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Case Number: **S1508000235**

Release Date: **04/25/2020**

Symptom/Vehicle Issue: No Scan Tool Communication, Dominant Module Terminating Resistor Module Locations, BUS Circuit Terminal Testing Locations At The DLC (Diagnostic Link Connector) And BUS Test Values At DLC

Discussion: CAN C1 BUS, CAN C2 BUS, CAN BH BUS Topologies Fig 1, Fig 2, Fig 3, BUS Circuit Locations At The Diagnostic Connector Fig 4. BUS circuit test values Fig 5, Fig 6, Fig 7, Fig 8, and Fig 9.

- **CAN-C1 (high-speed 500 kb/s)**
- **CAN-C2 (high-speed 500 kb/s)**
- **CAN-BH (medium-speed 125 kb/s)**

The ECUs interconnected by the CAN-C1 are displayed in Fig 1:

BCM (Body Control Module)
IPC (Instrument Panel Cluster)
ETM (Entertainment Telematics Module – Info-telematics Module VP2 with NAV or VP4)
ORC (Occupant Restraint Control – Airbag module)
RFH (Radio Frequency Module)
DTCM (Drive Train Control Module - Transmission Module)
ESM (Electronic Shifter Module – Automatic transmission selector lever module)
ABS (Anti-lock Braking System Module)
ACC (Adaptive Cruise Control Module)
TCM (Automatic Transmission Control Module)
ECM (Engine Control Module)

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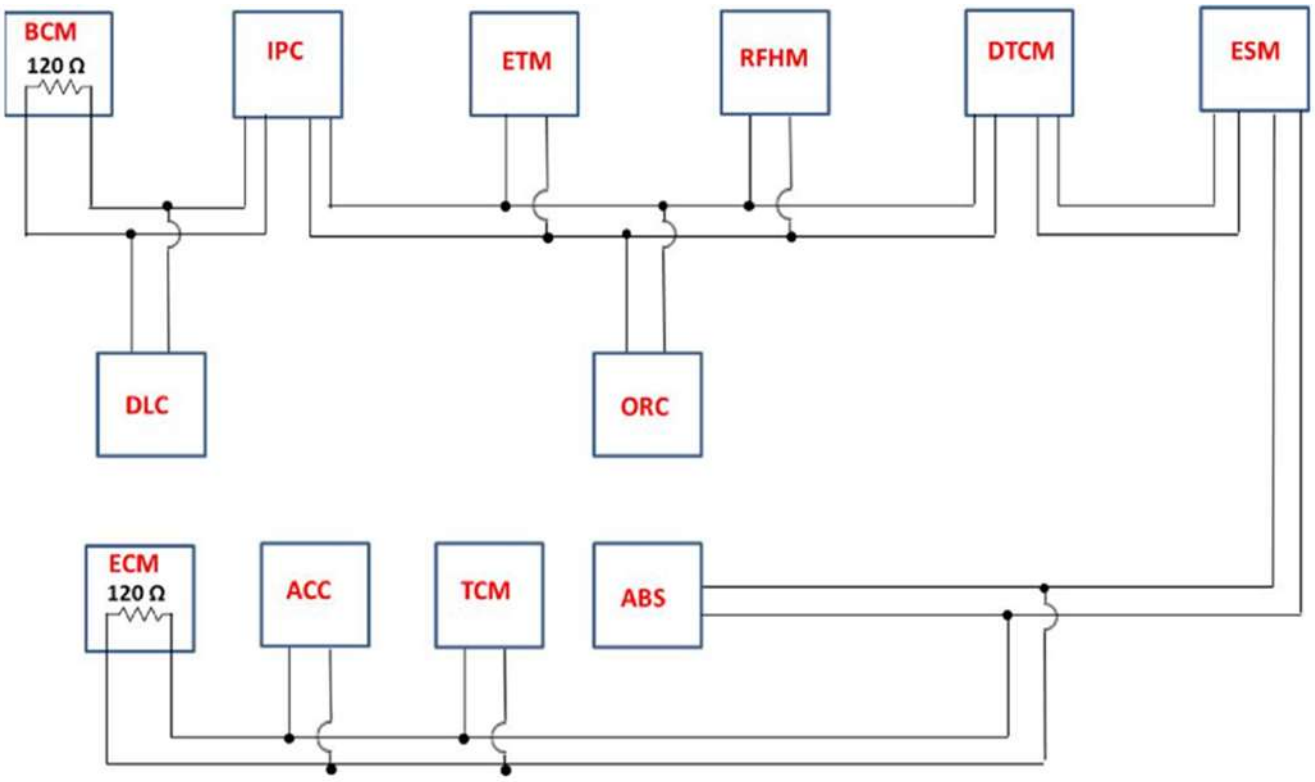
CAN-C1



The 120-ohm terminal resistors of the CAN-C1 are located in the BCM and in the ECM.

Fig 1

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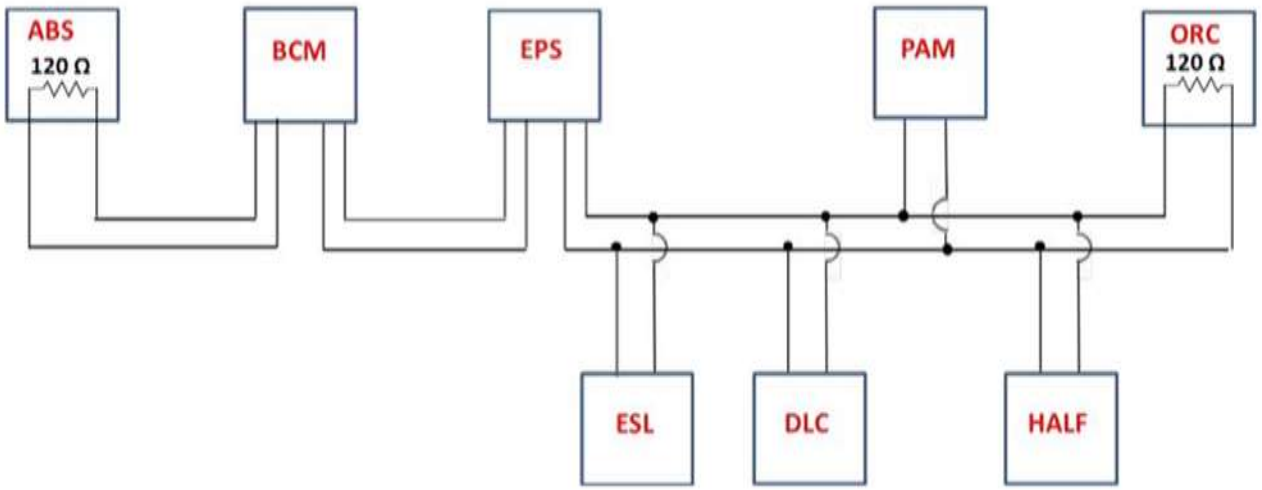
CAN-C2

The ECUs interconnected by the CAN-C2 are displayed in Fig 2:

The CAN-C2 manages the data which is exchanged at high speed between the ECU modules of the vehicle chassis.
ABS (Anti-lock Braking System Module)
BCM (Body Control Module)
ESL (Electric Steering Wheel – Steering Lock Module)
PAM (Parking Aid Module)
EPS (Electric Power Steering Module)
HALF (Haptic Lane Feedback – Lane maintenance assistance module)
ORC (Occupant Restraint Control)



The 120-ohm terminal resistors are in the ABS module and the ORC Airbag module.

Fig 2

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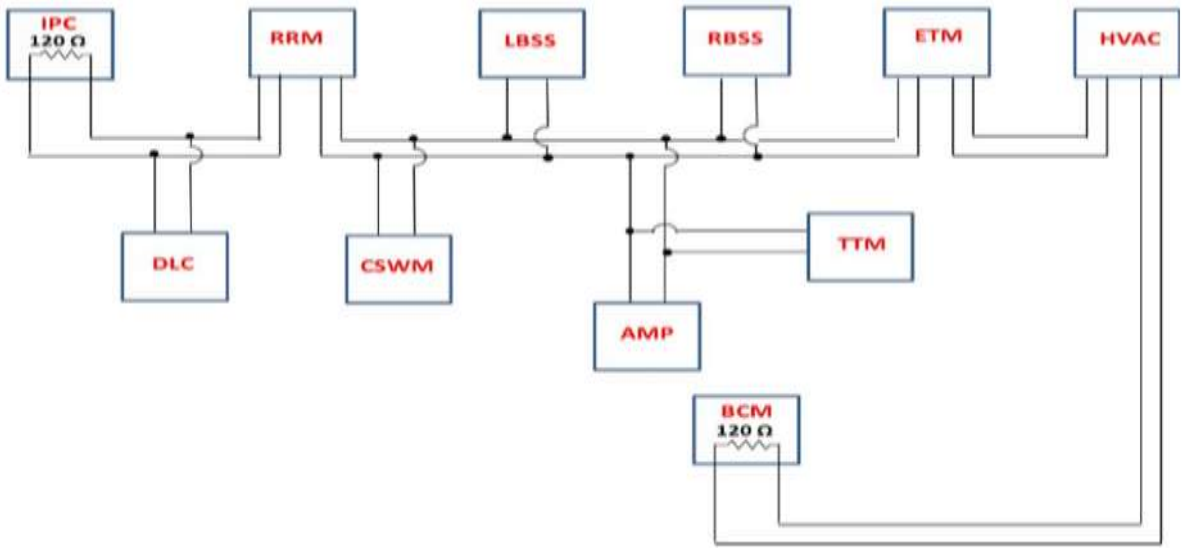
CAN-BH

The control units interconnected by the CAN-BH are displayed in Fig 3:

The CAN-BH manages the data exchanged at medium speed between the electronic modules which manage the passenger compartment comfort on the vehicle.
IPC (Instrument Panel Cluster)
RRM (Radio Receiver Module)
CSWM (Comfort Seat Wheel Module – Seat and Steering Wheel Heating Module)
LBSS (Left Blind Spot Sensor)
RBSS (Right Blind Spot Sensor)
AMP (Amplifier – Hi-Fi system amplifier)
TTM (Trailer Tow Module – Tow Hook Module)
HVAC (Heating Ventilation and Air Conditioning – Climate control module)
ETM (Entertainment Telematics Module – Info Telematics Module VP2, VP4)
BCM (Body Control Module)



The 120-ohm terminal resistors are in the BCM and the IPC module.

Fig 3

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Pin 3 – CAN-BH High Pin 11 – CAN – BH Low Pin 12 – CAN-C2 High Pin13 – CAN-C2 Low Pin 14 – CAN-C1 Low Pin 6 – CAN-C1 High

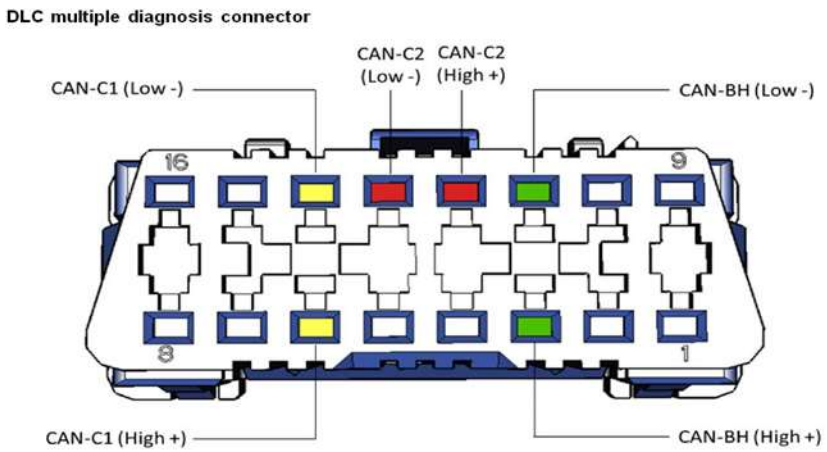

Fig 4

Digital network voltage levels:

The voltage levels of the three CANs that can be measured using the multi-meter are as follows
CAN-C1

Pin 6 - High

Pin 14 – Low

Fig 5

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CAN-C2

Pin 12 - High **Pin 13 – Low**

Fig 6

CAN-BH

Pin 3 - High **Pin 11 – Low**

Fig 7

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The CAN-C1, CAN-C2 and CAN-BH enter Sleep mode approximately 10–12 seconds after the key is turned to OFF.

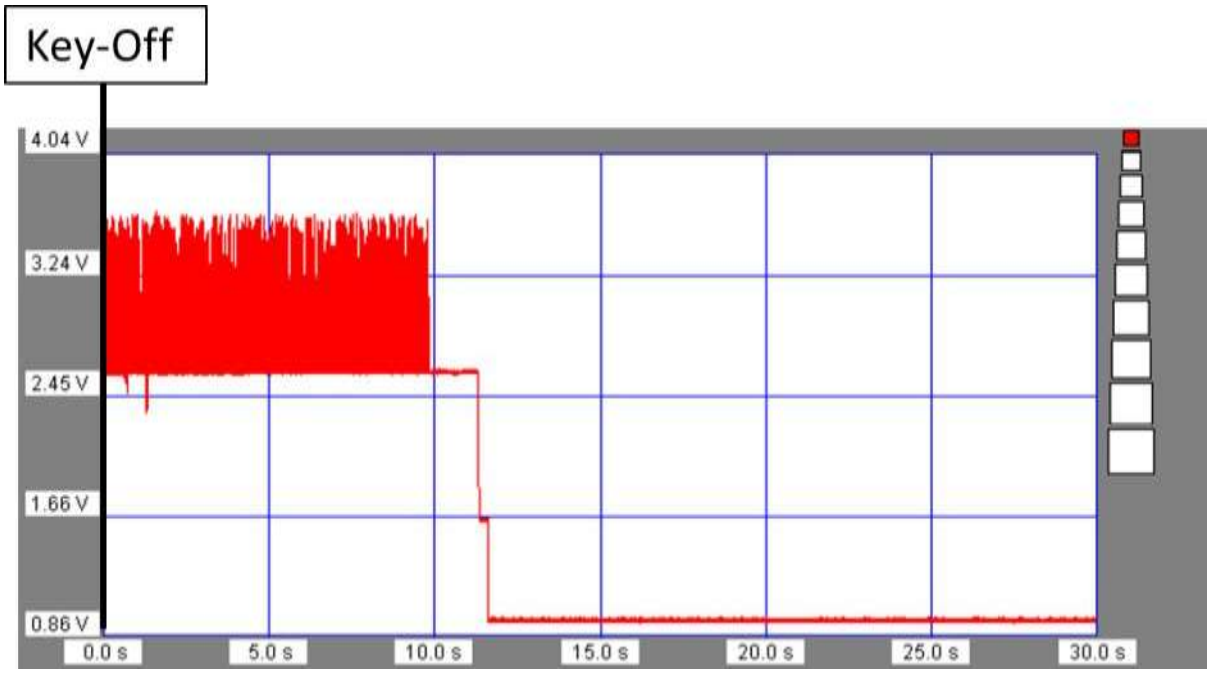

Fig 8

The networks "wake up" with the key at OFF when one of the vehicle's doors passes from "Closed" status to "Open" status.

The ACC module is connected to the half module via a dedicated CAN-C line. The reason behind the dedicated data transmission line between the two modules is the continuous exchange of information between them during operation of the cruise control and of the FCW function.

Electrical continuity of the networks:
The three digital networks CAN-C1, CAN-C2 and CAN-BH have 120-ohm terminal resistors. The electrical continuity of the networks can be checked directly via the diagnosis connector by setting the multi meter to the Ohm function. When the network is electrically continuous, the value that the operator needs to read on the display is approximately 60 ohms for all three networks.

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CAN-C1 – (Pin 14 and Pin 6) **CAN-C2 – (Pin 12 and Pin 13)** **CAN – BH – (Pin 11 and Pin 3)**

Fig 9

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