

2004 ACCESSORIES & EQUIPMENT

Data Link Communications - Hummer H2

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Data Link Connector Bolt	2 N.m	18 lb in

SCHEMATIC AND ROUTING DIAGRAMS

DATA LINK COMMUNICATIONS SCHEMATIC ICONS

Data Link Communications Schematic Icons

Icon	Icon Definition
	<p>CAUTION: When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling Zones. Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.</p>

DATA LINK CONNECTOR (DLC) SCHEMATICS

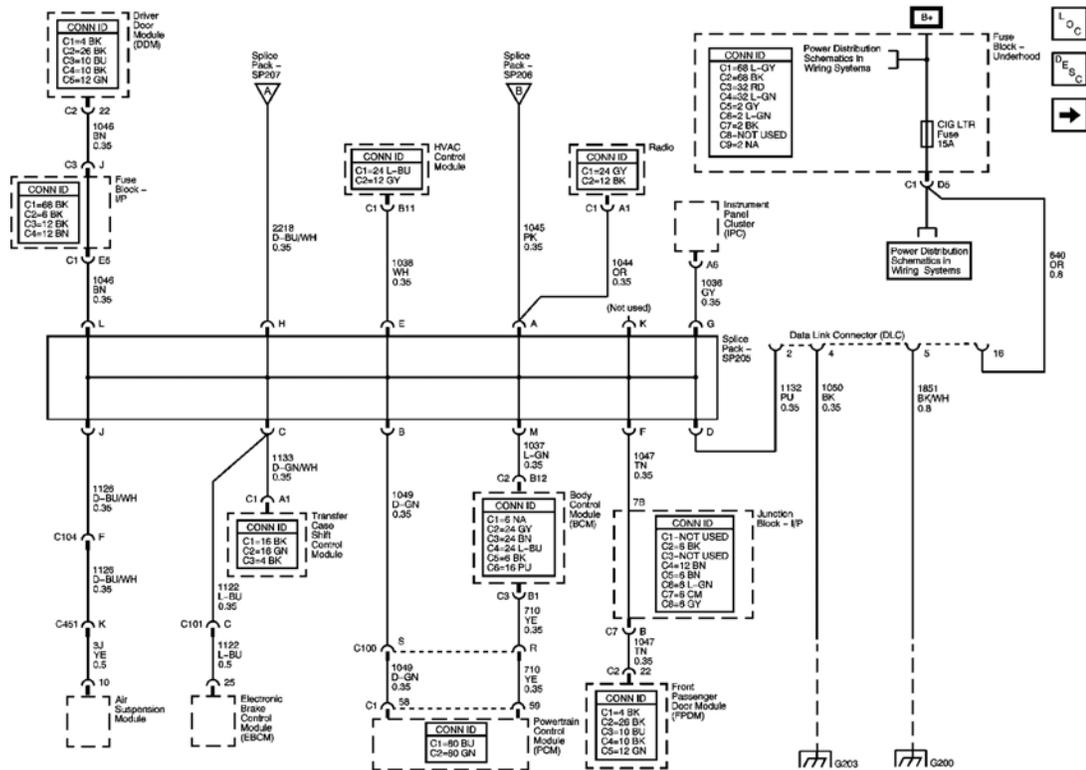
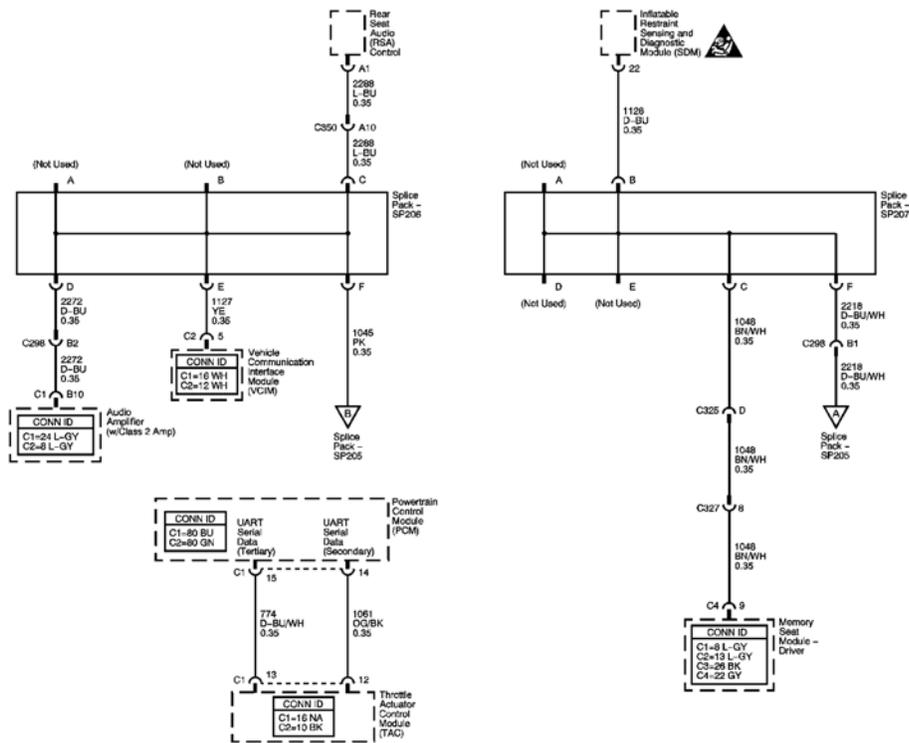


Fig. 1: Power, Ground, DLC & SP205
 Courtesy of GENERAL MOTORS CORP.



L O C

D E S C



Fig. 2: Splice Packs SP206, SP207 & Dedicated TAC Serial Data Circuits
 Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

DATA LINK COMMUNICATIONS COMPONENT VIEWS

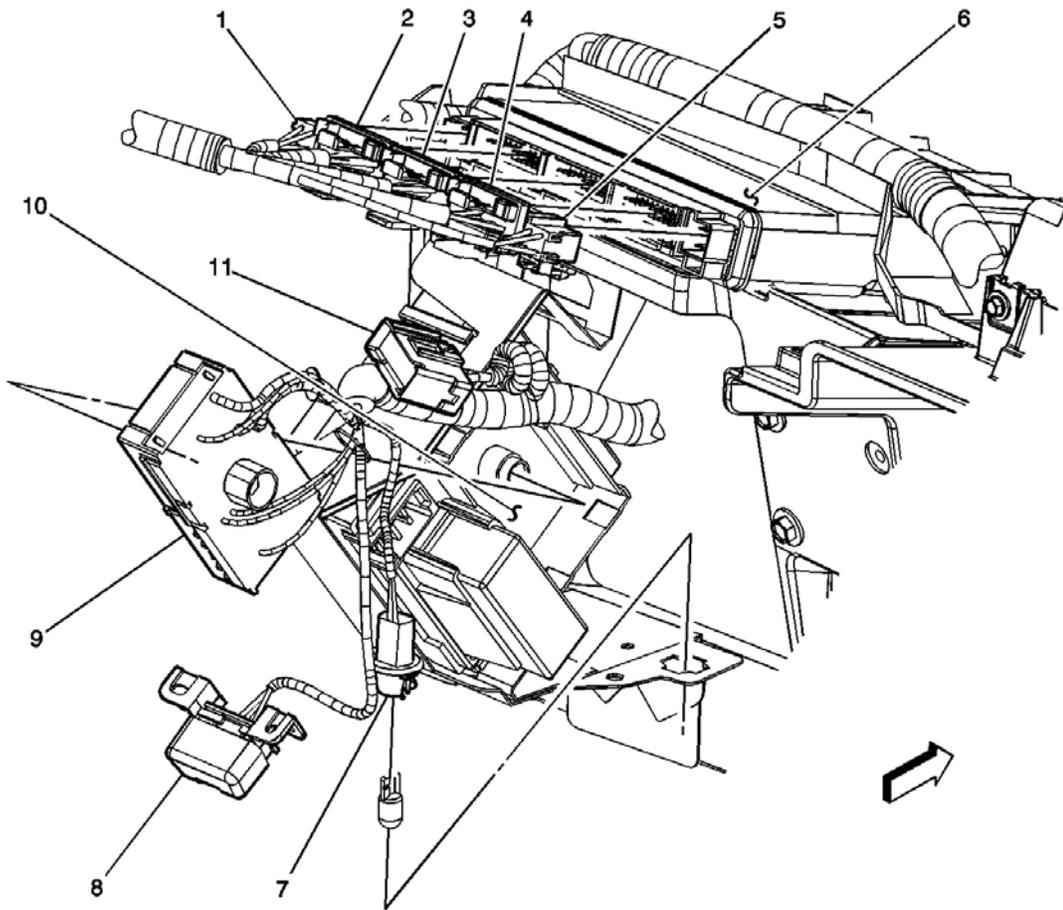


Fig. 3: Data Link Connector & Splice Pack SP205 Component Views
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 3

Callout	Component Name
1	BCM-C1
2	BCM-C2
3	BCM-C4
4	BCM-C3
5	BCM-C5
6	Body Control Module (BCM)
7	Footwell Courtesy Lamp-Left (If Equipped)
8	Data Link Connector (DLC)
9	Fuse Block-IP-C1
10	Fuse Block-IP Center Block
11	Splice Pack SP205

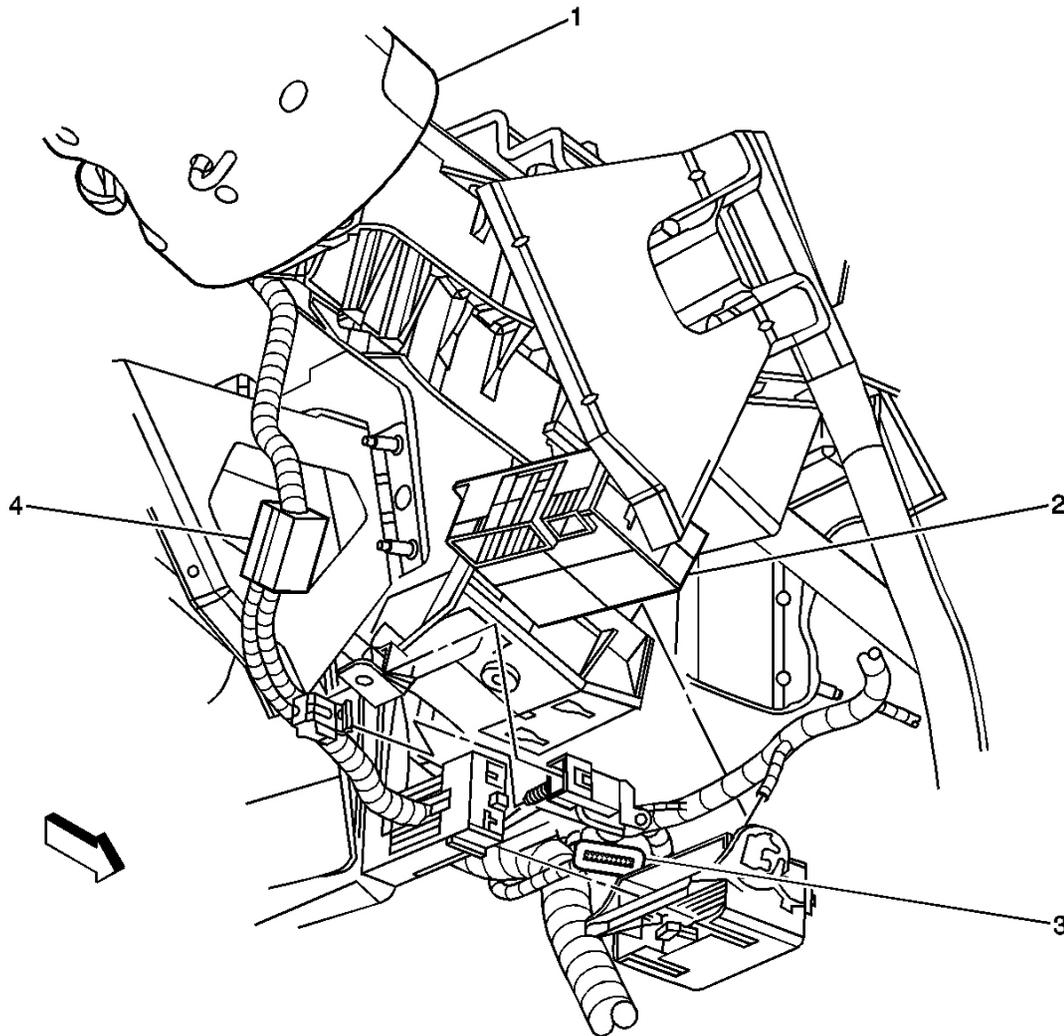


Fig. 4: Splice Pack SP206 Component Views
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	Steering Column
2	Transfer Case Shift Control Module
3	Splice Pack SP206
4	Steering Wheel Controls Backlight Fuse

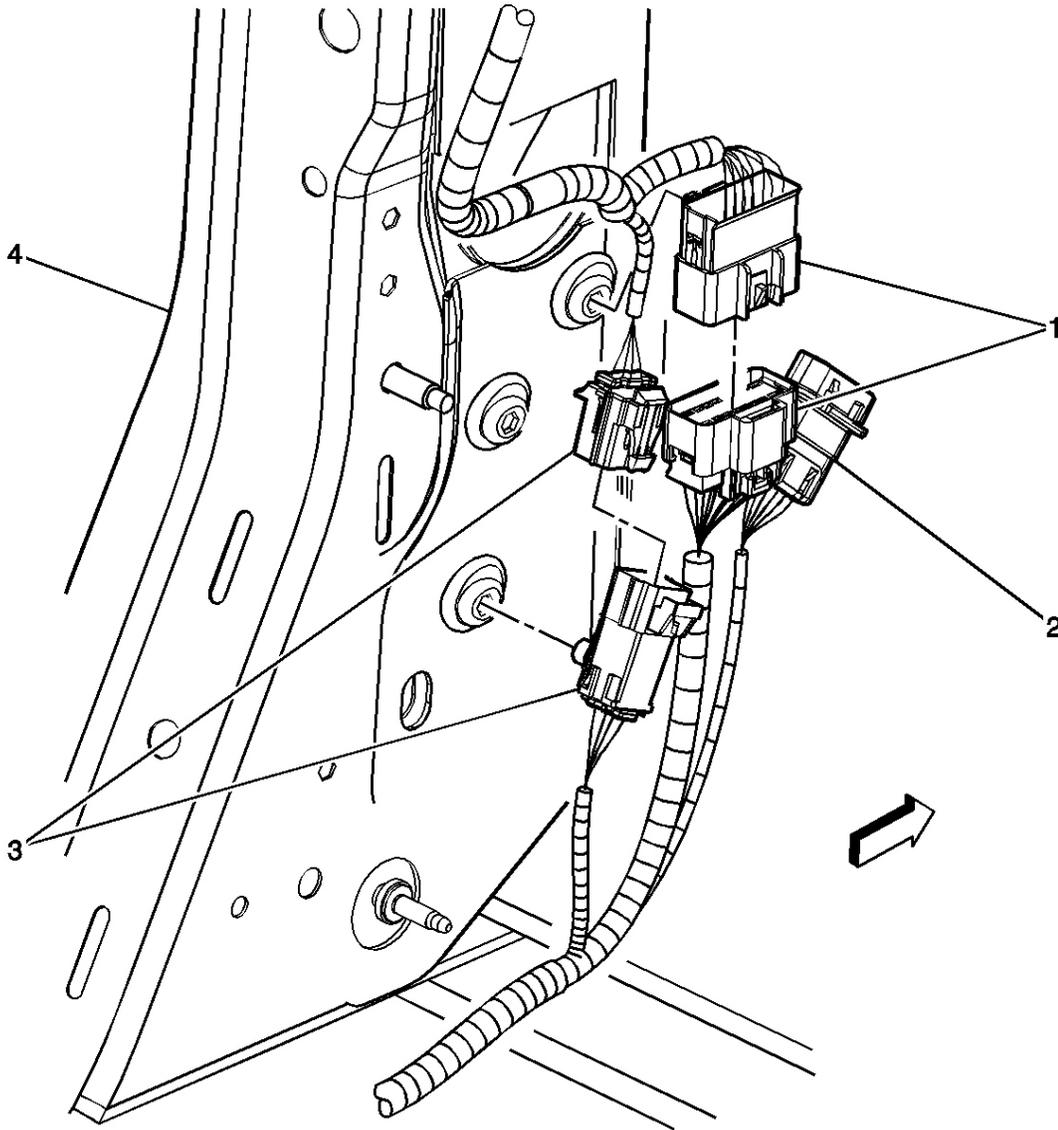
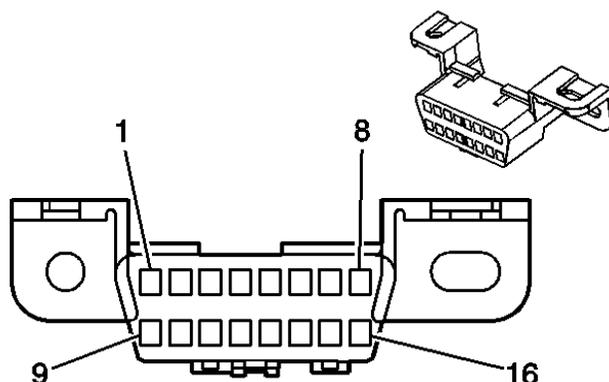


Fig. 5: Splice Pack SP207 Component Views
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 5

Callout	Component Name
1	C200
2	Splice Pack SP207
3	C201
4	Left Side Cowl Panel

Data Link Connector Terminal Identification - (DLC)



Connector Part Information		<ul style="list-style-type: none"> • 12110250 • 16-Way F Metri-Pack 150 Series (BK) 	
Pin	Wire Color	Circuit No.	Function
1	-	-	Not Used
2	PU	1132	DLC Class 2 Serial Data
3	-	-	Not Used
4	BK	1050	Ground
5	BK/WH	1851	Ground
6-15	-	-	Not Used
16	OG	640	Battery Positive Voltage

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - DATA LINK COMMUNICATIONS

Begin the diagnosis of the Data Link Communications by performing the Diagnostic System Check for the system in which the customer concern is apparent. The Diagnostic System Check will direct you to the correct procedure within the Data Link Communications section when a communication malfunction is present.

DIAGNOSTIC TROUBLE CODE (DTC) LIST

Diagnostic Trouble Code (DTC) List

DTC	Diagnostic Procedure	Modules
U1000	<u>DTC U1000</u>	Audio Amplifier, BCM, DDM, DSM, EBCM, ESC, FPDM, HVAC, IPC, PCM, Radio, RSA, SDM, TCSCM, VCIM
U1016	<u>DTC U1001-U1254</u>	Audio Amplifier, BCM, DDM, DSM, EBCM, ESC, FPDM, HVAC, IPC, Radio, RSA, SDM, TCSCM, VCIM
U1026	<u>DTC U1001-U1254</u>	EBCM, IPC, PCM

U1040	<u>DTC U1001-U1254</u>	ESC, IPC, PCM, SDM
U1057	<u>DTC U1001-U1254</u>	BCM, IPC
U1064	<u>DTC U1001-U1254</u>	DDM, ESC, FPDM, HVAC, IPC, PCM, Radio, RSA, SDM, VCIM
U1088	<u>DTC U1001-U1254</u>	VCIM
U1096	<u>DTC U1001-U1254</u>	BCM, SDM
U1128	<u>DTC U1001-U1254</u>	Audio Amplifier, RSA
U1129	<u>DTC U1001-U1254</u>	Radio
U1151	<u>DTC U1001-U1254</u>	Radio
U1152	<u>DTC U1001-U1254</u>	BCM
U1160	<u>DTC U1001-U1254</u>	BCM, DSM, ESC, FPDM
U1161	<u>DTC U1001-U1254</u>	BCM, DDM, DSM, ESC
U1166	<u>DTC U1001-U1254</u>	DDM
U1167	<u>DTC U1001-U1254</u>	Radio
U1300	<u>DTC U1300, U1301, or U1305</u>	EBCM, ESC, HVAC, IPC, PCM, Radio, RSA, SDM, VCIM
U1301	<u>DTC U1300, U1301, or U1305</u>	EBCM, ESC, HVAC, IPC, PCM, Radio, RSA, SDM, VCIM
U1305	<u>DTC U1300, U1301, or U1305</u>	Audio Amplifier, BCM, DDM, DSM, FPDM, TCSCM or

DTC U1000

Circuit Description

Modules connected to the class 2 serial data circuit monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the modules. When a module receives a message for a critical operating parameter, the module records the identification number of the module which sent the message for State of Health monitoring. A critical operating parameter is one which, when not received, requires that the module use a default value for that parameter. When a module does not associate an identification number with at least one critical parameter within 5 seconds of beginning serial data communication, DTC U1000 is set. When more than one critical parameter does not have an identification number associated with it, the DTC will only be reported once.

The class 2 serial data line on this vehicle is a star configuration, with the body control module (BCM) and powertrain control module (PCM) each have a second class 2 serial data line between them. The following modules communicate on the class 2 serial data line:

- The audio amplifier
- The body control module (BCM)
- The driver door module (DDM)
- The driver seat module (DSM)
- The electronic brake control module (EBCM)
- The electronic suspension control (ESC) module

- The front passenger door module (FPDM)
- The HVAC control module
- The inflatable restraint sensing and diagnostic module (SDM)
- The instrument panel cluster (IPC)
- The powertrain control module (PCM)
- The radio
- The rear seat audio (RSA) controller
- The transfer case shift control module (TCSCM)
- The vehicle communication interface module (VCIM) w/UE1

Conditions for Running the DTC

- Voltage supplied to the module is in the normal operating voltage range of 9-16 volts.
- DTCs U1300, U1301 or U1305 do not have a current status.
- The vehicle power mode requires serial data communication to occur.

Conditions for Setting the DTC

A node alive message has not been received from an unidentified module within the last 5 seconds after establishing class 2 serial data communication.

Action Taken When the DTC Sets

The module uses a default value for the missing parameter.

Conditions for Clearing the DTC

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

Diagnostic Aids

When a malfunction occurs while modules are communicating, a lost communication DTC is set as a current DTC. When the modules stop communicating the current lost communication DTC is cleared but the history DTC remains. When the modules begin to communicate again, the module with the open fuse will not be learned by the other modules so U1000 is set current by the other modules. If the malfunction occurs when the modules are not communicating, only U1000 is set.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

1: A DTC U1001 - U1254 Lost Communications with XXX with a history status may indicate the cause

of U1000.

2: The modules not communicating are the likely cause of U1000. The modules that are available on the class 2 serial data circuit are listed in the Circuit Description.

6: The module which was not communicating due to a poor connection to the class 2 serial data circuit may have set DTC U1001 - U1254 Lost Communications with XXX for those modules that it was monitoring.

9: The modules which can communicate indicate the module which cannot communicate. You must clear the serial data communication DTCs from these modules to avoid future misdiagnosis.

12: If all modules are communicating, the module which set U1000 may have done so due to some other condition.

14: The module which set U1000 is the likely cause of the malfunction.

DTC U1000

Step	Action	Yes	No
Schematic Reference: <u>Data Link Connector (DLC) Schematics</u> Connector End View Reference: <u>Master Electrical Component List</u> and <u>Inline Harness Connector End Views</u> in Wiring Systems			
1	<ol style="list-style-type: none">1. Install a scan tool.2. Turn ON the ignition, with the engine OFF.3. Record the DTCs set in by each module. If using a Tech 2, use the Class 2 DTC Check feature to determine which modules have DTCs set. <p>Did you record any DTCs in the range of U1001-U1254 with a history status?</p>	Go to Diagnostic Trouble Code (DTC) List	Go to Step 2
2	<ol style="list-style-type: none">1. Turn ON the ignition, with the engine OFF.2. Attempt to communicate with each module on the class 2 serial data circuit. If using a Tech 2, obtain this information using the class 2 Message Monitor feature.3. Record all of the modules communicating on the class 2 serial data circuit.4. Compare the list of modules which are communicating to the list given in Circuit Description. <p>Does any module on the class 2 serial data circuit not communicate?</p>	Go to Step 3	Go to Step 12
	<p>Test the following circuits of the module that is not communicating for an open or short to ground:</p> <ul style="list-style-type: none">• The battery positive voltage supply circuits• The switched battery positive supply circuits		

3	<ul style="list-style-type: none"> • The battery positive voltage output circuits • The ignition voltage input circuits • The ignition voltage output circuits <p>Refer to the following:</p> <ul style="list-style-type: none"> • <u>Control Module References</u> in Body Control System for the applicable schematic • <u>Circuit Testing</u> in Wiring Systems • <u>Wiring Repairs</u> in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 8	Go to Step 4
4	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Test the ground circuits of the module that is not communicating for an open. Refer to the following: <ul style="list-style-type: none"> • <u>Control Module References</u> in Body Control System for the applicable schematic • <u>Circuit Testing</u> in Wiring Systems • <u>Wiring Repairs</u> in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 8	Go to Step 5
5	<p>IMPORTANT: Inspect all connectors in the serial data communications circuit. Refer to the following:</p> <ul style="list-style-type: none"> • <u>Data Link Connector (DLC) Schematics</u> • <u>Testing for Intermittent Conditions and Poor Connections in Wiring Systems</u> • <u>Connector Repairs in Wiring Systems</u> <ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Test the class 2 serial data circuits of the module that is not communicating for an open. Refer to the following: <ul style="list-style-type: none"> • <u>Data Link Connector (DLC) Schematics</u> • <u>Circuit Testing</u> in Wiring Systems • <u>Wiring Repairs</u> in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 8	Go to Step 6

6	<p>Inspect the harness connector of the module that is not communicating for poor connections and terminal tension at the following circuits:</p> <ul style="list-style-type: none"> • The battery positive voltage input circuits • The switched battery positive voltage supply • The battery positive voltage output circuits • The ignition voltage input circuits • The ignition voltage output circuits • The ground circuits • The class 2 serial data circuits <p>Refer to the following:</p> <ul style="list-style-type: none"> • <u>Control Module References</u> in Body Control System for the applicable schematic • <u>Testing for Intermittent Conditions and Poor Connections</u> in Wiring Systems • <u>Connector Repairs</u> in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 8	Go to Step 7
7	<p>IMPORTANT: Perform the module programming or setup procedure if required.</p> <p>Replace the module that is not communicating. Refer to <u>Control Module References</u> in Body Control System for the appropriate Repair Instructions for the module replacement. Did you complete the replacement?</p>	Go to Step 10	-
8	<ol style="list-style-type: none"> 1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Select the Display DTCs function for the module which was not communicating. <p>Does the scan tool display any DTCs which do not begin with a "U"?</p>	Go to <u>Control Module References</u> in Body Control System for applicable Diagnostic System Check	Go to Step 9
9	Use the scan tool in order to clear the DTCs. Did you complete the action?	Go to Step 10	-
10	Select the Display DTCs function for the modules which had U1000 set as a current DTC. Does the scan tool display DTCs which do not begin with	Go to <u>Control Module References</u> in Body Control System for	

	a "U"?	applicable Diagnostic System Check	Go to Step 11
11	Use the scan tool in order to clear the DTCs. Did you complete the action?	System OK	-
12	Did you record any other DTCs for the modules which had U1000 set as a current DTC?	Go to Control Module References in Body Control System for applicable Diagnostic System Check	Go to Step 13
13	<ol style="list-style-type: none"> 1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Use the scan tool in order to clear the DTCs. 4. Turn OFF the ignition for at least 5 seconds. 5. Turn ON the ignition with the engine OFF. 6. Select the Display DTCs function. 		
	Does the scan tool display U1000 set as a current DTC?	Go to Step 14	Go to Diagnostic Aids
14	<p>IMPORTANT: Perform the module programming or setup procedure if required.</p> <p>Replace the module which had U1000 set as a current DTC. Refer to Control Module References in Body Control System for the appropriate Repair Instructions for the module replacement. Did you complete the replacement?</p>	System OK	-

DTC U1001-U1254

Circuit Description

Modules connected to the class 2 serial data circuit monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the modules. When a module receives a message for a critical operating parameter, the module records the identification number of the module which sent the message for State of Health monitoring. A critical operating parameter is one which, when not received, requires that the module use a default value for that parameter. Once an identification number is learned by a module, it will monitor for that module's Node Alive message. Each module on the class 2 serial data circuit which is powered and performing functions that require detection of a communications malfunction is required to send a Node Alive message every 2 seconds. When no message is detected from a learned identification number for 5 seconds, a DTC U1xxx where xxx is equal to the 3-digit identification number is set.

The control module ID number list below provides a method for determining which module is not communicating. A module with a class 2 serial data circuit malfunction or which loses power during the current

ignition cycle will have a Loss of Communication DTC set by other modules that depend on information from that failed module. The modules that can communicate will set a DTC indicating the module that can not communicate.

DTC U1001-U1254

Control Module	ID Number
Powertrain Control Module (PCM)	016
Transfer Case Shift Control Module (TCSCM)	026
Electronic Brake Control Module (EBCM)	040
Air Suspension Module (ESC)	057
Body Control Module (BCM)	064
Inflatable Restraint Sensing and Diagnostic Module (SDM)	088
Instrument Panel Cluster (IPC)	096
Radio	128
Audio Amplifier	129
Vehicle Communications Interface Module (VCIM)	151
HVAC Control Module	152
Driver Door Module (DDM)	160
Front Passenger Door Module (FPDM)	161
Driver Seat Module (DSM)	166
Rear Seat Audio (RSA) Control	167

When more than one Loss of Communication DTC is set in either 1 module or in several modules, diagnose the DTCs in the following order:

1. Current DTCs before history DTCs unless told otherwise in the diagnostic table.
2. The DTC which is reported the most times.
3. From the lowest number DTC to the highest number DTC.

Conditions for Running the DTC

- The following diagnostic trouble codes do not have a current status:
 - U1300
 - U1301
 - U1305
- The vehicle power mode requires serial data communication to occur.

Conditions for Setting the DTC

A message from a learned identification number has not been detected for the past 5 seconds.

Action Taken When the DTC Sets

The module uses a default value for the missing parameter.

Conditions for Clearing the DTC

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

Diagnostic Aids

- An intermittent open between the inoperative module and a star connector may cause this code to set.
- A poor connection at the inoperative module or a star connector may cause this code to set.
- An intermittent open in a star connector may cause this code to set.
- An improperly powered module may cause this code to set.

Test Description

The number below refers to the step number on the diagnostic table.

6: The module which was not communicating on the class 2 serial data circuit may have set Loss of Communication DTCs for those modules that it was monitoring.

DTC U1001-U1254

Step	Action	Yes	No
<p>Schematic Reference: <u>Data Link Connector (DLC) Schematics</u> Connector End View Reference: <u>Master Electrical Component List</u> and <u>Inline Harness Connector End Views</u> in Wiring Systems</p>			
1	<p>IMPORTANT: Use the control module ID number list in order to determine which module is not communicating.</p> <p>Test the following circuits of the module that is not communicating for an open or a short to ground:</p> <ul style="list-style-type: none"> • The battery positive voltage input circuits • The battery positive voltage output circuits • The ignition voltage input circuits • The ignition voltage output circuits • The switched battery positive voltage circuits <p>Refer to the following:</p> <ul style="list-style-type: none"> • <u>Control Module References</u> in Body Control System for the applicable schematic 		

	<ul style="list-style-type: none"> • Circuit Testing in Wiring Systems • Wiring Repairs in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 6	Go to Step 2
2	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Test the ground circuits of the module that is not communicating for an open. <p>Refer to the following:</p> <ul style="list-style-type: none"> • Control Module References in Body Control System for the applicable Schematic • Circuit Testing in Wiring Systems • Wiring Repairs in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 6	Go to Step 3
3	<p>Test the class 2 serial data circuits of the module that is not communicating for an open. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to Step 6	Go to Step 4
4	<p>Inspect the harness connectors of the module that is not communicating for poor connections and terminal tension at the following circuits:</p> <ul style="list-style-type: none"> • The battery positive voltage input circuits • The battery positive voltage output circuits • The ignition voltage input circuits • The ignition voltage output circuits • The switched battery positive voltage supply circuits • The ground circuits • The class 2 serial data circuits <p>Refer to the following:</p> <ul style="list-style-type: none"> • Control Module References in Body Control System for the applicable schematic • Testing for Intermittent Conditions and Poor Connections in Wiring Systems • Connector Repairs in Wiring Systems 		Go to

	Did you find and correct the condition?	Go to Step 6	Step 5
5	<p>IMPORTANT: Perform the programming or set up procedure for the module, if required.</p> <p>Replace the module that is not communicating. Refer to Control Module References for the applicable replacement procedure. Did you complete the replacement?</p>	Go to Step 6	-
6	<ol style="list-style-type: none"> 1. Install a scan tool. 2. Turn ON the ignition with the engine OFF. 3. Select the Display DTCs function for the module which was not communicating. <p>Does the scan tool display any DTCs which do not begin with a "U"?</p>	Go to Control Module References for the applicable Diagnostic System Check	Go to Step 7
7	<p>Select the Display DTCs function for the modules which had the Loss of Communications DTC set.</p> <p>Does the scan tool display any DTCs which do not begin with a "U"?</p>	Go to Control Module References for the applicable Diagnostic System Check	Go to Step 8
8	<ol style="list-style-type: none"> 1. Use the scan tool in order to clear the DTCs. 2. Continue diagnosing or clearing the DTCs until all the modules have been diagnosed and all the DTCs have been cleared. <p>Did you complete the action?</p>	Go to Control Module References for the applicable Diagnostic System Check	-

DTC U1300, U1301, OR U1305

Circuit Description

Modules connected to the class 2 serial data circuit monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the modules. In addition to this, Node Alive messages are transmitted by each module on the class 2 serial data circuit about once every 2 seconds. When the module detects one of the following conditions on the class 2 serial data circuit for approximately 3 seconds, the setting of all other class 2 serial communication DTCs is inhibited and a DTC will set.

DTC U1300, U1301, or U1305

DTC	Condition
U1300	Low voltage on the class 2 serial data circuit.
U1301	High voltage on the class 2 serial data circuit.
U1305	Either high or low voltage on the class 2 serial data circuit. Some modules will set DTC U1305 if they are not capable of distinguishing between a short to battery voltage or ground.

Conditions for Running the DTCs

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

Conditions for Setting the DTCs

- No valid messages are detected on the class 2 serial data circuit.
- The voltage level detected on the class 2 serial data circuit is in one of the following conditions:
 - High
 - Low
- The above conditions are met for approximately 3 seconds.

Action Taken When the DTCs Sets

The module uses default values for all parameters received on the class 2 serial data circuit.

Conditions for Clearing the DTC

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

Diagnostic Aids

- These DTCs cannot be retrieved with a current status. Diagnosis of current DTCs is accomplished via the symptom, Scan Tool Does Not Communicate with a Class 2 Device. Refer to **Scan Tool Does Not Communicate with Class 2 Device** .
- An intermittent condition is likely to be caused by a short on the class 2 serial data circuit. Use the Scan Tool Does Not Communicate with a Class 2 Device procedure in order to isolate an intermittent condition. Refer to **Scan Tool Does Not Communicate with Class 2 Device** .

SYMPTOMS - DATA LINK COMMUNICATIONS

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

1. Perform the applicable diagnostic system check before using the Symptom Tables in order to verify that there are no DTCs set.
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 vehicle systems. Refer to **Checking Aftermarket Accessories** in Wiring Systems.

- 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** in Wiring Systems.

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 Class 2 Device**

SCAN TOOL DOES NOT POWER UP

Circuit 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 power battery positive voltage at terminal 16
- Scan tool power ground at terminal 4
- Common signal ground at terminal 5

The scan tool will power up with the ignition OFF. Some modules however, will not communicate unless the ignition is ON and the power mode master (PMM) module sends the appropriate power mode message.

Test Description

The number below refers to the step number on the diagnostic table.

- 4:** If the battery positive voltage and ground circuits of the DLC are functioning properly. The malfunction must be due to the scan tool.

Scan Tool Does Not Power Up

Step	Action	Yes	No
Schematic Reference: <u>Data Link Connector (DLC) Schematics</u>			
Connector End View Reference: <u>Data Link Communications Connector End Views</u>			
1	Test the battery positive voltage circuit of the data link connector (DLC) for an open or a short to ground. Refer to <u>Circuit Testing</u> or <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	Go to <u>Control Module References</u> in Body Control System for the applicable Diagnostic System Check	Go to Step 2

2	Test the ground circuit from pin 4 of the DLC for an open or high resistance. Refer to Circuit Testing or Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Control Module References in Body Control System for the applicable Diagnostic System Check	Go to Step 3
3	Inspect for poor connections and terminal tension at the DLC. Refer to Testing for Intermittent Conditions and Poor Connections or Connector Repairs in Wiring Systems. Did you find and correct the condition?	Go to Control Module References in Body Control System for the applicable Diagnostic System Check	Go to Step 4
4	The scan tool may be malfunctioning. Refer to the scan tool user guide. Did you obtain a properly operating scan tool?	Go to Control Module References in Body Control System for the applicable Diagnostic System Check	-

SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE

Circuit Description

Modules connected to the class 2 serial data circuit monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the modules. Connecting a scan tool to the DLC allows communication with the modules for diagnostic purposes.

Diagnostic Aids

The engine will not start when there is a total loss of class 2 serial data communication while the ignition is OFF. The following conditions will cause a total loss of class 2 serial data communication:

- A class 2 serial data circuit shorted to ground.
- A class 2 serial data circuit shorted to voltage.
- An internal condition within a module or connector on the class 2 serial data circuit, that causes a short to voltage or ground to the class 2 serial data circuit.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2: A partial malfunction in the class 2 serial data circuit uses a different procedure from a total malfunction of the class 2 serial data circuit. The following modules communicate on the class 2 serial data circuit:

- Air Suspension Module (ESC)
- Audio Amplifier (early production), refer to **Radio/Audio System Description and Operation** in Entertainment for more information.
- BCM
- DDM
- DSM

- EBCM
- FPDM
- HVAC Control Module
- IPC
- PCM
- Radio
- RSA Module
- SDM
- TCSCM
- VCIM

3: The following DTCs may be retrieved with a history status, but are not the cause of the present condition.

- U1300
- U1301
- U1305

6: A state of health DTC with a history status may be present along with a U1000 or U1255 code having a current status. This indicates that the malfunction occurred when the ignition was ON.

7: Data link connector terminals 2 and 5 provide the connection to the class 2 serial data circuit and the signal ground circuit respectively.

10: A poor connection at DLC terminal of the splice pack - SP205 would cause this condition but will not set a DTC.

11: An open in the class 2 serial data circuit between the DLC and splice pack - SP205 will prevent the scan tool from communicating with any module. This condition will not set a DTC.

12: The class 2 serial data circuit is shorted to voltage or ground. The condition may be due to the wiring or due to a malfunction in one of the modules. When testing the wire for a short, make sure there is not a module connected to the wire being tested. This test isolates the BCM and the PCM class 2 serial data circuits.

13: This test isolates the BCM class 2 serial data circuits.

16: The BCM detects that the ignition is ON and sends the appropriate power mode message to the other modules. Therefore, the BCM must remain connected to the DLC for any other module to communicate with the scan tool. This test isolates the splice pack - SP207 serial data circuits.

21: This test isolates the splice pack - SP206 serial data circuits and radio.

28: This test isolates the EBCM and TCSCM class 2 serial data circuits.

32: This test isolates the rest of the splice pack - SP205 serial data circuits.

36: If there are no current DTCs that begin with a "U", the communication malfunction has been repaired.

37: The communication malfunction may have prevented diagnosis of the customer complaint.

Scan Tool Does Not Communicate with Class 2 Device

Step	Action	Yes	No
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Schematic Reference: Data Link Connector (DLC) Schematics

Connector End View Reference: Master Electrical Component List and Inline Harness Connector End Views in Wiring Systems

1	Does the scan tool power up?	Go to Step 2	Go to Scan Tool Does Not Power Up
2	<ol style="list-style-type: none"> 1. Turn ON the ignition leaving the engine OFF. 2. Attempt to communicate with each module on the class 2 serial data circuit. If using a Tech 2, obtain this information using the Class 2 Message Monitor feature. <p>Does the scan tool communicate with any module on the class 2 serial data circuit?</p>	Go to Step 3	Go to Step 8
3	<ol style="list-style-type: none"> 1. Select the Display DTCs function for each module. If using a Tech 2, use the Class 2 DTC Check feature in order to determine which modules do have DTCs set. 2. Record all of the displayed DTCs, the DTC status and the module which set the DTC. <p>Did you record any DTCs in the range of U1000 to U1305?</p>	Go to Step 4	Go to Step 7
4	Are the history DTCs U1300, U1301 or U1305 retrieved from any module?	Go to Step 5	Go to Step 6
5	<p>IMPORTANT: Turn ON the ignition, with the engine OFF, when testing for a short to voltage. Use the DMM MIN/MAX function to capture intermittent conditions.</p> <p>Test the class 2 serial data circuit for an intermittent short to ground or an intermittent short to voltage. Refer to the following:</p> <ul style="list-style-type: none"> • <u>Testing for Intermittent Conditions and Poor Connections</u> • <u>Circuit Testing</u> • <u>Connector Repairs</u> • <u>Wiring Repairs</u> in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to Step 36	Go to Step 6
6	Is U1000 or U1255 the only DTC displayed in the previously specified range?	Go to DTC U1000	Go to DTC U1001-U1254
	Diagnose the non-communicating module by using the DTC U1001-U1254 procedure for the module which is not	Go to Control Module References in Body	

7	communicating. Refer to DTC U1001-U1254 Did you complete the action?	Control System for the applicable Diagnostic System Check	-
8	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the scan tool from the data link connector (DLC). 3. Inspect for poor connections at the DLC terminals 2 and 5. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to <u>Control Module References</u> in Body Control System for the applicable Diagnostic System Check	Go to Step 9
9	Test the DLC ground circuit at terminal 5 for an open. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	Go to <u>Control Module References</u> in Body Control System for the applicable Diagnostic System Check	Go to Step 10
10	<ol style="list-style-type: none"> 1. Disconnect the splice pack - SP205. 2. Inspect for poor connections at the splice pack - SP205. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to <u>Control Module References</u> in Body Control System for the applicable Diagnostic System Check	Go to Step 11
11	Test the class 2 serial data circuit between the DLC and the splice pack - SP205 for an open, a short to ground, or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?	Go to <u>Control Module References</u> in Body Control System for the applicable Diagnostic System Check	Go to Step 12
12	<ol style="list-style-type: none"> 1. Using the correct terminal adapter, connect a jumper wire to the DLC terminal of the splice pack - SP205. 2. Connect the other end of the jumper wire, using correct terminal adapter, to the BCM terminal of the splice pack - SP205. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. <p>Does the scan tool communicate with the BCM?</p>	Go to Step 16	Go to Step 13
13	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the PCM. 3. Turn ON the ignition leaving the engine OFF. 		

	<p>4. Attempt to communicate with the BCM.</p> <p>Does the scan tool communicate with the BCM?</p>	Go to Step 14	Go to Step 15
14	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Test the class 2 serial data circuit between the splice pack - SP205 and the PCM for an open, a short to ground, or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to Step 36	Go to Step 34
15	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the BCM. 3. Test both class 2 serial data circuits of the BCM for an open, a short to ground or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to Step 36	Go to Step 34
16	<ol style="list-style-type: none"> 1. Leave the jumper wire connected to the DLC terminal and to the BCM terminal of the splice pack - SP205. 2. Connect another jumper wire from the jumper wire connected to the DLC terminal of the splice pack - SP205. 3. Connect the other end of the jumper wire, using correct terminal adapter, to the splice pack - SP207 terminal of the splice pack - SP205. 4. Turn ON the ignition leaving the engine OFF. 5. Attempt to communicate with the BCM. <p>Does the scan tool communicate with the BCM?</p>	Go to Step 21	Go to Step 17
17	<ol style="list-style-type: none"> 1. Disconnect the splice pack - SP207. 2. Inspect for poor connections at the splice pack - SP207. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs in Wiring Systems. 3. Attempt to communicate with the BCM. <p>Does the scan tool communicate with the BCM?</p>	Go to Step 19	Go to Step 18
	Repair the class 2 serial data circuit for a short to ground or		

18	<p>a short to voltage between the splice pack - SP205 and the splice pack - SP207. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> in Wiring Systems. Did you find and correct the condition?</p>	Go to Step 36	-
19	<p>Repeat the following steps on the class 2 serial data circuits connected to the splice pack - SP207 until the concern is located:</p> <ol style="list-style-type: none"> 1. Connect another jumper wire to the splice pack - SP205 terminal of the splice pack - SP207. 2. Connect the other end of the jumper wire, using correct terminal adapter, to the terminal for the devices connected to splice pack - SP207. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. <p>Does the scan tool communicate with the BCM?</p>	Go to Step 36	Go to Step 20
20	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the module that caused the no communication condition. 3. Test the class 2 serial data circuit between the splice pack - SP207 and the respective module for a short to ground or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to Step 36	Go to Step 34
21	<ol style="list-style-type: none"> 1. Disconnect the jumper wire from the splice pack - SP207 terminal of the splice pack - SP205. 2. Connect the jumper wire to the splice pack - SP206 terminal of the splice pack - SP205. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. <p>Does the scan tool communicate with the BCM?</p>	Go to Step 28	Go to Step 22
22	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the radio. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. 		

	Does the scan tool communicate with the BCM?	Go to Step 34	Go to Step 23
23	Test the class 2 serial data circuit between the splice pack - SP205 and the radio for a short to ground or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find the condition?	Go to Step 36	Go to Step 24
24	<ol style="list-style-type: none"> 1. Disconnect the splice pack - SP206. 2. Inspect for poor connections at the splice pack - SP206. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs in Wiring Systems. 3. Attempt to communicate with the BCM. <p>Does the scan tool communicate with the BCM?</p>	Go to Step 26	Go to Step 25
25	Repair the class 2 serial data circuit for a short to ground or a short to voltage between the splice pack - SP205 and the splice pack - SP206. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 36	-
26	<p>Repeat the following steps on the class 2 serial data circuits connected to the splice pack - SP206 until the concern is located:</p> <ol style="list-style-type: none"> 1. Connect another jumper wire to the splice pack - SP205 terminal of the splice pack - SP206. 2. Connect the other end of the jumper wire, using correct terminal adapter, to the terminal for the devices connected to splice pack - SP206. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. <p>Does the scan tool communicate with the BCM?</p>	Go to Step 36	Go to Step 27
27	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the module that caused the no communication condition. 3. Test the class 2 serial data circuit between the splice pack - SP205 and the respective module for a short to ground or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to Circuit Testing and Wiring 		

	Repairs in Wiring Systems.		
	Did you find and correct the condition?	Go to Step 36	Go to Step 34
28	<ol style="list-style-type: none"> 1. Disconnect the jumper wire from the splice pack - SP206 terminal of the splice pack - SP205. 2. Connect the jumper wire to the EBCM terminal of the splice pack - SP205. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. 		
	Does the scan tool communicate with the BCM?	Go to Step 32	Go to Step 29
29	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the EBCM. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. 		
	Does the scan tool communicate with the BCM?	Go to Step 34	Go to Step 30
30	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the TCSCM. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. 		
	Does the scan tool communicate with the BCM?	Go to Step 34	Go to Step 31
31	<p>Repair the class 2 serial data circuit between the splice pack - SP205 and either the EBCM or TCSCM for a short to ground or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you complete the repair?</p>	Go to Step 36	-
32	<p>Repeat the following steps on the class 2 serial data circuits connected to the splice pack - SP205 until the concern is located:</p> <ol style="list-style-type: none"> 1. Disconnect the jumper wire from the EBCM terminal of the splice pack - SP205. 2. Connect the jumper wire, using correct terminal adapter, to the terminal for the rest of devices connected to splice pack - SP205. 3. Turn ON the ignition leaving the engine OFF. 4. Attempt to communicate with the BCM. 		
			Go to Step

	Does the scan tool communicate with the BCM?	Go to Step 36	33
33	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the module that caused the no communication condition. 3. Test the class 2 serial data circuit between the splice pack - SP205 and the respective module for a short to ground or a short to voltage. Turn ON the ignition leaving the engine OFF when testing for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to Step 36	Go to Step 34
34	<p>Inspect for poor connections at the class 2 serial data circuit of the last disconnected module. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to Step 36	Go to Step 35
35	<p>IMPORTANT: Perform the module setup procedure if required.</p> <p>Replace the last disconnected module. Refer to Control Module References in Body Control System for the appropriate repair instructions. Did you complete the replacement?</p>	Go to Step 36	-
36	<ol style="list-style-type: none"> 1. Reconnect all of the disconnected modules. 2. Reconnect any other disconnected connectors. 3. Install a scan tool. 4. Turn ON the ignition leaving the engine OFF. 5. Wait for 10 seconds. <p>The scan tool may require a power up reset before communication will occur due to a short on the class 2 serial data circuit. Turn OFF the scan tool prior to performing this test.</p> <ol style="list-style-type: none"> 6. Select the Display DTCs function for each module. If using a Tech 2, use the Class 2 DTC Check feature in order to determine which modules do have DTCs set. 7. Record all of the displayed DTCs and the DTC status. <p>Did you record any DTCs which begin with a "U" and with a current status?</p>	Go to Step 38	Go to Step 37
37	Did you record any DTCs which do not begin with a "U"?		Go to Step

		Go to Step 38	40
38	Diagnose the DTCs as directed by the diagnostic procedures for the particular module or malfunction. Refer to Control Module References in Body Control System for the applicable Diagnostic System Check. Did you complete the action?	Go to Step 39	-
39	Did you diagnose all of the DTCs?	Go to Step 40	Go to Step 38
40	Use the scan tool in order to clear the DTCs. Did you complete the action?	System OK	-

REPAIR INSTRUCTIONS

DATA LINK CONNECTOR REPLACEMENT

Removal Procedure

1. Remove the bolts/screws from the data link connector.

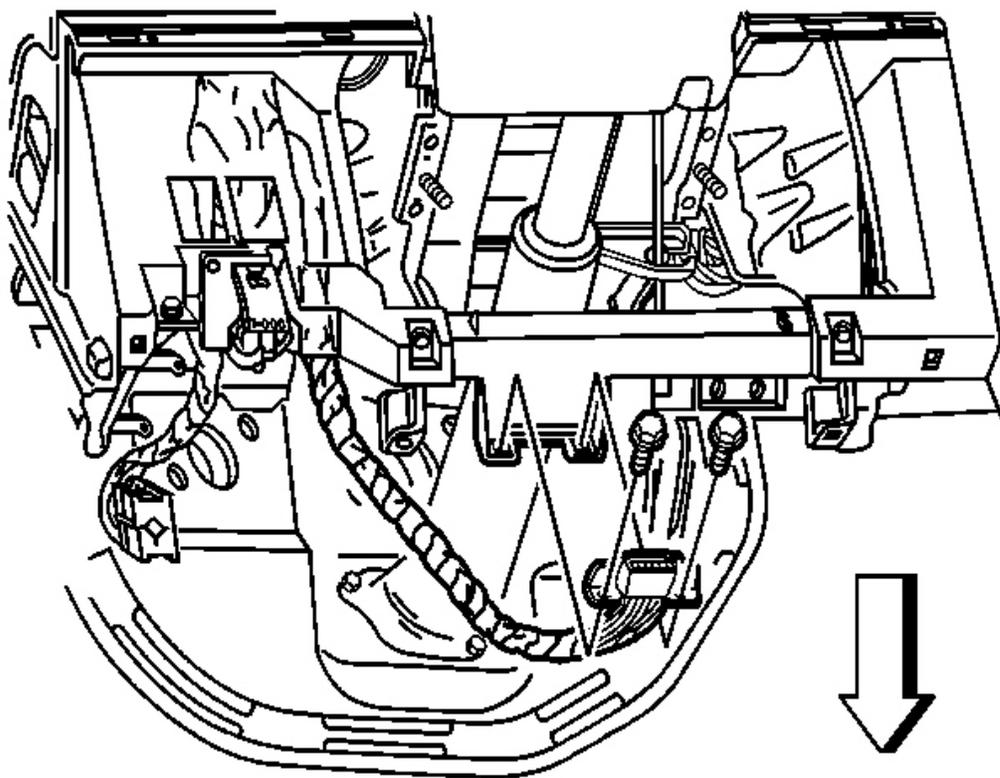


Fig. 6: Data Link Connector
Courtesy of GENERAL MOTORS CORP.

2. Remove the lower data link connector.

Installation Procedure

1. Place the data link connector into position.

NOTE: Refer to Fastener Notice in Cautions and Notices.

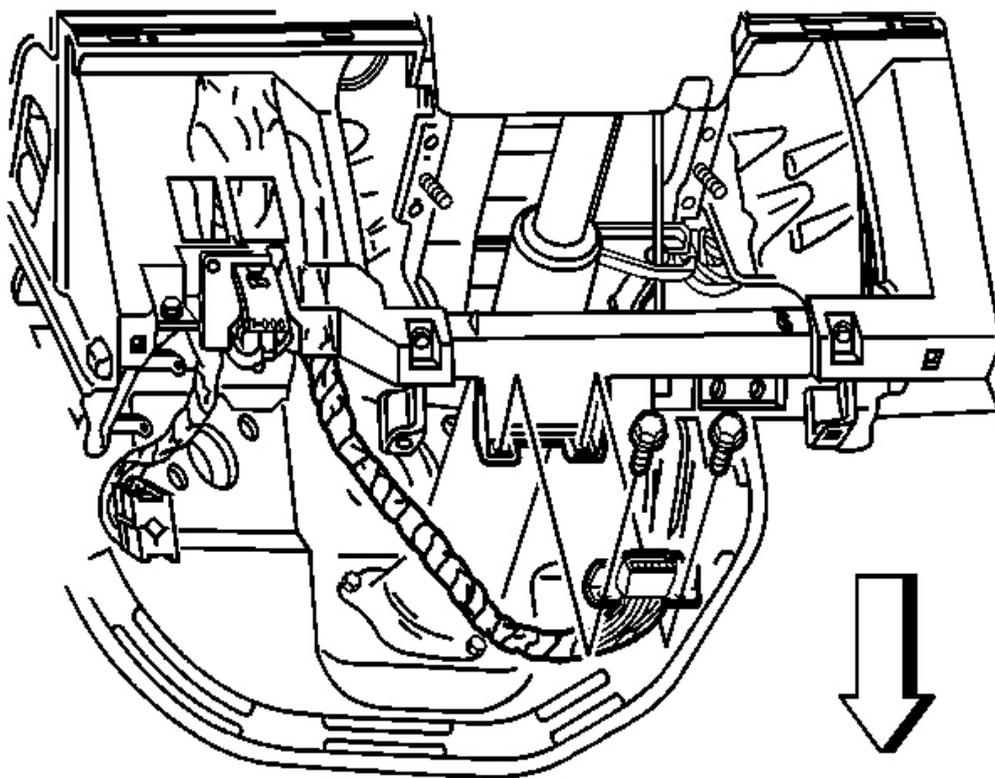


Fig. 7: Data Link Connector
Courtesy of GENERAL MOTORS CORP.

2. Install the bolts/screws to the data link connector.

Tighten: Tighten the bolts/screws to 2 N.m (18 lb in).

DESCRIPTION AND OPERATION

DATA LINK COMMUNICATIONS DESCRIPTION AND OPERATION

Circuit Description

The data link connector (DLC) allows a scan tool to communicate with the class 2 serial data line. The serial data line is the means by which the microprocessor-controlled modules in the vehicle communicate with each other. Once the scan tool is connected to the class 2 serial data line through the DLC, the scan tool can be used to monitor each module for diagnostic purposes and to check for diagnostic trouble codes (DTCs). Class 2 serial data is transmitted on a single wire at an average of 10.4 kbps. This value is an average, class 2 uses a variable

pulse width modulation to carry data and depending on the message it may operate faster or slower. The bus will float at a nominal 7.0 volts during normal operation. Each module can pull this lower during the transmission. The bus is not at battery positive voltage or ground potential during normal operation. When the ignition switch is in RUN, each module communicating on the class 2 serial data line sends a state of health (SOH) message every 2 seconds to ensure that the module is operating properly. When a module stops communicating on the class 2 serial data line, for example if the module loses power or ground, the SOH message it normally sends on the data line every 2 seconds disappears. Other modules on the class 2 serial data line, which expect to receive that SOH message, detect its absence; those modules in turn set an internal DTC associated with the loss of SOH of the non-communicating module. The DTC is unique to the module which is not communicating, for example, when the inflatable restraint sensing and diagnostic module (SDM) SOH message disappears, several modules set DTC U1088. Note that a loss of serial data DTC does not normally represent a failure of the module that set it.

On some vehicles, if the PCM is unable to communicate with the VTD system after the vehicle has started, the PCM will consider the VTD system to be malfunctioning. The PCM will enter a fail enable state and will command the security indicator to illuminate. When the PCM is in a fail enable state the vehicle will NOT stall or stop running. If the PCM is in a fail enable state when the ignition is switched OFF, the PCM will remain fail enable until communications with the VTD system has been restored. When the PCM is in a fail enable state the VTD system is NOT active and the vehicle will start. This feature is NOT available on all GM vehicle lines.

Data Link Connector (DLC)

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 power battery positive voltage at terminal 16.
- Scan tool power ground at terminal 4.
- Common signal ground at terminal 5.
- Class 2 signal at terminal 2.

Class 2 Serial Data Line

The class 2 serial data communications circuit on this vehicle is in a star configuration. This configuration has 3 splice packs, located as follows:

- The splice pack - SP205 located near the data link connector
- The splice pack - SP206 located under the steering column
- The splice pack - SP207 located under the LH cowl panel

There is also a direct redundant class 2 serial data circuit between BCM and PCM.

The following modules communicate on the class 2 serial data circuit:

- Splice pack - SP205 attaches to:
 - BCM

- DDM
- EBCM
- ESC
- FPDM
- HVAC control module
- IPC
- PCM
- Radio
- TCSCM
- Splice pack - SP206 attaches to:
 - Audio amplifier (early production), refer to **Radio/Audio System Description and Operation** in Entertainment for more information.
 - RSA control
 - VCIM
- Splice pack - SP207 attaches to DSM and SDM.

2004 ACCESSORIES & EQUIPMENT

Programming - Hummer H2

REPAIR INSTRUCTIONS

SERVICE PROGRAMMING SYSTEM (SPS)

For step by step programming instructions, please refer to the techline information system (TIS) terminal.

Review the information below to ensure proper programming protocol.

IMPORTANT: DO NOT program a control module unless you are directed by a service procedure or you are directed by a General Motors Corporation service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.

It is essential that the Tech 2 and the TIS terminal are both equipped with the latest software before performing service programming system (SPS).

Some modules will require additional programming/setup events performed before or after programming.

Review the appropriate service information for these procedures.

Ensure the following conditions are met before programming a control module:

- Vehicle system voltage
 - There is not a charging system concern. All charging system concerns must be repaired before programming a control module.
 - Battery voltage is greater than 12 volts but less than 16 volts. The battery must be charged before programming the control module if the battery voltage is low.
 - A battery charger is NOT connected to the vehicle's battery. Incorrect system voltage or voltage fluctuations from a battery charger, may cause programming failure or control module damage.
 - Turn OFF or disable any system that may put a load on the vehicle's battery, such as the following components:
 - Twilight sentinel
 - Interior lights
 - Daytime running lights (DRL) - Applying the parking brake, on most vehicles, disables the DRL system. Refer to the Owner's manual.
 - Heating, ventilation, and air conditioning (HVAC) systems
 - Engine cooling fans, radio, etc.
- The ignition switch must be in the proper position. The Tech 2 prompts you to turn ON the ignition, with the engine OFF. DO NOT change the position of the ignition switch during the programming procedure, unless instructed to do so.
- Make certain all tool connections are secure, including the following components and circuits:

- The control module Serial Data Link Tester
- The RS-232 communication cable port
- The connection at the data link connector (DLC)
- The voltage supply circuits
- DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.
- DO NOT turn OFF the ignition if the programming procedure is interrupted or unsuccessful. Ensure that all control module and DLC connections are secure and the TIS terminal operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module.