# SECTION : 418-00 Module Communications Network

## VEHICLE APPLICATION : 2008.0 Falcon

## CONTENTS

## SPECIFICATIONS

### General Specifications

| Description | Specification |
|---|---|
| Heat shrink tube overlap mm (inch) | 12.7 (0.5) |
| Wire insulation removal length (twist side) mm (inch) | 37.2 (1.5) |
| Wire insulation removal length (receiving side) mm (inch) | 19.5 (0.75) |
| Raychem SCT® Heat Shrink Tubing, Motorcraft part number WT-5627 | ESB-M99D56-A2 |

# DESCRIPTION AND OPERATION

## Communications Network

### General

In a communication network (data bus system), the various modules of different systems are connected to one another via one or several lines. The data bus system is used exclusively for the transmission of data between the connected modules themselves, as well as between the connected modules and the Integrated Diagnostic System (IDS). In a data bus system, complete data blocks are transmitted instead of single in/out pulses. In addition to the actual information, these data blocks also contain data regarding the address of the module to be addressed, the size of the data block and information for monitoring the content of each individual data block.

Data bus systems offer various advantages:

- Simplified data transmission between the modules due to a standardised protocol
- Fewer sensors and connectors
- Improved diagnostic options
- Lower costs

The IDS is connected to the various bus systems and to the power supply via the standard 16-pin Data Link Connector (DLC). The signal for the module programming is also transmitted via the DLC.

If, in a data bus system, there is a break in one or both lines or a short to ground or short to voltage is present, then communication between the modules and with the IDS is faulty or is no longer possible at all. In order to be able to establish communication with one another, the modules of the individual systems must use the same language. This language is called a protocol. At present, Ford uses three different data bus systems. Depending upon model and equipment level, all three data bus systems are used. Each of these data bus systems has its own protocol.

Data bus systems:

- The Local Interconnect Network (LIN) bus is a standard especially for the cost efficient communication between intelligent sensors and actuators in motor vehicles. Local Interconnect Network (LIN) is used in every situation where the band width and versatility of CAN is not needed. The LIN specification comprises the LIN protocol, a standard format for describing a complete LIN and the interface between a LIN and the application. A LIN comprises a LIN master and one or several LIN slaves. The LIN utilizes the master/slave principle for the purpose of bus access control. This has the significant advantage that few resources (CPU performance, ROM, RAM) are required for bus management in the slave module. The master is implemented in a control module or a gateway which has the necessary resources. All communication is initiated by the master. Consequently, a message always consists of a header, which is generated by the master, and a response from the slave. The data transfer rate is in the region of up to 20 Kbit/s. The LIN master knows the time sequence of all data which are to be transmitted. These data are transmitted by the corresponding LIN slaves (e.g. alarm) when requested to do so by the LIN master. LIN is a single-wire bus, i.e. the data is transferred in the cable via one wire. Usually the same cable is also used to provide the supply voltage. The ground connection of the supply voltage also acts as the ground connection of the data transmission. No terminating resistors are used in the LIN.

- Controller Area Network (CAN) bus. This consists of two twisted wires and operates serially (data is transmitted sequentially). It is used for communication between the modules themselves and between the modules and the IDS. The modules are connected to the data bus in parallel. New modules can be incorporated easily, without modifying the other wiring or modules. The transmitted data is received by every module connected to the Controller Area Network (CAN). As each data packet has an identifier, in which the priority of the message is determined as well as the content identification, each module can detect whether or not the data is relevant for its own information processing. This enables several modules to be addressed with a particular data packet and supplied with data simultaneously. For this purpose, it is ensured that important data (for example from the Anti-lock Brake System (ABS)) is transmitted first. The other modules are only able to submit their data to the data bus after the high-priority messages have been received. In order to guarantee a high degree of error

protection, two 120 Ohm terminating resistors are installed in the CAN. These are integrated in the first module connected to the CAN and in the last module connected to the CAN respectively and are used for suppression as well as the elimination of voltage peaks. In order to ensure correct functioning of the data bus system, the modules must always be connected with an integral terminating resistor. The advantages of the CAN bus are:

- Minimization of wiring requirements.
- High degree of error protection (fault / fail-proof).
- Robustness.
- Good extendibility.
- Prioritization of messages.
- Inexpensive.
- Automatic repetition of faulty messages.
- Independent system monitoring and option for automatic disconnection of faulty modules from the data bus.

For 2008 a second CAN bus is used, MS CAN. The only significant difference is a lower transmission rate and it is mainly used for the convenience electronics at present. In order to be able to differentiate between individual CAN systems, the CAN with the high transmission rate is designated as high-speed (HS) CAN and the CAN with the lower transmission rate as mid-speed (MS) CAN. As in all CAN systems, two 120 Ohm terminating resistors are also installed in the MS CAN in order to increase the error protection. In order to enable communication between the modules on the HS CAN and the modules on the MS CAN, one module is connected to both data bus systems. The connection of both data bus systems is designated as gateway. In this gateway, the received data is converted to the transmission rate required for the relevant data bus and is transmitted. This ensures an optimal distribution of information between both data bus systems. The instrument cluster is the gateway. The Audio Control Module (ACM or ICC) is now on MS CAN and other entertainment modules are now individually adressable.

**Communications Network Components**

The module communications network consists of the following items:

* Audio Control Module (ACM) {*or ICC}
* Alarm Module
* Anti-lock Braking System, Traction Control System and Dynamic Stability Control (ABS/ TCS/DSC) {*or ABS Module, TCS/DSC Module}
* Body Electronics Module (BEM)
* Bluetooth Phone Module (BPM) {*or Bluetooth}
* Data Link Connector (DLC) {* or Diagnostics}
* Front Display Module (FDM) {* or Display 2}
* Front Entertainment Module (FEM) {* or AIM Audio Interface Module}
* Gateway between HS-CAN and MS-CAN, inside the Instrument Cluster.
* HVAC Integrated Module (HIM)
* Instrument Cluster (IC) {*or Cluster}
* Junction Connector (JC) {* or J/C}
* Parking Aid Module (PAM) {*or Sonar Module}
* Powertrain Control Module (PCM) {*or EEC-B}
* Restraints Control Module (RCM) {*or ARS}
* Steering Angle Sensor {*or Steering Angle SSR}
* Transmission Control Module (TCM) {* or TRANSMISSION 6AT}
* Yaw Rate Sensor {*or Yaw Rate SSR}

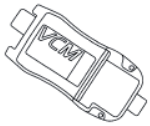
**NOTE**: The abbreviations shown in { } may also be shown on wiring diagrams.

## DIAGNOSIS AND TESTING

### Communications Network

Refer to Wiring Diagrams Section 418-00, for schematic and connector information.

Refer to workshop manual index for other system numbers.

| Special Tool(s) | |
|---|---|
|  SST105-R0057 | 73III Automotive Meter<br>105-R0057 or equivalent |
|  ST2834-A | Integrated Diagnostic System (IDS) |

### Principles of Operation

The vehicle has two externally accesible module communications networks, HS-CAN and MS-CAN from the DLC.

The Private HS-CAN is not directly accesible.

LIN is only used by the BEM and Alarm and is not directly accessible.

The ISO9141 circuit 70 [SB-W] is a single wire and is only used by the component manufacturer (eg. used for 6 speed automatic transmission).

The High Speed Controller Area Network (HS-CAN), is an unshielded twisted pair cable (data bus plus, CAN High, circuit 1908 [BR-Y] and data bus minus, CAN Low, circuit 1909 [P-L]).

The High Speed Controller Area Network Private (HS-CAN private), is an unshielded twisted pair cable (data bus plus, CAN High, circuit 1908 [BR-Y] and data bus minus, CAN Low, circuit 1909 [P-L]).

The Medium Speed Controller Area Network (MS-CAN), is an unshielded twisted pair cable (data bus plus, CAN High, circuit 2180 [W-B] and data bus minus, CAN Low, circuit 2181 [B-Y]).

The Local Interconnect Network (LIN) communications network is a single wire (2184 [O-L]) and is not directly accessible for diagnostics.

The HS-CAN network is terminated at one end by the PCM, with the other end terminated by the IC. Additionally, the DLC and the remaining HS-CAN modules are connected to this bus.

The MS-CAN network is terminated at one end by the FDM, with the other end terminated by the IC. Additionally, the DLC and the remaining MS-CAN modules are connected to this bus

* **High Speed Controller Area Network (HS-CAN) communications network connects the following.**
  * Anti-lock Braking System, Traction Control System and Dynamic Stability Control (ABS/TCS/DSC) {*or ABS Module, or TCS/DSC Module}
  * Data Link Connector (DLC) {* or Diagnostics}
  * HVAC Integrated Module (HIM)
  * Instrument Cluster (IC) {*or Cluster} (GATEWAY to MS CAN)
  * Powertrain Control Module (PCM) {*or EEC-B}
  * Restraints Control Module (RCM) {*or ARS}
  * Transmission Control Module (TCM) {* or TRANSMISSION 6AT} (6 speed automatic transmission equipped vehicles)

* **High Speed Controller Area Network private (HS-CAN - private) communications network connects the following.** (All diagnostics are performed by communicating with the DSC module over public CAN)
  * Dynamic Stability Control (DSC) {*or TCS/DSC Module}
  * Steering Angle Sensor
  * Yaw Rate Sensor

* **Medium Speed Controller Area Network (MS-CAN) communications network connects the following.**
  * Audio Module (ACM)
  * Body Electronics Module (BEM)
  * Bluetooth Phone Module (BPM) {*or Bluetooth for factory fit, or mobile phone1 dealer fit}
  * Data Link Connector (DLC) {* or Diagnostics}
  * Front Entertainment Module (FEM) {* or AIM Audio Interface Module}
  * Front Display Module (FDM) {* or Display 2}
  * Instrument Cluster (IC) {*or Cluster} (GATEWAY to HS CAN)
  * Parking Aid Module (PAM) {*or Sonar Module}

## Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of electrical damage.

**Visual Inspection Chart**

| Electrical |
|---|
| * Wiring harness |
| * Electrical connectors |
| * Data Link Connector |
| * Central junction box (CJB) {or J/B} Fuses |
| * Power distribution box (PDB) Fuses |
| * Junction connector (joins CAN circuits) |
| * Modules: |
| • ABS/TCS/DSC module |
| • ACM |
| • BEM |
| • BPM |
| • FDM |
| • FEM |
| • HIM |
| • IC |
| • PAM |
| • PCM |
| • RCM |
| • TCM |

3. If the concern remains after the inspection, connect the diagnostic tool to the Data Link Connector (DLC) and select the vehicle to be tested from the diagnostic tool menu. If the diagnostic tool does not communicate with the vehicle:
   - Check the connections to the vehicle.
   - Check the ignition switch position is in RUN.
   - Check the VCM connection to the IDS software.

If the diagnostic tool still does not communicate with the vehicle, go to Pinpoint Test Q.

4. Go to Pinpoint Test A.

## Symptom Chart

| Condition | Possible Sources | Action |
|---|---|---|
| ABS/TCS/DSC module does not respond to the diagnostic tool (IDS) | * Circuit or connection on HS-CAN<br>* ABS/TCS/DSC module.<br>* Power and ground circuits. | *GO to Pinpoint Test B. |
| RCM does not respond to the diagnostic tool (IDS) | * Circuit or connection on HS-CAN<br>* RCM.<br>* Power and ground circuits. | *GO to Pinpoint Test C. |
| PAM does not respond to the diagnostic tool (IDS) | * Circuit or connection on MS-CAN<br>* PAM.<br>* Power and ground circuits. | *GO to Pinpoint Test D. |
| IC does not respond to the diagnostic tool (IDS) | * Circuit or connection on MS-CAN.<br>* IC.<br>* Power and ground circuits. | *GO to Pinpoint Test E. |
| PCM does not respond to the diagnostic tool (IDS) | * Circuit or connection on HS-CAN.<br>* PCM.<br>* Power and ground circuits. | *GO to Pinpoint Test F. |
| ACM does not respond to the diagnostic tool (IDS) | * Circuit or connection on MS-CAN.<br>* ACM.<br>* Power and ground circuits. | *GO to Pinpoint Test G. |
| BEM does not respond to the diagnostic tool (IDS) | * Circuit or connection on MS-CAN.<br>* BEM.<br>* Power and ground circuits. | *GO to Pinpoint Test H. |
| HIM does not respond to the diagnostic tool (IDS) | * Circuit or connection on HS-CAN.<br>* HIM.<br>* Power and ground circuits. | *GO to Pinpoint Test I |
| TCM does not respond to the diagnostic tool (IDS) | * Circuit or connection on HS-CAN.<br>* TCM.<br>* Power and ground circuits. | *GO to Pinpoint Test J. |
| FDM does not respond to the diagnostic tool (IDS) | * Circuit or connection on MS-CAN.<br>* FDM.<br>* Power and ground circuits. | *GO to Pinpoint Test K. |
| BPM does not respond to the diagnostic tool (IDS) | * Circuit or connection on MS-CAN.<br>* BPM.<br>* Power and ground circuits. | *GO to Pinpoint Test L. |
| FEM does not respond to the diagnostic tool (IDS) | * Circuit or connection on MS-CAN.<br>* FEM.<br>* Power and ground circuits. | *GO to Pinpoint Test M. |
| No ISO 9141 network communication | * Circuit or connection on the ISO 9141 network.<br>* ISO 9141 network modules. | *GO to Pinpoint Test N |

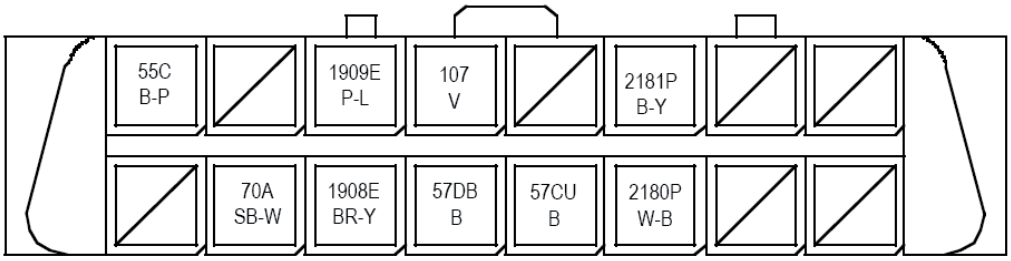
continued on the following page

| Condition | Possible Sources | Action |
|---|---|---|
| No HS-CAN communication | * Circuit or connection on the HS-CAN.<br>* HS-CAN modules. | *GO to Pinpoint Test O |
| No MS-CAN communication | * Circuit or connection on the MS-CAN.<br>* MS-CAN modules. | *GO to Pinpoint Test P. |
| No module/network communication - no power to the diagnostic tool | * Data link connector (DLC).<br>* Central junction box (CJB) Fuse (Courtesy Lamp).<br>* Circuits.<br>* Diagnostic tool. | *GO to Pinpoint Test Q. |

## Connector Circuit Reference

NOTE: Connector view is looking into the front of the connector (wiring half).

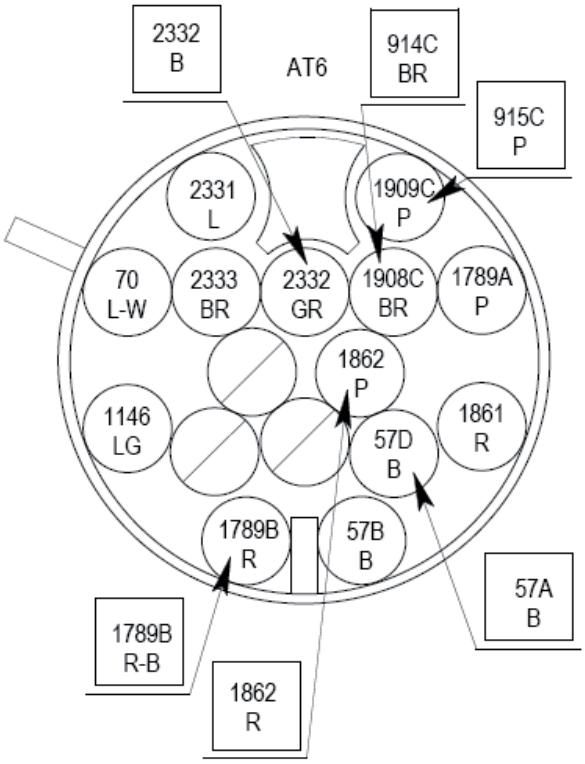
**Data Link Connector (DLC) - C174**




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 70A | (SB-W)<br>ISO Communications | — |
| 1908E | ( BR-Y)<br>HS-CAN Communications (High) | — |
| 1909E | ( P-L)<br>HS-CAN Communications (Low) | — |
| 57CU | (B)<br>Ground | 0 volt |
| 57DB | (B)<br>Ground | 0 volt |
| 55C | (B-P)<br>Battery. | 12 volt |
| 107 | (V)<br>FEPS | — |
| 2180P | (W-B)<br>MS-CAN Communications (High) | — |
| 2181P | ( B-Y)<br>MS-CAN Communications (Low) | — |

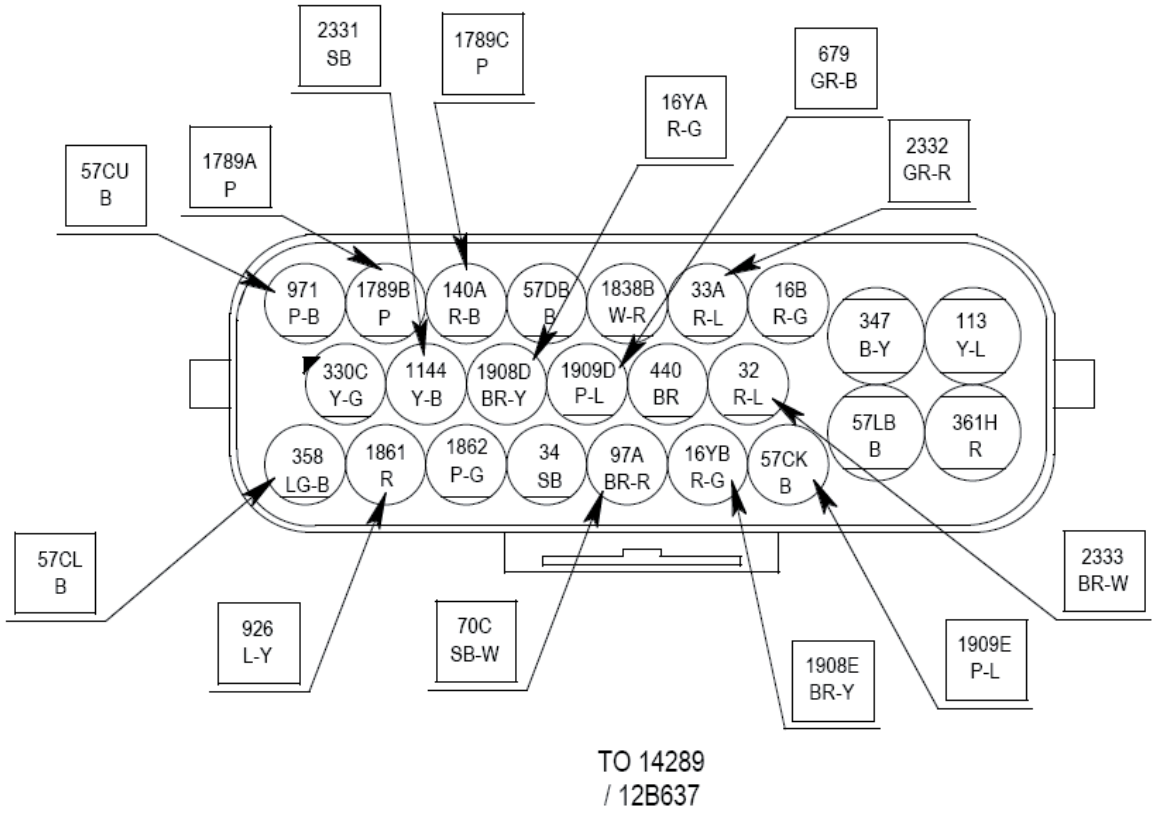
**OTHER CONNECTORS**

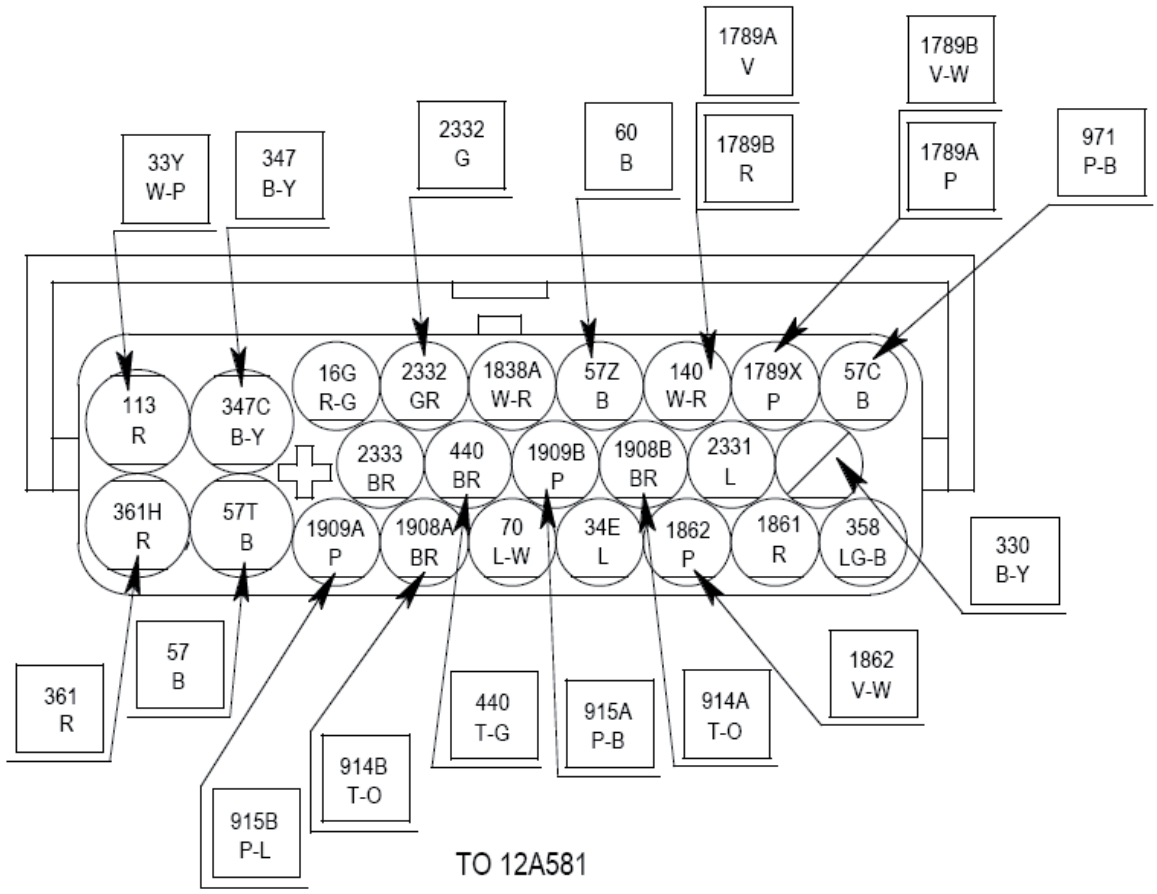
**Transmission Control Module (TCM) C14 (Automatic Transmission, Section 307-01)**




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 70 | (L-W)<br>ISO | — |
| 1908C (I6)<br>914C (V8) | (BR)<br>HS-CAN Communications (High) | — |
| 1909C (I6)<br>915C (V8) | (P)<br>HS-CAN Communications (Low) | — |
| 57B / 57D (I6)<br>57B / 57A (V8) | (B)<br>Ground | 0 Volt |
| 1861 | (R)<br>Battery | 12 Volt |
| 1862 | (P) (I6)<br>(R) (V8)<br>Ignition | 12 Volt |

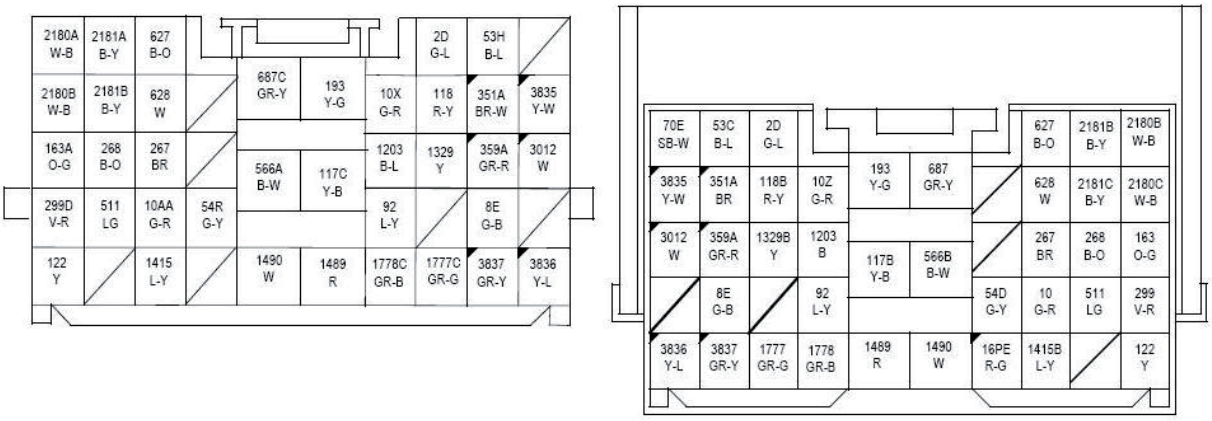
**Inline connector Engine control to Engine Wiring C20**
**(12A581-14289 (I6) / 12B637 (V8) connector, Section 418-00)**



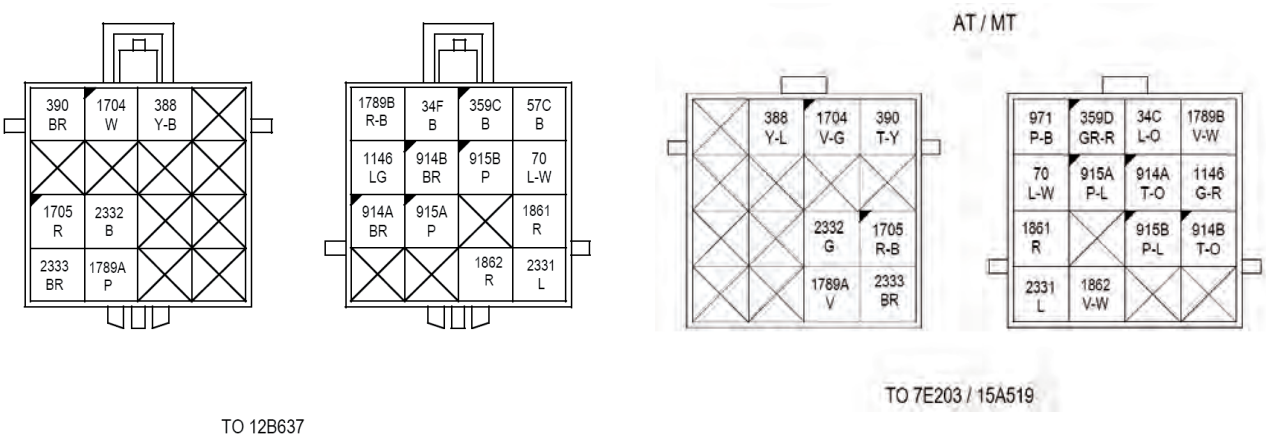
| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 70 | (L-W)<br>ISO | — |
| 1908E to 1908A<br>1908E to 914B | (BR-Y) to (BR) I6<br>(BR-Y) to (T-O) V8<br>HS-CAN Communications (High) | — |
| 1909E to 1909A<br>1909E to 915B | (P-L) to (P) I6<br>(P-L) to (P-L) V8<br>HS-CAN Communications (Low) | — |
| 1908D to 1908B<br>1908D to 914A | (BR-Y) to (BR) I6<br>(BR-Y) to (T-O) V8<br>HS-CAN Communications (High) | — |
| 1909D to 1909B<br>1909D to 915A | (P-L) to (P) I6<br>(P-L) to (P-B) V8<br>HS-CAN Communications (Low) | — |

**Inline connector Instrument Panel to Rear Wiring C50 (14K024-14405, Section 418-00, 413-13)**



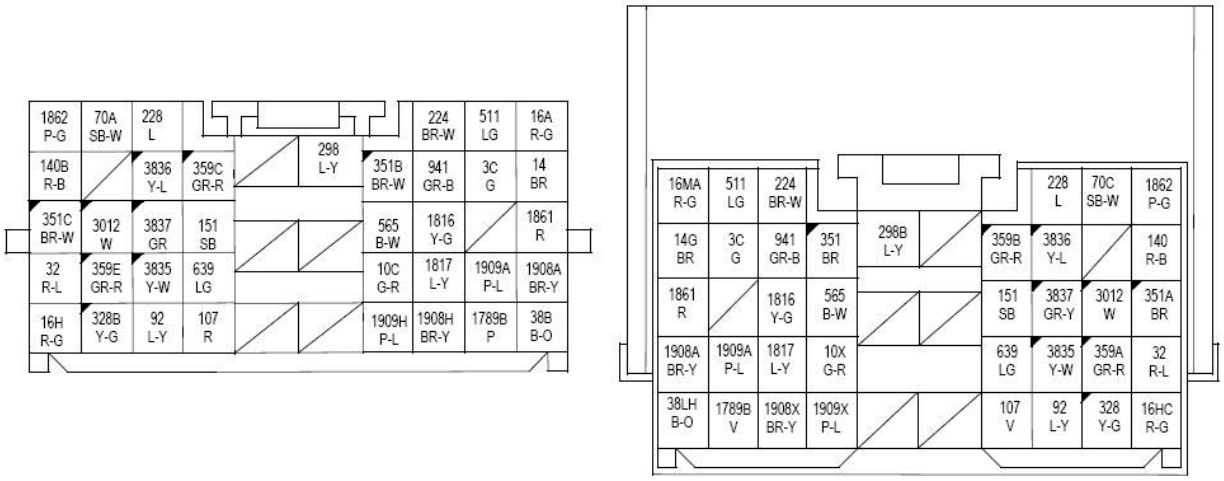

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180A | (W-B)<br>MS-CAN Communications (High) | — |
| 2181A | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 2180B | (W-B)<br>MS-CAN Communications (High) | — |
| 2181B | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 2180C | (W-B)<br>MS-CAN Communications (High) | — |
| 2181C | ( B-Y)<br>MS-CAN Communications (Low) | — |

**In-line connector (V8 engine to transmission) C106 (12B637 TO 7E203)**
**(ENGINE TO TRANSMISSION WIRING)**



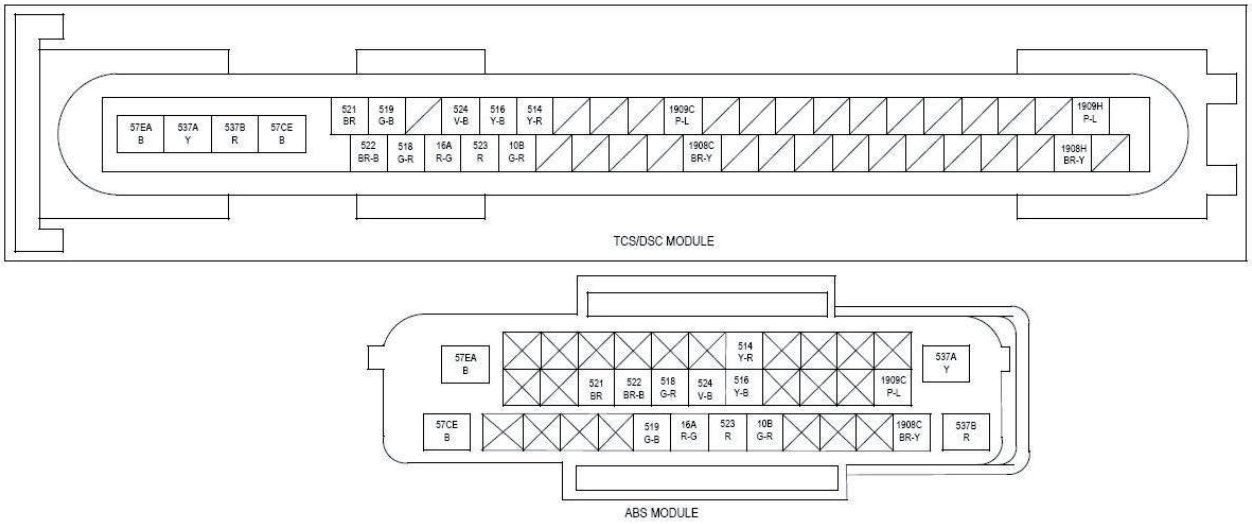

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 914 (914A to 914B) | (BR) to (T-O)<br>HS-CAN Communications (High) | — |
| 915 (915A to 915B) | (P) to (P-L)<br>HS-CAN Communications (Low) | — |
| 914 (914B to 914A) | (BR) to (T-O)<br>HS-CAN Communications (High) | — |
| 915(915B to 915A) | (P) to (P-L)<br>HS-CAN Communications (Low) | — |

**In-line connector (left hand side) C119 (12A581 TO 14K024)**
**(ENG CONTROL TO INSTRUMENT PANEL WIRING)**



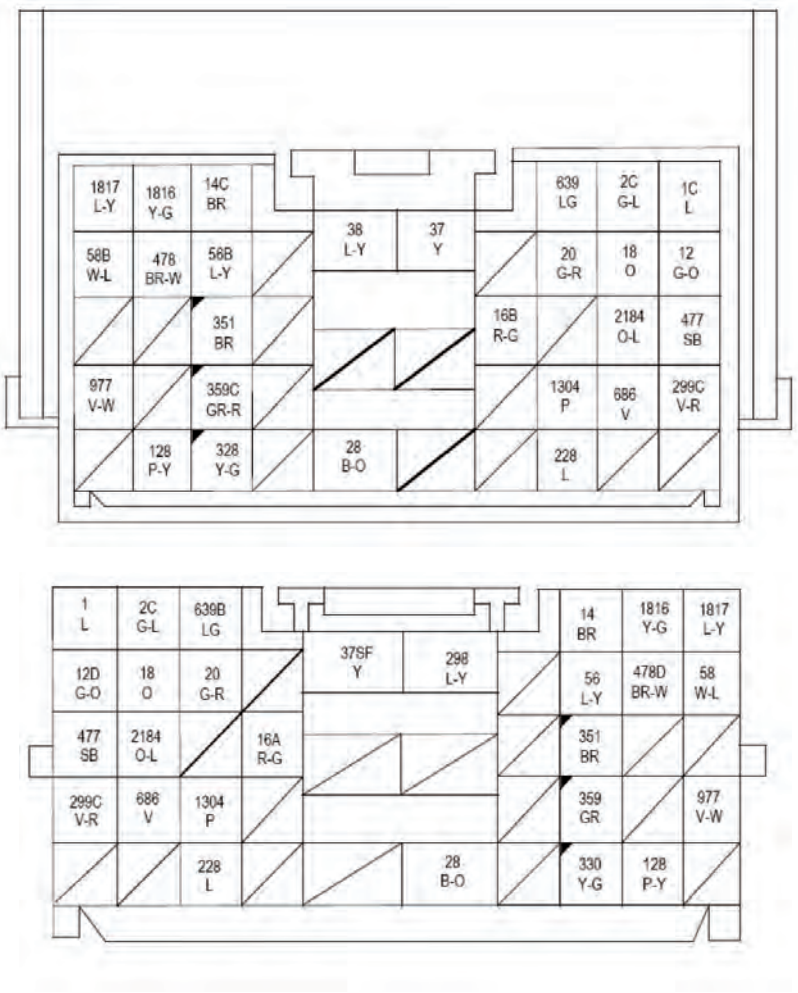

| Circuit number/Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908 / (1908A to 1908A) | (BR-Y)<br>HS-CAN Communications (High) | — |
| 1909 / (1909A to 1909A) | (P-L)<br>HS-CAN Communications (Low) | — |
| 1908 / (1908H to 1908X) | (BR-Y)<br>PRIVATE HS-CAN Communications (High) | — |
| 1909 / (1909H to 1909X) | (P-L )<br>PRIVATE HS-CAN Communications (Low) | — |
| 70 / (70A to 70C) | (SB-W)<br>ISO Communications | — |

**ABS/DSC/TCS Connector C150 (ABS, Section 206-09)**



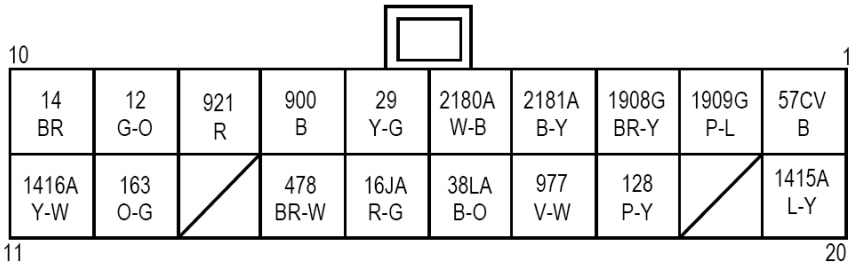

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908C | (BR-Y )<br>HS-CAN Communications (High) | — |
| 1909C | (P-L)<br>HS-CAN Communications (Low) | — |
| 1908H | (BR-Y)<br>HS-CAN Private - Communications (High) | — |
| 1909H | (P-L)<br>HS-CAN Private - Communications (Low) | — |
| 16A | (R-G)<br>Ignition | 12 Volt |
| 537A | (Y)<br>Motor Rly – Battery feed | 12 Volt |
| 537B | (R)<br>Valve relay – Battery feed | 12 Volt |
| 57EA / 57CE | (B)<br>Ground | 0 Volt |

**Inline connector (right hand side) C158 (14K011 to 14K024, Section 418-00, 419-10)**




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2184 | (O-L)<br>LIN | — |

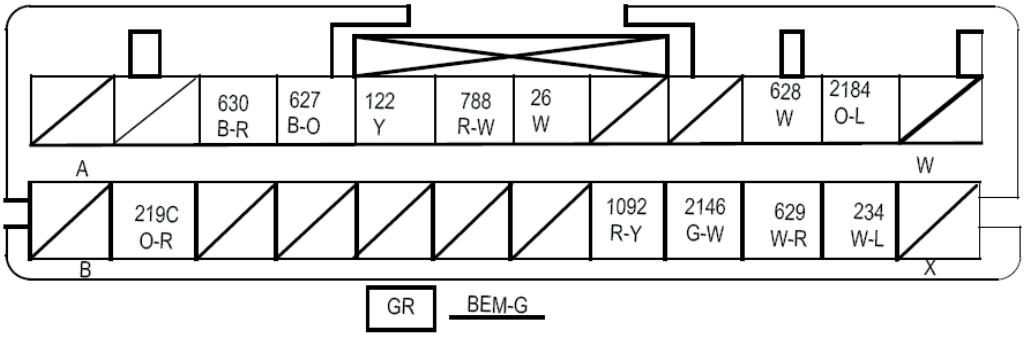
**Instrument Cluster (IC) C171 (Section 413-01)**



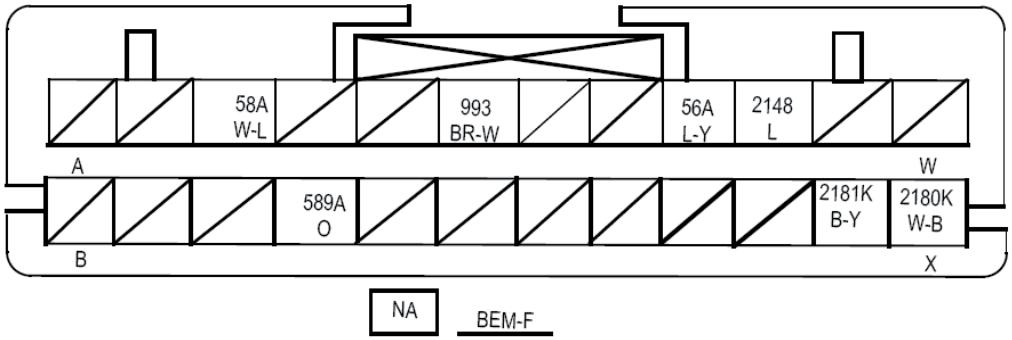

A

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908G | (BR-Y)<br>HS-CAN Communications (High) | — |
| 1909G | (P-L)<br>HS-CAN Communications (Low) | — |
| 2180A | (W-B)<br>MS-CAN Communications (High) | — |
| 2181A | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 16JA | (R-G)<br>Ignition | 12 Volt |
| 38LA | (B-O)<br>Battery | 12 Volt |
| 57CV | (B)<br>Ground | 0 Volt |

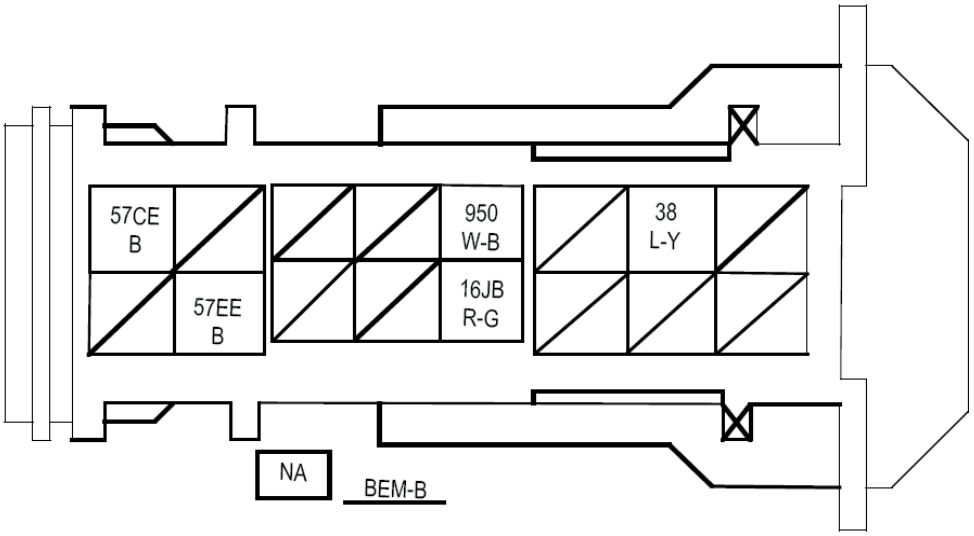
**Body Electronics module (BEM) C173 (Section 418-00, 419-10)**



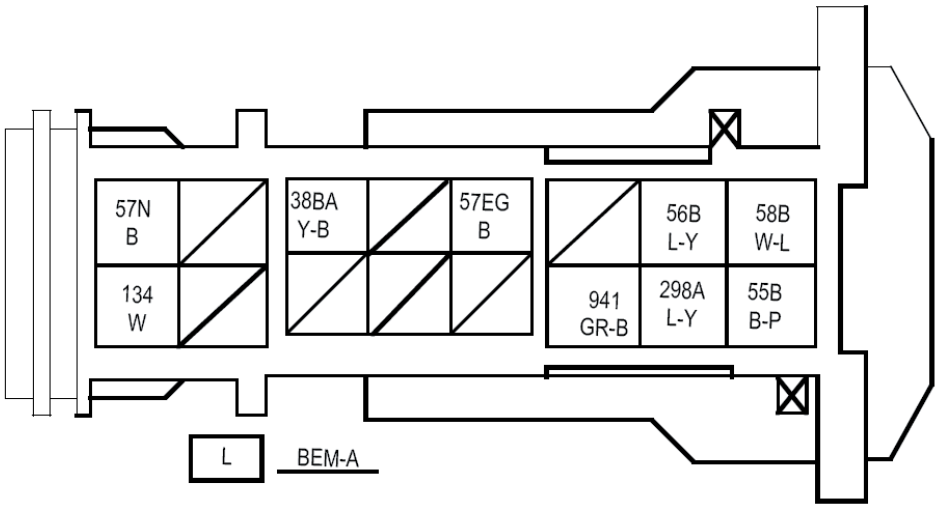

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2184 | (O-L)<br>LIN | — |



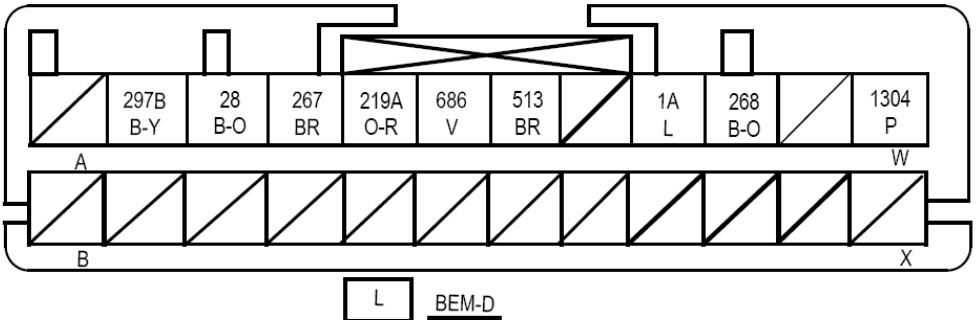

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180K | (W-B)<br>MS-CAN Communications (High) | — |
| 2181K | ( B-Y)<br>MS-CAN Communications (Low) | — |




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 57CE / 57EE | (B)<br>Ground | 0 Volt |
| 16JB | (R-G)<br>Ignition | 12 Volt |

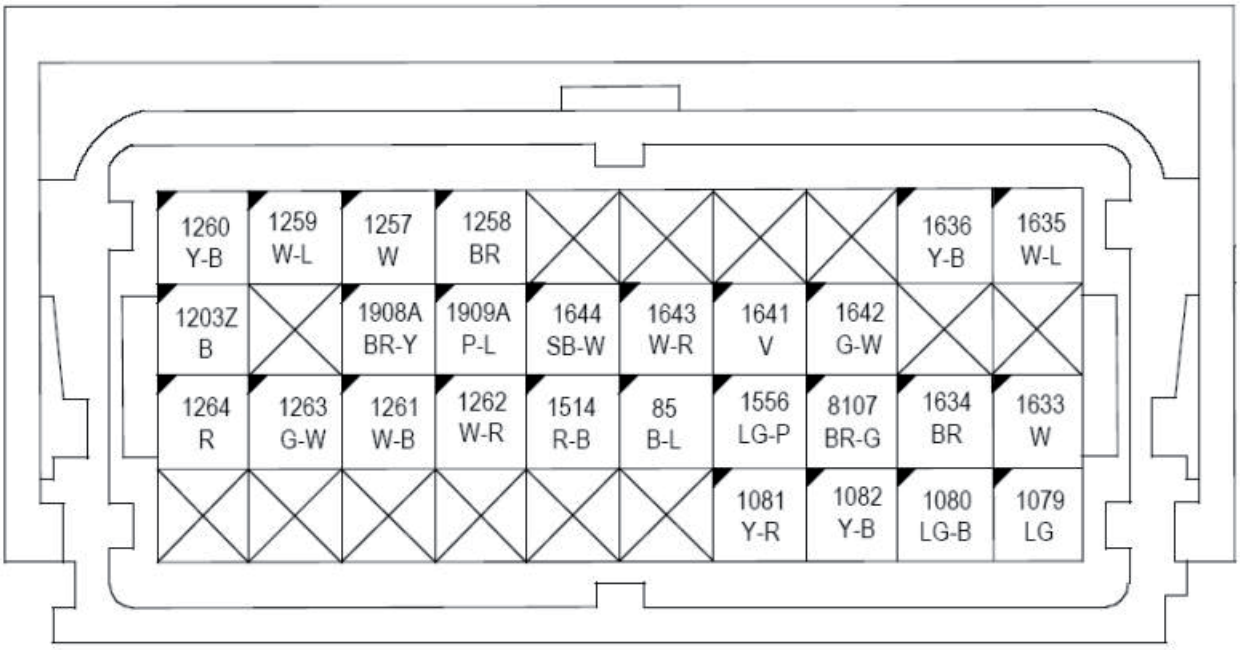



| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 57N | (B)<br>Ground | 0 Volt |
| 57EG | (B)<br>Ground | 0 Volt |
| 38BA | (Y-B)<br>Battery | 12 Volt |

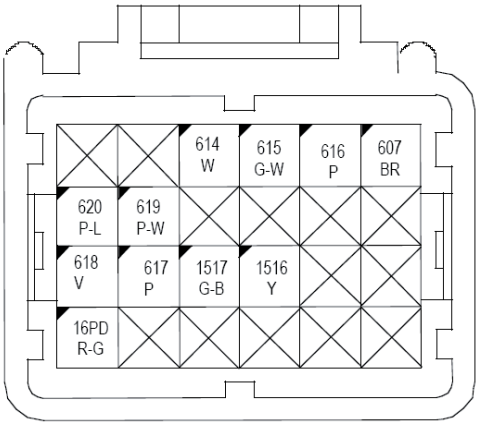



| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 297B | (B-Y)<br>Accessory | 12 Volt |

**Restraints Control Module (RCM) C189 (Occupant Restraints, Section 501-20B)**

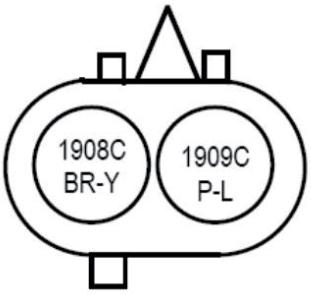


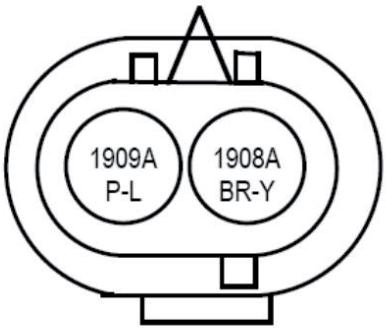

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908A | (BR-Y)<br>HS-CAN Communications (High) | — |
| 1909A | (P-L)<br>HS-CAN Communications (Low) | — |




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 16PD | (R-G)<br>Ignition (12volt) | (12volt Ignition on) |

**Inline Connector Instrument Panel to Rear Wiring C190 (14K024-14405, Section 418-00, 510-20B)**

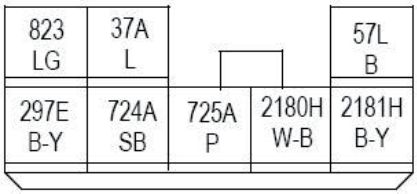


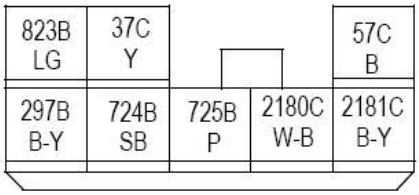




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908C 1908A | (BR-Y)<br>HS-CAN Communications (High) | — |
| 1909C 1909A | (P-L)<br>HS-CAN Communications (Low) | — |

**Mobile Phone/ Front Entertainment Module (FEM) wiring (14K024 To Mobile Phone or to 14C575, 14C575 to Mobile Phone)**

**C192 (Section 418-00, 419-08-00-1, 415-00-00-3)**

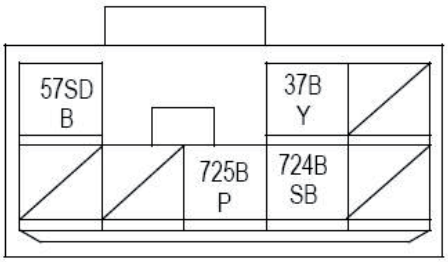


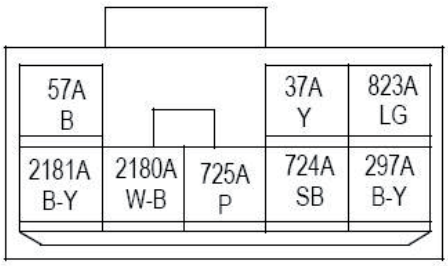




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180C / 2180H | (W-B)<br>MS-CAN Communications (High) | — |
| 2181C / 2181H | ( B-Y)<br>MS-CAN Communications (Low) | — |

**Mobile Phone/ Front Entertainment Module (FEM) wiring (14K024 to 14K024 C-192 Mobile Phone, 14C575 TO 14K024 C-192)**

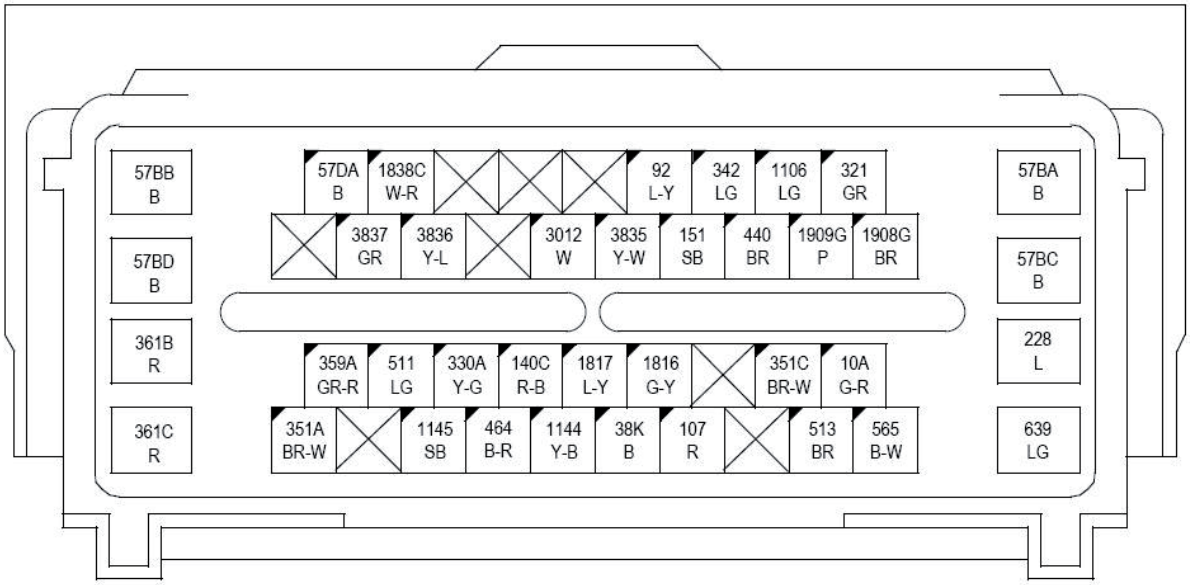
**C204, Section 418-00, 419-08-00-1, 415-00-00-3)**



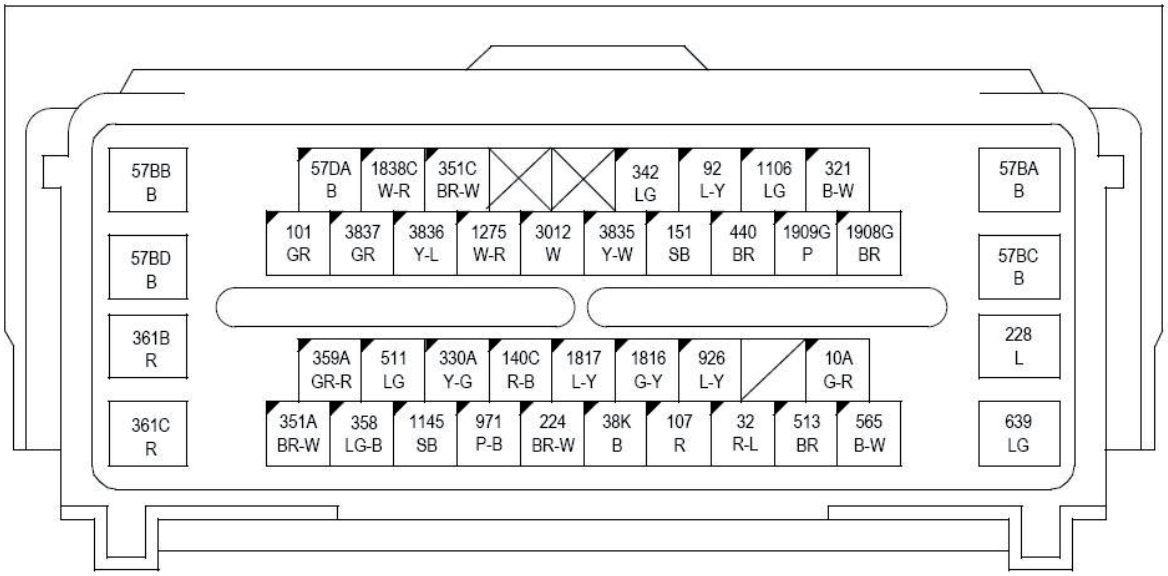




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180A | (W-B)<br>MS-CAN Communications (High) | — |
| 2181A | ( B-Y)<br>MS-CAN Communications (Low) | — |

**Powertrain control module (PCM) C301 (Section 303-14)**



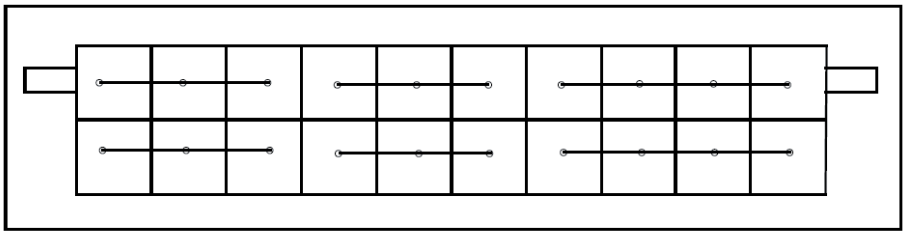

LPG




Petrol

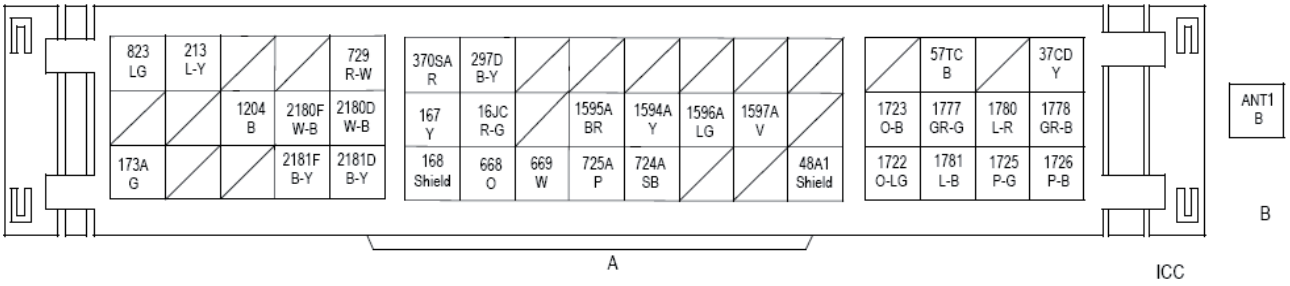
| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 107 | (R)<br>FEPS | — |
| 1908G | (BR)<br>HS-CAN Communications (High) | — |
| 1909G | (P)<br>HS-CAN Communications (Low) | — |
| 57BA / 57BB / 57BC / 57BD | (B)<br>Ground | 0 Volt |
| 361B / 361C | (R)<br>VPWR | 12 Volt (PCM controlled) |

**Junction connector (JC) C336 (Section 418-00)**

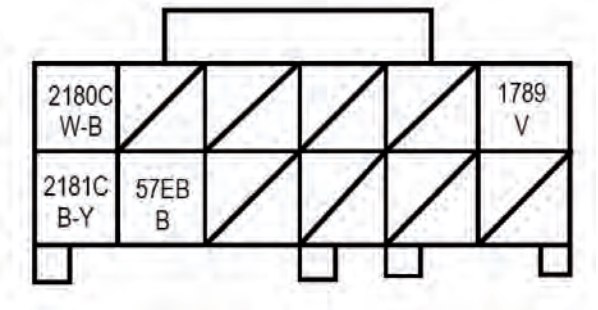
| Circuit number/Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908 / (1908B, 1908D, 1908F) | (BR-Y)<br>HS-CAN Communications (High) | — |
| 1909 / (1909B, 1909D, 1909F) | (P-L)<br>HS-CAN Communications (Low) | — |
| 2180 / (2180L,2180M,2180N) | (W-B)<br>MS-CAN Communications (High) | — |
| 2181 / (2181L,2181M,2181N) | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 70 / (70A, 70C) | (SB-W)<br>ISO Communications | — |

**Audio Control Module ACM Connector C364 (ICC, Section 413-08)**



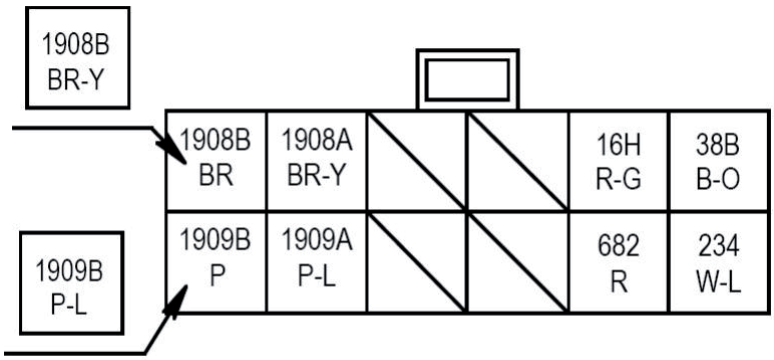

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180D | (W-B)<br>MS-CAN Communications (High) | — |
| 2181D | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 2180F | (W-B)<br>MS-CAN Communications (High) | — |
| 2181F | (B-Y)<br>MS-CAN Communications (Low) | — |
| 16JC | (R-G)<br>Ignition | 12 Volt |
| 37CD | (Y)<br>Battery | 12 Volt |
| 297D | (B-Y)<br>Accessory | 12 Volt |
| 57TC | (B)<br>Ground | 0 Volt |

**Parking Aid Module (PAM) C369 (Section 418-00, 413-13)**



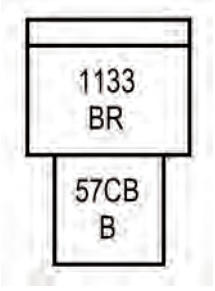

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180C | (W-B)<br>MS-CAN Communications (High) | — |
| 2181C | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 57EB | (B)<br>Ground | 0 Volt |
| 1789 | (V)<br>Ignition | 12 Volt |

**HVAC interface module (HIM) Connector C376 (Section 412-00)**



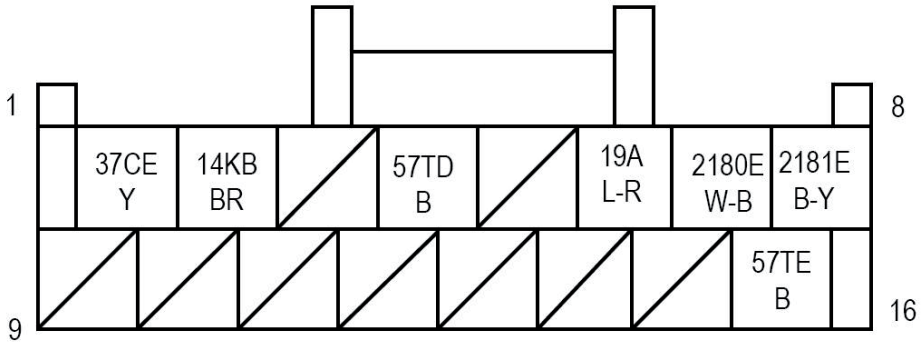

A

| Circuit number/Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908 / (1908A) | (BR-Y )<br>HS-CAN Communications (High)<br>to instrument panel CAN | — |
| 1909 / (1909A) | (P-L)<br>HS-CAN Communications (Low)<br>to instrument panel CAN | — |
| 1908 / (1908B) | (BR-Y) or (BR)<br>HS-CAN Communications (High)<br>to engine bay CAN | — |
| 1909 / (1909B) | (P-L) or (P)<br>HS-CAN Communications (Low) t<br>o engine bay CAN | — |
| 16H | (R-G)<br>Ignition | 12 Volt |
| 38B | (B-O)<br>Battery | 12 Volt |



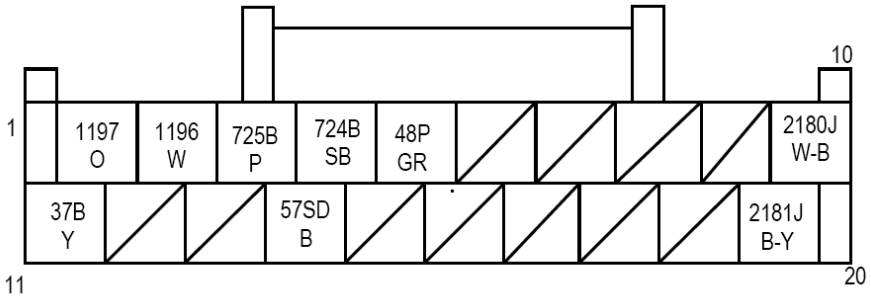

| Circuit number/Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 57CB | (B)<br>Ground | 0 Volt |

**Front Display Module (FDM) - C920 (Section 415-00)**



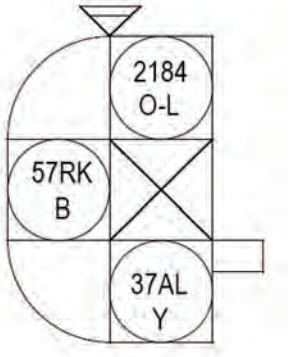

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 37CE | (Y)<br>Battery | — |
| 57TD / 57TE | (B)<br>Ground | — |
| 2180E | (W-B)<br>MS-CAN Communications (High) | — |
| 2181E | ( B-Y)<br>MS-CAN Communications (Low) | — |

**Bluetooth Phone Module (BPM) C921 (Section 418-00, 419-08-00-1)**



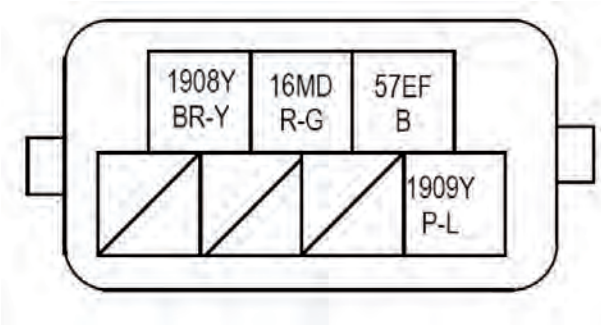

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180J | (W-B)<br>MS-CAN Communications (High) | — |
| 2181J | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 37B | (Y)<br>Battery | 12 Volt |
| 57SD | (B)<br>Ground | 0 Volt |

**Alarm C929 (Section 418-00, 419-10)**



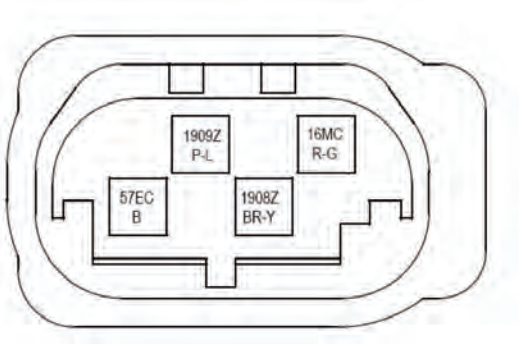

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2184 | (O-L )<br>LIN | — |
| 37AL | (Y)<br>Battery | 12 Volt |
| 57RK | (B)<br>Ground | 0 Volt |

**Steering Angle Sensor C961 (Section 418-00, 206-09-00-2)**



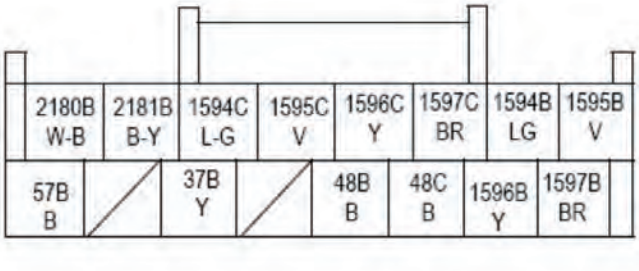

| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908Y | (BR-Y)<br>HS-CAN PRIVATE<br>Communications (High) | — |
| 1909Y | (P-L)<br>HS-CAN PRIVATE<br>Communications (Low) | — |
| 16MD | (R-G)<br>Ignition | 12 Volt |
| 57EF | (B)<br>Ground | 0 Volt |

**Yaw Rate sensor C963 (Section 418-00, 206-09-00-2)**




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 1908Z | (BR-Y)<br>HS-CAN PRIVATE<br>Communications (High) | — |
| 1909Z | (P-L)<br>HS-CAN PRIVATE<br>Communications (Low) | — |
| 16MC | (R-G)<br>Ignition | 12 Volt |
| 57EC | (B)<br>Ground | 0 Volt |

**Front Entertainment Module (FEM) C981 (Audio interface module connector, Section 415-00)**




| Pin Number(s) | Circuit Designation/Description | Normal Condition/Measurement |
|---|---|---|
| 2180B | (W-B)<br>MS-CAN Communications (High) | — |
| 2181B | ( B-Y)<br>MS-CAN Communications (Low) | — |
| 37B | (Y)<br>Battery | 12 Volt |
| 57B | (B)<br>Ground | 0 Volt |

## Pinpoint Tests

| PINPOINT TEST A : DATA LINK DIAGNOSTICS NETWORK TEST | |
|---|---|
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **A1 : DATA LINK DIAGNOSTICS NETWORK TEST** | |
| | 1 SPX_Australia_SVC@SPX, VFT_ME_All_Users@SPX |
| | Key in ON position. |
| | 2 Run the data link diagnostics network test. |
| | Is SYSTEM PASSED obtained? |
| | **Yes** |
| | Test passed. RETURN to the Symptom Chart of the section for the module in question. |
| | **No** |
| | If no response from the diagnostic tool, GO to Pinpoint Test Q. |
| | If CKT70, CKT1908, or CKT1909, or CKT 2180, or CKT 2181 = SOME ECUS NO RESP/ NOT EQUIP, REFER to the Symptom Chart. |
| | If CKT70 = ALL ECUS NO RESP/NOT EQUIP, GO to Pinpoint Test N. |
| | If CKT1908 = ALL ECUS NO RESP/NOT EQUIP, GO to Pinpoint Test O |
| | If CKT1909 = ALL ECUS NO RESP/NOT EQUIP, GO to Pinpoint Test O |
| | If CKT 2180 = ALL ECUS NO RESP/NOT EQUIP, GO to Pinpoint Test P |
| | If CKT2181 = ALL ECUS NO RESP/NOT EQUIP, GO to Pinpoint Test P |
| | If module in question is NO RESPONSE/NOT EQUIPPED, REFER to the Symptom Chart. |
| | If module in question is NO RESPONSE ON CKT1908(BUS+) or NO RESPONSE ON CKT1909 (BUS-), REFER to Symptom Chart |
| | If module in question is NO RESPONSE ON CKT2180 (BUS+) or NO RESPONSE ON CKT2181 (BUS-), REFER to Symptom Chart. |

| PINPOINT TEST B : ABS/TCS/DSC MODULE DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **B1 : CHECK ABS/TCS/DSC C150 CIRCUIT 1908C AND 1909C FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect ABS/TCS/DSC C150. |
| | 3 Inspect ABS/TCS/DSC C150 for damage. |
| | Is the ABS/TCS/DSC C150 OK? |
| | **Yes** |
| | Go to B2 |
| | **No** |
| | REPAIR the ABS/TCS/DSC C150. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **B2 : CHECK CIRCUIT 1908 (BR-Y) AND 1909 (P-L) BETWEEN DLC C174 AND ABS/TCS/DSC C150 FOR OPEN** | |
| | 1 Measure the resistance between ABS/TCS/DSC C150, circuit 1908C (BR-Y), harness side and DLC C174, circuit 1908E (BR-Y), harness side. |
| | 2 Measure the resistance between ABS/TCS/DSC C150, circuit 1909C (P-L), harness side and DLC C174, circuit 1909E (P-L), harness side. |
| | Are the resistances less than 5 ohms for both circuits? |
| | **Yes** |
| | Go to B3 |
| | **No** |
| | REPAIR the circuit(s) as necessary. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **B3 : CHECK FOR CORRECT ABS/TCS/DSC OPERATION POWER CIRCUITS** | |
| | 1 Disconnect all ABS/TCS/DSC connectors. |
| | 2 Measure Voltage at circuit 537A, 537B (Battery) and 16A (Ignition on). |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to B4: |
| | **No** |
| | Repair the faulty circuit. |
| **B4 : CHECK FOR CORRECT ABS/TCS/DSC OPERATION GROUND CIRCUITS** | |
| | 1 Measure the resistance between 57EA, 57CE and ground. |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Go to B5. |
| | **No** |
| | Repair the circuit. |
| **B5 : CHECK FOR CORRECT ABS/TCS/DSC OPERATION** | |
| | 1 Connect all ABS/TCS/DSC connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new ABS/TCS/DSC module. Refer to Section 206-09. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST C : RCM DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| **WARNING: REFER TO SECTION 501-20b FOR WARNINGS REGARDING RCM MODULES.**<br>NOTE: For additional connector circuit information on C189, refer to chapter 501-20b. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **C1 : CHECK RCM C189 CIRCUIT 1908A AND 1909A FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Deactivate the air bag system. Refer to Section 501-20b. |
| | 3 Disconnect RCM C189. |
| | 4 Inspect RCM C189 for damage. |
| | Is the RCM C189 OK? |
| | **Yes** |
| | Go to C2 |
| | **No** |
| | REPAIR the RCM C189. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **C2 : CHECK CIRCUIT 1908A AND 1909A BETWEEN DLC C174 AND RCM C189 FOR OPEN** | |
| | 1 Measure the resistance between RCM C189, circuit 1908A (BR-Y), harness side and DLC C174, circuit 1908E (BR-Y), harness side. |
| | 2 Measure the resistance between RCM C189, circuit 1909A (P-L), harness side and DLC C174, circuit 1909E (P-L), harness side. |
| | Are the resistances less than 5 ohms for both circuits? |
| | **Yes** |
| | Go to C3 |
| | **No** |
| | Check C-190 interconnection of Instrument Panel 14K024 wiring and Floor 14405 wiring. REPAIR the circuit(s) as necessary. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **C3 : CHECK FOR CORRECT RCM OPERATION POWER SUPPLY** | |
| | 1 Disconnect all RCM connectors. |
| | 2 Measure voltage on circuit 16PD with ignition switch on. |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to C4. |
| | **No** |
| | Repair the circuit. |
| **C4 : CHECK FOR CORRECT RCM OPERATION** | |
| | 1 Ensure that the case ground bolts are properly secured and conducting to ground. |
| | 2 Connect all RCM connectors and make sure they seat correctly. |
| | 3 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new RCM module. Refer to Section 501-20b. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST D : PAM DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For additional connector circuit information on C369, refer to module connector diagram in chapter 413-13. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **D1 : CHECK PAM C369 CIRCUIT 2180C (W-B), 2181C (B-Y), FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect PAM C369. |
| | 3 Inspect PAM C369 for damage. |
| | Is the PAM C369 OK? |
| | **Yes** |
| | Go to D2 |
| | **No** |
| | REPAIR the PAM C369. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **D2 : CHECK CIRCUIT 2180C (W-B), 2181C (B-Y), BETWEEN DLC C174 AND PAM C369 FOR OPEN** | |
| | 1 Measure the resistance between PAM C369, circuit 2180C (W-B), harness side and DLC C174, circuit 2180P (W-B), harness side. |
| | 2 Measure the resistance between RCM C189, circuit 2181C (B-Y), harness side and DLC C174, circuit 2181P (B-Y), harness side. |
| | Is the resistance less than 5 ohms? |
| | **Yes** |
| | Go to D3 |
| | **No** |
| | REPAIR the circuit(s) as necessary. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **D3 : CHECK FOR CORRECT PAM OPERATION POWER SUPPLY CIRCUIT** | |
| | 1 Disconnect all PAM connectors. |
| | 2 Measure voltage on circuit 1789 (V) (ignition on). |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to D3. |
| | **No** |
| | Repair circuit. |
| **D4 : CHECK FOR CORRECT PAM OPERATION GROUND CIRCUIT** | |
| | 1 Measure ground circuit 57EB resistance to ground. |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Go to D5. |
| | **No** |
| | Repair the circuit. |
| **D5 : CHECK FOR CORRECT PAM OPERATION** | |
| | 1 Connect all PAM connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new PAM module. Refer to section 413-13. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST E : IC MODULE DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For additional connector circuit information on C171, refer to module connector diagram in chapter 413-01. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **E1 : CHECK IC C171 CAN CIRCUITS 2180A (W-B), 2181A (B-Y), FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect IC C171. |
| | 3 Inspect IC C171 for damage. |
| | Is the IC C171 OK? |
| | **Yes** |
| | Go to E2 |
| | **No** |
| | REPAIR IC C171. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **E2 : CHECK CAN HIGH AND CAN LOW 2180A (W-B), 2181A (B-Y), BETWEEN DLC C174 AND IC C171 FOR OPEN** | |
| | 1 Measure the resistance between IC C171, circuit 2180A (W-B) harness side and DLC C174, circuit 2180P (W-B), harness side. |
| | 2 Measure the resistance between IC C171, circuit 2181A (B-Y) harness side and DLC C174, circuit 2181P (B-Y), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | Go to E3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **E3 : CHECK FOR CORRECT IC OPERATION POWER CIRCUITS** | |
| | 1 Disconnect all IC connectors. |
| | 2 Measure voltage on circuit 38L (B-O) (Battery) and on 16J (R-G) (Ignition). |
| | Is Battery voltage present on the circuits? |
| | **Yes** |
| | Go to E4. |
| | **No** |
| | Repair the faulty circuit(s). |
| **E4 : CHECK FOR CORRECT IC OPERATION GROUND CIRCUIT** | |
| | 1 Measure circuit 57CV (B) resistance to vehicle ground. |
| | Is the resistance less than 5 ohms? |
| | **Yes** |
| | Go to E5. |
| | **No** |
| | Repair ground circuit 57. |
| **E5 : CHECK FOR CORRECT IC OPERATION** | |
| | 1 Connect all IC connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new IC module. Refer to section 413-01. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST F : PCM DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For additional connector circuit information on C301, refer to module connector diagram in chapter 303-14. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **F1 : CHECK PCM C301 CAN CIRCUITS 1908G (BR) AND 1909G (P) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect PCM C301. |
| | 3 Inspect PCM C301 for damage. |
| | Is the PCM C301 OK? |
| | **Yes** |
| | Go to F2 |
| | **No** |
| | REPAIR PCM C301. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **F2 : CHECK CAN HIGH AND CAN LOW CIRCUITS 1908G (BR) AND 1909G (P) BETWEEN DLC C174 AND PCM C301 FOR OPEN** | |
| | 1 Measure the resistance between PCM module C301, circuit 1908G (BR), harness side and DLC C174, circuit 1908E (BR-Y), harness side. |
| | 2 Measure the resistance between PCM module C301, circuit 1909G (P) , harness side and DLC C174, circuit 1909E (P-L), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | Go to F3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **F3 : CHECK FOR CORRECT PCM OPERATION EEC RELAY** | |
| | 1 Disconnect all PCM connectors. |
| | 2 Test EEC relay (located in power distribution box). |
| | Is the EEC relay faulty? |
| | **No** |
| | Go to F4 |
| | **Yes** |
| | Replace relay. (Check mating terminals on power distribution box for proper connection). CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **F4 : CHECK FOR CORRECT PCM OPERATION EEC RELAY POWER SUPPLY CIRCUIT** | |
| | 1 Remove EEC relay. Measure relay supply voltage at, circuits 175B (B-Y), 175D (B-W) |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to F5 |
| | No |
| | Repair the circuit. |
| **F5 : CHECK FOR CORRECT PCM OPERATION POWER SUSTAIN CIRCUIT** | |
| | 1 Measure the resistance of the PWRSTN circuit 513 from EEC relay C-163 to EEC-B C-301 |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | GO to F6 |
| | **No** |
| | Repair the circuit. |

| | |
|---|---|
| **F6 : CHECK FOR CORRECT PCM OPERATION POWER SUPPLY CIRCUIT** | |
| | 1 Measure the resistance of VPWR circuit 361 from 361A at EEC relay C-163 to 361B and 361C at EEC-B C-301 |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Replace EEC relay. Go to F7 |
| | **No** |
| | Repair the circuit. |
| **F7 : CHECK FOR CORRECT PCM OPERATION GROUND CIRCUIT** | |
| | 1 Measure circuit 57BB, 57BD, 57BA, 57BC and 57DA (B) for resistance to ground |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Go to F8. |
| | **No** |
| | Repair the circuit(s). |
| **F8 : CHECK FOR CORRECT PCM OPERATION** | |
| | 1 Connect all PCM connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new PCM module. Refer to section 303-14. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST G : ACM (ICC MODULE) DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For additional connector circuit information on C364, refer to module connector diagram in chapter 415-. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **G1 : CHECK ACM C364 CAN CIRCUITS 2180D (W-B) AND 2181D (B-Y) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect ACM C364. |
| | 3 Inspect ACM C364 for damage. |
| | Is the ACM C364 OK? |
| | **Yes** |
| | Go to G2 |
| | **No** |
| | REPAIR ICC C364. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **G2 : CHECK CAN HIGH AND CAN LOW CIRCUITS 2180 (W-B) AND 2181 (B-Y) BETWEEN DLC C174 AND ICC C364 FOR OPEN** | |
| | 1 Measure the resistance between ICC module C364, circuit 2180D (W-B), harness side and DLC C174, circuit 2180P (W-B), harness side. |
| | 2 Measure the resistance between ICC module C364, circuit 2181D (B-Y) harness side and DLC C174, circuit 2181P (B-Y), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | Go to G3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **G3 : CHECK FOR CORRECT ACM OPERATION POWER SUPPLY** | |
| | 1 Disconnect all ACM connectors. |
| | 2 Measure the power supply to the ACM. Check for Ignition 12Volt on circuit 16H (R-G), Accessory 12Volt on circuit 297D(B-Y) and Battery 12Volt on circuit 37CD (Y). |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to G4: |
| | **No** |
| | Repair the circuit(s). |
| **G4 : CHECK FOR CORRECT ACM OPERATION GROUND CIRCUIT** | |
| | 1 Measure the resistance of ground circuit 57TC (B) to vehicle ground. |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Go to G5. |
| | **No** |
| | Repair the circuit. |
| **G5 : CHECK FOR CORRECT ACM OPERATION** | |
| | 1 Connect all ACM connectors and make sure they seat correctly (ensure the large self aligning connector is correctly reset to allow connection). |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new ACM module. Refer to section 413-08. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST H : BEM DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For additional connector circuit information on C173, refer to module connector diagram in chapter 419-10. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **H1 : CHECK BEM C173 CAN CIRCUITS 2180K (W-B) AND 2181K (B-Y) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect BEM C173. |
| | 3 Inspect BEM C173 for damage. |
| | Is the BEM C173 OK? |
| | **Yes** |
| | Go to H2 |
| | **No** |
| | REPAIR BEM C173. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **H2 : CHECK CAN HIGH AND CAN LOW CIRCUITS 2180K (W-B) AND 2181K (B-Y) BETWEEN DLC C174 AND BEM C173 FOR OPEN** | |
| | 1 Measure the resistance between BEM module C173, circuit 2180K (W-B) harness side and DLC C174, circuit 2180P (W-B), harness side. |
| | 2 Measure the resistance between BEM module C173, circuit 2181K (B-Y), harness side and DLC C174, circuit 2181P (B-Y), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | Go to H3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **H3 : CHECK FOR CORRECT BEM OPERATION POWER SUPPLY** | |
| | 1 Disconnect all BEM connectors. |
| | 2 Measure power supply to BEM. Check circuit 297B (B-Y) for 12Volt with Accessory/ Ignition on, 38BA (Y-B) for 12 Volt Battery, 16JB (R-G) for 12 Volt with Ignition on. |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to H4. |
| | **No** |
| | Repair the faulty circuit(s). CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **H4 : CHECK FOR CORRECT BEM OPERATION GROUND CIRCUITS** | |
| | 1 Measure 57CE, 57EE, 57EG, 57N (B) for resistance to ground. |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Go to H5. |
| | **No** |
| | Repair the faulty circuit(s). CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **H5 : CHECK FOR CORRECT BEM OPERATION** | |
| | 1 Connect all BEM connectors and make sure they seat correctly. Ensure wiring is clear of moving parts at pedal box and steering column. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new BEM module. Refer to Section 419-10. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST I : HIM DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For additional connector circuit information on C376, refer to module connector diagram in chapter 412-04. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **I1 : CHECK HIM C376 CAN CIRCUITS 1908A (BR-Y) AND 1909A (P-L) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect HIM C376. |
| | 3 Inspect HIM C376 for damage. |
| | Is the HIM C376 OK? |
| | **Yes** |
| | Go to I2 |
| | **No** |
| | REPAIR HIM C376. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **I2 : CHECK CAN HIGH AND CAN LOW CIRCUITS 1908 AND 1909 BETWEEN DLC C174 AND HIM C376 FOR OPEN** | |
| | 1 Measure the resistance between HIM module C376, circuit 1908A (BR-Y), harness side and DLC C174, circuit 1908E (BR-Y), harness side. |
| | 2 Measure the resistance between HIM module C376, circuit 1909A (P-L), harness side and DLC C174, circuit 1909E (P-L), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | Go to I3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **I3 : CHECK FOR CORRECT HIM OPERATION POWER SUPPLY** | |
| | 1 Disconnect all HIM connectors. |
| | 2 Measure power supply to HIM. Measure voltage at circuit 16H (R-G) with Ignition on, circuit 38B (B-O) Battery |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to I4. |
| | **No** |
| | Repair the circuit(s). CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **I4 : CHECK FOR CORRECT HIM OPERATION GROUND CIRCUITS** | |
| | 1 Measure resistance of circuit 57CB to ground |
| | Is the resistance less than 2 ohm? |
| | **Yes** |
| | Go to I5. |
| | **No** |
| | Repair the circuit. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **I5 : CHECK FOR CORRECT HIM OPERATION** | |
| | 1 Connect all HIM connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new HIM module. Refer to Section 412-04. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST J: TCM (TRANSMISSION CONTROL MODULE) DOES NOT RESPOND TO DIAGNOSTIC TOOL. | |
|---|---|
| NOTE: For additional connector circuit information on C14, refer to module connector diagram in chapter 307- | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **J1 : CHECK TCM C14 CAN CIRCUITS (1908C (BR) AND 1909C (P))I6, (914C(BR) AND 915C(P))V8 FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect C14. |
| | 3 Inspect C14 for damage. |
| | Is the connector C14 OK? |
| | **Yes** |
| | GO to J2 |
| | **No** |
| | Repair connector C14. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **J2 : CHECK CHECK CAN HIGH AND CAN LOW CIRCUITS (1908 AND 1909 FOR I6) (914 AND 915 FOR V8) BETWEEN DLC C174 AND C14 FOR OPEN** | |
| | 1 Measure the resistance between TCM C14, circuit 1908C (I6) 914C (V8) (BR), harness side and DLC C174, circuit 1908E (BR-Y), harness side. |
| | 2 Measure the resistance between TCM C14, circuit 1909C (I6) 915C (V8) (P), harness side and DLC C174, circuit 1909E (P-L), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | GO to J3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **J3 : CHECK FOR CORRECT TCM OPERATION POWER SUPPLY** | |
| | 1 Disconnect C14 connector. |
| | 2 Measure power supply to TCM. Measure circuit 1861 (R) 12Volt battery, circuit 1862 (P) (I6) (R) (V8) for 12Volt ignition on. |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to J4. |
| | **No** |
| | Repair the circuit. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **J4 : CHECK FOR CORRECT TCM OPERATION GROUND CIRCUIT** | |
| | 1 Measure circuit (57B (B) and 57D (B)) (I6) (57B (B) and 57A (B)) (V8) resistance to ground. |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Go to J5. |
| | **No** |
| | Repair the circuit. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **J5 : CHECK FOR CORRECT TCM OPERATION** | |
| | 1 Connect all connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | Refer to Transmission section of workshop manual for repair. Refer to Section 307-01B. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST K : FRONT DISPLAY MODULE (FDM) DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For additional connector circuit information on C920, refer to module connector diagram in chapter 413-08. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **K1 : CHECK FDM C920 CAN CIRCUITS 2180E (W-B) AND 2181E (B-Y) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect C920. |
| | 3 Inspect C920 for damage. |
| | Is the C920 OK? |
| | **Yes** |
| | GO to K2 |
| | **No** |
| | REPAIR FDM C920. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **K2 : CHECK CAN HIGH AND CAN LOW CIRCUITS 2180E (W-B) AND 2181E (B-Y) BETWEEN DLC C174 AND FDM C920 FOR OPEN** | |
| | 1 Measure the resistance between FDM C920, circuit 2180E (W-B), harness side and DLC C174, circuit 2180P (W-B), harness side. |
| | 2 Measure the resistance between FDM C920, circuit 2181F (B-Y) harness side and DLC C174, circuit 2181P (B-Y), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | Go to K3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **K3 : CHECK FOR CORRECT FDM OPERATION POWER SUPPLY CIRCUITS** | |
| | 1 Disconnect FDM connectors. |
| | 2 Measure voltage at circuit 37CE (Y) Battery 12Volt. |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to K4. |
| | **No** |
| | Repair the circuit. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **K4 : CHECK FOR CORRECT FDM OPERATION GROUND CIRCUITS** | |
| | 1 Measure circuits 57TD and 57TE (B) resistance to ground. |
| | Are the resistances less than 5 ohm? |
| | **Yes** |
| | Go to K5. |
| | **No** |
| | Repair the circuit(s). CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **K5 : CHECK FOR CORRECT FDM OPERATION** | |
| | 1 Connect all FDM connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new FDM module. Refer to section 413-08. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST L : BPM DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For connector circuit information on C921, refer to module connector diagram in chapter 419-08. | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **L1 : CHECK BPM C921 CAN CIRCUITS 2180J (W-B) AND 2181J (B-Y) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect BPM C921. |
| | 3 Inspect BPM C921 for damage. |
| | Is the BPM C921 OK? |
| | **Yes** |
| | Go to L2 |
| | **No** |
| | REPAIR BPM C921. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **L2 : CHECK CAN HIGH AND CAN LOW CIRCUITS 2180J (W-B) AND 2181J (B-Y) BETWEEN DLC C174 AND BPM C921 FOR OPEN** | |
| | 1 Measure the resistance between BPM module C921, circuit 2180J (W-B) harness side and DLC C174, circuit 2180P (W-B), harness side. |
| | 2 Measure the resistance between BEM module C921, circuit 2181J (B-Y), harness side and DLC C174, circuit 2181P (B-Y), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | Go to L3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **L3 : CHECK FOR CORRECT BPM OPERATION POWER SUPPLY** | |
| | 1 Disconnect all BPM connectors. |
| | 2 Measure voltage at circuit 37B (Y) 12Volt Battery. |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to L4. |
| | **No** |
| | Repair the circuit. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **L4 : CHECK FOR CORRECT BPM OPERATION GROUND CIRCUIT** | |
| | 1 Measure circuit 57SD (B) resistance to ground. |
| | Is the resistance less than 5 ohm? |
| | **Yes** |
| | Go to L5. |
| | **No** |
| | Repair the circuit. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **L5 : CHECK FOR CORRECT BPM OPERATION** | |
| | 1 Connect all BPM connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new BPM module. Refer to Section 419-08 CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST M : FEM DOES NOT RESPOND TO THE DIAGNOSTIC TOOL (IDS) | |
|---|---|
| NOTE: For connector circuit information on C981 refer to module connector diagram in chapter 415-04 | |
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **M1 : CHECK FEM C981 CAN CIRCUITS 2180B (W-B) AND 2181B (B-Y) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Disconnect FEM C981. |
| | 3 Inspect FEM C981 for damage. |
| | Is the FEM C981 OK? |
| | **Yes** |
| | GO to M2 |
| | **No** |
| | REPAIR FEM C981. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **M2 : CHECK CAN HIGH AND CAN LOW CIRCUITS 2180 (W-B) AND 2181 (B-Y) BETWEEN DLC C174 AND FEM C981 FOR OPEN** | |
| | 1 Measure the resistance between FEM module C981, circuit 2180B (W-B) harness side and DLC C174, circuit 2180P (W-B), harness side. |
| | 2 Measure the resistance between FEM module C921, circuit 2181B (B-Y), harness side and DLC C174, circuit 2181P (B-Y), harness side. |
| | Are the resistances less than 5 ohms? |
| | **Yes** |
| | GO to M3 |
| | **No** |
| | REPAIR the circuit(s) in question. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **M3 : CHECK FOR CORRECT FEM OPERATION POWER SUPPLY CIRCUIT** | |
| | 1 Disconnect all FEM connectors. |
| | 2 Measure the voltage on circuit 37B (Y) 12Volt Battery. |
| | Is Battery voltage present? |
| | **Yes** |
| | Go to M4. |
| | **No** |
| | Repair the circuit. |
| **M4 : CHECK FOR CORRECT FEM OPERATION GROUND CIRCUIT** | |
| | 1 Measure the resistance of circuit 57B (B) to ground. |
| | Is the resistance less than 5 ohm. |
| | **Yes** |
| | Go to M5. |
| | **No** |
| | Repair the circuit. |
| **M5 : CHECK FOR CORRECT FEM OPERATION** | |
| | 1 Connect all FEM connectors and make sure they seat correctly. |
| | 2 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new FEM module. Refer to Section 415-04. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose, or a corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST N : NO MODULE / NETWORK COMMUNICATION- ISO 9141 NETWORK | |
|---|---|
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **N1 : CHECK THE SCAN TOOL FOR DAMAGE** | |
| | 1 Inspect scan tool tester circuit 70 pin for damage. |
| | Is the scan tool OK? |
| | **Yes** |
| | GO to N2 |
| | **No** |
| | REPAIR the scan tool tester as necessary. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **N2 : CHECK THE DLC C174 FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Inspect DLC C174 circuit 70C (SB-W). |
| | Is DLC C174 OK? |
| | **Yes** |
| | GO to N3 |
| | **No** |
| | REPAIR the DLC C174. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **N3 : CHECK TCM CIRCUIT 70 (L-W) FOR OPEN** | |
| | 1 Disconnect TCM C14. |
| | 2 Measure the resistance between TCM C14, circuit 70 (L-W), harness side and DLC C174, circuit 70C (SB-W). |
| | Is the resistance less than 5 ohms? |
| | **Yes** |
| | GO to N4 |
| | **No** |
| | REPAIR circuit 70 (SB-W) between the DLC C174 and TCM C14. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **N4 : CHECK CIRCUIT 70 (L-W) FOR SHORT TO GROUND AND POWER - TCM DISCONNECTED** | |
| | 1 Key in ON position. |
| | 2 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | Goto N5. |
| | **No** |
| | Repair circuit. |
| **N5 : CHECK FOR CORRECT TCM OPERATION** | |
| | 1 Disconnect all TCM connectors. |
| | 2 Check for power and ground (refer to wiring schematics and pinpoint test J) |
| | 3 Connect all TCM connectors and make sure they seat correctly. |
| | 4 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new TCM module. Refer to Section 307. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST O : NO MODULE / NETWORK COMMUNICATION - HS-CAN | |
|---|---|
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **O1 : CHECK DIAGNOSTIC TOOL TESTER CIRCUITS 1908 AND 1909 FOR DAMAGE** | |
| | 1 Inspect diagnostic tool tester circuits 1908 and 1909 for damage. |
| | Is the diagnostic tool tester OK? |
| | **Yes** |
| | GO to O2 |
| | **No** |
| | REPAIR the diagnostic tool. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **O2 : CHECK DLC C174 CIRCUITS 1908E AND 1909E FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Inspect DLC C174 circuits 1908E and 1909E. Check the pins and the wires for damage. |
| | Is the DLC C174 OK? |
| | **Yes** |
| | GO to O3 |
| | **No** |
| | REPAIR DLC C174. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **O3 : CHECK CIRCUITS 1908(BR-Y) AND 1909 (P-L) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH PCM C301 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Disconnect PCM C301. |
| | 3 Key in ON position. |
| | 4 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to O10 |
| | **No** |
| | GO to O4 |
| **O4 : CHECK CIRCUITS 1908 (BR-Y) AND 1909 (P-L) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH ABS/TCS/DSC C150 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect PCM C301. |
| | 3 Disconnect ABS/TCS/DSC C150. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to O11 |
| | **No** |
| | GO to O5 |

| | |
|---|---|
| **O5 : CHECK CIRCUITS (1908 (BR) AND 1909 (P)) (I6) (914 (BR) AND 915(P)) (V8) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH TCM C14 DISCONNECTED (ONLY FOR 6 SPEED AUTOMATIC TRANSMISSION)** | |
| | 1 Key in OFF position. |
| | 2 Connect ABS/TCS/DSC C150. |
| | 3 Disconnect TCM C14. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to O13 |
| | **No** |
| | GO to O6 |
| **O6 : CHECK CIRCUITS 1908 (BR-Y) AND 1909 (P-L) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH HIM C376 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect TCM C14 (if previously disconnected). |
| | 3 Disconnect HIM C376. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to O12 |
| | **No** |
| | GO to O7 |
| **O7 : CHECK CIRCUITS 1908 (BR-Y) AND 1909 (P-L) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH THE IN-LINE C119 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect HIM C376. |
| | 3 Disconnect In-line C119. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | REPAIR the circuit in question between in-line C119 and HIM C376. REFER to Communication Circuit Wiring Repair in this section. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | GO to O8 |

| | |
|---|---|
| **O8 : CHECK CIRCUITS 1908 (BR-Y) AND 1909 (P-L) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH RCM C189 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect INLINE CONNECTOR C-119. |
| | 3 Disconnect RCM. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to 014 |
| | **No** |
| | GO to O9 |
| **O9 : CHECK CIRCUITS 1908 (BR-Y) AND 1909 (P-L) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH IC C171 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect RCM C189. |
| | 3 Disconnect IC C171. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: |
| | 6 DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to O15 |
| | **No** |
| | Check all circuits 1908 (BR-Y) and 1909(P-L) for short to battery and short to ground. REPAIR the circuit(s) as necessary. REFER to Communication Circuit Wiring Repair in this section. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **O10 : CHECK FOR CORRECT PCM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all PCM connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to PCM pinpoint test F): |
| | 4 Connect all PCM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new PCM module. Refer to Section 303-14. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| | |
|---|---|
| **O11 : CHECK FOR CORRECT ABS/TCS/DSC OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all ABS/TCS/DSC connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to ABS/TCS/DSC pinpoint test B): |
| | 4 Connect all ABS/TCS/DSC connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new ABS/TCS/DSC module. Refer to Section 206-09. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **O12 : CHECK FOR CORRECT HIM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all HIM connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to HIM pinpoint test I): |
| | 4 Connect all HIM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new HIM module. Refer to Section 412-04. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **O13 : CHECK FOR CORRECT TCM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all TCM connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to TCM pinpoint test J): |
| | 4 Connect all TCM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new TCM module. Refer to Section 307. CARRYOUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| | |
|---|---|
| **O14 : CHECK FOR CORRECT RCM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all RCM connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to RCM pinpoint test C): |
| | 4 Connect all RCM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new RCM module. Refer to Section 501-20. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **O15 : CHECK FOR CORRECT IC OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all IC connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to IC pinpoint test E ): |
| | 4 Connect all IC connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new IC module. Refer to Section 413-01. CARRYOUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST P : NO MODULE / NETWORK COMMUNICATION - MS-CAN | |
|---|---|
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **P1 : CHECK DIAGNOSTIC TOOL TESTER CIRCUITS 2180 AND 2181 FOR DAMAGE** | |
| | 1 Inspect diagnostic tool tester circuits 2810 and 2181 for damage. |
| | Is the diagnostic tool tester OK? |
| | **Yes** |
| | GO to P2 |
| | **No** |
| | REPAIR the diagnostic tool. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **P2 : CHECK DLC C174 CIRCUITS 2180P (W-B) AND 2181P (B-Y) FOR DAMAGE** | |
| | 1 Key in OFF position. |
| | 2 Inspect DLC C174 circuits 2180P and 2181P. Check the pins and the wires for damage. |
| | Is the DLC C174 OK? |
| | **Yes** |
| | GO to P3 |
| | **No** |
| | REPAIR DLC C174. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| **P3 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH BEM C173 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Disconnect BEM C173. |
| | 3 Key in ON position. |
| | 4 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to P11 |
| | **No** |
| | GO to P4 |
| **P4 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH ACM (ICC) C364 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect BEM C173. |
| | 3 Disconnect ACM (ICC) C364. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to P12 |
| | **No** |
| | GO to P5 |

| | |
|---|---|
| **P5 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH ACM (ICC) C364 CONNECTED AND FDM (DISPLAY 2) C920 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect ACM (ensure that the connector is correctly reset to allow for reconnection. |
| | 3 Disconnect FDM C920. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to P13 |
| | **No** |
| | GO to P6 |
| **P6 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH FDM C920 CONNECTED AND BPM C921 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect FDM C920. |
| | 3 Disconnect BPM C921 (If applicable). |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to P14 |
| | **No** |
| | GO to P7 |
| **P7 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH BPM C-921 CONNECTED AND FEM (AIM) C981 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect C921 (If applicable). |
| | 3 Disconnect FEM C981 (if fitted to vehicle) |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to P15 |
| | **No** |
| | Go to P8 |

| | |
|---|---|
| **P8 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH FEM (AIM) C981 CONNECTED AND MOBILE PHONE C192 DISCONNECTED ((BLUETOOTH OPTION) IF FITTED)** | |
| | 1 Key in OFF position. |
| | 2 Connect FEM C981. |
| | 3 Disconnect MOB PHONE C192 (if fitted to vehicle). |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | Go to P16 |
| | **No** |
| | Go to P9 |
| **P9 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH PAM C369 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect C192 (If fitted). |
| | 3 Disconnect PAM C369 (If fitted to vehicle). |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to P17 |
| | **No** |
| | Goto P10 |
| **P10 : CHECK CIRCUITS 2180 (W-B) AND 2181 (B-Y) FOR SHORT TO BATTERY AND SHORT TO GROUND WITH IC C171 DISCONNECTED** | |
| | 1 Key in OFF position. |
| | 2 Connect PAM C369 (If fitted). |
| | 3 Disconnect IC C171. |
| | 4 Key in ON position. |
| | 5 Enter the following diagnostic mode on the diagnostic tool: DATA LINK DIAGNOSTICS Test. |
| | Did the diagnostic tool indicate SYSTEM PASSED? |
| | **Yes** |
| | GO to P18 |
| | **No** |
| | Check all circuits 2180 (W-B) and 2181 (B-Y) for short to battery and short to ground. REPAIR the circuit(s) as necessary. REFER to Communication Circuit Wiring Repair in this section. CARRY OUT the DATA LINK DIAGNOSTICS test. |

| | |
|---|---|
| **P11 : CHECK FOR CORRECT BEM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all BEM connectors. |
| | 3 Check for wiring faults. Check inline connector C-50 is connected. (refer to wiring circuit diagrams and to BEM pinpoint test H): |
| | 4 Connect all BEM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new BEM module. Refer to Section 419-10. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **P12 : CHECK FOR CORRECT ACM (ICC) OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all ICC connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to ACM pinpoint test G): |
| | 4 Connect all ICC connectors and make sure they seat correctly (ensure connector is correctly reset to allow proper connection). |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new ACM module. Refer to Section 413-08. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **P13 : CHECK FOR CORRECT FDM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all FDM connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to FDM pinpoint test K): |
| | 4 Connect all FDM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new FDM Refer to Section 413-08. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| | |
|---|---|
| **P14 : CHECK FOR CORRECT BPM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all BPM connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to BPM pinpoint test L): |
| | 4 Connect all BPM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new BPM module. Refer to Section 419-08. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **P15 : CHECK FOR CORRECT FEM OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all FEM connectors. |
| | 3 Check for wiring faults (refer to wiring circuit diagrams and to FEM pinpoint test M): |
| | 4 Connect all FEM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new FEM module. Refer to Section 415-04. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **P16 : CHECK FOR CORRECT MOBILE PHONE OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all MOBILE PHONE connectors (INCLUDING FEM WIRING TO INSTRUMENT PANEL WIRING). |
| | 3 Check for wiring faults (refer to wiring circuit diagrams 419-08-00-1): |
| | 4 Connect all MOBILE PHONE connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new BPM module. Refer to Section 419-08 CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| P17 : CHECK FOR CORRECT PAM OPERATION | |
|---|---|
| | 1 Key in OFF position. |
| | 2 Disconnect all PAM connectors. |
| | 3 Check for wiring faults. Check inline connector C-50 is connected. (refer to wiring circuit diagrams and to PAM pinpoint test D): |
| | 4 Connect all PAM connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new PAM. Refer to Section 413-13. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |
| **P18 : CHECK FOR CORRECT IC OPERATION** | |
| | 1 Key in OFF position. |
| | 2 Disconnect all IC connectors. |
| | 3 Check for wiring faults. Check inline connector C-50 is connected. (refer to wiring circuit diagrams and to IC pinpoint test E): |
| | 4 Connect all IC connectors and make sure they seat correctly. |
| | 5 Operate the system and verify the concern is still present. |
| | Is the concern still present? |
| | **Yes** |
| | INSTALL a new IC module. Refer to Section 413-01. CARRY OUT the DATA LINK DIAGNOSTICS test. |
| | **No** |
| | The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test. |

| PINPOINT TEST Q : NO MODULE/NETWORK COMMUNICATION - NO POWER TO THE DIAGNOSTIC TOOL | |
|---|---|
| **CONDITIONS** | **DETAILS/RESULTS/ACTIONS** |
| **Q1 : CHECK DIAGNOSTIC TOOL CONNECTOR** | |
| | 1 Inspect diagnostic tool pins for damage. |
| | Are the pins OK? |
| | **Yes** |
| | GO to Q2 |
| | **No** |
| | REPAIR the diagnostic tool connector. TEST the system for normal operation. |
| Q2 : CHECK DATA LINK CONNECTOR (DLC) C174 FOR DAMAGE | |
| | 1 Key in OFF position. |
| | 2 Inspect DLC C174 pins for damage. |
| | Are the pins OK? |
| | **Yes** |
| | GO to Q3 |
| | **No** |
| | REPAIR DLC C174. TEST the system for normal operation. |
| **Q3 : CHECK VOLTAGE CIRCUIT 55C (B/P) TO DIAGNOSTIC TOOL** | |
| | 1 Measure the voltage between DLC C174 pin 16, circuit 55 (B/P), and ground. |
| | Is battery voltage present? |
| | **Yes** |
| | GO to Q4 |
| | **No** |
| | REPAIR the circuit. TEST the system for normal operation. |
| **Q4 : CHECK THE DLC GROUND CIRCUIT 57CU (B) AND CIRCUIT 57DB (B)** | |
| | 1 Measure the resistance between DLC C174 pin 4, circuit 57CU (B); C174 pin 5, circuit 57DB (B), and ground. |
| | Is the resistance less than 5 ohms? |
| | **Yes** |
| | REPAIR the diagnostic tool. TEST the system for normal operation. |
| | **No** |
| | REPAIR the circuit(s) in question. TEST the system for normal operation. |

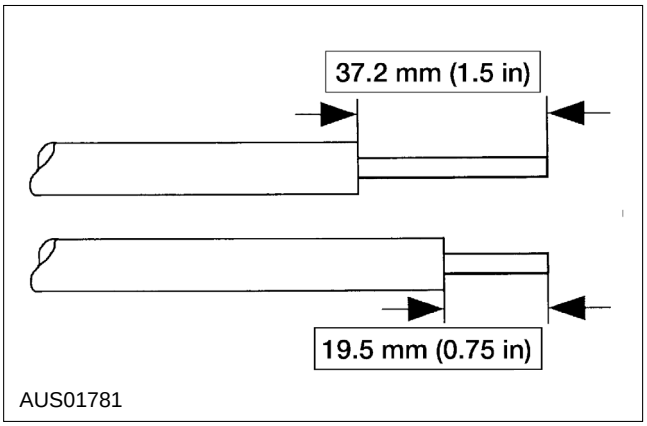
## GENERAL PROCEDURES

### Communication Circuit Wiring Repair

| Special Tool(s) |
| --- |
| Heat Gun |
| 107-R0300 or equivalent |

1. Disconnect the battery ground cable. Refer to Section 414-01.

2. Strip the wires.



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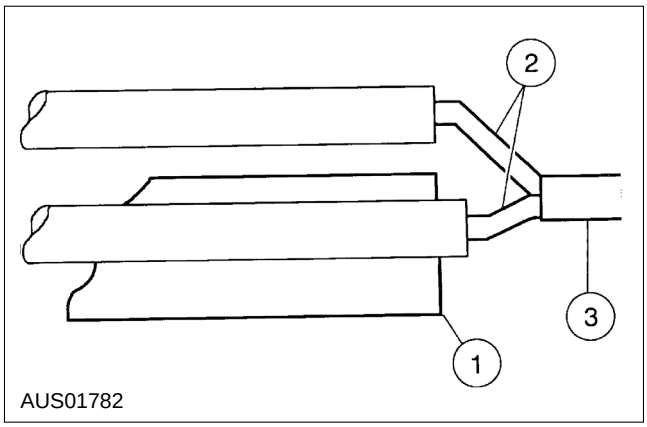
3. Solder the wires.
   - Install the heat shrink tube.
   - Twist the wires together.
   - Solder the wires together.

   NOTE: Use rosin core mildly activated (RMA) solder, not acid core solder.



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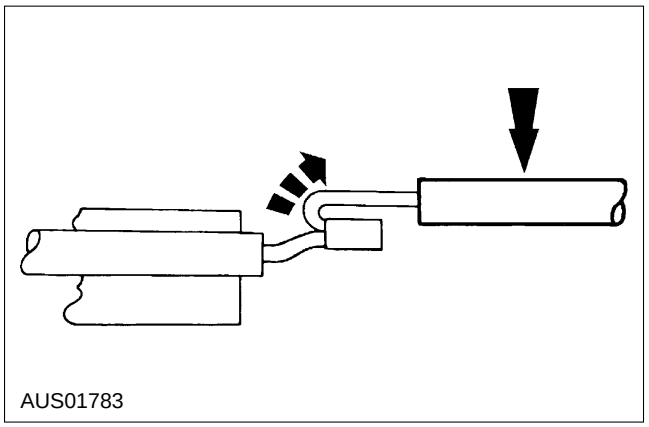
4. Bend the wires back in a straight line.

   NOTE: Wait for the solder to cool before moving the wires.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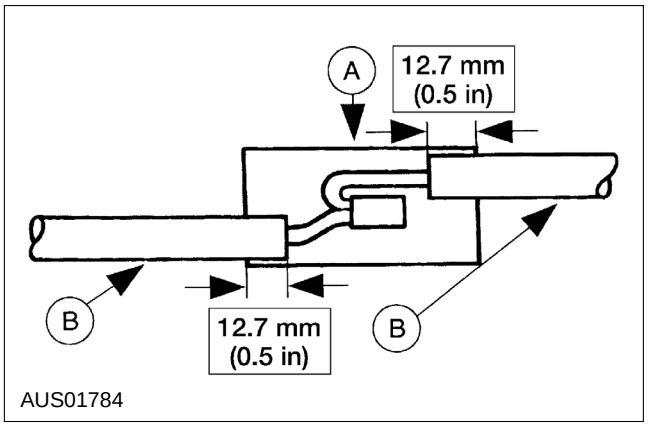
5. Position the (A) heat shrink tube over the (B) wire repair.
   - Overlap the heat shrink tube on both wires.



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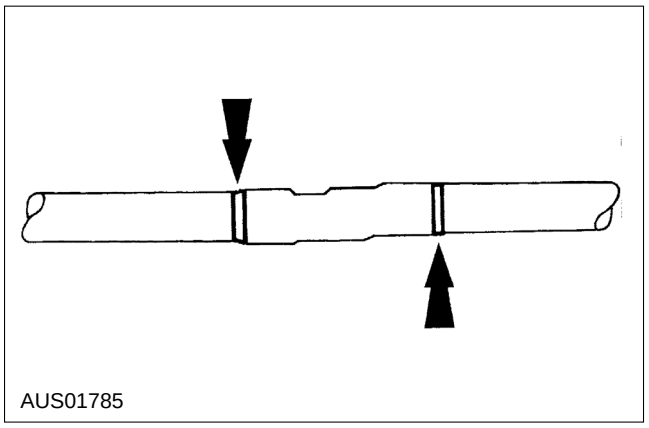
6. Use the heat gun to heat the repaired area until adhesive flows out both ends of the heat shrink tube.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7. Reconnect the battery ground cable.