

2018 ACCESSORIES & EQUIPMENT

Data Communications - Diagnostic Information And Procedures (2 Of 2) - Equinox & Terrain

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC U183A: LOST COMMUNICATION WITH TELEMATICS COMMUNICATION INTERFACE CONTROL MODULE ON HIGH SPEED CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U183A

Lost Communication with Telematics Communication Interface Control Module on High Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U183A	U183A	-	-
Ignition	U183A	U183A	-	-
Serial Data Communication Enable	U1814, U2099	U183A	-	-
Gateway Isolated High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (9)	U007C	U183A	U007C	-
Gateway Isolated High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (9)	U007C	U183A	U007C	-
Ground	-	U183A	-	-

Circuit/System Description

The serial data circuit is the means by which the devices in the vehicle communicate with each other. Once the scan tool is connected to the serial data circuit through the X84 Data Link Connector (DLC), the scan tool can be used to monitor each device for diagnostic purposes and to check for diagnostic trouble codes (DTC). When the vehicle is ON, each device communicating on the serial data circuit sends a state of health message to ensure that the device is operating properly. When a device stops communicating on the serial data circuit, for example if the device loses power or ground, the state of health message it normally sends on the serial data circuit disappears. Other devices on the serial data circuit, which expect to receive that state of health message, detect its absence; those devices in turn set a DTC associated with the loss of state of health of the non communicating device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored DTC.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K73 Telematics

Communication Interface Control Module. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K73 Telematics Communication Interface Control Module.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.

2. Test for less than 2 Ω in the serial data communication enable circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each gateway isolated high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than 100 Ω between each gateway isolated high speed GMLAN serial data circuit terminal and ground.
 - **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the device setting the DTC.
11. Test for less than 2 Ω in each serial data circuits end to end between the K73 Telematics Communication Interface Control Module and the device setting the DTC.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K73 Telematics Communication Interface Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U183E: LOST COMMUNICATION WITH TELEMATICS COMMUNICATION INTERFACE CONTROL MODULE ON LOW SPEED CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U183E

Lost Communication with Telematics Communication Interface Control Module on Low Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U183E	U183E	-	-
Ignition	U183E	U183E	-	-
Serial Data Communication Enable	U1814, U2099	U183E	-	-
Gateway Isolated Low Speed GMLAN Serial Data or Low Speed GMLAN Serial Data #2	U007D	U183E	U007D	-
Ground	-	U183E	-	-

Circuit/System Description

The serial data circuit is the means by which the devices in the vehicle communicate with each other. Once the scan tool is connected to the serial data circuit through the Data Link Connector (DLC), the scan tool can be used to monitor each device for diagnostic purposes and to check for diagnostic trouble codes (DTC). When the vehicle is ON, each device communicating on the serial data circuit sends a state of health message to ensure that the device is operating properly. When a device stops communicating on the serial data circuit, for example if the device loses power or ground, the state of health message it normally sends on the serial data circuit disappears. Other devices on the serial data circuit, which expect to receive that state of health message, detect its absence; those devices in turn set a DTC associated with the loss of state of health of the non communicating device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored DTC.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K73 Telematics Communication Interface Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K73 Telematics Communication Interface Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each gateway isolated low speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than 100 Ω between each gateway isolated low speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the device setting the DTC.
11. Test for less than 2 Ω in each serial data circuits end to end between the K73 Telematics Communication Interface Control Module and the device setting the DTC.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K73 Telematics Communication Interface Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U184A: LOST COMMUNICATION WITH BODY CONTROL MODULE ON LOW SPEED CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U184A

Lost Communication with Body Control Module on Low Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U184A, U0140	U184A, U0140	-	-
Ignition	U184A, U0140	U184A, U0140	-	-
Low Speed GMLAN Serial Data	U0078*	U0078, U184A	U0078*	-
Ground	-	U184A, U0140	-	-
* Scan Tool Does Not Communicate With Low Speed GMLAN Device				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U-code present. However, there is no associated "current" or "active" status. Loss-of-communication U-codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss-of-communication U-code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- A device may have a U-code stored in history that does not require any repairs. Issues with late or corrupted messages between devices can be temporary with no apparent symptom or complaint; this does not mean the device is faulty. Do not replace a device based only on a history U-code.
- Do not replace a device reporting a U-code. The U-code identifies which device needs to be diagnosed for a communication issue.

- Communication may be available between the device and the scan tool with one or more GMLAN serial data systems inoperative. This condition is due to the device using multiple GMLAN busses.
- Use [Data Link References](#) to determine what GMLAN serial data communications the non communicating device uses.
- The device may not have internal protection for specific control circuits and may open a B+ or ignition fuse. If a fuse is open and the B+ or ignition circuit is not shorted to ground, ensure none of the control circuits are shorted to ground before replacing the non communicating device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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[Data Link Communications Description and Operation](#)

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify that DTC U0073, U0078, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
 Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, and serial data circuit terminals.

1. Ignition OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 meters (9.8 feet) away from vehicle. Disconnect the harness connectors at the K9 Body Control Module. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
- **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
5. Ignition ON.
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
- **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Ignition OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 meters (9.8 feet) away from vehicle. Disconnect the harness connectors at the device setting the DTC. It may take up to 2 minutes for all vehicle systems to power down.
8. Test for less than 2 Ω in the low speed GMLAN serial data circuits end to end between the K9 Body Control Module and the device setting the DTC.
- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
9. Replace the K9 Body Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U184C: LOST COMMUNICATION WITH INSTRUMENT CLUSTER ON LOW SPEED CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.

- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U184C

Lost Communication with Instrument Cluster on Low Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U184C	U184C	-	-
Ignition	U184C	U184C	-	-
Gateway Isolated Low Speed GMLAN Serial Data or Low Speed GMLAN Serial Data #2	U007D	U184C	U007D	-
Ground	-	U184C	-	-

Circuit/System Description

The serial data circuit is the means by which the devices in the vehicle communicate with each other. Once the scan tool is connected to the serial data circuit through the Data Link Connector (DLC), the scan tool can be used to monitor each device for diagnostic purposes and to check for diagnostic trouble codes (DTC). When the vehicle is ON, each device communicating on the serial data circuit sends a state of health message to ensure that the device is operating properly. When a device stops communicating on the serial data circuit, for example if the device loses power or ground, the state of health message it normally sends on the serial data circuit disappears. Other devices on the serial data circuit, which expect to receive that state of health message, detect its absence; those devices in turn set a DTC associated with the loss of state of health of the non communicating device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored DTC.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0078, U007B, U007C, U007D, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the P16 Instrument Cluster. It may take up to 10 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the P16 Instrument Cluster.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the P16 Instrument Cluster.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
3. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, replace the control module that controls the ignition circuit.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each gateway isolated low speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than $100\ \Omega$ between each gateway isolated low speed GMLAN serial data circuit terminal and ground.

- **If $100\ \Omega$ or less**

Refer to [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than $100\ \Omega$**

10. Disconnect the harness connectors at the device setting the DTC.
11. Test for less than $2\ \Omega$ in the gateway isolated low speed GMLAN serial data circuits end to end between the P16 Instrument Cluster and the device setting the DTC.

- **If $2\ \Omega$ or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than $2\ \Omega$**

12. Replace the P16 Instrument Cluster.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18A2: LOST COMMUNICATION WITH FUEL PUMP DRIVER CONTROL MODULE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC U18A2

Lost Communication with Fuel Pump Driver Control Module

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18A2	U18A2	-	-
Ignition	U18A2	U18A2	-	-
Accessory Wake Up Serial Data	U1814, U2099	U18A2	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074*	U0074*	-
Ground	-	U18A2	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Verification](#)

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

[Circuit/System Testing](#)

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K111 Fuel Pump Driver Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K111 Fuel Pump Driver Control Module.
 - **Go to next step: If the test lamp illuminates**
- 5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K111 Fuel Pump Driver Control Module.
 - **Go to next step: If the test lamp illuminates**
- 6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
- 7. If equipped, verify a test lamp illuminates between the powertrain sensor bus relay control circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K20 Engine Control Module.
 2. Test for infinite resistance between the powertrain sensor bus relay control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the powertrain sensor bus relay control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
- 8. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit terminal and ground.
 - **If 4.5 V or greater**

Refer to [DTC U0074](#) to test for a short to voltage.
 - **Go to next step: If less than 4.5 V**
- 9. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

10. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0074](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

11. Disconnect the harness connectors at the device setting the DTC.

12. Test for less than 2 Ω in each serial data circuits end to end between the K111 Fuel Pump Driver Control Module and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

13. Replace the K111 Fuel Pump Driver Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18A6: LOST COMMUNICATION WITH RIGHT OBJECT DETECTION CONTROL MODULE ON DEDICATED BUS 1

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18A6

Lost Communication with Right Object Detection Control Module on Dedicated Bus 1

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18A6	U18A6	-	-
Communication Enable	U18A6	U18A6	-	-
Serial Data (+)	U18A6	U18A6	U18A6	-
Serial Data (-)	U18A6	U18A6	U18A6	-
Ground	-	U18A6	-	-

Circuit/System Description

The side object sensor modules use radar to determine the presence of objects nearby. The left side object sensor is the master that communicates on serial data. There is a private communication network between the left and right sensors. The scan tool can communicate only with the left sensor. Side blind zone alert is active when the vehicle is out of park or the parking brake is off on manual transmission vehicles. If a vehicle is detected in the side blind zone, the warning symbols will illuminate on the appropriate side. The warning symbols will vary brightness based on the ambient light conditions. When an object is detected in the left side blind zone, the side object sensor module sends a message to the right sensor through serial data. The right sensor then supplies voltage to illuminate the visual indicator

on the left side outside rear view mirror. When an object is detected in the right side blind zone, the right side object sensor will supply a voltage to illuminate the visual indicator on the right side outside rear view mirror.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 40, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Verify that DTC U0073, U0075, U0078, U007B, U007C, U007D, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

2. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connector at the B218R Side Object Sensor Module - Right. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the B218R Side Object Sensor Module - Right.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, test for at least 6 V between the communication enable circuit terminal and ground.
 - **If less than 6 V**
 1. Ignition/Vehicle OFF, disconnect the harness connectors at the B218L Side Object Sensor Module - Left.
 2. Test for infinite resistance between the communication enable circuit terminal and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the B218L Side Object Sensor Module - Left.
 - **Go to next step: If 6 V or greater**
6. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connector at the B218L Side Object Sensor Module - Left. It may take up to 10 min for all vehicle systems to power down.
7. Test for less than 1 V between each serial data circuits and ground.
 - **If 1 V or greater**

Repair the short to voltage in the serial data circuit.
 - **Go to next step: If less than 1 V**
8. Test for infinite resistance between each serial data circuits and ground.
 - **If less than infinite resistance**

Repair the short to ground in the serial data circuit.
 - **Go to next step: If infinite resistance**
9. Test for infinite resistance between 2 serial data circuits.
 - **If less than infinite resistance**

Repair the short together between the serial data circuits.

- **Go to next step: If infinite resistance**

10. Test for less than 2 Ω in each of the serial data circuits end to end between the B218L Side Object Sensor Module - Left and the B218R Side Object Sensor Module - Right.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

NOTE: Prior to replacing a module, visually inspect wiring connections to both Side Object Sensor Modules for contamination, deformation, terminal fretting corrosion, terminal tension, and chafing.

11. Replace the B218R Side Object Sensor Module - Right.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18A7: LOST COMMUNICATION WITH POWER SUPPLY TRANSFORMER ON POWERTRAIN EXPANSION CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18A7

Lost Communication with Power Supply Transformer on Powertrain Expansion CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18A7	U18A7	-	-
Ignition	U18A7	U18A7	-	-
Accessory Wakeup Serial Data	U1814, U2099	U18A7	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074, U18A7*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074, U18A7*	U0074*	-
Ground	-	U18A7	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data

circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE:

Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the T19 Power Supply Transformer. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the T19 Power Supply Transformer.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the T19 Power Supply Transformer.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit terminal and ground.

- If 4.5 V or greater

Refer to [DTC U0074](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

- Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
- Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0074](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

- Disconnect the harness connectors at the device setting the DTC.
- Test for less than 2 Ω in each powertrain high speed GMLAN serial data circuits end to end between the T19 Power Supply Transformer and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

- Replace the T19 Power Supply Transformer.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18AA: TRANSMISSION RANGE CONTROL MODULE LOST COMMUNICATION WITH ENGINE CONTROL MODULE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18AA

Transmission Range Control Module Lost Communication with Engine Control Module

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18AA	U18AA	-	-
Ignition	U18AA	U18AA	-	-
Accessory Wakeup Serial Data	U1814, U2099	U18AA	-	-
High Speed GMLAN Serial Data (+)	U0073*	U0073, U18AA*	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U0073, U18AA*	U0073*	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ground	-	U18AA	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- A device may have a U code stored in history that does not require any repairs. Issues with late or corrupted messages between devices can be temporary with no apparent symptom or complaint; this does not mean the device is faulty. Do not replace a device based only on a history U code.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Communication may be available between the device and the scan tool with one or more GMLAN serial data systems inoperative. This condition is due to the device using multiple GMLAN busses.
- Use [Data Link References](#) to determine what GMLAN serial data communications the non communicating device uses.

- The device may not have internal protection for specific control circuits and may open a B+ or ignition fuse. If a fuse is open and the B+ or ignition circuit is not shorted to ground, ensure none of the control circuits are shorted to ground before replacing the non communicating device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0077, U0078, U007A, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
 Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
 Disconnect the harness connectors at the K20 Engine Control Module.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the K20 Engine Control Module.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the K20 Engine Control Module.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.

2. Test for infinite resistance between the accessory wakeup serial data circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance

3. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K173 Transmission Range Control Module.

11. Test for less than 2 Ω in each high speed GMLAN serial data circuits end to end between the K20 Engine Control Module and the K173 Transmission Range Control Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18AF-U18B4: LOST COMMUNICATION

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18AF

Lost Communications With Telematics Communications Interface Control Module on Ethernet Bus

DTC U18B0

Lost Communications With Instrument Cluster on Ethernet Bus

DTC U18B1

Lost Communications With Audio Amplifier on Ethernet Bus

DTC U18B2

Lost Communication with Rear Audio Control Module on Ethernet Bus

DTC U18B3

Lost Communications With Navigation Control Module on Ethernet Bus

DTC U18B4

Lost Communication with Radio on Ethernet Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18AF - U18B4	U18AF - U18B4	-	-
Ignition	U18AF - U18B4	U18AF - U18B4	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ethernet Serial Data (+)	U18AF - U18B4	U18AF - U18B4	U18AF - U18B4	-
Ethernet Serial Data (-)	U18AF - U18B4	U18AF - U18B4	U18AF - U18B4	-
Ground	-	U18AF - U18B4	-	-

Circuit/System Description

At the core of the infotainment system is the Radio Ethernet Audio Video Bridging switch which communicates directly to each contributing Infotainment control module terminator. The Ethernet harness consists of twisted pair wires from point to point. Each control module on the Ethernet infotainment system sends/receives data at 100 Mbit/s to/from a specified port at the Radio. The Radio Ethernet will also be used to program USB software update files to the control modules connected to the Ethernet ports.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the control module's ground, B+, ignition, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the control module specified by the DTC descriptor. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the control module specified by the DTC descriptor.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the control module specified by the DTC descriptor.
 - **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit and all devices that share the same ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω
 4. Reconnect the control module that controls the ignition circuit, ignition ON/Vehicle In Service Mode.
 5. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the control module that controls the ignition circuit.
 - If the test lamp illuminates
 6. Ignition/Vehicle OFF, reconnect the first device that shares the same ignition circuit, ignition ON/Vehicle In Service Mode.
 7. Verify a test lamp illuminates between the ignition circuit terminal and ground.
 - If the test lamp does not illuminate, replace the device that was just connected.
 - If the test lamp illuminates and there are more devices to connect, connect the next device and repeat step 6.7 until there are no more devices to connect.
 - **Go to next step: If the test lamp illuminates**
 - 7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal or the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit or the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
 - 8. Ignition/Vehicle OFF, disconnect the harness connectors at the device setting the DTC.
 - 9. Ignition ON/Vehicle In Service Mode.
 - 10. Test for less than 4.5 V between each Ethernet serial data circuit terminal and ground.
 - **If 4.5 V or greater**

Repair the short to voltage in the serial data circuit.
 - **Go to next step: If less than 4.5 V**
 - 11. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
 - 12. Test for infinite resistance between each Ethernet serial data circuit terminal and ground.
 - **If less than infinite resistance**

Repair the short to ground in the serial data circuit.
 - **Go to next step: If infinite resistance**
 - 13. Test for infinite resistance between each pair of Ethernet serial data circuit terminals.
 - **If less than infinite resistance**

Repair the short together in the serial data circuits.

- **Go to next step: If infinite resistance**

14. Test for less than 2 Ω in each Ethernet serial data circuit end to end.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

15. Replace the control module specified by the DTC descriptor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18B9-U18BF: PRIMARY/SECONDARY HIGH SPEED CAN BUS SUBNET CONFIGURATION LIST

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18B9

Primary High Speed CAN Bus Subnet Configuration List

DTC U18BF

Secondary High Speed CAN Bus Subnet Configuration List

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

Devices on the high speed GMLAN serial data bus and the chassis high speed GMLAN serial data bus must be programmed with software that specifically identifies the correct type and quantity of devices on the bus based on RPO configuration. If a device was not properly configured after installation, the appropriate U Code may be set for that device. No external circuit diagnosis is involved.

Conditions for Running the DTC

- Voltage supplied to the device is in the normal operating voltage range.
- The vehicle power mode requires serial data communication to occur.

Conditions for Setting the DTC

- The device is not configured properly.
- Control unit recognizes a programming error.
- CAN-Bus configuration is invalid

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U18B9-U18BF is not set.
 - **If DTC U18B9-U18BF is set along with other DTCs set**

Diagnose all other DTCs first. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **If DTC U18B9-U18BF is set without other DTCs set**
 1. Program the device that sets the DTC.
 2. Ignition/Vehicle OFF, remove the scan tool, open and close the driver door. Wait 60 s.
 3. Ignition ON/Vehicle In Service Mode.
 4. Verify the DTC does not set.
 - If the DTC sets, replace the appropriate device.
 - If the DTC does not set
 5. All OK.
 - **Go to next step: If DTC U18B9-U18BF is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18C6: TRANSMISSION RANGE SELECTOR CONTROL MODULE LOST COMMUNICATION WITH ENGINE CONTROL MODULE ON POWERTRAIN SENSOR CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC U18C6

Transmission Range Selector Control Module Lost Communication with Engine Control Module on Powertrain Sensor CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18C6	U18C6	-	-
Ignition	U18C6	U18C6	-	-
Accessory Wakeup Serial Data	U1814, U2099	U18C6	-	-
Powertrain Sensor High Speed GMLAN Serial Data (+) [or High Speed GMLAN Serial Data (+) 7]	U0076*	U0076, U18C6*	U0076*	-
Powertrain Sensor High Speed GMLAN Serial Data (-) [or High Speed GMLAN Serial Data (-) 7]	U0076*	U0076, U18C6*	U0076*	-
Ground	-	U18C6	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

Description and Operation

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Electrical Information Reference

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- [Wiring Repairs](#)

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073-U0078, U007A-U007F, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
- **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
- **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each powertrain sensor high speed GMLAN serial data circuit terminal and ground.
- **If 4.5 V or greater**

Refer to [DTC U0076](#) to test for a short to voltage.
 - **Go to next step: If less than 4.5 V**
8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than 100 Ω between each powertrain sensor high speed GMLAN serial data circuit terminal and ground.
- **If 100 Ω or less**

Refer to [DTC U0076](#) to test for a short to ground.
 - **Go to next step: If greater than 100 Ω**
10. Disconnect the harness connectors at the A97 Transmission Range Selector Controls.
11. Test for less than 2 Ω in each powertrain sensor high speed GMLAN serial data circuits end to end between the K20 Engine Control Module and the A97 Transmission Range Selector Controls.
- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
12. Reconnect the harness connectors at the A97 Transmission Range Selector Controls.
13. Test for 110 - 130 Ω between each pair of the powertrain sensor high speed GMLAN serial data circuits at the K20 Engine Control Module.
- **If less than 110 Ω**

Refer to [DTC U0076](#) to test for a short between the serial data circuits.

- If greater than 130 Ω

Refer to [DTC U0076](#) to test for an open/high resistance in the serial data circuit.

- Go to next step: If between 110 - 130 Ω

14. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18CC: TRANSMISSION RANGE CONTROL MODULE LOST COMMUNICATION WITH ECM ON POWERTRAIN EXPANSION BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18CC

Transmission Range Control Module Lost Communication with ECM on Powertrain Expansion Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18CC	U18CC	-	-
Ignition	U18CC	U18CC	-	-
Accessory Wakeup Serial Data	U1814, U2099	U18CC	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074, U18CC*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074, U18CC*	U0074*	-
Ground	-	U18CC	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0077, U0078, U007A, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**

1. Ignition/Vehicle OFF.
2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for infinite resistance between the accessory wakeup serial data circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit terminal and ground.
 - **If 4.5 V or greater**

Refer to [DTC U0074](#) to test for a short to voltage.
 - **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0074](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K173 Transmission Range Control Module.

11. Test for less than 2 Ω in each powertrain high speed GMLAN serial data circuits end to end between the K20 Engine Control Module and the K173 Transmission Range Control Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18D1: LOST COMMUNICATION WITH TRANSMISSION RANGE CONTROL MODULE ON POWERTRAIN EXPANSION CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18D1

Lost Communication with Transmission Range Control Module on Powertrain Expansion CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18D1	U18D1	-	-
Ignition	U18D1	U18D1	-	-
Accessory Wakeup Serial Data	U1814, U2099	U18D1	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074, U18D1*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074, U18D1*	U0074*	-
Ground	-	U18D1	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Data Link Communications Description and Operation

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- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K173 Transmission Range Control Module. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K173 Transmission Range Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K173 Transmission Range Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for infinite resistance between the accessory wakeup serial data circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [DTC U0074](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0074](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the device setting the DTC.

11. Test for less than 2 Ω in each powertrain high speed GMLAN serial data circuits end to end between the K173 Transmission Range Control Module and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K173 Transmission Range Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18D2: LOST COMMUNICATION WITH TRANSMISSION RANGE SELECTOR CONTROL MODULE ON POWERTRAIN SENSOR CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U18D2

Lost Communication with Transmission Range Selector Control Module on Powertrain Sensor CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18D2	U18D2	-	-
Ignition	U18D2	U18D2	-	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Accessory Wakeup Serial Data	U1814, U2099	U18D2	-	-
Powertrain Sensor High Speed GMLAN Serial Data (+)	U0076*	U0076, U18D2*	U0076*	-
Powertrain Sensor High Speed GMLAN Serial Data (-)	U0076*	U0076, U18D2*	U0076*	-
Ground	-	U18D2	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#).

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the A97 Transmission Range Selector Controls. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the A97 Transmission Range Selector Controls.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the A97 Transmission Range Selector Controls.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
- **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for infinite resistance between the accessory wakeup serial data circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each powertrain sensor high speed GMLAN serial data circuit terminal and ground.
- **If 4.5 V or greater**

Refer to [DTC U0076](#) to test for a short to voltage.
 - **Go to next step: If less than 4.5 V**
8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
9. Test for greater than 100 Ω between each powertrain sensor high speed GMLAN serial data circuit terminal and ground.
- **If 100 Ω or less**

Refer to [DTC U0076](#) to test for a short to ground.
 - **Go to next step: If greater than 100 Ω**
10. Disconnect the harness connectors at the device setting the DTC.
11. Test for less than 2 Ω in each powertrain sensor high speed GMLAN serial data circuits end to end between the A97 Transmission Range Selector Controls and the device setting the DTC.
- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
12. Replace the A97 Transmission Range Selector Controls.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U18D3: LOST COMMUNICATION WITH TRANSMISSION RANGE SELECTOR CONTROL MODULE ON POWERTRAIN EXPANSION CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC U18D3

Lost Communication with Transmission Range Selector Control Module on Powertrain Expansion CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U18D3	U18D3	-	-
Ignition	U18D3	U18D3	-	-
Accessory Wakeup Serial Data	U1814, U2099	U18D3	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074, U18D3*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074, U18D3*	U0074*	-
Ground	-	U18D3	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the A97 Transmission Range Selector Controls. It may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the A97 Transmission Range Selector Controls.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the A97 Transmission Range Selector Controls.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.

2. Test for infinite resistance between the accessory wakeup serial data circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance

3. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

7. Test for less than 4.5 V between each powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [DTC U0074](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between each powertrain high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [DTC U0074](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the device setting the DTC.

11. Test for less than 2 Ω in each powertrain high speed GMLAN serial data circuits end to end between the A97 Transmission Range Selector Controls and the device setting the DTC.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the A97 Transmission Range Selector Controls.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)

- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2098: MOST COMMUNICATION ENABLE CIRCUIT

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U2098 00

MOST Communication Enable Circuit Malfunction

DTC U2098 02

MOST Communication Enable Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
MOST Control	U2098 00, U2098 02, U0029 02	U0028 00	-	-

Circuit/System Description

When the ignition is ON, the A11 Radio initializes the Media Oriented Systems Transport (MOST) bus by sending a short 100 ms low voltage pulse on the electronic control line (or MOST control line) connected to all devices contained on the MOST ring. When MOST receive, transmit, or control line faults are detected, transmit/receive messages will not be received as expected from the wakeup request. The A11 Radio and the K74 Human Machine Interface Control Module will then perform diagnostics to isolate these MOST faults. If the MOST control line is shorted low to 0 V for an excess amount of time, the A11 Radio and the T3 Audio Amplifier, if equipped, will set a U2098 DTC and K74 Human Machine Interface Control Module, if equipped, will set a U0029 02 DTC. At this point the MOST bus will be unable to communicate until the shorted MOST control line is repaired.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The ignition is ON.
- The Radio is ON.

Conditions for Setting the DTC

- The Radio senses a short to ground on the MOST control circuit.
- A current DTC is set when a MOST control circuit initialization is invoked and the circuit is detected to be pulled low (0 V) for longer than 1 s.

Action Taken When the DTC Sets

Many or all entertainment components may not function properly.

Conditions for Clearing the DTC

The DTC current status is cleared upon a successful MOST control circuit initialization occurs and the circuit is no longer pulled low.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Testing](#)

NOTE: Use the wiring schematics to determine which MOST devices are connected to the A11 Radio's MOST control circuit. Use the connector end views to identify the MOST control circuit terminal for each of those MOST devices.

1. Ignition OFF, disconnect the harness connectors at an easily accessible MOST device that shares the A11 Radio's MOST control circuit. Ignition ON.
2. Verify that the DTC U2098 or DTC U0029 02 remains current.
 - **If the DTCs become history**
Replace the MOST device that was just disconnected.
 - **Go to next step: If any of the DTCs remain current**
3. With the prior devices disconnected, repeat steps 1 and 2 for each MOST device on the MOST control circuit except the A11 Radio.
4. Ignition OFF and all vehicle systems OFF, disconnect the X2 harness connector at the A11 Radio.
5. Test for infinite resistance between the MOST control circuit terminal at the A11 Radio and ground.
 - **If less than infinite resistance**
Repair the short to ground on the circuit.
 - **Go to next step: If infinite resistance**
6. Replace the A11 Radio.

[Repair Instructions](#)

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2099: HIGH SPEED COMMUNICATION ENABLE CIRCUIT

[Diagnostic Instructions](#)

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.

- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U2099

High Speed Communication Enable Circuit

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition	U2099*	U0100-U02FF	U0100-U02FF	-
* Vehicle may not start.				

Circuit/System Description

The body control module (BCM) activates the ignition circuit, when the ignition key is in ACC, ON or START. The ignition circuit wakes up the devices for serial data bus communication.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode master requires serial data communication to occur.

Conditions for Setting the DTC

The BCM senses a short to ground on the ignition circuit.

Action Taken When the DTC Sets

- The output command is turned off while the malfunction is present.
- The devices use a default value for the missing parameters until the next ignition cycle.
- The device(s) is never signaled. Therefore, the specific subsystem(s) will not function.
- The vehicle will not start while the circuit is shorted to ground.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

NOTE: Use the schematic to determine which devices are on the K9 Body Control Module's ignition circuit terminal 23 X4. Use the connector end view to identify the ignition circuit terminal for each of those devices.

1. Ignition OFF, disconnect the harness connectors at an easily accessible device that shares the K9 Body Control Module's ignition circuit terminal 23 X4. Ignition ON.
2. Verify that the DTC U2099 remains current.
 - **If the DTC becomes history**
Replace the device that was just disconnected.
 - **Go to next step: If the DTC remains current**
3. With the prior devices disconnected, repeat steps 1 and 2 for each device on the ignition circuit except the K9 Body Control Module.
4. Ignition OFF, disconnect the X4 harness connector at the K9 Body Control Module.
5. Test for infinite resistance between the ignition circuit terminal 23 X4 at the K9 Body Control Module and ground.
 - **If less than infinite resistance**
Repair the short to ground on the circuit.
 - **Go to next step: If infinite resistance**
6. Replace the K9 Body Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2101: CAN BUS MAXIMUM LIST OF CONTROL MODULES

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U2101

CAN Bus Maximum List of Control Modules

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

Some devices must be programmed with software that specifically identifies the correct type and quantity of devices on the serial data bus based on RPO configuration. If a device was not properly configured after installation, the appropriate U Code may be set for that device. No external circuit diagnosis is involved.

Conditions for Running the DTC

- The system voltage is in the normal operating voltage range.
- The vehicle power mode requires serial data communication to occur.

Conditions for Setting the DTC

- The device is not configured properly.
- Control unit recognizes a programming error.
- CAN Bus configuration is invalid.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#)

Circuit/System Verification

1. Ignition ON.
2. Verify DTC U2101 is not set.
 - **If DTC U2101 is set along with other DTCs set**

Diagnose all other DTCs first. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **If DTC U2101 is set without other DTCs set**

1. Program the device that set the DTC.
2. Clear the DTC.
3. Ignition OFF, remove the scan tool, open and close the driver door. Wait 60 s.
4. Verify the DTC does not set.

- If the DTC sets, replace the appropriate device.
- If the DTC does not set

5. All OK.

- **Go to next step: If DTC U2101 is not set**

3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2160-U2231: CONTROL MODULE U CODE LIST

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

For device DTC descriptors, refer to [Control Module U Code List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U2160 - U2231	U2160 - U2231	-	-
Ignition	U2160 - U2231, U1814, U2099	U2160 - U2231	-	-
Object High Speed GMLAN Serial Data (+)	U0075	U2160 - U2231	U0075	-
Object High Speed GMLAN Serial Data (-)	U0075	U2160 - U2231	U0075	-
Chassis High Speed GMLAN Serial Data (+)	U0074, U0077	U2160 - U2231	U0074, U0077	-
Chassis High Speed GMLAN Serial Data (-)	U0074, U0077	U2160 - U2231	U0074, U0077	-
Mid Speed GMLAN Serial Data (+)	U0074	U2160 - U2231	U0074	-
Mid Speed GMLAN Serial Data (-)	U0074	U2160 - U2231	U0074	-
High Speed GMLAN Serial Data (+)	U0073, 2	U2160 - U2231	U0073, 2	-
High Speed GMLAN Serial Data (-)	U0073, 2	U2160 - U2231	U0073, 2	-
Low Speed GMLAN Serial Data	U0078, 1	U2160 - U2231	U0078, 1	-
Ground	-	U2160 - U2231	-	-
1. Scan tool does not communicate with most low speed GMLAN device				
2. Scan tool does not communicate with most high speed GMLAN device				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data

circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device. A loss of serial data communications DTC does not represent a failure of the devices that contain the stored code.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U-code present. However, there is no associated "current" or "active" status. Loss-of-communication U-codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss-of-communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- A device may have a U-code stored in history that does not require any repairs. Issues with late or corrupted messages between devices can be temporary with no apparent symptom or complaint; this does not mean the device is faulty. Do not replace a device based only on a history U-code.
- Do not replace a device reporting a U-code. The U-code identifies which device needs to be diagnosed for a communication issue.
- Communication may be available between some devices and the scan tool with either the low or high speed GMLAN serial data system inoperative. This condition is due to those devices using multiple serial data communication systems.
- Use [Data Link References](#) to determine what serial data communications the device uses.
- Some devices may not have internal protection for specific control circuits and may open a B+ or ignition fuse. If a fuse is open and the B+ or ignition circuit is not shorted to ground, ensure none of the control circuits are shorted to ground before replacing the device.
- Some intermittent communication concerns may be caused by fretting corrosion on the serial data circuit terminals. Inspect all connectors at the device that set the communication DTC, the device that the communication DTC was set against, and any inline harness connectors between the two devices. Do not replace a device based only on fretting corrosion. Refer to bulletin 09-06-03-004 for assistance with the diagnosis and repair of this condition, if applicable.
- This diagnostic can be used for any device that is not communicating, regardless of the type of serial data circuit it is connected to, providing the vehicle is equipped with the device.

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Determine the device that is not communicating. Refer to [Control Module U Code List](#) .
2. Verify that DTC U0073, U2100, U0074, U0078, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, serial data communication enable, and serial data circuit terminals.

1. Ignition OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect all the harness connectors at the device that is not communicating. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF.

2. Test for less than $2\ \Omega$ in the B+ circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, verify the fuse is not open and there is voltage at the fuse.
- **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
- **Go to next step: If the test lamp illuminates**
5. Ignition ON.
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition OFF.
 2. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
7. Ignition ON.
8. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition OFF, disconnect the harness connectors at the control module that controls the ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, replace the control module that controls the ignition circuit.
 - **Go to next step: If the test lamp illuminates**

NOTE: This test step is only applicable to a low speed GMLAN device.

9. Test for less than 4.5 V between each low speed GMLAN serial data circuit terminal and ground.
 - **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#) to test for a short to voltage in the serial data circuit.

- **Go to next step: If less than 4.5 V**

10. Ignition OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
11. Test for less than $2\ \Omega$ in each of the serial data circuits end to end between the device harness connector and the X84 Data Link Connector terminals listed below.
 - Low speed GMLAN serial data circuit terminal 1
 - High speed GMLAN serial data circuit terminal 6 or 14

- Mid speed GMLAN serial data circuit terminal 3 or 11
- Chassis high speed GMLAN serial data circuit terminal 12 or 13
- Object high speed GMLAN serial data circuit terminal 3 or 11
- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit between the non communicating device and the device setting the DTC or a serial data splice pack.

- **Go to next step: If less than 2 Ω**

NOTE: The following test step is only applicable to a high speed GMLAN device with 2 pairs of serial data circuits or a high speed GMLAN device with an internal terminating resistor.

12. Test for 110 - 130 Ω between each pair of high speed GMLAN serial data circuits.

- **If less than 110 Ω**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground or a short between the serial data circuits.

- **If greater than 130 Ω**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for an open/high resistance in the serial data circuit.

- **Go to next step: If between 110 - 130 Ω**

13. Replace the device that is not communicating.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2409: TRANSMISSION RANGE CONTROL MODULE HIGH SPEED CAN BUS OFF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U2409

Transmission Range Control Module High Speed CAN Bus Off

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
High Speed GMLAN Serial Data (+)	U0073, U2409*	U0073, U2409*	U0073, U2409*	-
High Speed GMLAN Serial Data (-)	U0073, U2409*	U0073, U2409*	U0073, U2409*	-
* Other DTCs may set with this fault.				

Circuit/System Description

The high speed GMLAN serial data circuits are serial data buses used to communicate information between the devices. The high speed GMLAN serial data circuits also connect directly to the X84 Data Link Connector (DLC) for programming purposes. If this serial data system is inoperative, some devices may still be able to communicate with the scan tool due to other serial data systems but not with each other.

Conditions for Running the DTC

- Supply voltage to the devices are in the normal operating range.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

The device setting the DTC has attempted to establish communications on the high speed GMLAN serial data circuits more than 3 times.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC U2409 is not set.
 - **If DTC U2409 is set**

- Go to next step: If DTC U2409 is not set

3. All OK

DTC U240D: TRANSMISSION RANGE SELECTOR CONTROL MODULE POWERTRAIN EXPANSION CAN BUS OFF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U240D

Transmission Range Selector Control Module Powertrain Expansion CAN Bus Off

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Powertrain High Speed GMLAN Serial Data (+) [or High Speed GMLAN Serial Data (+) 3]	U0074, U240D*	U0074, U240D*	U0074, U240D*	-
Powertrain High Speed GMLAN Serial Data (-) [or High Speed GMLAN Serial Data (-) 3]	U0074, U240D*	U0074, U240D*	U0074, U240D*	-
* Other DTCs may set with this fault.				

Circuit/System Description

The powertrain high speed GMLAN serial data circuits are serial data buses used to communicate information between the devices. If this serial data system is inoperative, the devices will still communicate with the scan tool due to other serial data systems but not with each other.

Conditions for Running the DTC

- Supply voltage to the devices are in the normal operating range.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

The device setting the DTC has attempted to establish communications on the powertrain high speed GMLAN serial data circuits more than 3 times.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.

- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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- [Wiring Repairs](#)

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC U240D is not set.
 - **If DTC U240D is set**
Refer to [DTC U0074](#) to diagnose powertrain expansion bus.
 - **Go to next step: If DTC U240D is not set**
3. All OK

DTC U240E: TRANSMISSION RANGE SELECTOR CONTROL MODULE POWERTRAIN SENSOR CAN BUS OFF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U240E

Transmission Range Selector Control Module Powertrain Sensor CAN Bus Off

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Powertrain Sensor High Speed GMLAN Serial Data (+) [or High Speed GMLAN Serial Data (+) 7]	U0076, U240E*	U0076, U240E*	U0076, U240E*	-
Powertrain Sensor High Speed GMLAN Serial Data (-) [or High Speed GMLAN Serial Data (-) 7]	U0076, U240E*	U0076, U240E*	U0076, U240E*	-
* Other DTCs may set with this fault.				

Circuit/System Description

The powertrain sensor high speed GMLAN serial data circuits are serial data buses used to communicate information between the devices. If this serial data system is inoperative, the devices will still communicate with the scan tool due to other serial data systems but not with each other.

Conditions for Running the DTC

- Supply voltage to the devices are in the normal operating range.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

The device setting the DTC has attempted to establish communications on the powertrain sensor high speed GMLAN serial data circuits more than 3 times.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
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- [Wiring Repairs](#)

Control Module References for scan tool information**Circuit/System Verification**

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC U240E is not set.

- **If DTC U240E is set**

Refer to **DTC U0076** to diagnose powertrain sensor bus.

- **Go to next step: If DTC U240E is not set**

3. All OK

DTC U240F: TRANSMISSION RANGE CONTROL MODULE LOST COMMUNICATION WITH EBCM ON HIGH SPEED CAN BUS**Diagnostic Instructions**

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- Refer to **Diagnostic Procedure Instructions** to provide an overview of each diagnostic category.

DTC Descriptor**DTC U240F**

Transmission Range Control Module Lost Communication with EBCM on High Speed CAN Bus

For symptom byte information, refer to **Symptom Byte List**.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U240F	U240F	-	-
Ignition	U240F	U240F	-	-
Serial Data Communication Enable	U1814, U2099	U240F	-	-
High Speed GMLAN Serial Data (+)	U0073*	U240F	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U240F	U0073*	-
Ground	-	U240F	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

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- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

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[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, U1814, U2099, U2100, B1325, B1330, B1370, B1380, B1424, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, P0562, P06E4, or P1EB9 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, serial data communication enable, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K17 Electronic Brake Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**

1. Ignition/Vehicle OFF.
 2. Test for less than $2\ \Omega$ in the ground circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, repair the open/high resistance in the ground connection.
 - **Go to next step: If less than $10\ \Omega$**
3. Ignition ON/Vehicle In Service Mode.
4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than $2\ \Omega$ in the B+ circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K17 Electronic Brake Control Module.
 - **Go to next step: If the test lamp illuminates**
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than $2\ \Omega$ in the ignition circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K17 Electronic Brake Control Module.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between the serial data communication enable circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than $2\ \Omega$ in the serial data communication enable circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
7. Test for less than 4.5 V between each high speed GMLAN serial data circuit terminal and ground.
 - **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.
 - **Go to next step: If less than 4.5 V**
8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for greater than $100\ \Omega$ between each high speed GMLAN serial data circuit terminal and ground.
 - **If $100\ \Omega$ or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the harness connectors at the K173 Transmission Range Control Module.

11. Test for less than 2 Ω in each high speed GMLAN serial data circuits end to end between the K17 Electronic Brake Control Module and the K173 Transmission Range Control Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the K17 Electronic Brake Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2410: TRANSMISSION RANGE CONTROL MODULE LOST COMMUNICATION WITH BCM ON HIGH SPEED CAN BUS

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U2410

Transmission Range Control Module Lost Communication with BCM on High Speed CAN Bus

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U2410	U2410	-	-
Ignition	U2410	U2410	-	-
High Speed GMLAN Serial Data (+)	U0073*	U0073, U2410*	U0073*	-
High Speed GMLAN Serial Data (-)	U0073*	U0073, U2410*	U0073*	-
Ground	-	U2410	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

The device is never signaled. Therefore, the specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

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Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.

- **If any of the DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If none of the DTCs are set**

3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wakeup serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K9 Body Control Module. It

may take up to 2 min for all vehicle systems to power down.

2. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. Ignition ON/Vehicle In Service Mode.

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

6. Test for less than 4.5 V between each high speed GMLAN serial data circuit terminal and ground.

- **If 4.5 V or greater**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to voltage.

- **Go to next step: If less than 4.5 V**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.

8. Test for greater than 100 Ω between each high speed GMLAN serial data circuit terminal and ground.

- **If 100 Ω or less**

Refer to [Scan Tool Does Not Communicate with High Speed GMLAN Device](#) to test for a short to ground.

- **Go to next step: If greater than 100 Ω**

9. Disconnect the harness connectors at the K173 Transmission Range Control Module.

10. Test for less than 2 Ω in each high speed GMLAN serial data circuits end to end between the K9 Body Control Module and the K173 Transmission Range Control Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

11. Replace the K9 Body Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2411: TRANSMISSION RANGE CONTROL MODULE POWERTRAIN EXPANSION CAN BUS OFF

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U2411

Transmission Range Control Module Powertrain Expansion CAN Bus Off

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Powertrain High Speed GMLAN Serial Data (+) [or High Speed GMLAN Serial Data (+) 3]	U0074, U2411*	U0074, U2411*	U0074, U2411*	-
Powertrain High Speed GMLAN Serial Data (-) [or High Speed GMLAN Serial Data (-) 3]	U0074, U2411*	U0074, U2411*	U0074, U2411*	-
* Other DTCs may set with this fault.				

Circuit/System Description

The powertrain high speed GMLAN serial data circuits are serial data buses used to communicate information between the devices. If this serial data system is inoperative, the devices will still communicate with the scan tool due to other serial data systems but not with each other.

Conditions for Running the DTC

- Supply voltage to the devices are in the normal operating range.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

The device setting the DTC has attempted to establish communications on the powertrain high speed GMLAN serial data circuits more than 3 times.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

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- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

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- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC U2411 is not set.

- **If DTC U2411 is set**

Refer to [DTC U0074](#) to diagnose powertrain expansion bus.

- **Go to next step: If DTC U2411 is not set**

3. All OK

DTC U2500-U25FF: CONTROL MODULE U CODE LIST

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

Refer to [Control Module U Code List](#) .

Circuit/System Description

Some devices are constantly receiving information from other devices through serial data communication network. The invalid data code will be set when a receiving device detects a discrepancy in information it receives from another device causing its integrity to be questioned. The symptom byte listed in the DTC Descriptor is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

Battery voltage is between 9 - 16 V and data link communications operate normally.

Conditions for Setting the DTC

The device is not configured properly.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

NOTE: An invalid data DTC is normally set along with another DTC or symptom. Diagnose other DTCs and/or symptoms before replacing any device.

1. Engine running for 10 s.
2. Ignition ON/Vehicle In Service Mode, engine OFF, verify DTC U2500-U25FF is not set.
 - If DTC U2500-U25FF is set along with other DTCs set

Diagnose all other DTCs first. Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- If DTC U2500-U25FF is set without other DTCs set
 1. Program the device specified by the DTC descriptor.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the appropriate device.
 - If the DTC does not set

3. All OK.

- Go to next step: If DTC U2500-U25FF is not set

3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

Refer to [Control Module References](#) for device replacement, programming and setup

DTC U2616: FUEL PUMP DRIVER CONTROL MODULE LOST COMMUNICATION WITH ECM

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptors

DTC U2616

Fuel Pump Driver Control Module Lost Communication with ECM

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U2616, U0100	U2616, U0100	-	-
Ignition	U2616, U0100	U2616, U0100	-	-
Accessory Wake Up Serial Data	U1814, U2099	U2616, U0100	-	-
Powertrain High Speed GMLAN Serial Data (+)	U0074*	U0074*	U0074*	-
Powertrain High Speed GMLAN Serial Data (-)	U0074*	U0074*	U0074*	-
Ground	-	U2616, U0100	-	-
* Other DTCs may set with this fault.				

Circuit/System Description

Devices connected to the serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the devices. The devices have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised and also, some periodic messages are used by the receiver device as an availability indication of the transmitter device. Each message contains the identification number of the transmitter device.

Conditions for Running the DTC

The system voltage is between 9 - 16 V.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

Specific subsystems will not function.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0076, U0077, U0078, U007A, U007B, U007C, U007D, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the wiring schematics and connector end views to identify the device's ground, B+, ignition, accessory wake up serial data, and serial data circuit terminals.

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K20 Engine Control Module. It may take up to 10 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.

- If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. Ignition ON/Vehicle In Service Mode.
 4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
 5. If equipped, verify a test lamp illuminates between each ignition circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K20 Engine Control Module.
 - **Go to next step: If the test lamp illuminates**
 6. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
 2. Test for less than 2 Ω in the accessory wakeup serial data circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.
 - **Go to next step: If the test lamp illuminates**
 7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K111 Fuel Pump Driver Control Module. It may take up to 10 min for all vehicle systems to power down.
 8. Test for less than 2 Ω in each serial data circuits end to end between the K20 Engine Control Module and the K111 Fuel Pump Driver Control Module.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.
 - **Go to next step: If less than 2 Ω**
 9. Replace the K20 Engine Control Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DTC U3000: CONTROL MODULE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U3000

Control Module

For symptom byte information, refer to [Symptom Byte List](#) .

Circuit/System Description

The internal fault detection is handled inside the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

The device runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground.

Conditions for Setting the DTC

The device has detected an internal malfunction.

Action Taken When the DTC Sets

The device refuses all additional inputs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the device.
- If stored only as a history DTC and not retrieved as a current DTC, do not replace the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

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Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode, engine OFF.
2. Verify DTC U3000 is not set.
 - **If DTC U3000 is set with symptom byte 43, 47, or 4B**
 1. Program the device that sets the DTC.
 2. Verify the DTC does not set.
 - If the DTC sets, replace the device that sets the DTC.
 - If the DTC does not set
 3. All OK.
 - **If DTC U3000 is set with any symptom byte, except 43, 47, or 4B**
Replace the device that sets the DTC.
 - **Go to next step: If DTC U3000 is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

Refer to [Control Module References](#) for device replacement, programming and setup

DTC U3012: CONTROL MODULE IMPROPER WAKE-UP PERFORMANCE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

DTC Descriptor

DTC U3012

Control Module Improper Wake-up Performance

For symptom byte information, refer to [Symptom Byte List](#).

Circuit/System Description

The internal fault detection is handled inside the device. The symptom byte information is for engineering reference only. No external circuit diagnosis is involved.

Conditions for Running the DTC

The device runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground.

Conditions for Setting the DTC

The device has detected an internal malfunction.

Action Taken When the DTC Sets

The device refuses all additional inputs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the device.
- If stored only as a history DTC and not retrieved as a current DTC, do not replace the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify DTC U3012 is not set.
 - **If DTC U3012 is set**

Replace the device that sets the DTC.
 - **Go to next step: If DTC U3012 is not set**
3. All OK

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

Refer to [Control Module References](#) for device replacement, programming and setup

SYMPTOMS - DATA COMMUNICATIONS

NOTE: The following steps must be completed before using the symptom tables.

1. Perform the [Diagnostic System Check - Vehicle](#) before using the symptom tables in order to verify that all of the following are true:
 - There are no Diagnostic Trouble Codes (DTC) set.
 - The devices can communicate via the serial data links.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to [Data Link Communications Description and Operation](#).

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the systems. Refer to [Checking Aftermarket Accessories](#).
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#).

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- [Scan Tool Does Not Power Up](#)
- [Scan Tool Does Not Communicate with High Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Low Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Gateway Expansion High Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Gateway Isolated High Speed GMLAN Device](#)
- [Scan Tool Does Not Communicate with Gateway Isolated Low Speed GMLAN Device](#)

SCAN TOOL DOES NOT POWER UP

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Data Link Connector B+	1	1	-	-
Data Link Connector Ground	-	1	-	-
1. Scan Tool Does Not Power Up				

Circuit/System Description

The data link connector (DLC) is a standardized 16 cavity connector. Connector design and location is dictated by an industry wide standard, and is required to provide the following:

- Scan tool B+ voltage at terminal 16
- Scan tool ground at terminal 4
- Common ground at terminal 5

Diagnostic Aids

- The scan tool will power up with the ignition OFF. Some devices however, will not communicate unless the ignition is ON and the power mode master device sends the appropriate power mode message.

- If the B+ circuit, ground circuits, and connections of the data link connector are functioning properly, the malfunction must be due to the scan tool.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 minutes for all vehicle systems to power down.
2. Test for less than 2 Ω between each of the X84 Data Link Connector ground circuit terminals listed below and ground.
 - Ground circuit terminal 4
 - Ground circuit terminal 5
 - **If 2 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 2 Ω**
3. Ignition ON/Vehicle In Service Mode.
4. Verify a test lamp illuminates between the B+ circuit terminal 16 at the X84 Data Link Connector and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - **Go to next step: If the test lamp illuminates**

5. Refer to the scan tool user guide.

SCAN TOOL DOES NOT COMMUNICATE WITH GATEWAY EXPANSION HIGH SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Expansion High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (8)	U007B	U007B	U007B	-
Gateway Expansion High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (8)	U007B	U007B	U007B	-

Circuit/System Description

The devices connected to the gateway expansion high speed GMLAN serial data circuits (circuit numbers 3935 & 3936) monitor for serial data communications during normal vehicle operation. The K56 Serial Data Gateway Module acts as the gateway module between devices on primary high speed GMLAN bus and devices on gateway expansion high speed GMLAN bus. The gateway expansion high speed GMLAN serial data bus uses terminating resistors that are in parallel with the gateway expansion high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0077, U0078, U007A, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**.
 - **Go to next step: If none of the DTCs are set**
3. Attempt to communicate with all devices on the gateway expansion high speed GMLAN serial data circuits. Refer to **Data Link References** to determine which devices are on the gateway expansion high speed GMLAN bus.
4. Verify which devices are communicating on the gateway expansion high speed GMLAN serial data circuits.
 - **If only one device is not communicating**

Refer to Circuit/System Testing - Testing the Device Circuits.
 - **If one or more devices are communicating but not all, except the K56 Serial Data Gateway Module**

Refer to Circuit/System Testing - Testing the Serial Data Circuit for an Open/High Resistance.
 - **Go to next step: If none of the devices are communicating, except the K56 Serial Data Gateway Module**
5. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Each device may need to be disconnected to isolate a circuit fault. Use the schematic to identify the following:

- Gateway expansion high speed GMLAN devices and terminating resistors the vehicle is equipped with
- Device locations on the gateway expansion high speed GMLAN serial data circuits
- Each device's ground, B+, ignition, and gateway expansion high speed GMLAN serial data circuit terminals

Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data

circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests.

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at an easily accessible device that is not communicating. Refer to [Data Link References](#) to determine which devices are on the gateway expansion high speed GMLAN bus.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each gateway expansion high speed GMLAN serial data circuit at the device that was just disconnected and ground.

- **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
5. Test for greater than 100 Ω between each gateway expansion high speed GMLAN serial data circuit at the device that was just disconnected and ground.

- **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

6. Test for 110 - 130 Ω between each pair of the gateway expansion high speed GMLAN serial data circuits at the device that was just disconnected:

- **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Refer to Testing the Device Circuits.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage, ignition ON/Vehicle In Service Mode.
2. Test for greater than 4.5 V between each serial data circuit at the device connector that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

1. Ignition/Vehicle OFF.

2. Test for less than 10 Ω between each of the device's ground circuit terminals and ground.

- If 10 Ω or greater, repair the open/high resistance in the circuit.
- If less than 10 Ω , replace the device that was disconnected.

- **Go to next step: If any serial data circuit is greater than 4.5 V**

3. Repeat step 1 until one of the following conditions are isolated:

- A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
- A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.
3. Test for greater than 100 Ω between each serial data circuit at the device connector that was just disconnected and ground.

- **If each serial data circuit is 100 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any serial data circuit is less than 100 Ω**

4. Repeat step 1 until one of the following conditions are isolated:
 - A short to ground on the serial data circuit between two devices or splice packs, if equipped.
 - A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

5. Repeat step 2 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway expansion high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 2 until one of the following conditions are isolated:
 - An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
 - An open/high resistance on the serial data circuit between a device and a terminating resistor.
 - An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal at the device that was just disconnected and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
4. Ignition ON/Vehicle In Service Mode.
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the control module that controls the ignition circuit.
 - **Go to next step: If the test lamp illuminates**
7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway

Module. It may take up to 2 min for all vehicle systems to power down.

8. Test for less than 2 Ω in each of the gateway expansion high speed GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

9. Test for less than 2 Ω in each of the primary high speed GMLAN serial data circuits (circuit numbers 2500 & 2501) end to end between the K56 Serial Data Gateway Module and the appropriate X84 Data Link Connector (DLC) terminals listed below.

- X84 Data Link Connector high speed GMLAN serial data circuit terminal 6
- X84 Data Link Connector high speed GMLAN serial data circuit terminal 14
- **If 2 Ω or greater**

Repair the open/high resistance in the high speed GMLAN serial data circuit.

- **Go to next step: If less than 2 Ω**

10. Replace the non communicating device that was disconnected.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

SCAN TOOL DOES NOT COMMUNICATE WITH GATEWAY ISOLATED HIGH SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Isolated High Speed GMLAN Serial Data (+) or High Speed GMLAN Serial Data (+) (9)	U007C	U007C	U007C	-
Gateway Isolated High Speed GMLAN Serial Data (-) or High Speed GMLAN Serial Data (-) (9)	U007C	U007C	U007C	-

Circuit/System Description

The devices connected to the gateway isolated high speed GMLAN serial data circuits (circuit numbers 1304 & 1305) monitor for serial data communications during normal vehicle operation. The K56 Serial Data Gateway Module acts as the gateway module between devices on primary high speed GMLAN bus and devices on gateway isolated high speed GMLAN bus. The gateway isolated high speed GMLAN serial data bus uses terminating resistors that are in parallel with the gateway isolated high speed GMLAN (+) and (-) circuits.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.

- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0077, U0078, U007A, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
 Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Attempt to communicate with all devices on the gateway isolated high speed GMLAN serial data circuits. Refer to [Data Link References](#) to determine which devices are on the gateway isolated high speed GMLAN bus.
4. Verify which devices are communicating on the gateway isolated high speed GMLAN serial data circuits.
 - **If only one device is not communicating**

Refer to Circuit/System Testing - Testing the Device Circuits.

- **If one or more devices are communicating but not all, except the K56 Serial Data Gateway Module**

Refer to Circuit/System Testing - Testing the Serial Data Circuit for an Open/High Resistance.

- **Go to next step: If none of the devices are communicating, except the K56 Serial Data Gateway Module**

5. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Each device may need to be disconnected to isolate a circuit fault. Use the schematic to identify the following:

- **Gateway isolated high speed GMLAN devices and terminating resistors the vehicle is equipped with**
- **Device locations on the gateway isolated high speed GMLAN serial data circuits**
- **Each device's ground, B+, ignition, and gateway isolated high speed GMLAN serial data circuit terminals**

Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests.

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at an easily accessible device that is not communicating. Refer to [Data Link References](#) to determine which devices are on the gateway isolated high speed GMLAN bus.
2. Ignition ON/Vehicle In Service Mode.
3. Test for less than 4.5 V between each gateway isolated high speed GMLAN serial data circuit at the device that was just disconnected and ground.
 - **If 4.5 V or greater**

Refer to Testing the Serial Data Circuits for a Short to Voltage.

 - **Go to next step: If less than 4.5 V**
4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
5. Test for greater than 100 Ω between each gateway isolated high speed GMLAN serial data circuit at the device that was just disconnected and ground.
 - **If 100 Ω or less**

Refer to Testing the Serial Data Circuits for a Short to Ground.

 - **Go to next step: If greater than 100 Ω**
6. Test for 110 - 130 Ω between each pair of the gateway isolated high speed GMLAN serial data circuits at the device that was just disconnected:
 - **If less than 110 Ω**

Refer to Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 130 Ω**

Refer to Testing the Serial Data Circuits for an Open/High Resistance.

- **Go to next step: If between 110 - 130 Ω**

7. Refer to Testing the Device Circuits.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage, ignition ON/Vehicle In Service Mode.
2. Test for greater than 4.5 V between each serial data circuit at the device connector that was just disconnected and ground.
 - **If each serial data circuit is 4.5 V or less**
 1. Ignition/Vehicle OFF.
 2. Test for less than 10 Ω between each of the device's ground circuit terminals and ground.
 - If 10 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 10 Ω , replace the device that was disconnected.
 - **Go to next step: If any serial data circuit is greater than 4.5 V**
3. Repeat step 1 until one of the following conditions are isolated:
 - A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
 - A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.
3. Test for greater than 100 Ω between each serial data circuit at the device connector that was just disconnected and ground.
 - **If each serial data circuit is 100 Ω or greater**
Replace the device that was disconnected.
 - **Go to next step: If any serial data circuit is less than 100 Ω**
4. Repeat step 1 until one of the following conditions are isolated:
 - A short to ground on the serial data circuit between two devices or splice packs, if equipped.
 - A short to ground on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
4. Test for greater than 110 Ω between each pair of serial data circuits at the device connector that was just disconnected.
 - **If each pair of serial data circuits is 110 Ω or greater**
Replace the device that was disconnected.
 - **Go to next step: If any pair of serial data circuits is less than 110 Ω**
5. Repeat step 2 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Connect the harness connectors at the device that was previously disconnected.
3. Disconnect the harness connectors with the gateway isolated high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
4. Test for less than 130 Ω between each pair of the serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

5. Repeat step 2 until one of the following conditions are isolated:
 - An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
 - An open/high resistance on the serial data circuit between a device and a terminating resistor.
 - An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal at the device that was just disconnected and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.
2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

3. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

4. Ignition ON/Vehicle In Service Mode.
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance

3. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the control module that controls the ignition circuit.

- **Go to next step: If the test lamp illuminates**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 2 min for all vehicle systems to power down.

8. Test for less than 2 Ω in each of the gateway isolated high speed GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

9. Test for less than 2 Ω in each of the primary high speed GMLAN serial data circuits (circuit numbers 2500 & 2501) end to end between the K56 Serial Data Gateway Module and the appropriate X84 Data Link Connector (DLC) terminals listed below.

- X84 Data Link Connector high speed GMLAN serial data circuit terminal 6
- X84 Data Link Connector high speed GMLAN serial data circuit terminal 14
- **If 2 Ω or greater**

Repair the open/high resistance in the primary high speed GMLAN serial data circuit.

- **Go to next step: If less than 2 Ω**

10. Replace the non communicating device that was disconnected.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

SCAN TOOL DOES NOT COMMUNICATE WITH GATEWAY ISOLATED LOW SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Gateway Isolated Low Speed GMLAN Serial Data or Low Speed GMLAN Serial Data #2 (Circuit #1102)	U007D	U0100-U02FF	U007D	-

Circuit/System Description

The gateway isolated low speed GMLAN serial data bus is used to communicate information between the devices. The serial data is transmitted over a single wire (circuit number 1102) to the appropriate devices. The K56 Serial Data Gateway Module acts as the gateway module between devices on low speed GMLAN bus and devices on gateway isolated low speed GMLAN bus.

Conditions for Running the DTC

- The system voltage is between 9 - 16 V.
- The vehicle power mode requires serial data communications.

Conditions for Setting the DTC

A supervised periodic message that includes the transmitter device availability has not been received.

Action Taken When the DTC Sets

- The device suspends all message transmission.
- The device uses default values for all parameters received on the serial data circuits.
- The device inhibits the setting of all other communication DTCs.

Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Data Link Communications Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle In Service Mode.
2. Verify that DTC U0073, U0074, U0075, U0077, U0078, U007A, P06E4, P1EB9, U1814, U2099, B1325, B1330, B1370, B1380, B1424, B1428, B1440, B1441, B1517, C0800, C0899, C12E1, P0560, or P0562 is not set.
 - **If any of the DTCs are set**
Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If none of the DTCs are set**
3. Verify that the K56 Serial Data Gateway Module is communicating.
 - **If the K56 Serial Data Gateway Module is not communicating**
Refer to [DTC U0100-U02FF](#) to diagnose the K56 Serial Data Gateway Module.
 - **Go to next step: If the K56 Serial Data Gateway Module is communicating**
4. Attempt to communicate with all devices on the gateway isolated low speed GMLAN serial data circuit. Refer to [Data Link References](#) to determine which devices are on the gateway isolated low speed GMLAN bus.
5. Verify which devices are communicating on the gateway isolated low speed GMLAN serial data circuit.
 - **If only one device is not communicating**
Refer to Circuit/System Testing - Testing the Device Circuits.
 - **If one or more devices are communicating but not all, except the K56 Serial Data Gateway Module**
Refer to Circuit/System Testing - Testing the Serial Data Circuit for an Open/High Resistance.
 - **Go to next step: If none of the devices are communicating, except the K56 Serial Data Gateway Module**
6. Refer to Circuit/System Testing.

Circuit/System Testing

NOTE: Use the schematic to identify the following:

- **Gateway Isolated low speed GMLAN devices the vehicle is equipped with**
 - **Device and splice pack locations on the gateway isolated low speed GMLAN serial data circuit**
 - **The gateway isolated low speed GMLAN serial data circuit terminals for each device or splice pack**
1. Ignition/Vehicle OFF, disconnect the appropriate harness connectors at all gateway isolated low speed GMLAN serial data splice packs, ignition ON/Vehicle In Service Mode.
 2. Test for less than 4.5 V between each gateway isolated low speed GMLAN serial data circuit at a splice pack and ground.
 - **If any serial data circuit is greater than 4.5 V**
 1. Ignition/Vehicle OFF, disconnect all devices on the failed serial data circuit, ignition ON/Vehicle In Service Mode.
 2. Test for less than 1 V between each section of the failed serial data circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V

3. Connect the splice pack and connect the first device on the failed serial data circuit, ignition ON/Vehicle In Service Mode.
4. Verify the scan tool communicates or not with the gateway isolated low speed GMLAN serial data circuit.
 - If the scan tool does not communicate, replace the device that was just connected.
 - If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 2.4.
 - If the scan tool communicates and there are no more devices to connect
5. All OK.
 - **Go to next step: If all serial data circuits are less than 4.5 V**
3. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the appropriate harness connectors at all gateway isolated low speed GMLAN serial data splice packs. It may take up to 2 min for all vehicle systems to power down.
4. Test for greater than 100 Ω between each gateway isolated low speed GMLAN serial data circuit at a splice pack and ground.
 - **If any serial data circuit is 100 Ω or less**
 1. Disconnect all devices on the failed serial data circuit.
 2. Test for infinite resistance between each section of the failed serial data circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
 3. Connect the splice pack and connect the first device on the failed serial data circuit, ignition ON/Vehicle In Service Mode.
 4. Verify the scan tool communicates or not with the gateway isolated low speed GMLAN serial data circuit.
 - If the scan tool does not communicate, replace the device that was just connected.
 - If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 4.4.
 - If the scan tool communicates and there are no more devices to connect
 5. All OK.
 - **Go to next step: If all serial data circuits are greater than 100 Ω**
5. Inspect all gateway isolated low speed GMLAN splice packs for damage.

Testing the Serial Data Circuit for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 2 min for all vehicle systems to power down.
2. Disconnect the harness connectors at the gateway isolated low speed GMLAN device that is not communicating and closest to the K56 Serial Data Gateway Module.
3. Disconnect the harness connectors at the K56 Serial Data Gateway Module.
4. Test for less than 2 Ω in the gateway isolated low speed GMLAN serial data circuit (circuit number 1102) end to end between the non-communicating device and the K56 Serial Data Gateway Module.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

 - **Go to next step: If less than 2 Ω**
5. Test for less than 2 Ω in the primary low speed GMLAN serial data circuit (circuit number 5060) end to end between the K56 Serial Data Gateway Module and the X84 Data Link Connector terminal 1.
 - **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

6. Replace the non-communicating device that was disconnected.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the Gateway isolated low speed GMLAN device that is not communicating. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between each ground circuit terminal at the device that was just disconnected and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
3. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
4. Ignition ON/Vehicle In Service Mode.
5. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.
 - **If the test lamp does not illuminate and the circuit fuse is good**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
 - **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the control module that controls the ignition circuit.

• **Go to next step: If the test lamp illuminates**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Disconnect the harness connectors at the K56 Serial Data Gateway Module. It may take up to 2 min for all vehicle systems to power down.
8. Test for less than 2 Ω in each of the gateway isolated low speed GMLAN serial data circuits end to end between the non communicating device and the K56 Serial Data Gateway Module.

• **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

• **Go to next step: If less than 2 Ω**

9. Test for less than 2 Ω in the primary low speed GMLAN serial data circuit (circuit number 5060) end to end between the K56 Serial Data Gateway Module and X84 Data Link Connector terminal 1.

• **If 2 Ω or greater**

Repair the open/high resistance in the low speed GMLAN serial data circuit.

• **Go to next step: If less than 2 Ω**

10. Replace the non communicating device that was disconnected.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

SCAN TOOL DOES NOT COMMUNICATE WITH HIGH SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
High Speed GMLAN Serial Data (+)	1	U0100 - U02FF*	1	-
High Speed GMLAN Serial Data (-)	1	U0100 - U02FF*	1	-
Ground (X84 Data Link Connector terminal 5)	-	1	-	-
* No communications with one or more high speed GMLAN devices. An open in only one high speed GMLAN serial data circuit may allow degraded communication between the devices. An open between the X84 Data Link Connector (DLC) and the first splice/device will only affect the communication with the scan tool. The devices will still communicate. 1. No communication with any high speed GMLAN device				

Circuit/System Description

The devices connected to the high speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. The serial data is transmitted on two twisted wires that allow speeds up to 500 kbit/s. The twisted pair is terminated with two 120 Ω resistors, one is

internal to the K20 Engine Control Module (ECM) and the other can be a separate resistor in a connector assembly or in another device. The resistors are used as the load for the High Speed GMLAN bus during normal vehicle operation. The high speed GMLAN is a differential bus. The high speed GMLAN serial data bus (+) and high speed GMLAN serial data (-) are driven to opposite extremes from a rest or idle level of approximately 2.5 V. Driving the lines to their extremes, adds 1 V to the high speed GMLAN serial data bus (+) circuit and subtracts 1 V from the high speed GMLAN serial data bus (-) circuit. If serial data is lost, devices will set a no communication code against the non-communicating device. Note that a loss of serial data DTC does not represent a failure of the device that set it.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis.
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Communication may be available between some devices and the scan tool with the high speed GMLAN serial data system inoperative. This condition is due to those devices using multiple serial data communication systems.
- An open in the X84 Data Link Connector ground circuit terminal 5 will allow the scan tool to operate but not communicate with the vehicle.
- The engine will not start when there is a total malfunction of the high speed GMLAN serial data bus.
- Technicians may find various Local Area Network (LAN) communication Diagnostic Trouble Codes (DTC) and no high speed GMLAN communications with the scan tool.
- These conditions may be caused by the installation of an aftermarket navigation radio module (refer to any appropriate bulletins). Some customers may comment of one or more of the following concerns:
 - Vehicle will not crank
 - Vehicle cranks but will not start
 - Vehicle stability enhancement system warning lights and messages
 - PRNDL gear indicator position errors
- Some devices may not have internal protection for specific voltage outputs and may open a battery positive voltage or ignition voltage source fuse. If a voltage input fuse is open and no short is found in that circuit, ensure that no device output voltage circuit is shorted to ground before replacing the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)
- [Control Module References](#)

Connector End View Reference

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

NOTE: Review and understand how to use the Detected State section of the Data Bus Diagnostic Tool User Guide in service information web site prior to using the Data Bus Diagnostic Tool section in this diagnostic procedure.

Perform Circuit/System Verification using one of the following two methods:

Verifying the Serial Data Circuits using Data Bus Diagnostic Tool

1. Using wiring schematics and vehicle build information, identify all high speed GMLAN devices the tested vehicle is equipped with, terminating resistors, and each device location on the high speed GMLAN bus.
2. Ignition ON/Vehicle In Service Mode.
3. From Data Circuit input selection, select Terminal 6, 14 to test the high speed GMLAN serial data bus.
4. Start the test and verify the Detected State parameter is displayed as OK.
 - **If the Detected State parameter is displayed as Control Module Not Awake**
Refer to Circuit/System Testing - Testing the Device Circuits.
 - **If the Detected State parameter is displayed as Control Module Ground Connection Malfunction**
Refer to Circuit/System Testing - Testing the Device Circuits.
 - **If the Detected State parameter is displayed as CAN Bus [+] (pin 6) Circuit Shorted to High Voltage or CAN Bus [-] (pin 14) Circuit Shorted to High Voltage**
Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short to Voltage.
 - **If the Detected State parameter is displayed as CAN Bus [+] (pin 6) Circuit Shorted to Low Voltage or CAN Bus [-] (pin 14) Circuit Shorted to Low Voltage**
Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short to Ground.
 - **If the Detected State parameter is displayed as CAN Bus [-] Shorted to Bus [+]**
Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short between the Circuits.
 - **If the Detected State parameter is displayed as CAN Bus Open with one or more non responding high speed GMLAN devices**

Refer to Circuit/System Testing - Testing the Serial Data Circuits for an Open/High Resistance (Data Bus Diagnostic Tool).

- **If the Detected State parameter is displayed as CAN Bus Open and all high speed GMLAN devices are responding**

Repair the open/high resistance in the circuit between the external terminating resistor and the closest responding device.

- **If the Detected State parameter is displayed as OK and none of the high speed GMLAN devices are responding**

Repair the open/high resistance in the circuit between the X84 Data Link Connector and the first splice/device in the serial data circuit. If the circuit tests normal, check the MDI cable and the connection at X84 Data Link Connector prior to replacing the first device or splice pack.

- **If the Detected State parameter is displayed as OK and one or more high speed GMLAN devices are not responding**

Refer to Circuit/System Testing - Testing the Device Circuits to test the non responding device closest to a responding device.

- **Go to next step: If the Detected State parameter is displayed as OK and all high speed GMLAN devices are responding**

5. All OK.

Verifying the Serial Data Circuits using Digital Multimeter

1. Ignition ON/Vehicle In Service Mode.

2. Verify two or more devices are not communicating on the high speed GMLAN serial data circuit. Refer to [Data Link References](#) to determine how many devices should be communicating on the high speed GMLAN bus.

- **If only one device is not communicating**

Refer to Circuit/System Testing - Testing the Device Circuits.

- **Go to next step: If two or more devices are not communicating**

3. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down. Disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.

4. Test for less than 10 Ω between the ground circuit terminal 5 and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

5. Ignition ON/Vehicle In Service Mode.

6. Test for less than 4.5 V between the serial data circuits listed below and ground.

- Terminal 6
- Terminal 14

- **If 4.5 V or greater**

Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

7. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

8. Test for greater than 100 Ω between the serial data circuits listed below and ground.

- Terminal 6
- Terminal 14
- **If 100 Ω or less**

Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

9. Test for 50 - 70 Ω between the serial data circuit terminals 6 and 14.

- **If less than 35 Ω**

Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short between the Circuits.

- **If between 35 - 50 Ω**

There may be a third terminating resistor between the serial data circuits. This can happen if the incorrect device is installed. Some devices are available with and without the terminating resistors installed to reduce the need of terminating resistors in the wiring harness. Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short between the Circuits.

- **If greater than 70 Ω but less than infinite**

Refer to Circuit/System Testing - Testing the Serial Data Circuits for an Open/High Resistance (Digital Multimeter).

- **If infinite resistance**

Repair the open/high resistance in the circuit between the X84 Data Link Connector and the first splice/device in the serial data circuit.

- **Go to next step: If between 50 - 70 Ω**

10. Refer to Circuit/System Testing - Testing the Device Circuits.

Circuit/System Testing

NOTE:

Each device may need to be disconnected to isolate a circuit fault. Use the schematic to identify the following:

- **High speed GMLAN devices and terminating resistors the vehicle is equipped with**
- **Device locations on the high speed GMLAN serial data circuits**
- **Each device's ground, B+, ignition, and high speed GMLAN serial data circuit terminals**

Some devices with an internal terminating resistor have a loop in the harness that connects the internal terminating resistor to the serial data circuit. When wired this way, test these loop circuits for the appropriate failure mode short to voltage, short to ground, or open/high resistance prior to replacing the device for each of the following tests.

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the harness connectors with the high speed GMLAN serial data circuits at an easily accessible device, ignition ON/Vehicle In Service Mode.
2. Test for greater than 4.5 V between each serial data circuit at the device connector that was just disconnected and ground.

- **If each serial data circuit is 4.5 V or less**

1. Ignition/Vehicle OFF.
2. Test for less than 10 Ω between each of the device's ground circuit terminals and ground.
 - If 10 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 10 Ω , replace the device that was disconnected.
 - **Go to next step: If any serial data circuit is greater than 4.5 V**
3. Ignition/Vehicle OFF, disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to voltage, ignition ON/Vehicle In Service Mode.
4. Test for greater than 4.5 V between each serial data circuit at the device connector that was just disconnected and ground.
 - **If each serial data circuit is 4.5 V or less**
 1. Ignition/Vehicle OFF.
 2. Test for less than 10 Ω between each of the device's ground circuit terminals and ground.
 - If 10 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 10 Ω , replace the device that was disconnected.
 - **Go to next step: If any serial data circuit is greater than 4.5 V**
5. Repeat step 3 until one of the following conditions are isolated:
 - A short to voltage on the serial data circuit between two devices or splice packs, if equipped.
 - A short to voltage on the serial data circuit between a device and a terminating resistor.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the high speed GMLAN serial data circuits at an easily accessible device.
3. Test for greater than 100 Ω between each serial data circuit at the device connector that was just disconnected and ground.
 - **If each serial data circuit is 100 Ω or greater**

Replace the device that was disconnected.
 - **Go to next step: If any serial data circuit is less than 100 Ω**
4. Disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted to ground.
5. Test for greater than 100 Ω between each serial data circuit at the device connector that was just disconnected and ground.
 - **If both serial data circuits are 100 Ω or greater**

Replace the device that was disconnected.
 - **Go to next step: If any serial data circuit is less than 100 Ω**
6. Repeat step 4 until one of the following conditions are isolated:
 - A short to ground on the serial data circuit between two devices or splice packs, if equipped.
 - A short to ground on the serial data circuit between a device and a terminating resistor.
 - A short to ground on the serial data circuit between the X84 Data Link Connector and the first device or splice pack.

Testing the Serial Data Circuits for a Short between the Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

2. Disconnect the harness connectors with the high speed GMLAN serial data circuits at an easily accessible device that is not communicating.
3. Test for greater than 110 Ω between each pair of serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

4. Connect the harness connectors at the device that was disconnected.
5. Disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit shorted together.
6. Test for greater than 110 Ω between each pair of serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 110 Ω or greater**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is less than 110 Ω**

7. Repeat step 4 until one of the following conditions are isolated:
 - Serial data circuits shorted together between two devices or splice packs, if equipped.
 - Serial data circuits shorted together between a device and a terminating resistor.
 - Serial data circuits shorted together between the X84 Data Link Connector and the first device or splice pack.
 - A shorted terminating resistor.

Testing the Serial Data Circuits for an Open/High Resistance (Data Bus Diagnostic Tool)

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the high speed GMLAN serial data circuits at the non responding device closest to the responding device.
3. Disconnect the harness connectors with the high speed GMLAN serial data circuits at the responding device closest to the non responding device.
4. Test for less than 2 Ω in each of the high speed GMLAN serial data circuits end to end between the two devices that was just disconnected.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

5. Replace the non responding device that was disconnected.

Testing the Serial Data Circuits for an Open/High Resistance (Digital Multimeter)

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors with the high speed GMLAN serial data circuits at an easily accessible device that is not communicating.
3. Test for less than 130 Ω between each pair of serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

4. Connect the harness connectors at the device that was disconnected.

5. Disconnect the harness connectors with the high speed GMLAN serial data circuits at another device, in the direction of the circuit with the open/high resistance.
6. Test for less than 130 Ω between each pair of serial data circuits at the device connector that was just disconnected.

- **If each pair of serial data circuits is 130 Ω or less**

Replace the device that was disconnected.

- **Go to next step: If any pair of serial data circuits is greater than 130 Ω**

7. Repeat step 4 until one of the following conditions are isolated:

- An open/high resistance on the serial data circuit between two devices or splice packs, if equipped.
- An open/high resistance on the serial data circuit between a device and a terminating resistor.
- An open/high resistance terminating resistor.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
2. Disconnect the harness connectors at a high speed GMLAN device that is not communicating.
3. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

4. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

5. Ignition ON/Vehicle In Service Mode.

6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance, replace the disconnected device.
 - **Go to next step: If the test lamp illuminates**
7. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which is controlled by a control module, and ground.
- **If the test lamp does not illuminate**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the control module that controls the ignition circuit.
 2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the control module that controls the ignition circuit.
 - **Go to next step: If the test lamp illuminates**
8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for less than 2 Ω in each of the high speed GMLAN serial data circuits end to end between the device harness connector and the appropriate X84 Data Link Connector terminals listed below:
- Terminal 6
 - Terminal 14
 - **If 2 Ω or greater**
- Repair the open/high resistance in the serial data circuit.
- **Go to next step: If less than 2 Ω**
10. Replace the device that was disconnected.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

SCAN TOOL DOES NOT COMMUNICATE WITH LOW SPEED GMLAN DEVICE

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- Refer to [Diagnostic Procedure Instructions](#) to provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Low Speed GMLAN Serial Data	1	U0100-U02FF*	1	-
Ground (X84 Data Link Connector terminal 5)	-	1*	-	-
* An open between the X84 Data Link Connector (DLC) and the first splice pack/device will only affect the communication with the scan tool. 1. No communication with any low speed GMLAN device				

Circuit/System Description

The devices connected to the low speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. The serial data is transmitted over a single wire to the appropriate devices. The transmission speed for GMLAN low speed is up to 83.33 kbit/s. Under normal vehicle operating conditions, the speed of the bus is 33.33 kbit/s. The devices toggle the serial data circuit between 0 - 5 V during normal communications. To wake the devices connected to the low speed GMLAN serial data circuit, a voltage wake up pulse of 10 V is sent out. If serial data is lost, devices will set a no communication code against the non-communicating device. A loss of serial data communications DTC does not represent a failure of the device that set it.

Diagnostic Aids

- Sometimes, while diagnosing a specific customer concern or after a repair, you may notice a history U code present. However, there is no associated "current" or "active" status. Loss of communication U codes such as these can set for a variety of reasons. Many times, they are transparent to the vehicle operator and technician, and/or have no associated symptoms. Eventually, they will erase themselves automatically after a number of fault-free ignition cycles. This condition would most likely be attributed to one of these scenarios:
 - A device on the data communication circuit was disconnected while the communication circuit is awake.
 - Power to one or more devices was interrupted during diagnosis
 - A low battery condition was present, so some devices stop communicating when battery voltage drops below a certain threshold.
 - Battery power was restored to the vehicle and devices on the communication circuit did not all re-initialize at the same time.
 - If a loss of communication U code appears in history for no apparent reason, it is most likely associated with one of the scenarios above. These are all temporary conditions and should never be interpreted as an intermittent fault, causing you to replace a part.
- Do not replace a device reporting a U code. The U code identifies which device needs to be diagnosed for a communication issue.
- Communication may be available between the device and the scan tool with the low speed GMLAN serial data system inoperative. This condition is due to the device using both the high and low speed GMLAN systems.
- An open in the low speed GMLAN serial data circuit between the splice pack and a device will only affect that specific device. This type of failure will set a loss of communication DTC for each device affected, and the other devices will still communicate.
- An open in the X84 Data Link Connector ground circuit terminal 5 will allow the scan tool to operate but not communicate with the vehicle.
- The engine may not start when there is a total malfunction of the low speed GMLAN serial data circuit.
- Technicians may find various Local Area Network (LAN) communication Diagnostic Trouble Codes (DTC) and no low speed LAN communications with the scan tool.
- These conditions may be caused by the installation of an aftermarket navigation radio device (refer to any appropriate bulletins). Some customers may comment of one or more of the following concerns:
 - Vehicle will not crank
 - Vehicle cranks but will not start
 - Vehicle stability enhancement system warning lights and messages
 - PRNDL gear indicator position errors
- Some devices may not have internal protection for specific voltage outputs and may open a battery positive voltage or ignition voltage source fuse. If a voltage input fuse is open and no short is found in that circuit, ensure that no device output voltage circuit is shorted to ground before replacing the device.

Reference Information

Schematic Reference

- [Data Communication Wiring Schematics](#)

- [Control Module References](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Data Link Communications Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

NOTE: Review and understand how to use the Detected State section of the Data Bus Diagnostic Tool User Guide in service information web site prior to using the Data Bus Diagnostic Tool section in this diagnostic procedure.

Perform Circuit/System Verification using one of the following two methods:

Verifying the Serial Data Circuits using Data Bus Diagnostic Tool

1. Using wiring schematics and vehicle build information, identify all low speed GMLAN devices the tested vehicle is equipped with, and each device location on the low speed GMLAN serial data bus.
2. Ignition ON/Vehicle In Service Mode.
3. From Data Circuit input selection, select Terminal 1 to test the low speed GMLAN serial data bus.
4. Start the test and verify that all applicable low speed GMLAN devices are displayed under the Control Module column of the Detected State tab.

- **If all low speed GMLAN devices are not responding**

Refer to step 3 of Circuit/System Verification - Verifying the Serial Data Circuits using Digital Multimeter to test for a short to voltage or short to ground on the low speed GMLAN serial data circuit, or an open/high resistance between the X84 Data Link Connector and the first low speed GMLAN device or splice pack.

- **If one or more low speed GMLAN devices are not responding**

Refer to Circuit/System Testing - Testing the Device Circuits to test the non-communicating low speed GMLAN device closest to the X84 Data Link Connector.

- **Go to next step: If all low speed GMLAN devices are responding**

5. All OK.

Verifying the Serial Data Circuits using Digital Multimeter

1. Ignition ON/Vehicle In Service Mode.
2. Attempt to communicate with all devices on the low speed GMLAN serial data circuit. Refer to [Data Link References](#) to determine how many devices should be communicating on the low speed GMLAN bus.
3. Verify which devices are communicating on the low speed GMLAN serial data circuit.
 - **If only one device is not communicating**

Diagnose that device only. Refer to [DTC U0100-U02FF](#).

- **If one or more devices are communicating but not all**

Refer to Circuit/System Testing - Testing the Serial Data Circuit for an Open/High Resistance.

- **Go to next step: If none of the devices are communicating**

4. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down. Disconnect the scan tool from the X84 Data Link Connector. The following tests will be done at the X84 Data Link Connector.

5. Test for less than 10 Ω between the ground circuit terminal 5 and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

6. Ignition ON/Vehicle In Service Mode.

7. Test for less than 4.5 V between the serial data circuit terminal 1 and ground.

- **If 4.5 V or greater**

Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short to Voltage.

- **Go to next step: If less than 4.5 V**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

9. Test for greater than 100 Ω between the serial data circuit terminal 1 and ground.

- **If 100 Ω or less**

Refer to Circuit/System Testing - Testing the Serial Data Circuits for a Short to Ground.

- **Go to next step: If greater than 100 Ω**

10. Disconnect the appropriate harness connector at the first splice pack closest in the circuit to the X84 Data Link Connector.

11. Test for less than 2 Ω between the X84 Data Link Connector's serial data circuit terminal 1 and the splice pack harness connector's serial data input terminal.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

12. Replace the splice pack.

Circuit/System Testing

NOTE: Each device may need to be disconnected to isolate a circuit fault. Use the schematic to identify the following:

- All low speed GMLAN devices the vehicle is equipped with
- Low speed GMLAN device and splice pack locations on the low speed GMLAN serial data circuit
- The low speed GMLAN serial data circuit terminals for each device or splice pack

Testing the Serial Data Circuits for a Short to Voltage

1. Ignition/Vehicle OFF, disconnect the appropriate harness connectors at all low speed GMLAN serial data splice packs, ignition ON/Vehicle In Service Mode.
2. Test for less than 4.5 V between the serial data circuit terminal 1 at the X84 Data Link Connector and ground.

- **If 4.5 V or greater**

Repair the short to voltage on the serial data circuit.

- **Go to next step: If less than 4.5 V**

3. Test for less than 4.5 V between each low speed GMLAN serial data circuit at a splice pack and ground.

- **If any serial data circuit is greater than 4.5 V**

1. Ignition/Vehicle OFF, disconnect all devices on the failed serial data circuit, ignition ON/Vehicle In Service Mode.
2. Test for less than 1 V between each section of the failed serial data circuit and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V
3. Connect the splice pack and connect the first device on the failed serial data circuit, ignition ON/Vehicle In Service Mode.
4. Verify the scan tool communicates or not with the low speed GMLAN serial data circuit.
 - If the scan tool does not communicate, replace the device that was just connected.
 - If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 3.4.
 - If the scan tool communicates and there are no more devices to connect
5. All OK.

- **Go to next step: If all serial data circuits are less than 4.5 V**

4. All OK.

Testing the Serial Data Circuits for a Short to Ground

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down. Disconnect the appropriate harness connectors at all low speed GMLAN serial data splice packs.
2. Test for infinite resistance between the serial data circuit terminal 1 at the X84 Data Link Connector and ground.

- **If less than infinite resistance**

Repair the short to ground on the serial data circuit.

- **Go to next step: If infinite resistance**

3. Test for greater than 100 Ω between each low speed GMLAN serial data circuit at a splice pack and ground.

- **If any serial data circuit is 100 Ω or less**

1. Disconnect all devices on the failed serial data circuit.
2. Test for infinite resistance between each section of the failed serial data circuit and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance
3. Connect the splice pack and connect the first device on the failed serial data circuit, ignition ON/Vehicle In Service Mode.
4. Verify the scan tool communicates or not with the low speed GMLAN serial data circuit.
 - If the scan tool does not communicate, replace the device that was just connected.
 - If the scan tool communicates and there are more devices to connect, connect the next device and repeat step 3.4.
 - If the scan tool communicates and there are no more devices to connect

5. All OK.

- **Go to next step: If all serial data circuits are greater than 100 Ω**

4. All OK.

Testing the Serial Data Circuit for an Open/High Resistance

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down. Disconnect the splice pack containing the devices that are not communicating on the low speed GMLAN serial data circuit.

2. Test for less than 2 Ω between the X84 Data Link Connector terminal 1 and the disconnected splice pack.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

3. Disconnect all devices on the failed serial data circuit.

4. Test for less than 2 Ω between each section of the failed serial data circuit end to end.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

5. Connect the splice pack and connect the first device on the failed serial data circuit.

6. Verify if the device communicates or not with the scan tool.

- **If the device does not communicates**

Replace the device.

- **If the device communicates and there are more devices to connect**

Connect the next device on the failed serial data circuit and repeat step 6.

- **Go to next step: If all devices are connected and communicating**

7. All OK.

Testing the Device Circuits

1. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.

2. Disconnect the harness connectors at a low speed GMLAN device that is not communicating.

3. Test for less than 10 Ω between each ground circuit terminal and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **Go to next step: If less than 10 Ω**

4. Ignition ON/Vehicle In Service Mode.

5. If equipped, verify a test lamp illuminates between each B+ circuit terminal and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.

2. Test for less than 2 Ω in the B+ circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

6. If equipped, verify a test lamp illuminates between each ignition circuit terminal, which has a fuse in the circuit, and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for less than 2 Ω in the ignition circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle OFF, remove the test lamp.
2. Test for infinite resistance between the ignition circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the disconnected device.

- **Go to next step: If the test lamp illuminates**

7. If equipped, verify a test lamp illuminates between the accessory wakeup serial data circuit terminal or the serial data communication enable circuit terminal and ground.

- **If the test lamp does not illuminate**

1. Ignition/Vehicle OFF, remove the test lamp, disconnect the harness connectors at the K9 Body Control Module.
2. Test for less than 2 Ω in the accessory wakeup serial data circuit or the serial data communication enable circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K9 Body Control Module.

- **Go to next step: If the test lamp illuminates**

8. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. It may take up to 10 min for all vehicle systems to power down.
9. Test for less than 2 Ω in the low speed GMLAN serial data circuit end to end between the device harness connector and the X84 Data Link Connector terminal 1.

- **If 2 Ω or greater**

Repair the open/high resistance in the serial data circuit.

- **Go to next step: If less than 2 Ω**

10. Replace the device that was disconnected.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- Refer to [Serial Data Circuit Wiring Repairs](#)
- Refer to [Control Module References](#) for device replacement, programming and setup

DATA LINK REFERENCES

This table identifies which serial data link that a particular device uses for in-vehicle data transmission. Some devices may use more than one data link to communicate. Some devices may have multiple communication circuits passing through them without actively communicating on that data link. This table is used to assist in correcting a communication malfunction. Not all devices listed will be applicable to all vehicles. Refer to the wiring schematics to determine which devices apply. For the

description and operation of these serial data communication circuits, refer to [Data Link Communications Description and Operation](#) .

Reference Information

Schematic Reference: [Data Communication Wiring Schematics](#)

Code	Device	Data Link Type	Diagnostic Procedure
A11	Radio	- Gateway Isolated High Speed GMLAN - Gateway Isolated Low Speed GMLAN - MOST Bus - Ethernet Bus - Local Interconnect Network (LIN)	DTC U007C DTC U007D DTC U0028 DTC U18AF-U18B4 DTC U1500-U15FF
A26	HVAC Controls	- Low Speed GMLAN - Local Interconnect Network (LIN)	Scan Tool Does Not Communicate with Low Speed GMLAN Device DTC U1500-U15FF
A97	Transmission Range Selector Controls	Powertrain NOX Bus	DTC U0076
B10B	Ambient Light/Sunload Sensor	Local Interconnect Network (LIN)	DTC U1500-U15FF
B110	Battery Sensor Module	Local Interconnect Network (LIN)	DTC U1500-U15FF
B136	Exhaust Particulate Matter Sensor	Powertrain NOX Bus	DTC U0076
B174W	Frontview Camera - Windshield	- High Speed GMLAN - Low Speed GMLAN	Scan Tool Does Not Communicate with High Speed GMLAN Device Scan Tool Does Not Communicate with Low Speed GMLAN Device
B177	Rain/Ambient Light Sensor Module	Local Interconnect Network (LIN)	DTC U1500-U15FF
B195A	Nitrogen Oxides Sensor 1	Powertrain NOX Bus	DTC U0076
B195B	Nitrogen Oxides Sensor 2	Powertrain NOX Bus	DTC U0076
B218L	Side Object Sensor Module - Left	Low Speed GMLAN	Scan Tool Does Not Communicate with Low Speed GMLAN Device
E13LA	Headlamp Assembly - Left	Local Interconnect Network (LIN)	DTC U1500-U15FF
E13RA	Headlamp Assembly - Right	Local Interconnect Network (LIN)	DTC U1500-U15FF

Code	Device	Data Link Type	Diagnostic Procedure
K9	Body Control Module	- High Speed GMLAN - Low Speed GMLAN - Local Interconnect Network (LIN)	<u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> <u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u> <u>DTC U1500-U15FF</u>
K17	Electronic Brake Control Module	- High Speed GMLAN - Chassis High Speed GMLAN	<u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> <u>DTC U0077</u>
K20	Engine Control Module	- High Speed GMLAN - Powertrain High Speed GMLAN - Powertrain NOX Bus - Local Interconnect Network (LIN)	<u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> <u>DTC U0074</u> <u>DTC U0076</u> <u>DTC U1500-U15FF</u>
K26	Headlamp Control Module	- Gateway Expansion High Speed GMLAN - Local Interconnect Network (LIN)	<u>DTC U007B</u> <u>DTC U1500-U15FF</u>
K29F	Seat Heating Control Module - Front	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
K29R	Seat Heating Control Module - Rear	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
K33	HVAC Control Module	- Low Speed GMLAN - Local Interconnect Network (LIN)	<u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u> <u>DTC U1500-U15FF</u>
K36	Inflatable Restraint Sensing and Diagnostic Module	- Chassis High Speed GMLAN - Low Speed GMLAN	<u>DTC U0077</u> <u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u>

Code	Device	Data Link Type	Diagnostic Procedure
K39	Liftgate Control Module	• Low Speed GMLAN • Local Interconnect Network (LIN)	• <u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u> • <u>DTC U1500-U15FF</u>
K40D	Seat Memory Control Module - Driver	• Low Speed GMLAN • Local Interconnect Network (LIN)	• <u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u> • <u>DTC U1500-U15FF</u>
K43	Power Steering Control Module	• High Speed GMLAN • Chassis High Speed GMLAN	• <u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> • <u>DTC U0077</u>
K47	Rear Differential Clutch Control Module	• High Speed GMLAN • Chassis High Speed GMLAN	• <u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> • <u>DTC U0077</u>
K56	Serial Data Gateway Module	• Gateway Expansion High Speed GMLAN • Gateway Isolated High Speed GMLAN • High Speed GMLAN • Gateway Isolated Low Speed GMLAN • Low Speed GMLAN • Chassis High Speed GMLAN	• <u>DTC U007B</u> • <u>DTC U007C</u> • <u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> • <u>DTC U007D</u> • <u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u> • <u>DTC U0077</u>
K61	Sunroof Control Module	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
K71/Q8/T12	Transmission Control Module/Control Solenoid Valve Assembly/Automatic Transmission Assembly	• High Speed GMLAN • Local Interconnect Network (LIN)	• <u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> • <u>DTC U1500-U15FF</u>

Code	Device	Data Link Type	Diagnostic Procedure
K73	Telematics Communication Interface Control Module	- Gateway Isolated High Speed GMLAN - Gateway Isolated Low Speed GMLAN - Ethernet Bus	<u>DTC U007C</u> <u>DTC U007D</u> <u>DTC U18AF-U18B4</u>
K74	Human Machine Interface Control Module	- Gateway Isolated High Speed GMLAN - MOST Bus - Local Interconnect Network (LIN)	<u>DTC U007C</u> <u>DTC U0028</u> <u>DTC U1500-U15FF</u>
K84	Keyless Entry Control Module	Low Speed GMLAN	<u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u>
K85	Passenger Presence Module	Low Speed GMLAN	<u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u>
K111	Fuel Pump Driver Control Module	- Powertrain High Speed GMLAN - Powertrain NOX Bus	<u>DTC U0074</u> <u>DTC U0076</u>
K115	Reductant Control Module	Powertrain NOX Bus	<u>DTC U0076</u>
K157	Video Processing Control Module	Gateway Isolated Low Speed GMLAN	<u>DTC U007D</u>
K171	Hands-Free Liftgate Sensor Control Module	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
K173	Transmission Range Control Module	- High Speed GMLAN - Powertrain High Speed GMLAN - Local Interconnect Network (LIN)	<u>Scan Tool Does Not Communicate with High Speed GMLAN Device</u> <u>DTC U0074</u> <u>DTC U1500-U15FF</u>
K182	Parking Assist Control Module	- Chassis High Speed GMLAN - Low Speed GMLAN	<u>DTC U0077</u> <u>Scan Tool Does Not Communicate with Low Speed GMLAN Device</u>
K188	Human Machine Interface Control Module Bypass Module	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
M35D	Window Motor Module - Driver	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>

Code	Device	Data Link Type	Diagnostic Procedure
M96A	Active Grille Air Shutter 1 Actuator	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
P2	Transmission Shift Lever Position Indicator	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
P16	Instrument Cluster	• Gateway Isolated Low Speed GMLAN • MOST Bus • Local Interconnect Network (LIN)	• <u>DTC U007D</u> • <u>DTC U0028</u> • <u>DTC U1500-U15FF</u>
P17	Info Display Module	• Gateway Isolated Low Speed GMLAN • Local Interconnect Network (LIN)	• <u>DTC U007D</u> • <u>DTC U1500-U15FF</u>
S32D	Seat Heating Switch - Driver	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S32LR	Seat Heating Switch - Left Rear	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S32P	Seat Heating Switch - Passenger	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S32RR	Seat Heating Switch - Right Rear	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S70R	Steering Wheel Controls Switch - Right	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S79D	Window Switch - Driver	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S79LR	Window Switch - Left Rear	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S79P	Window Switch - Passenger	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
S79RR	Window Switch - Right Rear	Local Interconnect Network (LIN)	<u>DTC U1500-U15FF</u>
T3	Audio Amplifier	• Gateway Isolated Low Speed GMLAN • MOST Bus • Ethernet Bus	• <u>DTC U007D</u> • <u>DTC U0028</u> • <u>DTC U18AF-U18B4</u>
T19	Power Supply Transformer	Powertrain High Speed GMLAN	<u>DTC U0074</u>