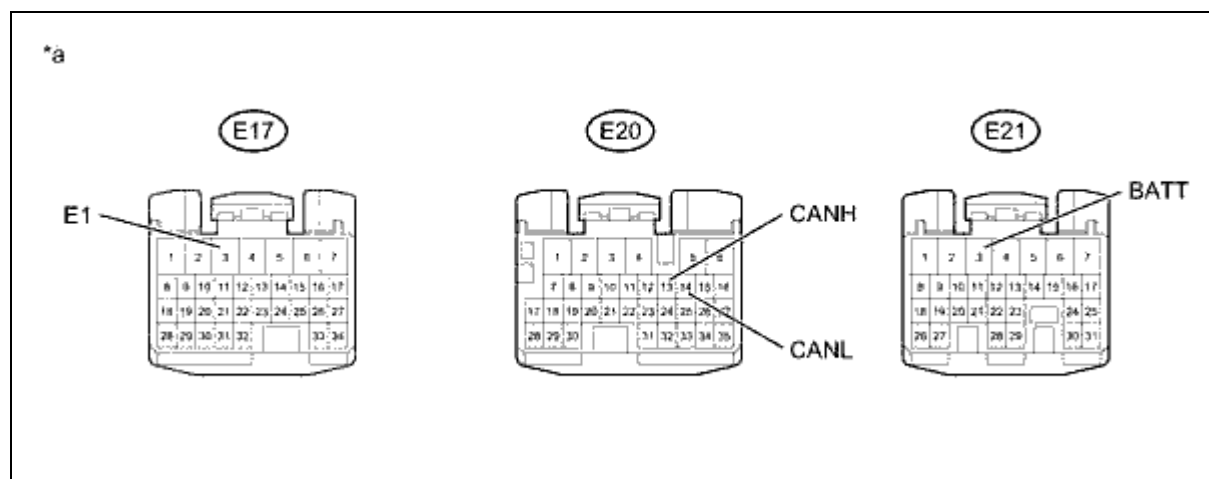


### Text in Illustration

|    |                                              |    |                                |
|----|----------------------------------------------|----|--------------------------------|
| *A | for Automatic Transmission Models            | *B | for Manual Transmission Models |
| *a | Component without harness connected<br>(ECM) | -  | -                              |

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the ECM connectors.



#### Text in Illustration

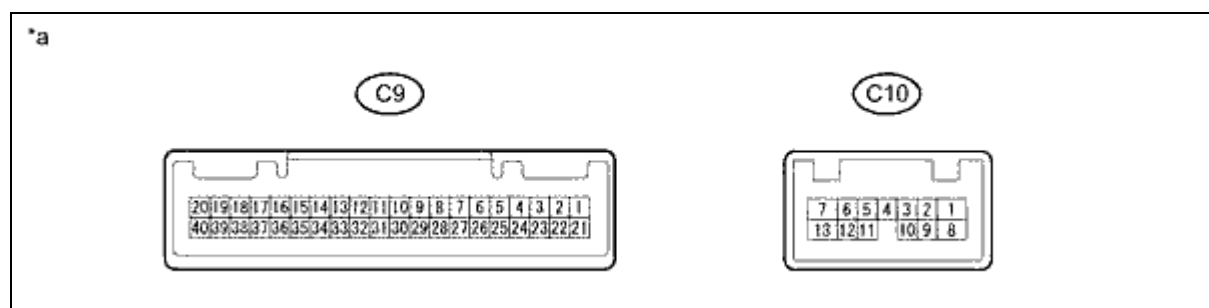
|    |                                                  |   |   |
|----|--------------------------------------------------|---|---|
| *a | Front view of wire harness connector<br>(to ECM) | - | - |
|----|--------------------------------------------------|---|---|

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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)         | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|----------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| E20-13 (CANH) -<br>E20-14 (CANL) | B - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 108 to 132 $\Omega$    |
| E20-13 (CANH) -<br>E17-3 (E1)    | B - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| E20-14 (CANL) -<br>E17-3 (E1)    | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| E20-13 (CANH) -<br>E21-3 (BATT)  | B - L           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| E20-14 (CANL) -<br>E21-3 (BATT)  | W - L           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 9. COMBINATION METER ASSEMBLY



#### Text in Illustration

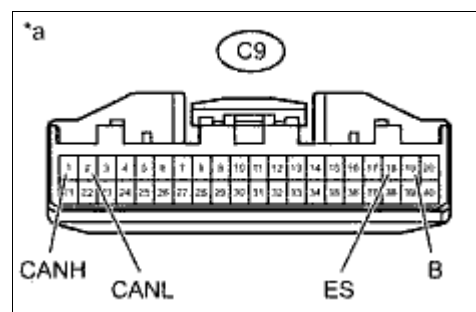
|    |                                                                     |   |   |
|----|---------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Combination Meter Assembly) | - | - |
|----|---------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the combination meter assembly connector.

# Text in Illustration

|    |                                                                         |
|----|-------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Combination Meter Assembly) |
|----|-------------------------------------------------------------------------|

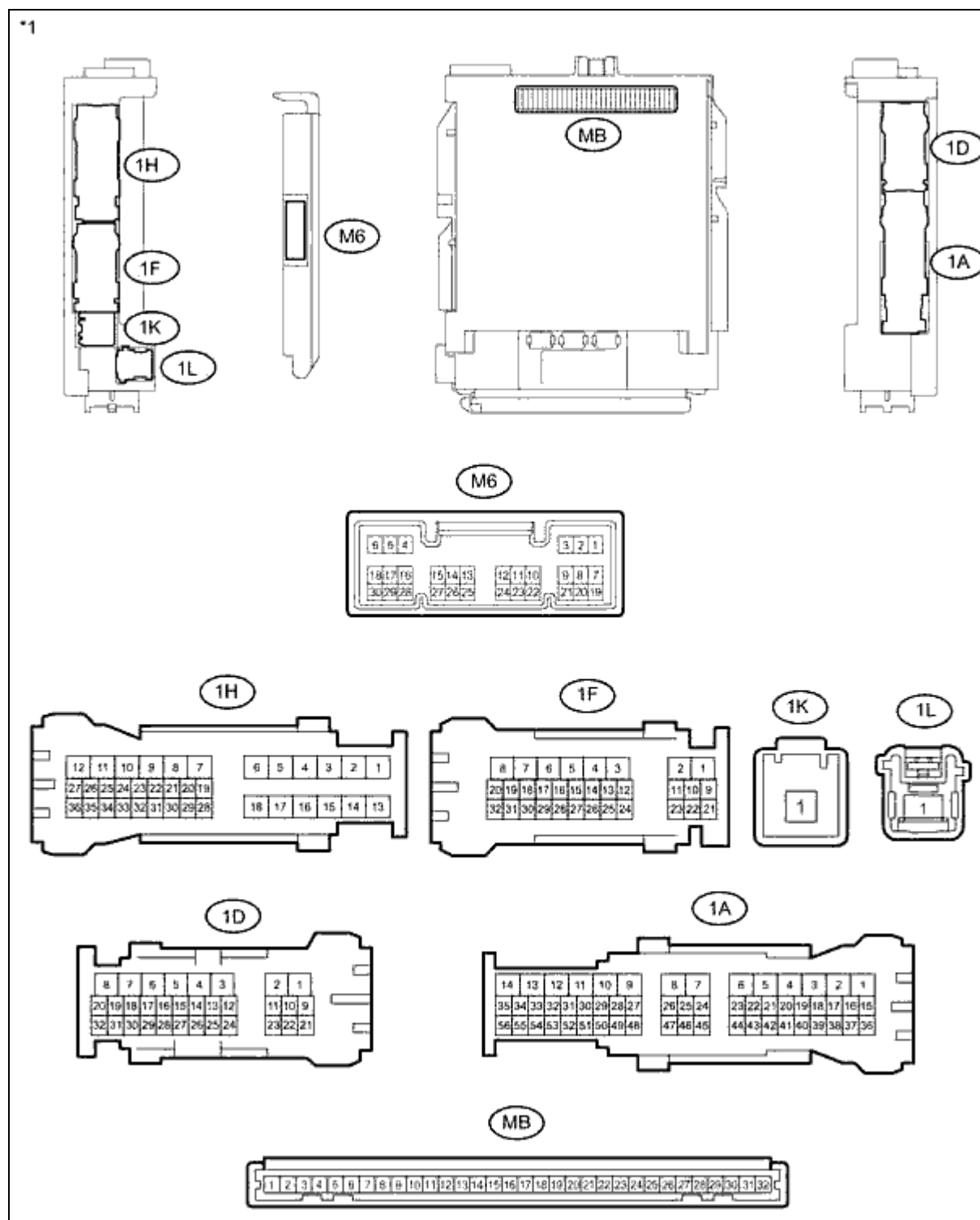


(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)     | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| C9-1 (CANH) -<br>C9-2 (CANL) | G - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 108 to 132 $\Omega$    |
| C9-1 (CANH) -<br>C9-18 (ES)  | G - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| C9-2 (CANL) -<br>C9-18 (ES)  | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| C9-1 (CANH) -<br>C9-19 (B)   | G - P           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| C9-2 (CANL) -<br>C9-19 (B)   | W - P           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 10. DRIVER SIDE JUNCTION BLOCK AND MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)



# Text in Illustration

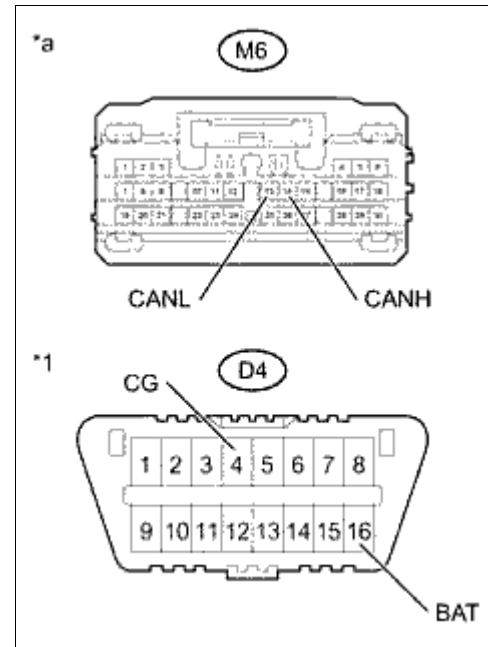
|    |                                                                        |   |   |
|----|------------------------------------------------------------------------|---|---|
| *1 | Driver Side Junction Block, Main Body ECU (Multiplex Network Body ECU) | - | - |
|----|------------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the main body ECU (multiplex network body ECU) connector.

**Text in Illustration**

|    |                                                                                         |
|----|-----------------------------------------------------------------------------------------|
| *1 | DLC3                                                                                    |
| *a | Front view of wire harness connector<br>(to Main Body ECU (Multiplex Network Body ECU)) |

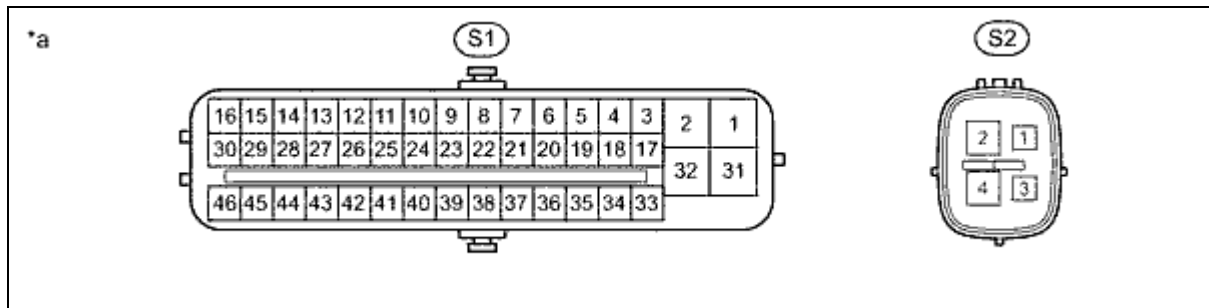


(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)       | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|--------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| M6-14 (CANH) -<br>M6-13 (CANL) | B - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| M6-14 (CANH) -<br>D4-4 (CG)    | B - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| M6-13 (CANL) -<br>D4-4 (CG)    | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| M6-14 (CANH) -<br>D4-16 (BAT)  | B - Y           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| M6-13 (CANL) -<br>D4-16 (BAT)  | W - Y           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

**11. BRAKE BOOSTER ASSEMBLY (SKID CONTROL ECU) (for Hydraulic Brake Booster)**



**Text in Illustration**

|    |                                     |   |   |
|----|-------------------------------------|---|---|
| *a | Component without harness connected | - | - |
|----|-------------------------------------|---|---|

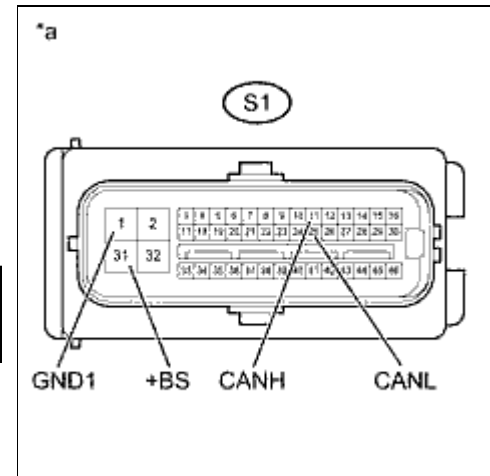
(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the brake booster assembly (skid control ECU) connector.

#### Text in Illustration

\*a

Front view of wire harness connector  
(to Brake Booster Assembly (Skid Control ECU))

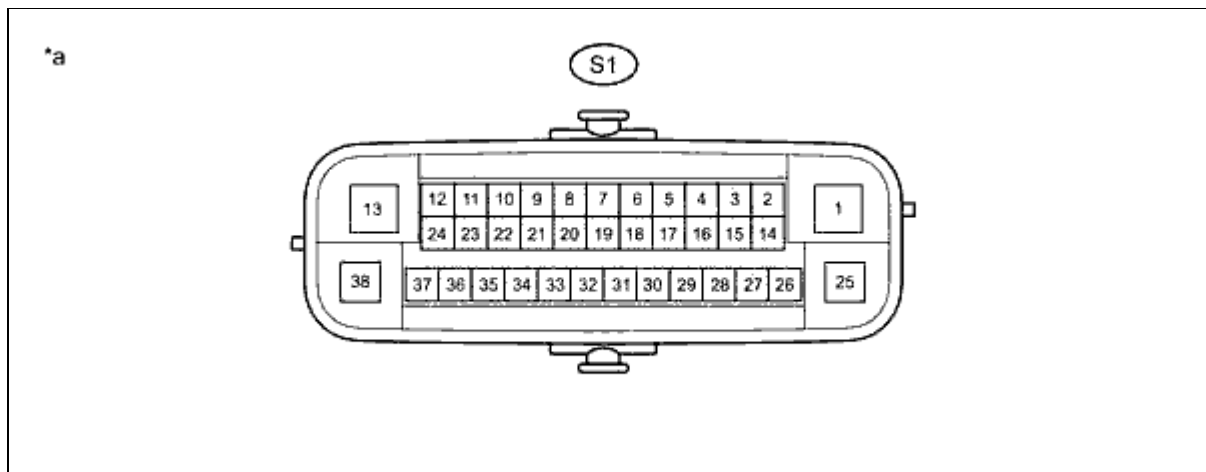


(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)       | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|--------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| S1-11 (CANH) -<br>S1-25 (CANL) | P - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| S1-11 (CANH) -<br>S1-1 (GND1)  | P - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| S1-25 (CANL) -<br>S1-1 (GND1)  | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| S1-11 (CANH) -<br>S1-31 (+BS)  | P - R           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| S1-25 (CANL) -<br>S1-31 (+BS)  | W - R           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 12. BRAKE ACTUATOR ASSEMBLY (SKID CONTROL ECU) (for Vacuum Brake Booster)



## Text in Illustration

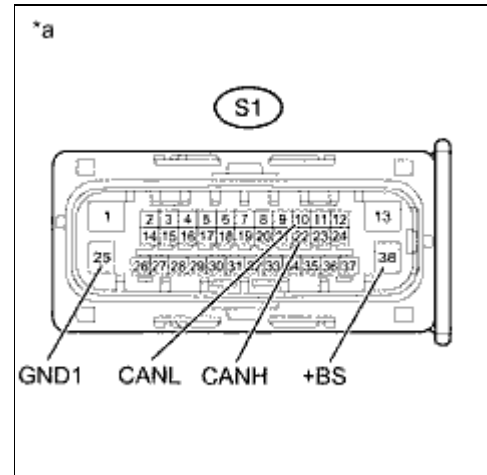
|    |                                                                                     |   |   |
|----|-------------------------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Brake Actuator Assembly (Skid Control ECU)) | - | - |
|----|-------------------------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the brake actuator assembly (skid control ECU) connector.

## Text in Illustration

|    |                                                                                         |
|----|-----------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Brake Actuator Assembly (Skid Control ECU)) |
|----|-----------------------------------------------------------------------------------------|



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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)       | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|--------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| S1-22 (CANH) -<br>S1-10 (CANL) | P - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 Ω             |
| S1-22 (CANH) -<br>S1-25 (GND1) | P - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 Ω or higher        |
| S1-10 (CANL) -<br>S1-25 (GND1) | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 Ω or higher        |
| S1-22 (CANH) -<br>S1-38 (+BS)  | P - R           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher         |
| S1-10 (CANL) -<br>S1-38 (+BS)  | W - R           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher         |

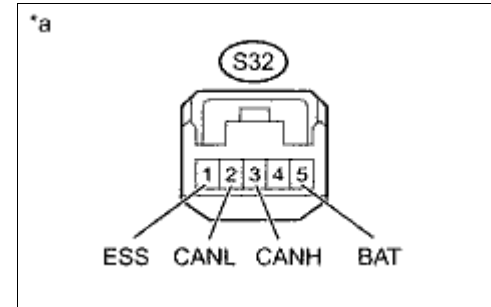
## 13. SPIRAL CABLE WITH SENSOR SUB-ASSEMBLY

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the steering sensor connector.

**Text in Illustration**

|    |                                                                                    |
|----|------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Spiral Cable with Sensor Sub-assembly) |
|----|------------------------------------------------------------------------------------|



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

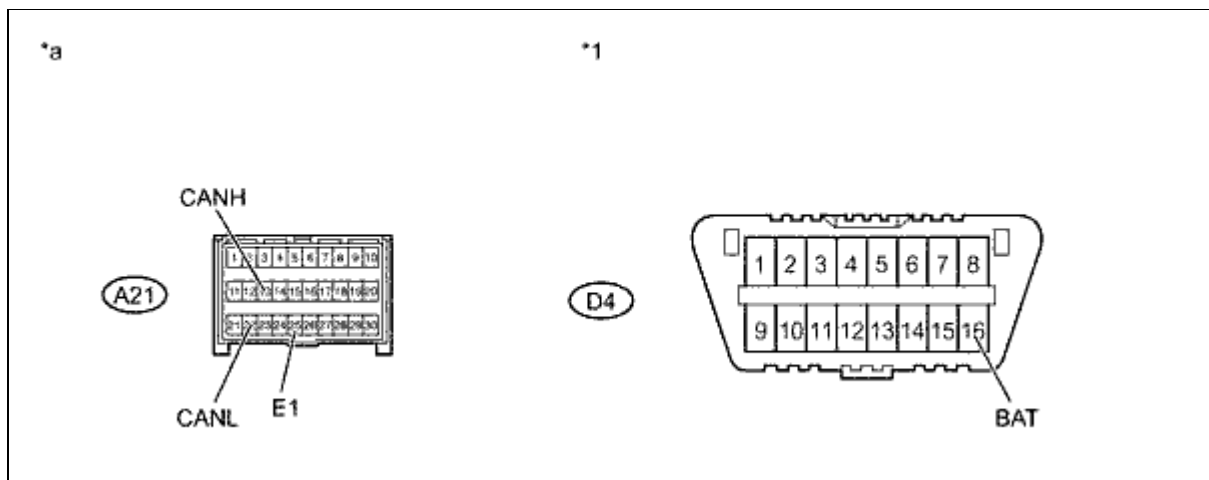
Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)       | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|--------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| S32-3 (CANH) -<br>S32-2 (CANL) | Y - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| S32-3 (CANH) -<br>S32-1 (ESS)  | Y - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| S32-2 (CANL) -<br>S32-1 (ESS)  | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| S32-3 (CANH) -<br>S32-5 (BAT)  | Y - W           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| S32-2 (CANL) -<br>S32-5 (BAT)  | W - W           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

#### 14. AIRBAG SENSOR ASSEMBLY

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the airbag sensor assembly connector.



**Text in Illustration**

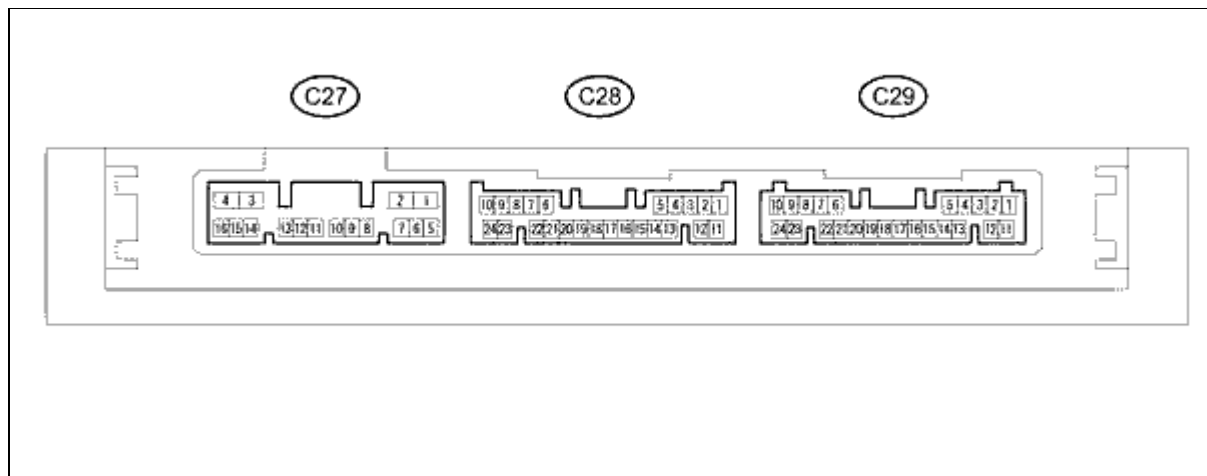
|    |                                                                     |   |   |
|----|---------------------------------------------------------------------|---|---|
| *1 | DLC3                                                                | - | - |
| *a | Front view of wire harness connector<br>(to Airbag Sensor Assembly) | - | - |

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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)         | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|----------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| A21-13 (CANH) -<br>A21-22 (CANL) | R - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| A21-13 (CANH) -<br>A21-25 (E1)   | R - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| A21-22 (CANL) -<br>A21-25 (E1)   | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| A21-13 (CANH) -<br>D4-16 (BAT)   | R - Y           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| A21-22 (CANL) -<br>D4-16 (BAT)   | W - Y           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 15. CERTIFICATION ECU (SMART KEY ECU ASSEMBLY) (w/ Smart Key System)

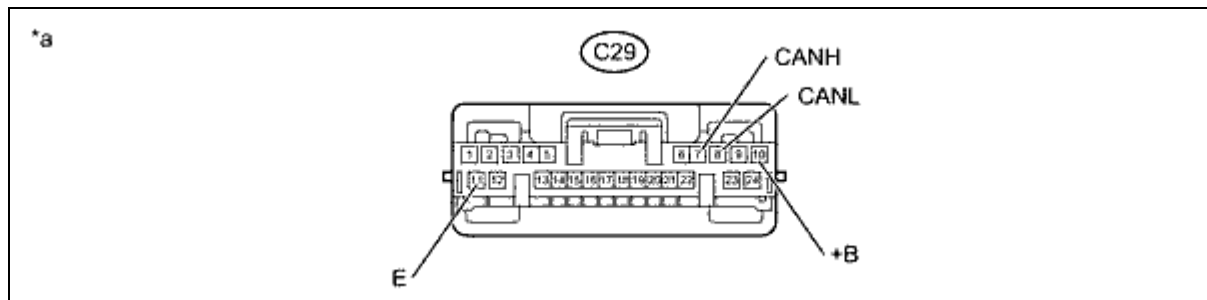


### Text in Illustration

|    |                                                                                     |   |   |
|----|-------------------------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Certification ECU (Smart Key ECU Assembly)) | - | - |
|----|-------------------------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the certification ECU (smart key ECU assembly) connector.



### Text in Illustration

|    |                                                                                         |   |   |
|----|-----------------------------------------------------------------------------------------|---|---|
| *a | Front view of wire harness connector<br>(to Certification ECU (Smart Key ECU Assembly)) | - | - |
|----|-----------------------------------------------------------------------------------------|---|---|

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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)       | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|--------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| C29-7 (CANH) -<br>C29-8 (CANL) | P - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| C29-7 (CANH) -<br>C29-11 (E)   | P - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| C29-8 (CANL) -<br>C29-11 (E)   | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| C29-7 (CANH) -<br>C29-10 (+B)  | P - P           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| C29-8 (CANL) -<br>C29-10 (+B)  | W - P           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

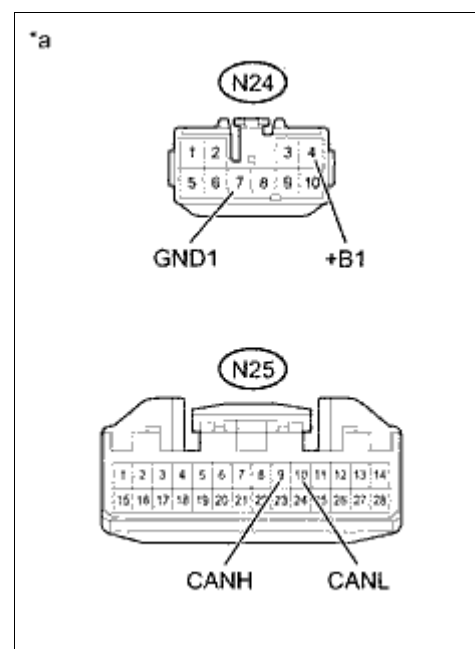
## 16. NAVIGATION RECEIVER ASSEMBLY (for Navigation Receiver Type)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the navigation receiver assembly connector.

### Text in Illustration

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Navigation Receiver Assembly) |
|----|---------------------------------------------------------------------------|



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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL) | WIRING<br>COLOR | TERMINAL DESCRIPTION      | CONDITION               | SPECIFIED<br>CONDITION |
|--------------------------|-----------------|---------------------------|-------------------------|------------------------|
| N25-9 (CANH) -           | V - W           | HIGH-level CAN bus line - | Cable disconnected from | 54 to 69 $\Omega$      |

| TERMINAL NO.<br>(SYMBOL)        | WIRING<br>COLOR | TERMINAL DESCRIPTION                              | CONDITION                                                | SPECIFIED<br>CONDITION |
|---------------------------------|-----------------|---------------------------------------------------|----------------------------------------------------------|------------------------|
| N25-10 (CANL)                   |                 | LOW-level CAN bus line                            | negative (-) battery terminal                            |                        |
| N25-9 (CANH) -<br>N24-7 (GND1)  | V - W-B         | HIGH-level CAN bus line -<br>Ground               | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| N25-10 (CANL) -<br>N24-7 (GND1) | W - W-B         | LOW-level CAN bus line -<br>Ground                | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| N25-9 (CANH) -<br>N24-4 (+B1)   | V - W           | HIGH-level CAN bus line -<br>Battery positive (+) | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| N25-10 (CANL) -<br>N24-4 (+B1)  | W - W           | LOW-level CAN bus line -<br>Battery positive (+)  | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

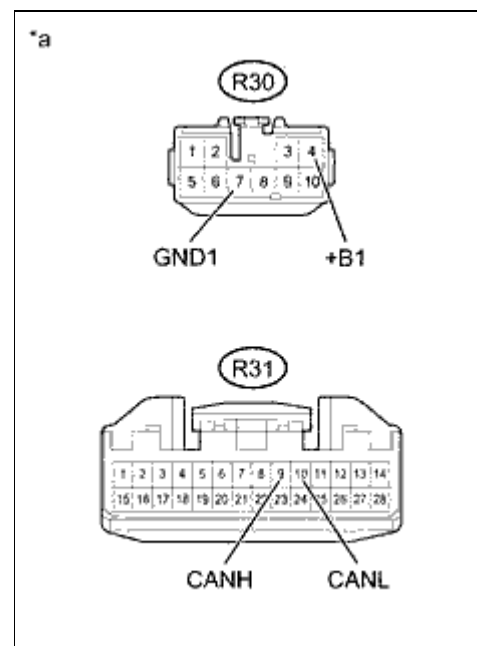
## 17. RADIO AND DISPLAY RECEIVER ASSEMBLY (for Radio and Display Type)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the radio and display receiver assembly connector.

### Text in Illustration

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Radio and Display Receiver Assembly) |
|----|----------------------------------------------------------------------------------|



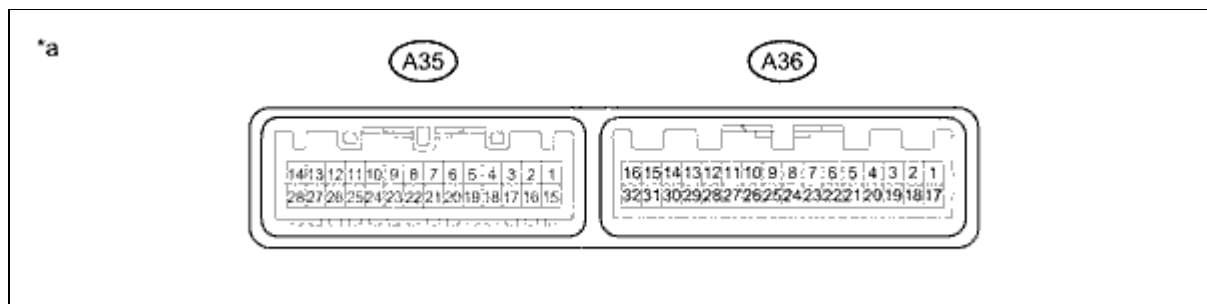
(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)        | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|---------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| R31-9 (CANH) -<br>R31-10 (CANL) | V - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| R31-9 (CANH) -<br>R30-7 (GND1)  | V - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| R31-10 (CANL) -<br>R30-7 (GND1) | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| R31-9 (CANH) -<br>R30-4 (+B1)   | V - W           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

| TERMINAL NO.<br>(SYMBOL)       | WIRING<br>COLOR | TERMINAL DESCRIPTION                             | CONDITION                                                | SPECIFIED<br>CONDITION |
|--------------------------------|-----------------|--------------------------------------------------|----------------------------------------------------------|------------------------|
| R31-10 (CANL) -<br>R30-4 (+B1) | W - W           | LOW-level CAN bus line -<br>Battery positive (+) | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 18. AIR CONDITIONING AMPLIFIER ASSEMBLY (for Automatic Air Conditioning System)



### Text in Illustration

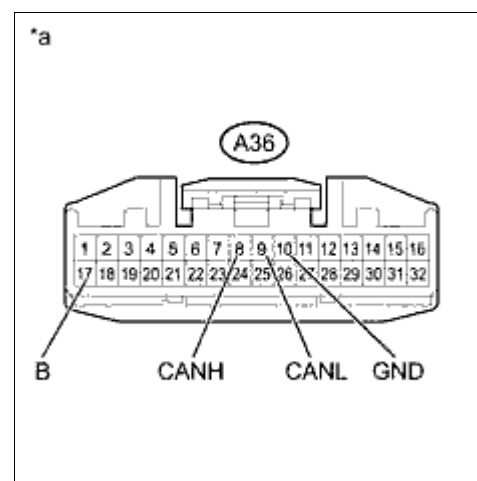
|    |                                                                              |   |   |
|----|------------------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Air Conditioning Amplifier Assembly) | - | - |
|----|------------------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the air conditioning amplifier assembly connector.

### Text in Illustration

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Air Conditioning Amplifier Assembly) |
|----|----------------------------------------------------------------------------------|



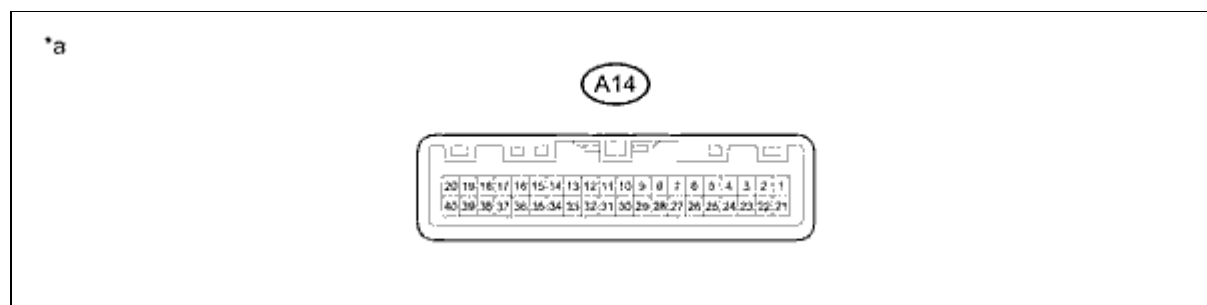
(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)       | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|--------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| A36-8 (CANH) -<br>A36-9 (CANL) | L - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| A36-8 (CANH) -<br>A36-10 (GND) | L - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| A36-9 (CANL) -<br>A36-10 (GND) | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |

| TERMINAL NO.<br>(SYMBOL)     | WIRING<br>COLOR | TERMINAL DESCRIPTION                              | CONDITION                                                | SPECIFIED<br>CONDITION |
|------------------------------|-----------------|---------------------------------------------------|----------------------------------------------------------|------------------------|
| A36-8 (CANH) -<br>A36-17 (B) | L - LG          | HIGH-level CAN bus line -<br>Battery positive (+) | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher         |
| A36-9 (CANL) -<br>A36-17 (B) | W - LG          | LOW-level CAN bus line -<br>Battery positive (+)  | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher         |

## 19. AIR CONDITIONING AMPLIFIER ASSEMBLY (for Manual Air Conditioning System)



### Text in Illustration

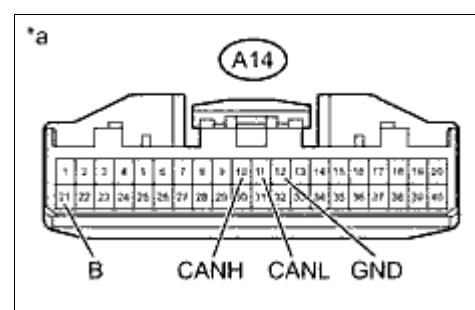
|    |                                                                              |   |   |
|----|------------------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Air Conditioning Amplifier Assembly) | - | - |
|----|------------------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the air conditioning amplifier assembly connector.

### Text in Illustration

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Air Conditioning Amplifier Assembly) |
|----|----------------------------------------------------------------------------------|



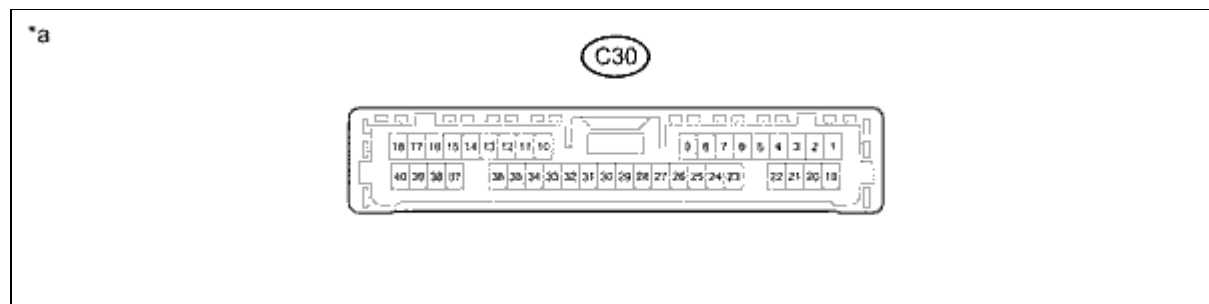
(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)         | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|----------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| A14-10 (CANH) -<br>A14-11 (CANL) | L - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 Ω             |
| A14-10 (CANH) -<br>A14-12 (GND)  | L - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 Ω or higher        |
| A14-11 (CANL) -<br>A14-12 (GND)  | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 Ω or higher        |
| A14-10 (CANH) -<br>A14-21 (B)    | L - LG          | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 kΩ or higher         |

| TERMINAL NO.<br>(SYMBOL)      | WIRING<br>COLOR | TERMINAL DESCRIPTION                             | CONDITION                                                | SPECIFIED<br>CONDITION |
|-------------------------------|-----------------|--------------------------------------------------|----------------------------------------------------------|------------------------|
| A14-11 (CANL) -<br>A14-21 (B) | W - LG          | LOW-level CAN bus line -<br>Battery positive (+) | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 20. CLEARANCE WARNING ECU ASSEMBLY (w/ Intuitive Parking Assist System)



### Text in Illustration

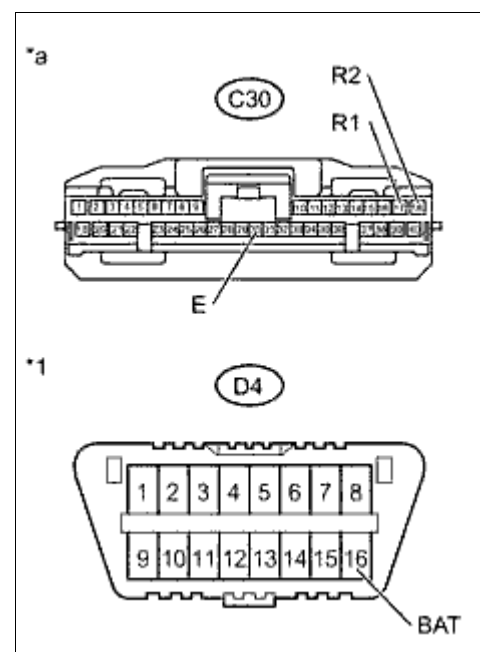
|    |                                                                         |   |   |
|----|-------------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Clearance Warning ECU Assembly) | - | - |
|----|-------------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the clearance warning ECU assembly connector.

### Text in Illustration

|    |                                                                             |
|----|-----------------------------------------------------------------------------|
| *1 | DLC3                                                                        |
| *a | Front view of wire harness connector<br>(to Clearance Warning ECU Assembly) |



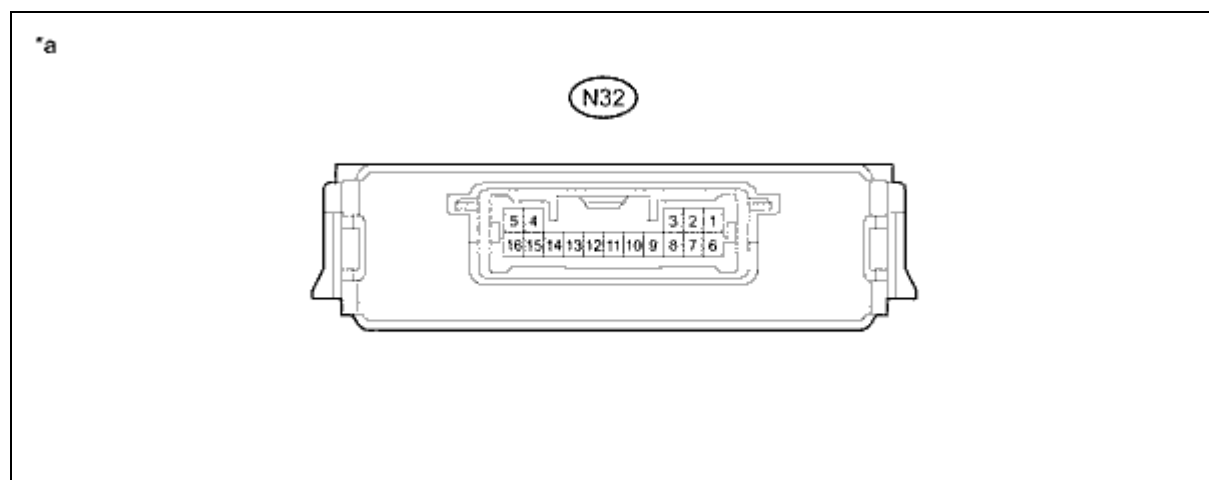
(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)     | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| C30-17 (R1) -<br>C30-18 (R2) | Y - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |

| TERMINAL NO.<br>(SYMBOL)     | WIRING<br>COLOR | TERMINAL DESCRIPTION                              | CONDITION                                                | SPECIFIED<br>CONDITION |
|------------------------------|-----------------|---------------------------------------------------|----------------------------------------------------------|------------------------|
| C30-17 (R1) -<br>C30-30 (E)  | Y - W-B         | HIGH-level CAN bus line -<br>Ground               | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| C30-18 (R2) -<br>C30-30 (E)  | W - W-B         | LOW-level CAN bus line -<br>Ground                | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| C30-17 (R1) -<br>D4-16 (BAT) | Y - Y           | HIGH-level CAN bus line -<br>Battery positive (+) | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| C30-18 (R2) -<br>D4-16 (BAT) | W - Y           | LOW-level CAN bus line -<br>Battery positive (+)  | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 21. NETWORK GATEWAY ECU (w/ Blind Spot Monitor System or Intuitive Parking Assist System)



**Text in Illustration**

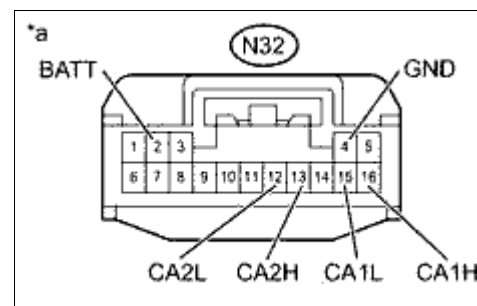
|    |                                                              |   |   |
|----|--------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Network Gateway ECU) | - | - |
|----|--------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the network gateway ECU connector.

**Text in Illustration**

|    |                                                                  |
|----|------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Network Gateway ECU) |
|----|------------------------------------------------------------------|



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

Standard Resistance:

### V Bus Branch Lines

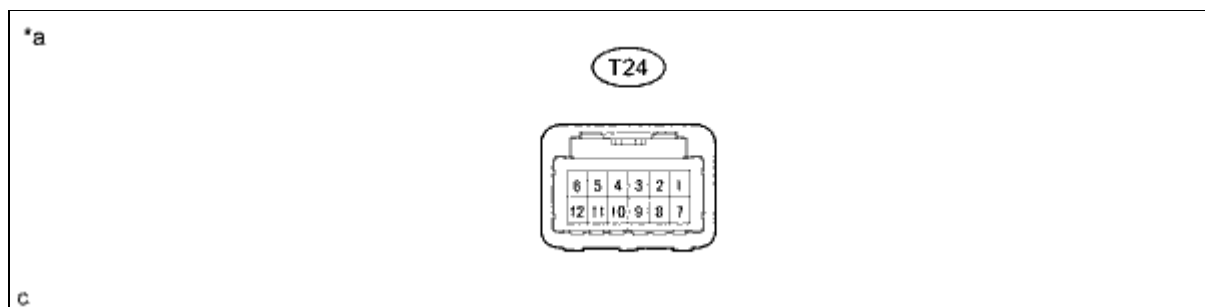
| TERMINAL NO. | WIRING | TERMINAL DESCRIPTION | CONDITION | SPECIFIED |
|--------------|--------|----------------------|-----------|-----------|
|--------------|--------|----------------------|-----------|-----------|

| (SYMBOL)                         | COLOR   |                                                     |                                                          | CONDITION              |
|----------------------------------|---------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| N32-16 (CA1H) -<br>N32-15 (CA1L) | G - W   | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| N32-16 (CA1H) -<br>N32-4 (GND)   | G - W-B | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| N32-15 (CA1L) -<br>N32-4 (GND)   | W - W-B | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| N32-16 (CA1H) -<br>N32-2 (BATT)  | G - R   | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| N32-15 (CA1L) -<br>N32-2 (BATT)  | W - R   | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

### Sub Bus 2 Main Lines

| TERMINAL NO.<br>(SYMBOL)         | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|----------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| N32-13 (CA2H) -<br>N32-12 (CA2L) | V - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 108 to 132 $\Omega$    |
| N32-13 (CA2H) -<br>N32-4 (GND)   | V - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| N32-12 (CA2L) -<br>N32-4 (GND)   | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| N32-13 (CA2H) -<br>N32-2 (BATT)  | V - R           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| N32-12 (CA2L) -<br>N32-2 (BATT)  | W - R           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 22. DOOR CONTROL AND TIRE PRESSURE MONITORING SYSTEM RECEIVER ASSEMBLY (w/ Tire Pressure Warning System and Tire Inflation Pressure Display Function)

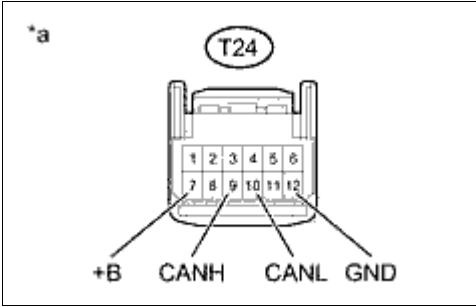


### Text in Illustration

|    |                                                                                                             |   |   |
|----|-------------------------------------------------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(Door Control and Tire Pressure Monitoring System Receiver Assembly) | - | - |
|----|-------------------------------------------------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the door control and tire pressure monitoring system receiver assembly connector.



**Text in Illustration**

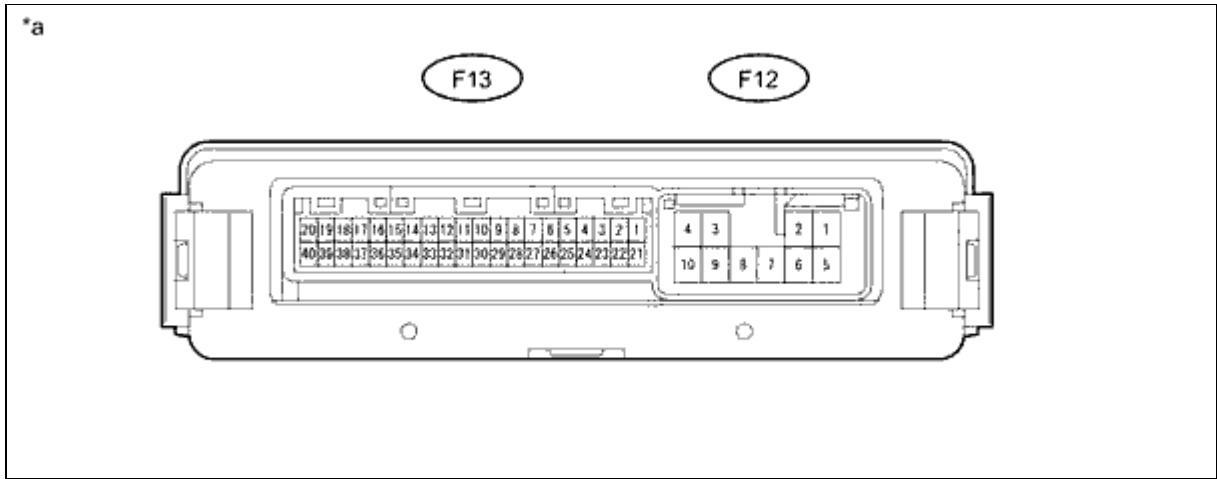
|    |                                                                                                                 |
|----|-----------------------------------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Door Control and Tire Pressure Monitoring System Receiver Assembly) |
|----|-----------------------------------------------------------------------------------------------------------------|

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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)        | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|---------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| T24-9 (CANH) -<br>T24-10 (CANL) | LG - W          | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| T24-9 (CANH) -<br>T24-12 (GND)  | LG - W-B        | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| T24-10 (CANL) -<br>T24-12 (GND) | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| T24-9 (CANH) -<br>T24-7 (+B)    | LG - BE         | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| T24-10 (CANL) -<br>T24-7 (+B)   | W - BE          | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

**23. 4 WHEEL DRIVE CONTROL ECU (for 4WD)**



**Text in Illustration**

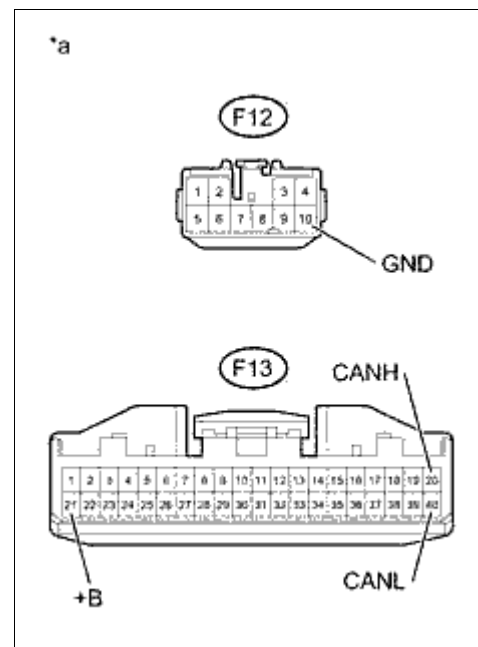
|    |                                                                    |   |   |
|----|--------------------------------------------------------------------|---|---|
| *a | Component without harness connected<br>(4 Wheel Drive Control ECU) | - | - |
|----|--------------------------------------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the 4 wheel drive control ECU connector.

# Text in Illustration

|    |                                                                        |
|----|------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to 4 Wheel Drive Control ECU) |
|----|------------------------------------------------------------------------|

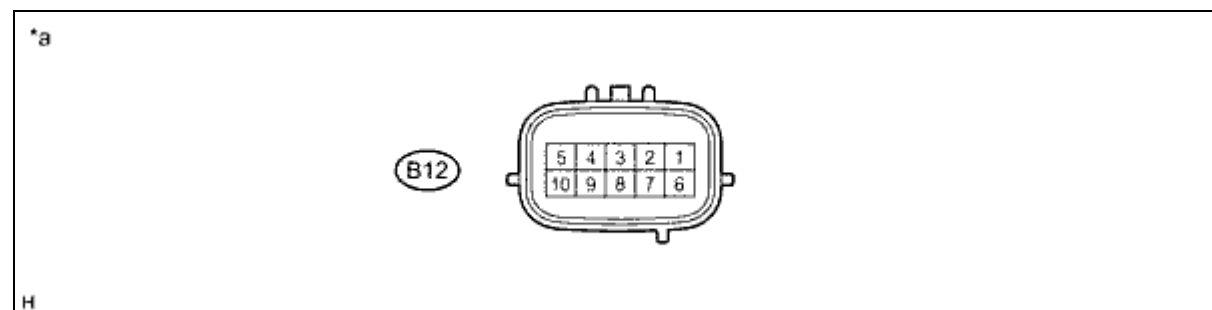


(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)         | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|----------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| F13-20 (CANH) -<br>F13-40 (CANL) | BE - W          | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| F13-20 (CANH) -<br>F12-10 (GND)  | BE - W-B        | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| F13-40 (CANL) -<br>F12-10 (GND)  | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| F13-20 (CANH) -<br>F13-21 (+B)   | BE - W          | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| F13-40 (CANL) -<br>F13-21 (+B)   | W - W           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |

## 24. BLIND SPOT MONITOR SENSOR LH (w/ Blind Spot Monitor System)



# Text in Illustration

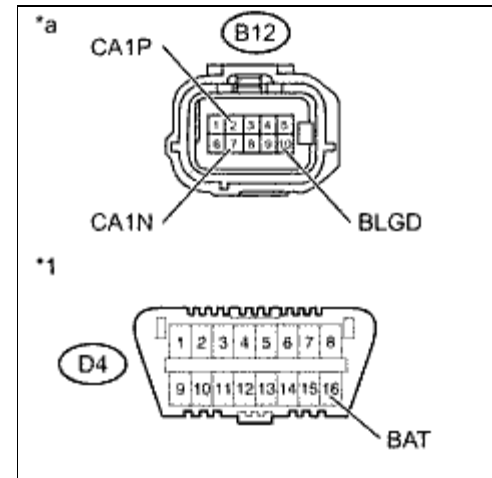
|    |                                     |   |   |
|----|-------------------------------------|---|---|
| *a | Component without harness connected | - | - |
|----|-------------------------------------|---|---|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the blind spot monitor sensor LH connector.

#### Text in Illustration

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *1 | DLC3                                                                      |
| *a | Front view of wire harness connector<br>(to Blind Spot Monitor Sensor LH) |



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

Standard Resistance:

| TERMINAL NO.<br>(SYMBOL)        | WIRING<br>COLOR | TERMINAL DESCRIPTION                                | CONDITION                                                | SPECIFIED<br>CONDITION |
|---------------------------------|-----------------|-----------------------------------------------------|----------------------------------------------------------|------------------------|
| B12-2 (CA1P) -<br>B12-7 (CA1N)  | B - W           | HIGH-level CAN bus line -<br>LOW-level CAN bus line | Cable disconnected from<br>negative (-) battery terminal | 54 to 69 $\Omega$      |
| B12-2 (CA1P) -<br>B12-10 (BLGD) | B - W-B         | HIGH-level CAN bus line -<br>Ground                 | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| B12-7 (CA1N) -<br>B12-10 (BLGD) | W - W-B         | LOW-level CAN bus line -<br>Ground                  | Cable disconnected from<br>negative (-) battery terminal | 200 $\Omega$ or higher |
| B12-2 (CA1P) -<br>D4-16 (BAT)   | B - Y           | HIGH-level CAN bus line -<br>Battery positive (+)   | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |
| B12-7 (CA1N) -<br>D4-16 (BAT)   | W - Y           | LOW-level CAN bus line -<br>Battery positive (+)    | Cable disconnected from<br>negative (-) battery terminal | 6 k $\Omega$ or higher |



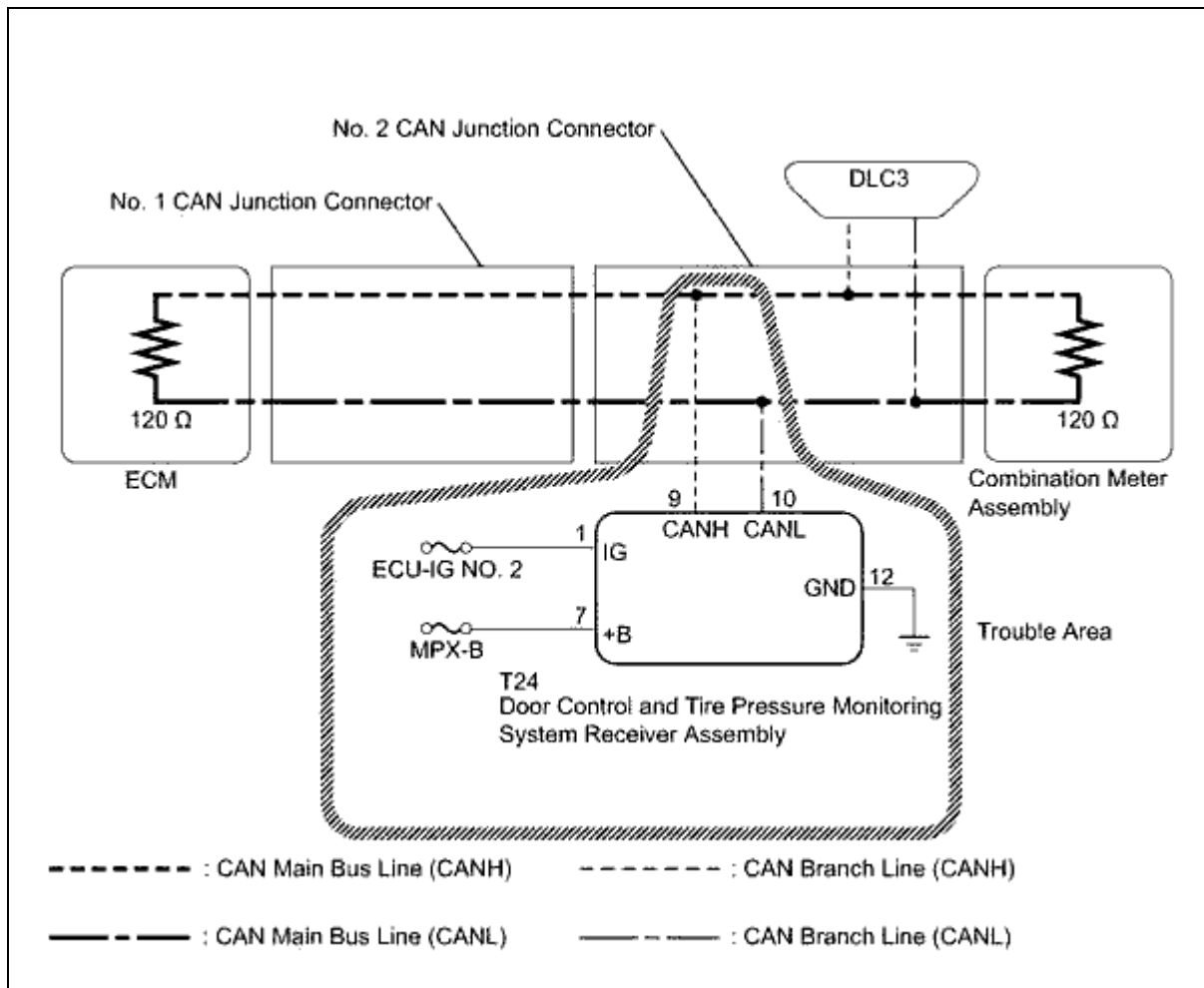
|                                                                                                                                               |                      |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                              | 6.6 J                | <b>Doc ID:</b> RM00000109K0G4X           |
| <b>Model Year Start:</b> 2016                                                                                                                 | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: Tire Pressure Monitor ECU Communication Stop Mode; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## Tire Pressure Monitor ECU Communication Stop Mode

## DESCRIPTION

| DETECTION ITEM                                    | SYMPTOM                                                                                                                                                                                                                                                                                                                                                                            | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tire Pressure Monitor ECU Communication Stop Mode | <p>Either condition is met:</p> <ul style="list-style-type: none"> <li>• "Tire Pressure2" is not displayed on the CAN Bus Check screen of the Techstream <span>INFO</span></li> <li>• Communication system DTCs (DTCs that start with U) that correspond to "Tire Pressure Monitor ECU Communication Stop Mode" in "DTC Combination Table" are output <span>INFO</span></li> </ul> | <ul style="list-style-type: none"> <li>• Door control and tire pressure monitoring system receiver assembly branch line or connector</li> <li>• Power source circuit of door control and tire pressure monitoring system receiver assembly</li> <li>• Door control and tire pressure monitoring system receiver assembly ground circuit</li> <li>• Door control and tire pressure monitoring system receiver assembly</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key or switches, or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notices before proceeding with work **INFO**.
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, wait at least 31 seconds.
- After the repair, perform the CAN bus check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

### HINT:

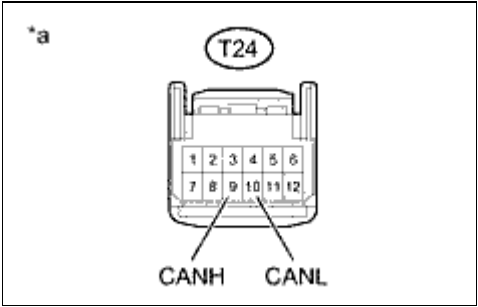
- Operating the ignition switch, any other switches or a door triggers related ECU and sensor communication on the CAN. This communication will cause the resistance value to change.
- Even after DTCs are cleared, if a DTC is stored again after driving the vehicle for a while, the malfunction may be occurring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

PROCEDURE

|    |                                                                                                                  |
|----|------------------------------------------------------------------------------------------------------------------|
| 1. | CHECK FOR OPEN IN CAN BUS LINES (DOOR CONTROL AND TIRE PRESSURE MONITORING SYSTEM RECEIVER ASSEMBLY BRANCH LINE) |
|----|------------------------------------------------------------------------------------------------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the door control and tire pressure monitoring system receiver assembly connector.



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

Standard Resistance:

| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION |
|------------------------------|-------------------------------------------------------|---------------------|
| T24-9 (CANH) - T24-10 (CANL) | Cable disconnected from negative (-) battery terminal | 54 to 69 Ω          |

Text in Illustration

|    |                                                                                                                 |
|----|-----------------------------------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Door Control and Tire Pressure Monitoring System Receiver Assembly) |
|----|-----------------------------------------------------------------------------------------------------------------|

NG ► REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (DOOR CONTROL AND TIRE PRESSURE MONITORING SYSTEM RECEIVER ASSEMBLY)

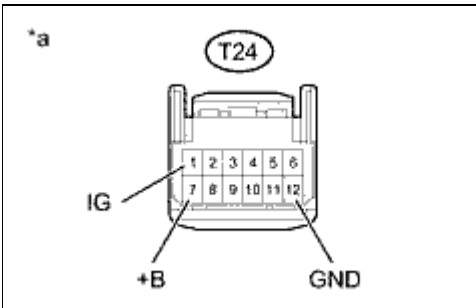
OK  
▼

|    |                                                    |
|----|----------------------------------------------------|
| 2. | CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT) |
|----|----------------------------------------------------|

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION |
|----------------------------|-------------------------------------------------------|---------------------|
| T24-12 (GND) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION        | SWITCH CONDITION   | SPECIFIED CONDITION |
|--------------------------|--------------------|---------------------|
| T24-7 (+B) - Body ground | Always             | 11 to 14 V          |
| T24-1 (IG) - Body ground | Ignition switch ON | 11 to 14 V          |

**Text in Illustration**

|    |                                                                                                                 |
|----|-----------------------------------------------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Door Control and Tire Pressure Monitoring System Receiver Assembly) |
|----|-----------------------------------------------------------------------------------------------------------------|

**NG** ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

**OK** ► **REPLACE DOOR CONTROL AND TIRE PRESSURE MONITORING SYSTEM RECEIVER ASSEMBLY**



|                                                                                                                                                             |                      |                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                                            | 6.6 C                | <b>Doc ID:</b> RM000002PA4061X           |
| <b>Model Year Start:</b> 2016                                                                                                                               | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: U0233; Lost Communication with Blind Spot Monitor Master Module; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

|            |              |                                                                 |
|------------|--------------|-----------------------------------------------------------------|
| <b>DTC</b> | <b>U0233</b> | <b>Lost Communication with Blind Spot Monitor Master Module</b> |
|------------|--------------|-----------------------------------------------------------------|

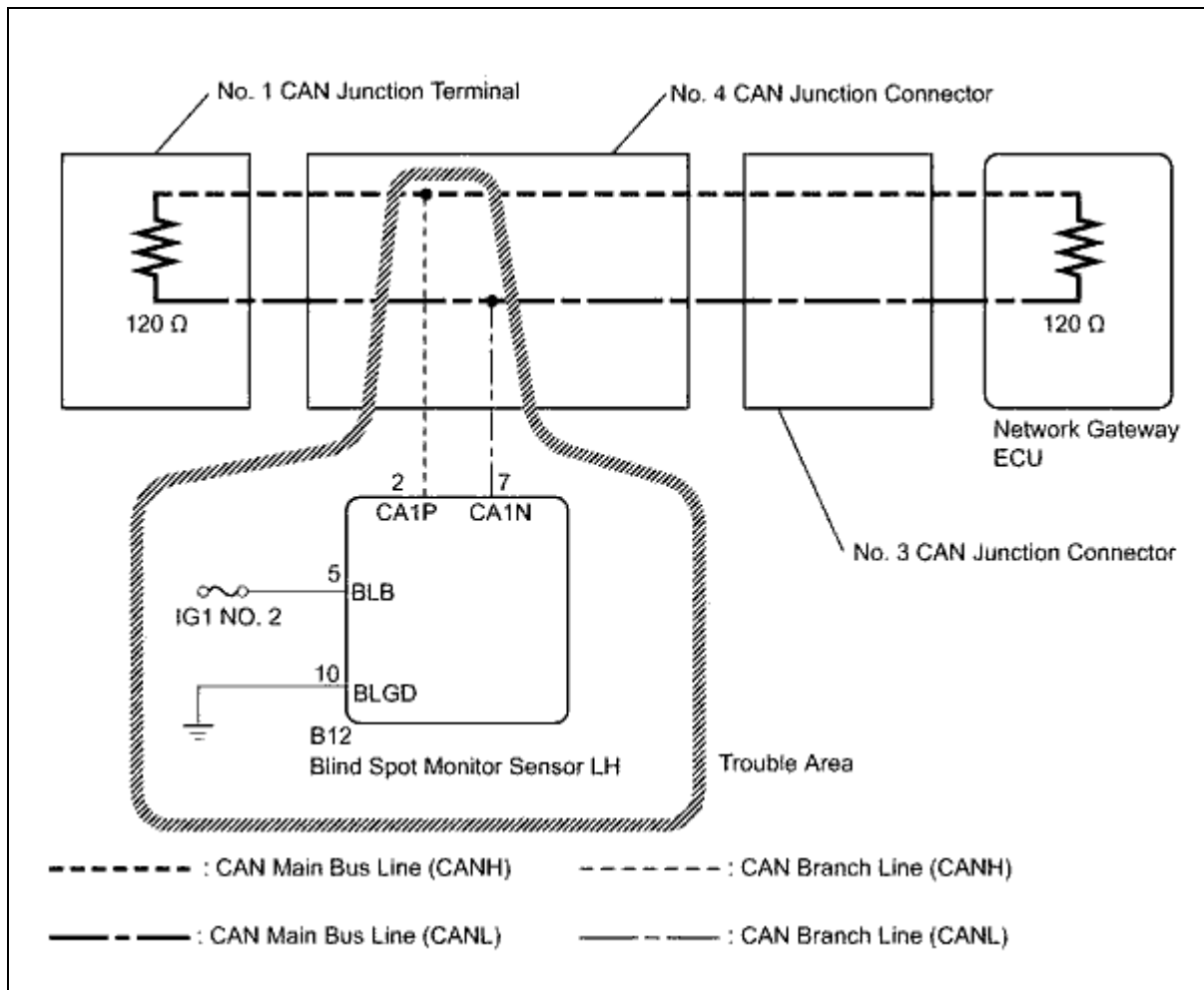
## DESCRIPTION

| DTC NO. | DTC DETECTION CONDITION                                           | TROUBLE AREA                                                                                                                                                                                                                                                             |
|---------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U0233   | No communication from the blind spot monitor sensor LH continues. | <ul style="list-style-type: none"> <li>• Blind spot monitor sensor LH branch line or connector</li> <li>• Power source circuit of blind spot monitor sensor LH</li> <li>• Blind spot monitor sensor LH ground circuit</li> <li>• Blind spot monitor sensor LH</li> </ul> |

### **HINT:**

This diagnosis procedure is for when DTC U0233 is output by the network gateway ECU (Techstream display: Gateway).

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notice before proceeding with work **INFO**.
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the procedure listed in DTC Reproduction Method and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, turn the blind spot monitor main switch on wait at least 20 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

### 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 may help determine the cause of the malfunction.

## PROCEDURE

### 1. RECONFIRM DTC OUTPUT

(a) Reconfirm DTCs.

#### HINT:

If DTC U1002 is output from Gateway of the network gateway ECU, this indicates a sub bus 2 malfunction.  
Troubleshoot for DTC U1002 and check for malfunctions in sub bus 2.

| RESULT                                                                         | PROCEED TO |
|--------------------------------------------------------------------------------|------------|
| U1002 is not output from network gateway ECU.<br>(Techstream display: Gateway) | A          |
| U1002 is output from network gateway ECU.<br>(Techstream display: Gateway)     | B          |

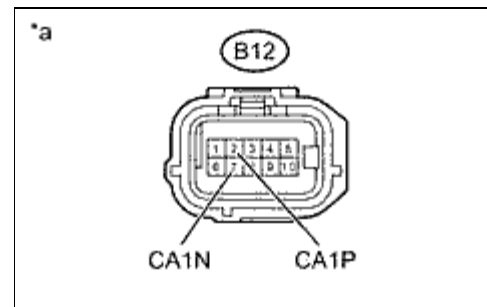
**B** ► GO TO DIAGNOSIS PROCEDURE INDICATED BY OUTPUT DTC

**A**

### 2. CHECK FOR OPEN IN CAN BUS LINES (BLIND SPOT MONITOR SENSOR LH BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the blind spot monitor sensor LH connector.



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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| B12-2 (CA1P) - B12-7 (CA1N) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

**Text in Illustration**

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Blind Spot Monitor Sensor LH) |
|----|---------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (BLIND SPOT MONITOR SENSOR LH)

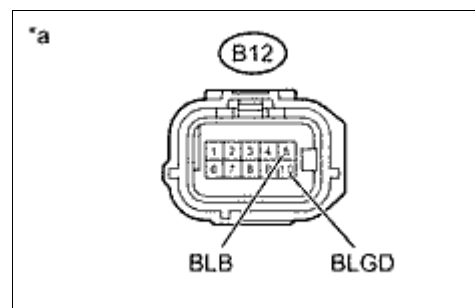
**OK**

|           |                                                           |
|-----------|-----------------------------------------------------------|
| <b>3.</b> | <b>CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)</b> |
|-----------|-----------------------------------------------------------|

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| B12-10 (BLGD) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 $\Omega$    |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION         | SWITCH CONDITION   | SPECIFIED CONDITION |
|---------------------------|--------------------|---------------------|
| B12-5 (BLB) - Body ground | Ignition switch ON | 11 to 14 V          |

#### Text in Illustration

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Blind Spot Monitor Sensor LH) |
|----|---------------------------------------------------------------------------|

**NG** ► REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)

**OK** ► REPLACE BLIND SPOT MONITOR SENSOR LH



|                                                                                                                                                                 |                      |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                                                | 6.6 C                | <b>Doc ID:</b> RM000002DX80DXX           |
| <b>Model Year Start:</b> 2016                                                                                                                                   | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: U1002; Lost Communication with Gateway Module (Network Gateway ECU); 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

|            |              |                                                                     |
|------------|--------------|---------------------------------------------------------------------|
| <b>DTC</b> | <b>U1002</b> | <b>Lost Communication with Gateway Module (Network Gateway ECU)</b> |
|------------|--------------|---------------------------------------------------------------------|

## DESCRIPTION

- The network gateway ECU will store this DTC when no signals can be received from the ECUs that have been memorized as those that are connected to sub bus 2.
- When the network gateway ECU receives a response signal from the ECUs connected to sub bus 2, the network gateway ECU recognizes and memorizes that the ECU is connected to sub bus 2. Based on this memorized data, the network gateway ECU monitors for malfunctions in the ECUs connected to sub bus 2 when communicating with those ECUs. If the network gateway ECU cannot receive response signals from the ECUs that have been memorized as those connected to sub bus 2, the network gateway ECU determines that a malfunction exists.

| DTC NO. | DTC DETECTION CONDITION                                                                                                | TROUBLE AREA                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U1002   | The network gateway ECU cannot receive signals from all ECUs that have been memorized as those connected to sub bus 2. | <ul style="list-style-type: none"> <li>• Open or short in sub bus 2 main line or connector</li> <li>• Open or short in sub bus 2 branch line or connector</li> <li>• Network gateway ECU</li> <li>• Blind spot monitor sensor LH*1</li> <li>• Clearance warning ECU assembly*2</li> <li>• No. 1 CAN junction terminal</li> <li>• Open or short in CAN No. 3 junction connector</li> <li>• Open or short in CAN No. 4 junction connector</li> </ul> |

- \*1: w/ Blind spot monitor system
- \*2: w/ Intuitive Parking Assist System

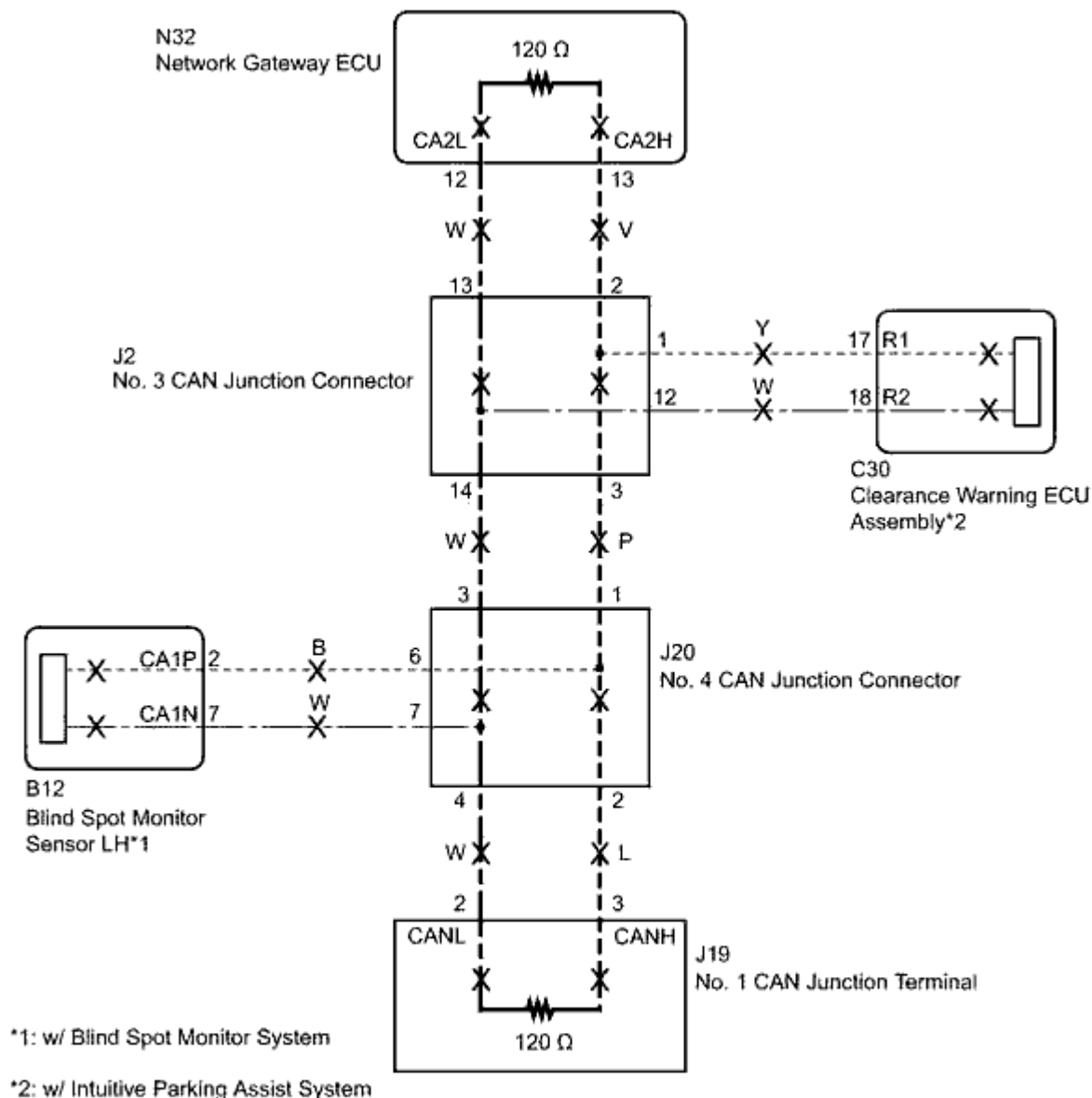
### **HINT:**

This diagnosis procedure is for when DTC U1002 is output by the network gateway ECU (Techstream display: Gateway).

## WIRING DIAGRAM

## Sub Bus 2:

x: Suspected Area



## INSPECTION PROCEDURE

### NOTICE:

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notice before proceeding with work [INFO](#).

- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output **INFO**.
- After performing repairs, perform the DTC check procedure and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, turn the blind spot monitor main switch on wait at least 20 seconds.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed **INFO**.

#### 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 may help determine the cause of the malfunction.

## PROCEDURE

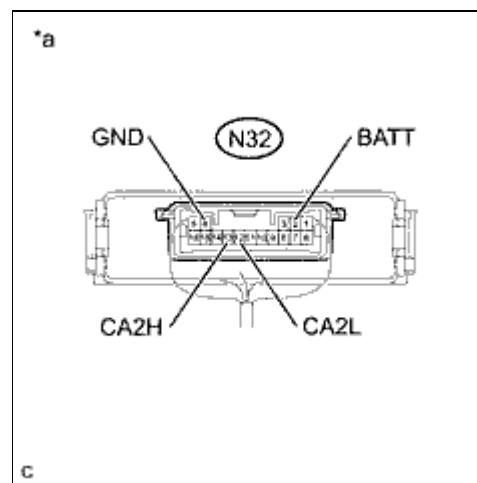
|           |                        |
|-----------|------------------------|
| <b>1.</b> | <b>CHECK SUB BUS 2</b> |
|-----------|------------------------|

(a) Disconnect the cable from the negative (-) battery terminal.

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

Standard Resistance:

| TESTER CONNECTION                | CONDITION                                             | SPECIFIED CONDITION    | RESULT                                                    |
|----------------------------------|-------------------------------------------------------|------------------------|-----------------------------------------------------------|
| N32-13 (CA2H) -<br>N32-12 (CA2L) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$      | Below 54 $\Omega$ :<br>Short circuit between bus lines    |
|                                  |                                                       |                        | 70 $\Omega$ or higher:<br>Open circuit in a main bus line |
| N32-13 (CA2H) -<br>N32-4 (GND)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Below 200 $\Omega$ :<br>CANH ground short                 |
| N32-12 (CA2L) -<br>N32-4 (GND)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Below 200 $\Omega$ :<br>CANL ground short                 |
| N32-13 (CA2H) -<br>N32-2 (BATT)  | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Below 6 k $\Omega$ :<br>CANH +B short                     |



| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION | RESULT                    |
|------------------------------|-------------------------------------------------------|---------------------|---------------------------|
| N32-12 (CA2L) - N32-2 (BATT) | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | Below 6 kΩ: CANL +B short |

#### Text in Illustration

|    |                                                        |
|----|--------------------------------------------------------|
| *a | Component with harness connector (Network Gateway ECU) |
|----|--------------------------------------------------------|

| RESULT                                                                               | PROCEED TO |
|--------------------------------------------------------------------------------------|------------|
| OK                                                                                   | A          |
| Open circuit in CAN main bus line                                                    | B          |
| Short circuit between bus lines                                                      | C          |
| <ul style="list-style-type: none"> <li>• Ground short</li> <li>• +B short</li> </ul> | D          |

**B** ► GO TO STEP 3

**C** ► GO TO STEP 7

**D** ► GO TO STEP 13

**A**



|           |                             |
|-----------|-----------------------------|
| <b>2.</b> | <b>RECONFIRM DTC OUTPUT</b> |
|-----------|-----------------------------|

- Reconnect the cable to the negative (-) battery terminal.
- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Clear the DTCs.
- Turn the ignition switch off.
- Turn the ignition switch to ON and recheck for DTCs.

| RESULT | PROCEED TO |
|--------|------------|
|--------|------------|

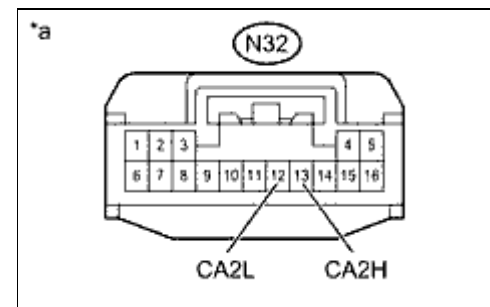
| RESULT                                                                    | PROCEED TO |
|---------------------------------------------------------------------------|------------|
| U1002 is output from network gateway ECU<br>(Techstream display: Gateway) | A          |
| Other DTC is output.                                                      | B          |

**B** ► **GO TO DIAGNOSIS PROCEDURE INDICATED BY OUTPUT DTC**

**A** ► **REPLACE NETWORK GATEWAY ECU**

|           |                                                                     |
|-----------|---------------------------------------------------------------------|
| <b>3.</b> | <b>CHECK FOR OPEN IN SUB BUS 2 MAIN LINES (NETWORK GATEWAY ECU)</b> |
|-----------|---------------------------------------------------------------------|

(a) Disconnect the network gateway ECU connector.



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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| N32-13 (CA2H) - N32-12 (CA2L) | Cable disconnected from negative (-) battery terminal | 108 to 132 Ω        |

#### Text in Illustration

|    |                                                                  |
|----|------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Network Gateway ECU) |
|----|------------------------------------------------------------------|

**NG** ► **GO TO STEP 4**

**OK** ► **REPLACE NETWORK GATEWAY ECU**

|           |                                                                             |
|-----------|-----------------------------------------------------------------------------|
| <b>4.</b> | <b>CHECK FOR OPEN IN SUB BUS 2 MAIN LINES (NO. 1 CAN JUNCTION TERMINAL)</b> |
|-----------|-----------------------------------------------------------------------------|

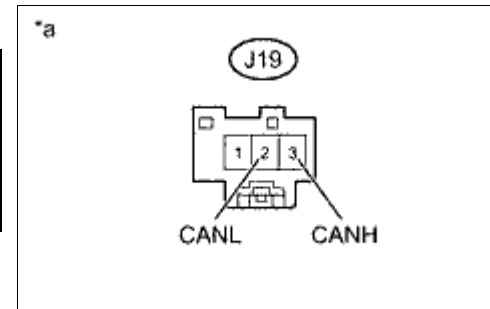
(a) Reconnect the N32 network gateway ECU connector.

(b) Disconnect the No. 1 CAN junction terminal connector.

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| J19-3 (CANH) - J19-2 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |



#### Text in Illustration

|    |                                                                       |
|----|-----------------------------------------------------------------------|
| *a | Front view of wire harness connector (to No. 1 CAN Junction Terminal) |
|----|-----------------------------------------------------------------------|

**NG** **GO TO STEP 5**

**OK** **REPLACE NO. 1 CAN JUNCTION TERMINAL**

|           |                                                                              |
|-----------|------------------------------------------------------------------------------|
| <b>5.</b> | <b>CHECK FOR OPEN IN SUB BUS 2 MAIN LINES (NO. 3 CAN JUNCTION CONNECTOR)</b> |
|-----------|------------------------------------------------------------------------------|

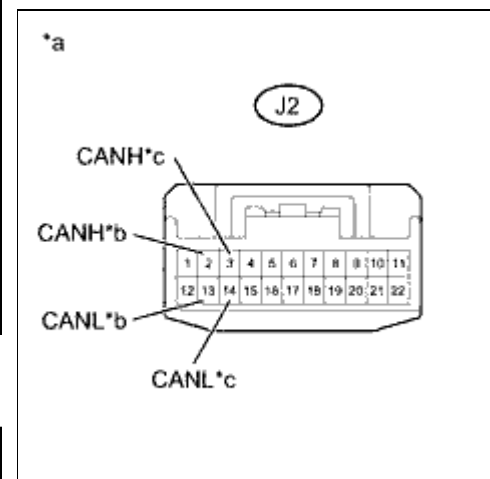
(a) Reconnect the J19 No. 1 CAN junction terminal connector.

(b) Disconnect the No. 3 CAN junction connector.

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

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION | CONNECTED TO                 |
|----------------------------|-------------------------------------------------------|---------------------|------------------------------|
| J2-2 (CANH) - J2-13 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ | Network gateway ECU          |
| J2-3 (CANH) - J2-14 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ | No. 4 CAN junction connector |



#### Text in Illustration

|    |                                                                        |
|----|------------------------------------------------------------------------|
| *a | Front view of wire harness connector (to No. 3 CAN Junction Connector) |
| *b | to Network Gateway ECU                                                 |
| *c | to No. 4 CAN Junction Connector                                        |

**Result**

| RESULT                                       | PROCEED TO |
|----------------------------------------------|------------|
| OK                                           | A          |
| NG (Network gateway ECU main lines)          | B          |
| NG (No. 4 CAN junction connector main lines) | C          |

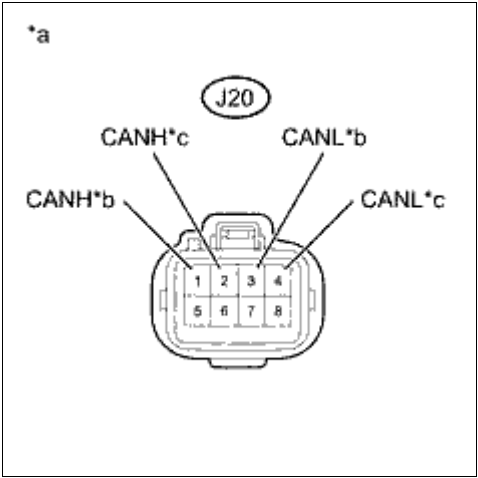
**B** ► **REPAIR OR REPLACE CAN MAIN BUS LINE OR CONNECTOR (NETWORK GATEWAY ECU - NO. 3 CAN JUNCTION CONNECTOR)**

**C** ► **GO TO STEP 6**

**A** ► **REPLACE NO. 3 CAN JUNCTION CONNECTOR**

|           |                                                                              |
|-----------|------------------------------------------------------------------------------|
| <b>6.</b> | <b>CHECK FOR OPEN IN SUB BUS 2 MAIN LINES (NO. 4 CAN JUNCTION CONNECTOR)</b> |
|-----------|------------------------------------------------------------------------------|

(a) Reconnect the J2 No. 3 CAN junction connector.



(b) Disconnect the No. 4 CAN junction connector.

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION | CONNECTED TO                 |
|-----------------------------|-------------------------------------------------------|---------------------|------------------------------|
| J20-1 (CANH) - J20-3 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 Ω        | No. 3 CAN junction connector |
| J20-2 (CANH) - J20-4 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 Ω        | No. 1 CAN junction terminal  |

**Text in Illustration**

|    |                                                                           |
|----|---------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to No. 4 CAN Junction Connector) |
| *b | to No. 3 CAN Junction Connector                                           |
| *c | to No. 1 CAN Junction Terminal                                            |

## Result

| RESULT                                       | PROCEED TO |
|----------------------------------------------|------------|
| OK                                           | A          |
| NG (No. 3 CAN junction connector main lines) | B          |
| NG (No. 1 CAN junction connector main lines) | C          |

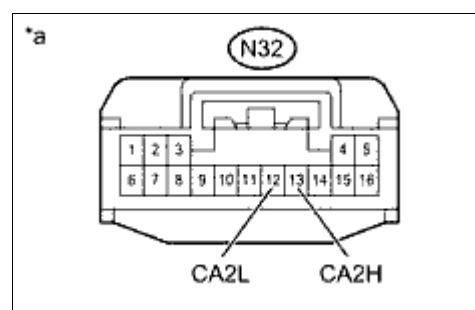
**B** ► REPAIR OR REPLACE CAN MAIN BUS LINES OR CONNECTOR (NO. 3 CAN JUNCTION CONNECTOR - NO. 4 CAN JUNCTION CONNECTOR)

**C** ► REPAIR OR REPLACE CAN MAIN BUS LINES OR CONNECTOR (NO. 4 CAN JUNCTION CONNECTOR - NO. 1 CAN JUNCTION TERMINAL)

**A** ► REPLACE NO. 1 CAN JUNCTION TERMINAL

|           |                                                                 |
|-----------|-----------------------------------------------------------------|
| <b>7.</b> | <b>CHECK FOR SHORT IN SUB BUS 2 LINES (NETWORK GATEWAY ECU)</b> |
|-----------|-----------------------------------------------------------------|

(a) Disconnect the network gateway ECU connector.



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

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| N32-13 (CA2H) - N32-12 (CA2L) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |

## Text in Illustration

|    |                                      |
|----|--------------------------------------|
| *a | Front view of wire harness connector |
|----|--------------------------------------|

(to Network Gateway ECU)

**NG** ► **GO TO STEP 8**

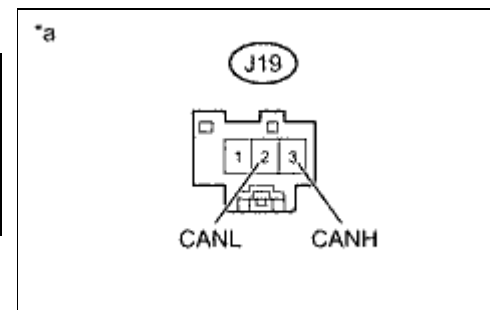
**OK** ► **REPLACE NETWORK GATEWAY ECU**

**8. CHECK FOR SHORT IN SUB BUS 2 LINES (NO. 1 CAN JUNCTION TERMINAL)**

- (a) Reconnect the N32 network gateway ECU connector.
- (b) Disconnect the No. 1 CAN junction terminal connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION |
|-----------------------------|-------------------------------------------------------|---------------------|
| J19-3 (CANH) - J19-2 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$ |



**Text in Illustration**

\*a Front view of wire harness connector (to No. 1 CAN Junction Terminal)

**NG** ► **GO TO STEP 9**

**OK** ► **REPLACE NO. 1 CAN JUNCTION TERMINAL**

**9. CHECK FOR SHORT IN SUB BUS 2 LINES (NO. 3 CAN JUNCTION CONNECTOR)**

- (a) Reconnect the J19 No. 1 CAN junction terminal connector.
- (b) Disconnect the No. 3 CAN junction connector.

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

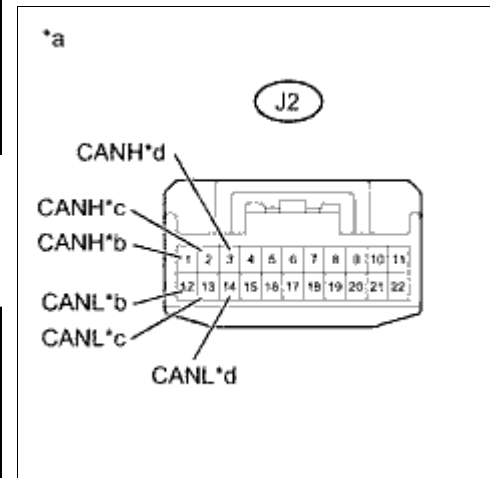
Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                     |
|----------------------------|-------------------------------------------------------|------------------------|----------------------------------|
| J2-1 (CANH) - J2-12 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Clearance warning ECU assembly*1 |
| J2-2 (CANH) - J2-13 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | Network gateway ECU              |
| J2-3 (CANH) - J2-14 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | No. 4 CAN junction connector     |

\*1: w/ Intuitive Parking Assist System

#### Text in Illustration

|    |                                                                        |
|----|------------------------------------------------------------------------|
| *a | Front view of wire harness connector (to No. 3 CAN Junction Connector) |
| *b | to Clearance Warning ECU Assembly (w/ Intuitive Parking Assist System) |
| *c | to Network Gateway ECU                                                 |
| *d | to No. 4 CAN Junction Connector                                        |



#### Result

| RESULT                                       | PROCEED TO |
|----------------------------------------------|------------|
| OK                                           | A          |
| NG (Network gateway ECU main lines)          | B          |
| NG (ECU or sensor branch lines)              | C          |
| NG (No. 4 CAN junction connector main lines) | D          |

**B** ► **REPAIR OR REPLACE CAN MAIN BUS LINE OR CONNECTOR (NETWORK GATEWAY ECU - NO. 3 CAN JUNCTION CONNECTOR)**

**C** ► **GO TO STEP 11**

**D** ► **GO TO STEP 10**

**A** ► **REPLACE NO. 3 CAN JUNCTION CONNECTOR**

**10. CHECK FOR SHORT IN SUB BUS 2 LINES (NO. 4 CAN JUNCTION CONNECTOR)**

- (a) Reconnect the J2 No. 3 CAN junction connector.
- (b) Disconnect the No. 4 CAN junction connector.
- (c) Measure the resistance according to the value(s) in the table below.

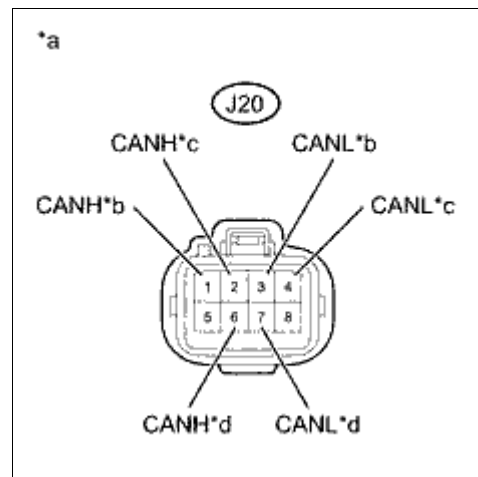
Standard Resistance:

| TESTER CONNECTION           | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                   |
|-----------------------------|-------------------------------------------------------|------------------------|--------------------------------|
| J20-1 (CANH) - J20-3 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | No. 3 CAN junction connector   |
| J20-2 (CANH) - J20-4 (CANL) | Cable disconnected from negative (-) battery terminal | 108 to 132 $\Omega$    | No. 1 CAN junction terminal    |
| J20-6 (CANH) - J20-7 (CANL) | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Blind Spot Monitor Sensor LH*1 |

\*1: w/ Blind Spot Monitor System

**Text in Illustration**

|    |                                                                        |
|----|------------------------------------------------------------------------|
| *a | Front view of wire harness connector (to No. 4 CAN Junction Connector) |
| *b | to No. 3 CAN Junction Connector                                        |
| *c | to No. 1 CAN Junction Terminal                                         |
| *d | to Blind Spot Monitor Sensor LH (w/ Blind Spot Monitor System)         |

**Result**

| RESULT                                       | PROCEED TO |
|----------------------------------------------|------------|
| OK                                           | A          |
| NG (No. 3 CAN junction connector main lines) | B          |
| NG (ECU or sensor branch lines)              | C          |
| NG (No. 1 CAN junction terminal main lines)  | D          |

**B** **REPAIR OR REPLACE CAN MAIN BUS LINES OR CONNECTOR (NO. 3 CAN JUNCTION CONNECTOR - NO. 4 CAN JUNCTION CONNECTOR)**

**C** **GO TO STEP 11**

**D** ► **REPAIR OR REPLACE CAN MAIN BUS LINES OR CONNECTOR (NO. 4 CAN JUNCTION CONNECTOR - NO. 1 CAN JUNCTION TERMINAL)**

**A** ► **REPLACE NO. 4 CAN JUNCTION CONNECTOR**

**11. CHECK FOR SHORT IN SUB BUS 2 LINE (ECUS, SENSOR)**

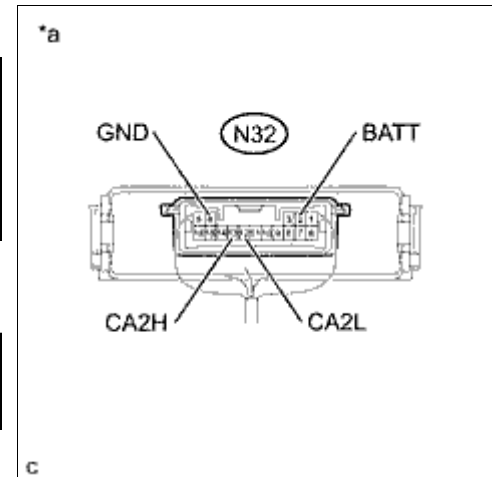
- (a) Reconnect all wire harness connectors (No. 3 CAN junction connector and No. 4 CAN junction connector).
- (b) Disconnect the connector that includes terminals CANH and CANL from the ECU (or sensor) to which the short-circuited branch line is connected **INFO**.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

| TESTER CONNECTION             | CONDITION                                             | SPECIFIED CONDITION |
|-------------------------------|-------------------------------------------------------|---------------------|
| N32-13 (CA2H) - N32-12 (CA2L) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

**Text in Illustration**

\*a Component with harness connector (Network Gateway ECU)



**HINT:**

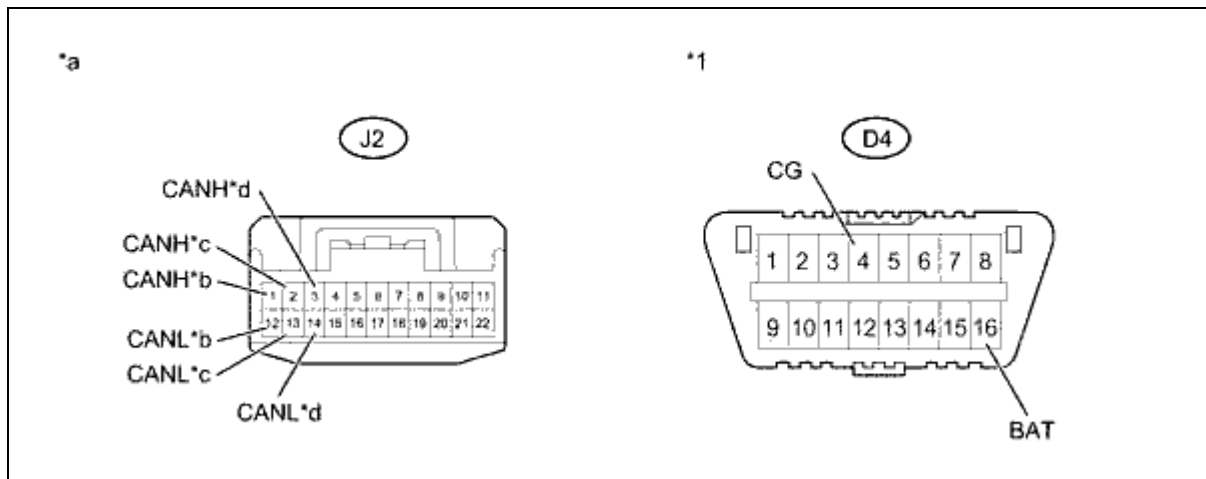
If the resistance becomes normal (between 54 and 69  $\Omega$ ) when the connector is disconnected from the ECU (or sensor), there may be a short in the ECU (or sensor).

**NG** ► **REPAIR OR REPLACE CORRESPONDING ECU OR SENSOR BRANCH LINES OR CONNECTOR**

**OK** ► **REPLACE CORRESPONDING ECU OR SENSOR**

**12. CHECK FOR SHORT IN CAN BUS LINE (NO. 3 CAN JUNCTION CONNECTOR)**

- (a) Disconnect the No. 3 CAN junction connector.
- (b) Measure the resistance according to the value(s) in the table below.



### Text in Illustration

|    |                                                                           |    |                                                                        |
|----|---------------------------------------------------------------------------|----|------------------------------------------------------------------------|
| *1 | DLC3                                                                      | -  | -                                                                      |
| *a | Front view of wire harness connector<br>(to No. 3 CAN Junction Connector) | *b | to Clearance Warning ECU Assembly (w/ Intuitive Parking Assist System) |
| *c | to Network Gateway ECU                                                    | *d | to No. 4 CAN Junction Connector                                        |

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                     |
|----------------------------|-------------------------------------------------------|------------------------|----------------------------------|
| J2-1 (CANH) - D4-4 (CG)    | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Clearance warning ECU assembly*1 |
| J2-12 (CANL) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |                                  |
| J2-2 (CANH) - D4-4 (CG)    | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Network gateway ECU              |
| J2-13 (CANL) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |                                  |
| J2-3 (CANH) - D4-4 (CG)    | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | No. 4 CAN junction connector     |
| J2-14 (CANL) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |                                  |
| J2-1 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Clearance warning ECU assembly*1 |
| J2-12 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher |                                  |
| J2-2 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Network gateway ECU              |
| J2-13 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher |                                  |

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION | CONNECTED TO                 |
|----------------------------|-------------------------------------------------------|---------------------|------------------------------|
| J2-3 (CANH) - D4-16 (BAT)  | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      | No. 4 CAN junction connector |
| J2-14 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 kΩ or higher      |                              |

\*1: w/ Intuitive Parking Assist System

| RESULT                                      | PROCEED TO |
|---------------------------------------------|------------|
| OK                                          | A          |
| NG (ECU or sensor branch line)              | B          |
| NG (No. 4 CAN junction connector main line) | C          |
| NG (Network gateway ECU main line)          | D          |

**HINT:**

- It is only necessary to perform the inspection in the above table for the result (short circuit) that was obtained in the Check Sub Bus 2 inspection.
- Find the necessary inspection from the Purpose column that matches the result in the Result column from the Check Sub Bus 2 inspection.

**B** ► GO TO STEP 15

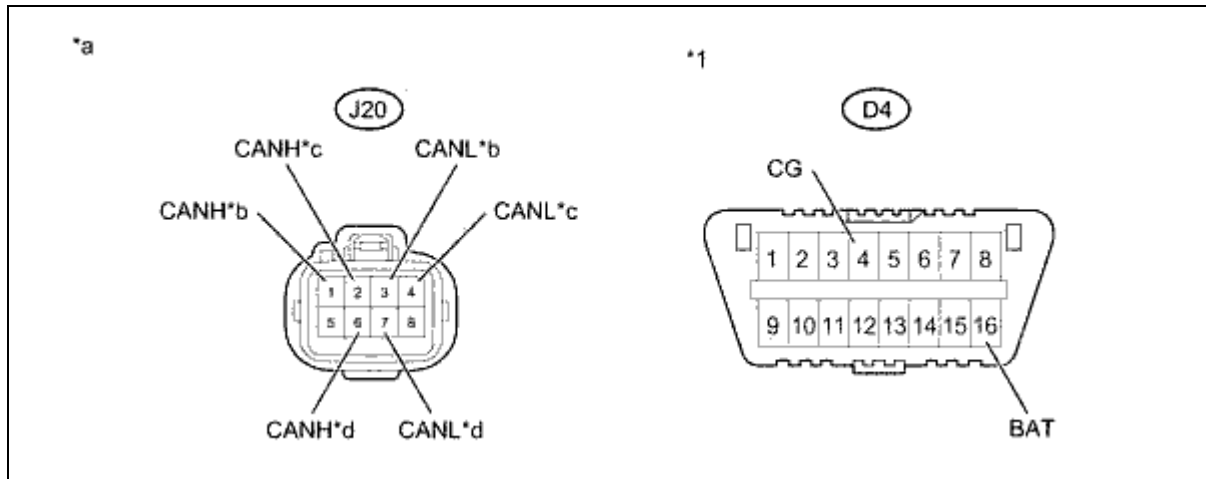
**C** ► GO TO STEP 13

**D** ► GO TO STEP 14

**A** ► REPLACE NO. 3 CAN JUNCTION CONNECTOR

|            |                                                                       |
|------------|-----------------------------------------------------------------------|
| <b>13.</b> | <b>CHECK FOR SHORT IN CAN BUS LINE (NO. 4 CAN JUNCTION CONNECTOR)</b> |
|------------|-----------------------------------------------------------------------|

- Reconnect the J2 No. 3 CAN junction connector.
- Disconnect the No. 4 CAN junction connector.
- Measure the resistance according to the value(s) in the table below.



### Text in Illustration

|    |                                                                           |    |                                                                |
|----|---------------------------------------------------------------------------|----|----------------------------------------------------------------|
| *1 | DLC3                                                                      | -  | -                                                              |
| *a | Front view of wire harness connector<br>(to No. 4 CAN Junction Connector) | *b | to No. 3 CAN Junction Connector                                |
| *c | to No. 1 CAN Junction Terminal                                            | *d | to Blind Spot Monitor Sensor LH (w/ Blind Spot Monitor System) |

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                   |
|----------------------------|-------------------------------------------------------|------------------------|--------------------------------|
| J20-1 (CANH) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | No. 3 CAN junction connector   |
| J20-3 (CANL) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |                                |
| J20-2 (CANH) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | No. 1 CAN junction terminal    |
| J20-4 (CANL) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |                                |
| J20-6 (CANH) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Blind Spot Monitor Sensor LH*1 |
| J20-7 (CANL) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher |                                |
| J20-1 (CANH) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | No. 3 CAN junction connector   |
| J20-3 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher |                                |
| J20-2 (CANH) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | No. 1 CAN junction terminal    |
| J20-4 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher |                                |

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION    | CONNECTED TO                   |
|----------------------------|-------------------------------------------------------|------------------------|--------------------------------|
| J20-6 (CANH) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Blind Spot Monitor Sensor LH*1 |
| J20-7 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher |                                |

\*1: w/ Blind Spot Monitor System

| RESULT                                          | PROCEED TO |
|-------------------------------------------------|------------|
| OK                                              | A          |
| NG (No. 3 CAN junction connector main bus line) | B          |
| NG (ECU or sensor branch line)                  | C          |
| NG (No. 1 CAN junction terminal main line)      | D          |

#### HINT:

- It is only necessary to perform the inspection in the above table for the result (short circuit) that was obtained in the Check Sub Bus 2 inspection.
- Find the necessary inspection from the Purpose column that matches the result in the Result column from the Check Sub Bus 2 inspection.

**B ► REPAIR OR REPLACE CAN MAIN BUS LINES OR CONNECTOR (NO. 3 CAN JUNCTION CONNECTOR - NO. 4 CAN JUNCTION CONNECTOR)**

**C ► GO TO STEP 15**

**D ► GO TO STEP 16**

**A ► REPLACE NO. 4 CAN JUNCTION CONNECTOR**

|            |                                                              |
|------------|--------------------------------------------------------------|
| <b>14.</b> | <b>CHECK FOR SHORT IN SUB BUS LINE (NETWORK GATEWAY ECU)</b> |
|------------|--------------------------------------------------------------|

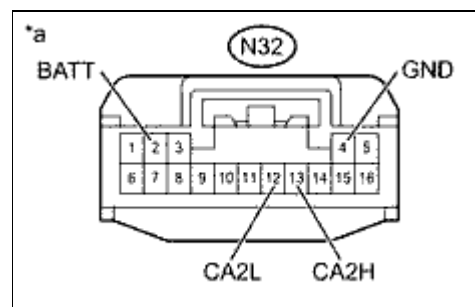
(a) Reconnect the J20 No. 4 CAN junction connector.

(b) Disconnect the network gateway ECU connector.

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

Standard Resistance:

| TESTER CONNECTION           | CONDITION                            | SPECIFIED CONDITION    | PURPOSE              |
|-----------------------------|--------------------------------------|------------------------|----------------------|
| N32-13 (CA2H) - N32-4 (GND) | Cable disconnected from negative (-) | 200 $\Omega$ or higher | Below 200 $\Omega$ : |



| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION    | PURPOSE                                |
|------------------------------|-------------------------------------------------------|------------------------|----------------------------------------|
|                              | battery terminal                                      |                        | CANH ground short                      |
| N32-12 (CA2L) - N32-4 (GND)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Below 200 $\Omega$ : CANL ground short |
| N32-13 (CA2H) - N32-2 (BATT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Below 6 k $\Omega$ : CANH +B short     |
| N32-12 (CA2L) - N32-2 (BATT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Below 6 k $\Omega$ : CANL +B short     |

#### Text in Illustration

|    |                                                               |
|----|---------------------------------------------------------------|
| *a | Front view of wire harness connector (to Network Gateway ECU) |
|----|---------------------------------------------------------------|

#### HINT:

- It is only necessary to perform the inspection in the above table for the result (short circuit) that was obtained in the Check Sub Bus 2 inspection.
- Find the necessary inspection from the Purpose column that matches the result in the Result column from the Check Sub Bus 2 inspection.

**NG**  **REPAIR OR REPLACE CAN MAIN BUS LINE OR CONNECTOR (NO. 3 CAN JUNCTION CONNECTOR - NETWORK GATEWAY ECU)**

**OK**  **REPLACE NETWORK GATEWAY ECU**

|            |                                          |
|------------|------------------------------------------|
| <b>15.</b> | <b>CHECK CAN BUS LINE (ECUS, SENSOR)</b> |
|------------|------------------------------------------|

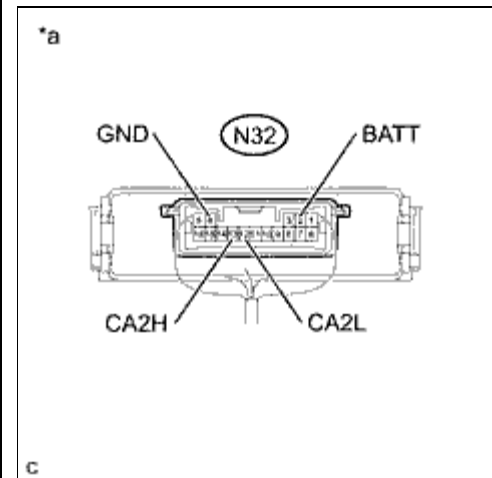
(a) Reconnect all wire harness connectors (No. 3 CAN junction connector and No. 4 CAN junction connector).

(b) Disconnect the connector that includes terminals CANH and CANL from the ECU to which the bus line shorted to B+ or shorted to GND is connected .

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

Standard Resistance:

| TESTER CONNECTION            | CONDITION                                             | SPECIFIED CONDITION    | PURPOSE                                |
|------------------------------|-------------------------------------------------------|------------------------|----------------------------------------|
| N32-13 (CA2H) - N32-4 (GND)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Below 200 $\Omega$ : CANH ground short |
| N32-12 (CA2L) - N32-4 (GND)  | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Below 200 $\Omega$ : CANL ground short |
| N32-13 (CA2H) - N32-2 (BATT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Below 6 k $\Omega$ : CANH +B short     |
| N32-12 (CA2L) - N32-2 (BATT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Below 6 k $\Omega$ : CANL +B short     |



#### Text in Illustration

|    |                                                           |
|----|-----------------------------------------------------------|
| *a | Component with harness connector<br>(Network Gateway ECU) |
|----|-----------------------------------------------------------|

#### HINT:

- It is only necessary to perform the inspection in the above table for the result (short circuit) that was obtained in the Check Sub Bus 2 inspection.
- If the resistance becomes abnormal when an ECU connector is reconnected, there may be a short in the ECU.

**NG** ► REPAIR OR REPLACE CORRESPONDING ECU OR SENSOR BRANCH LINES OR CONNECTOR

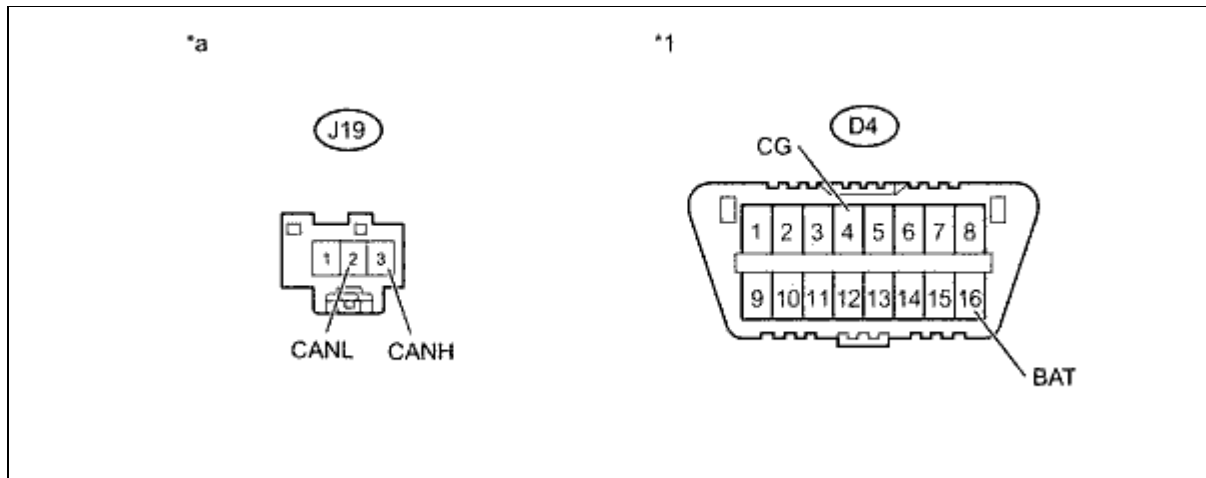
**OK** ► REPLACE CORRESPONDING ECU OR SENSOR

|            |                                                                      |
|------------|----------------------------------------------------------------------|
| <b>16.</b> | <b>CHECK FOR SHORT IN CAN BUS LINE (NO. 1 CAN JUNCTION TERMINAL)</b> |
|------------|----------------------------------------------------------------------|

(a) Reconnect the J20 No. 4 CAN junction connector.

(b) Disconnect the No. 1 CAN junction terminal.

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



**Text in Illustration**

|    |                                                                          |   |   |
|----|--------------------------------------------------------------------------|---|---|
| *1 | DLC3                                                                     | - | - |
| *a | Front view of wire harness connector<br>(to No. 1 CAN Junction Terminal) | - | - |

Standard Resistance:

| TESTER CONNECTION          | CONDITION                                             | SPECIFIED CONDITION    | PURPOSE                                |
|----------------------------|-------------------------------------------------------|------------------------|----------------------------------------|
| J19-3 (CANH) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Below 200 $\Omega$ : CANH ground short |
| J19-2 (CANL) - D4-4 (CG)   | Cable disconnected from negative (-) battery terminal | 200 $\Omega$ or higher | Below 200 $\Omega$ : CANL ground short |
| J19-3 (CANH) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Below 6 k $\Omega$ : CANH +B short     |
| J19-2 (CANL) - D4-16 (BAT) | Cable disconnected from negative (-) battery terminal | 6 k $\Omega$ or higher | Below 6 k $\Omega$ : CANL +B short     |

**HINT:**

- It is only necessary to perform the inspection in the above table for the result (short circuit) that was obtained in the Check Sub Bus 2 inspection.
- Find the necessary inspection from the Purpose column that matches the result in the Result column from the Check Sub Bus 2 inspection.

**NG** ► **REPAIR OR REPLACE CAN MAIN BUS LINES OR CONNECTOR (NO. 4 CAN JUNCTION CONNECTOR - NO. 1 CAN JUNCTION TERMINAL)**

**OK** ► **REPLACE NO. 1 CAN JUNCTION TERMINAL**



|                                                                                                                                                  |                      |                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                                                                 | 6.6 C                | <b>Doc ID:</b> RM000002PA4060X           |
| <b>Model Year Start:</b> 2016                                                                                                                    | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: CAN COMMUNICATION SYSTEM: U1110; Lost Communication with Clearance Warning ECU; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

|            |              |                                                      |
|------------|--------------|------------------------------------------------------|
| <b>DTC</b> | <b>U1110</b> | <b>Lost Communication with Clearance Warning ECU</b> |
|------------|--------------|------------------------------------------------------|

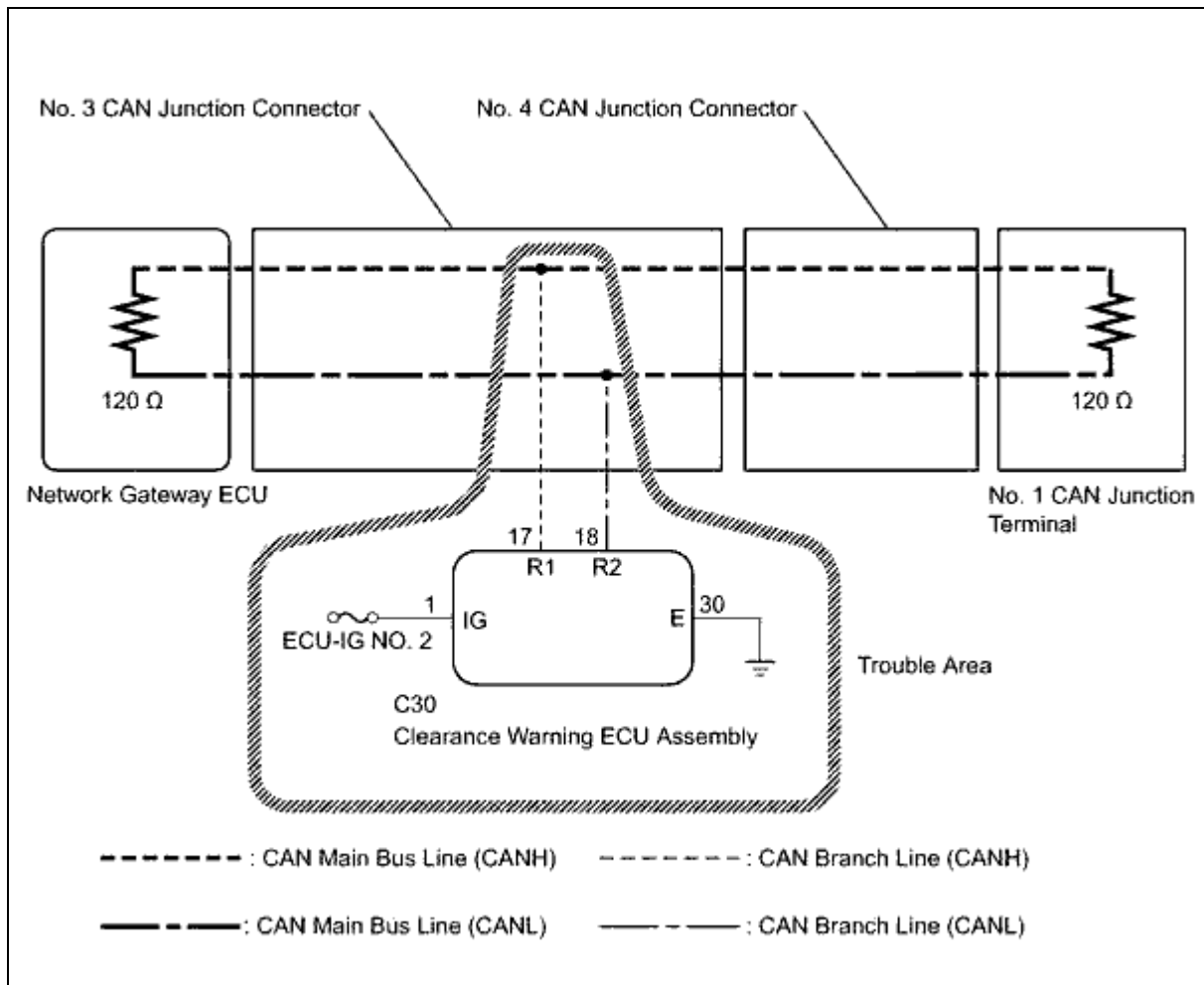
## DESCRIPTION

| DTC NO. | DTC DETECTION CONDITION                                             | TROUBLE AREA                                                                                                                                                                                                                                                                     |
|---------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U1110   | No communication from the clearance warning ECU assembly continues. | <ul style="list-style-type: none"> <li>• Clearance warning ECU assembly branch line or connector</li> <li>• Power source circuit of clearance warning ECU assembly</li> <li>• Clearance warning ECU assembly ground circuit</li> <li>• Clearance warning ECU assembly</li> </ul> |

### **HINT:**

This diagnosis procedure is for when DTC U1110 is output by the network gateway ECU (Techstream display: Gateway).

## WIRING DIAGRAM



## INSPECTION PROCEDURE

**NOTICE:**

- Before measuring the resistance of the CAN bus, turn the ignition switch off and leave the vehicle for 1 minute or more without operating the key, switches or opening or closing the doors. After that, disconnect the cable from the negative (-) battery terminal and leave the vehicle for 1 minute or more before measuring the resistance.
- After turning the ignition switch off, waiting time may be required before disconnecting the cable from the negative (-) battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) battery terminal notice before proceeding with work .
- Because the order of diagnosis is important to allow correct diagnosis, make sure to begin troubleshooting using How to Proceed with Troubleshooting when CAN communication system related DTCs are output .
- After performing repairs, perform the procedure listed in DTC Reproduction Method and confirm that the DTCs are not output again.
- DTC check procedure: Turn the ignition switch to ON, and wait at least 20 seconds or more.
- After the repair, perform CAN Bus Check and check that all the ECUs and sensors connected to the CAN communication system are displayed .

**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 may help determine the cause of the malfunction.

## PROCEDURE

### 1. RECONFIRM DTC OUTPUT

(a) Reconfirm DTCs.

#### HINT:

If DTC U1002 is output from Gateway of the network gateway ECU, this indicates a sub bus 2 malfunction.  
Troubleshoot for DTC U1002 and check for malfunctions in sub bus 2.

| RESULT                                                                         | PROCEED TO |
|--------------------------------------------------------------------------------|------------|
| U1002 is not output from network gateway ECU.<br>(Techstream display: Gateway) | A          |
| U1002 is output from network gateway ECU.<br>(Techstream display: Gateway)     | B          |

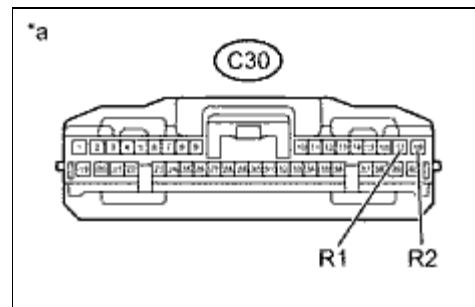
**B** ► GO TO DIAGNOSIS PROCEDURE INDICATED BY OUTPUT DTC

**A**

### 2. CHECK FOR OPEN IN CAN BUS LINES (CLEARANCE WARNING ECU ASSEMBLY BRANCH LINE)

(a) Disconnect the cable from the negative (-) battery terminal.

(b) Disconnect the clearance warning ECU assembly connector.



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

Standard Resistance:

| TESTER CONNECTION         | CONDITION                                             | SPECIFIED CONDITION |
|---------------------------|-------------------------------------------------------|---------------------|
| C30-17 (R1) - C30-18 (R2) | Cable disconnected from negative (-) battery terminal | 54 to 69 $\Omega$   |

**Text in Illustration**

|    |                                                                             |
|----|-----------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Clearance Warning ECU Assembly) |
|----|-----------------------------------------------------------------------------|

**NG** ► **REPAIR OR REPLACE CAN BRANCH LINE OR CONNECTOR (CLEARANCE WARNING ECU ASSEMBLY)**

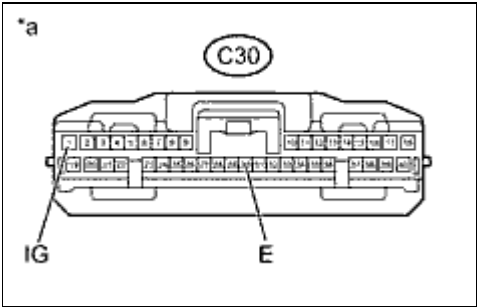
**OK**  
▼

|           |                                                           |
|-----------|-----------------------------------------------------------|
| <b>3.</b> | <b>CHECK HARNESS AND CONNECTOR (POWER SOURCE CIRCUIT)</b> |
|-----------|-----------------------------------------------------------|

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

Standard Resistance:

| TESTER CONNECTION        | CONDITION                                             | SPECIFIED CONDITION |
|--------------------------|-------------------------------------------------------|---------------------|
| C30-30 (E) - Body ground | Cable disconnected from negative (-) battery terminal | Below 1 Ω           |



(b) Connect the cable to the negative (-) battery terminal.

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

Standard Voltage:

| TESTER CONNECTION        | SWITCH CONDITION   | SPECIFIED CONDITION |
|--------------------------|--------------------|---------------------|
| C30-1 (IG) - Body ground | Ignition switch ON | 11 to 14 V          |

**Text in Illustration**

|    |                                                                             |
|----|-----------------------------------------------------------------------------|
| *a | Front view of wire harness connector<br>(to Clearance Warning ECU Assembly) |
|----|-----------------------------------------------------------------------------|

**NG** ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

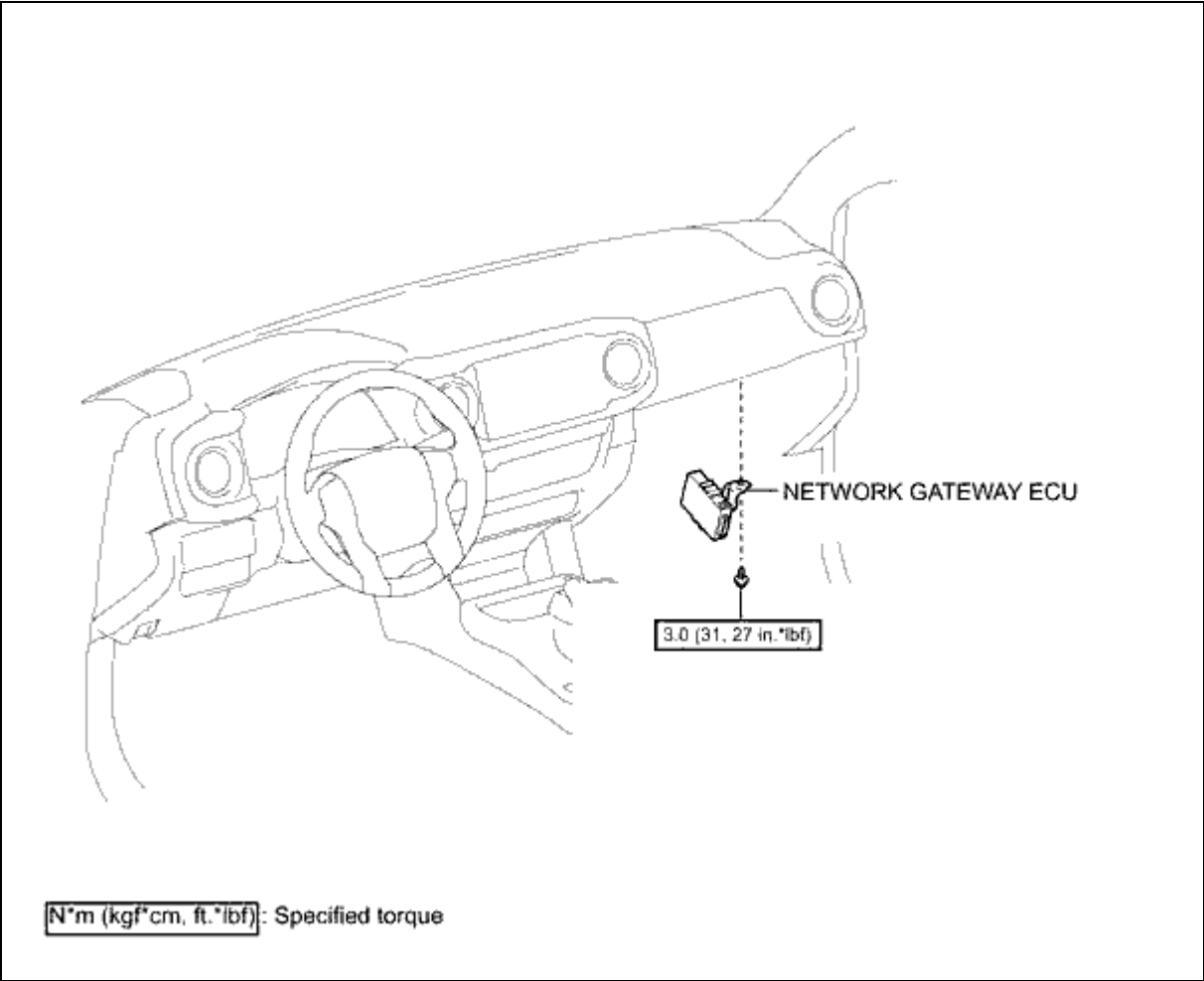
**OK** ► **REPLACE CLEARANCE WARNING ECU ASSEMBLY**



|                                                                                                   |                      |                                          |
|---------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                  | 6.6 K                | <b>Doc ID:</b> RM000005VY2000X           |
| <b>Model Year Start:</b> 2016                                                                     | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: NETWORK GATEWAY ECU: COMPONENTS; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

**COMPONENTS**

**ILLUSTRATION**



|                                                                                                     |                      |                                          |
|-----------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| <b>Last Modified:</b> 11-13-2015                                                                    | 6.6 A                | <b>Doc ID:</b> RM000005VY1000X           |
| <b>Model Year Start:</b> 2016                                                                       | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: NETWORK GATEWAY ECU: INSTALLATION; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

## INSTALLATION

### 1. INSTALL NETWORK GATEWAY ECU

(a) Install the network gateway ECU with the bolt.

**Torque:**

**3.0 N·m {31 kgf·cm, 27in·lbf}**

(b) Connect the connector.

### 2. INSTALL LOWER INSTRUMENT PANEL ASSEMBLY



|                                                                                                |                      |                                          |
|------------------------------------------------------------------------------------------------|----------------------|------------------------------------------|
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| <b>Model Year Start:</b> 2016                                                                  | <b>Model:</b> Tacoma | <b>Prod Date Range:</b> [08/2015 -     ] |
| <b>Title:</b> CAN COMMUNICATION: NETWORK GATEWAY ECU: REMOVAL; 2016 MY Tacoma [08/2015 -     ] |                      |                                          |

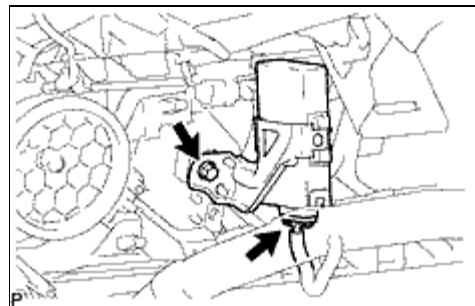
## REMOVAL

### 1. REMOVE LOWER INSTRUMENT PANEL ASSEMBLY

INFO

### 2. REMOVE NETWORK GATEWAY ECU

(a) Disconnect the connector.



(b) Remove the bolt and network gateway ECU.

