SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

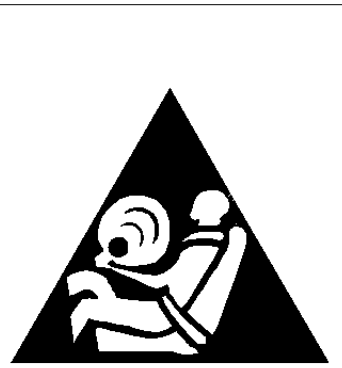
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Body Control Module Nuts	10 N.m	88 lb in
Center Support Bracket Nuts	10 N.m	88 lb in
Console Screws	2.5 N.m	22 lb in

SCHEMATIC AND ROUTING DIAGRAMS

COMPUTER/INTEGRATING SYSTEMS SCHEMATIC ICONS

Computer/Integrating Systems Schematic Icons

Icon	Icon Definition
	**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.**
	IMPORTANT: Twisted-pair wires provide an effective shield that helps protect sensitive electronic components from electrical interference. In order to prevent electrical interference from degrading the performance of the connected components, you must maintain the proper specification when making any repairs to the twisted-pair wires shown : • The wires must be twisted a minimum of 9 turns per 31 cm (12 in) as measured anywhere along the length of the wires. • The outside diameter of the twisted wires must not exceed 6.0 mm (0.25 in).

BODY CONTROL SYSTEM SCHEMATICS

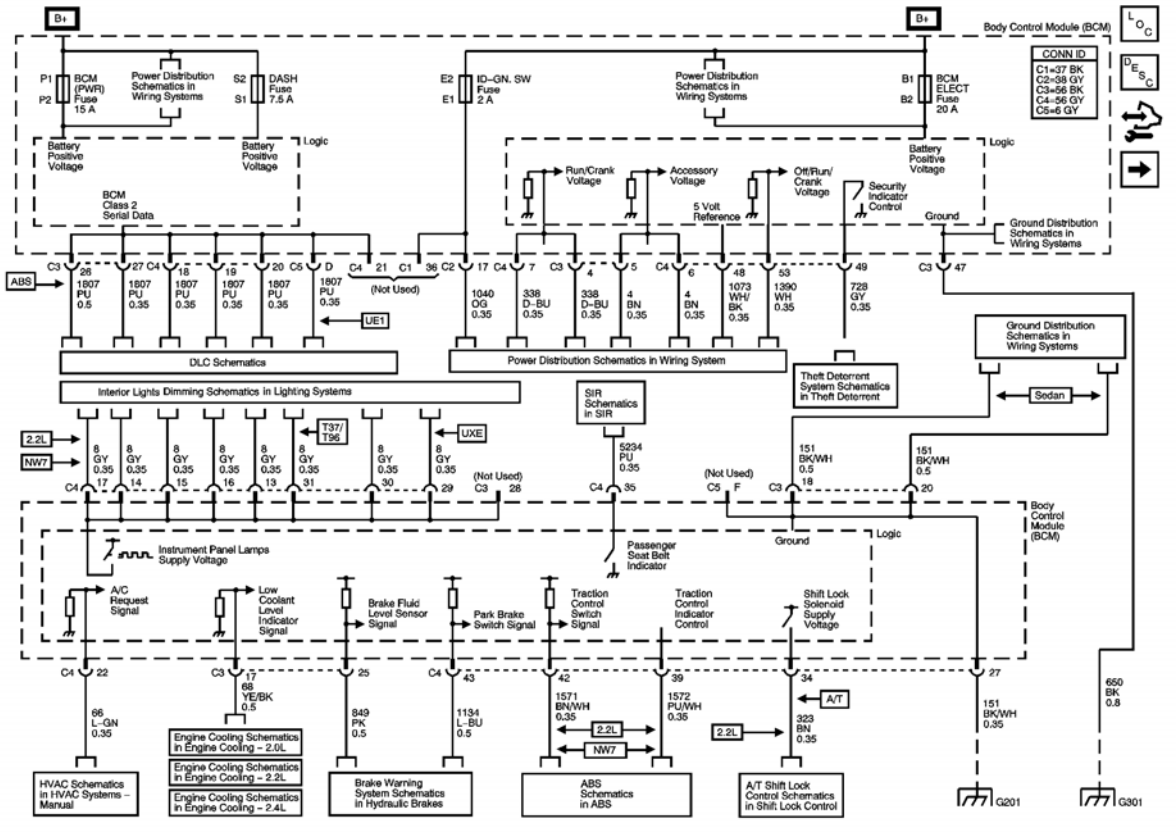


Fig. 1: BCM Power, Ground, and References to Brakes, Lights Dimming, DLC, HVAC, Shift Lock, and Theft Deterrent

Courtesy of GENERAL MOTORS CORP.

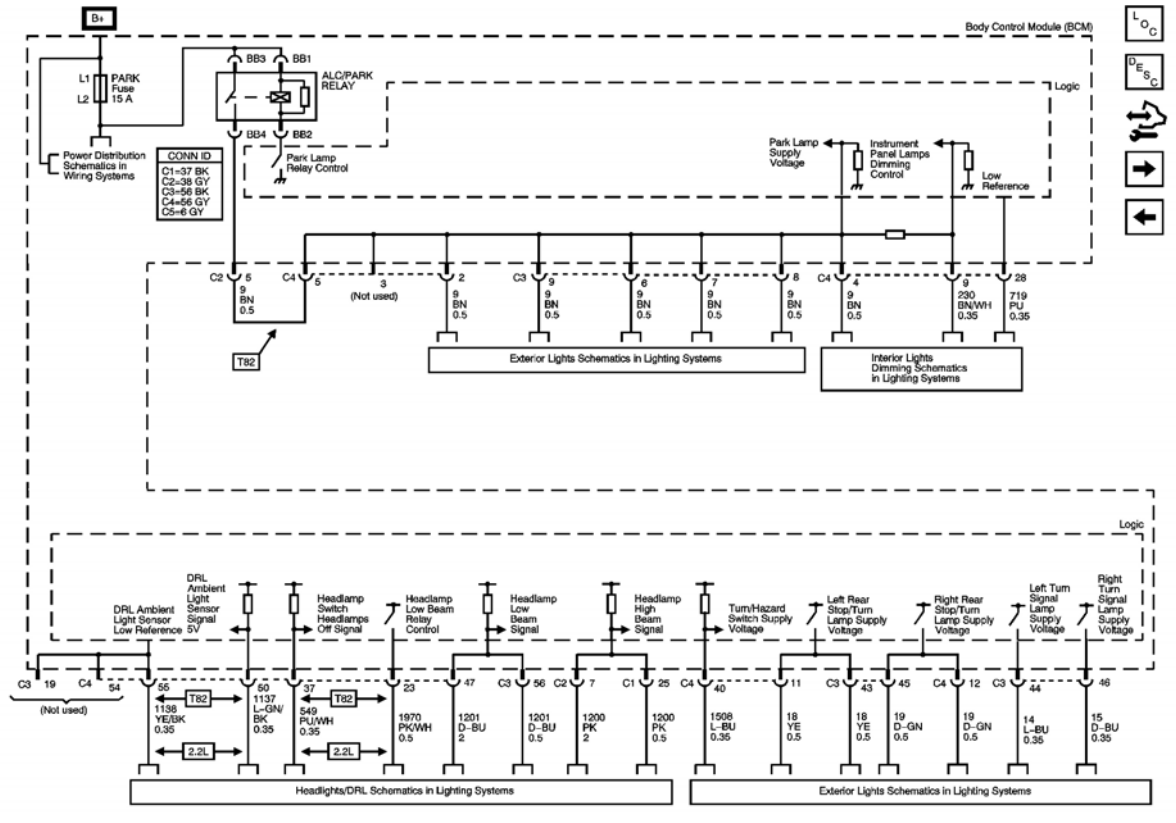


Fig. 2: References to Lighting 1 of 2

Courtesy of GENERAL MOTORS CORP.

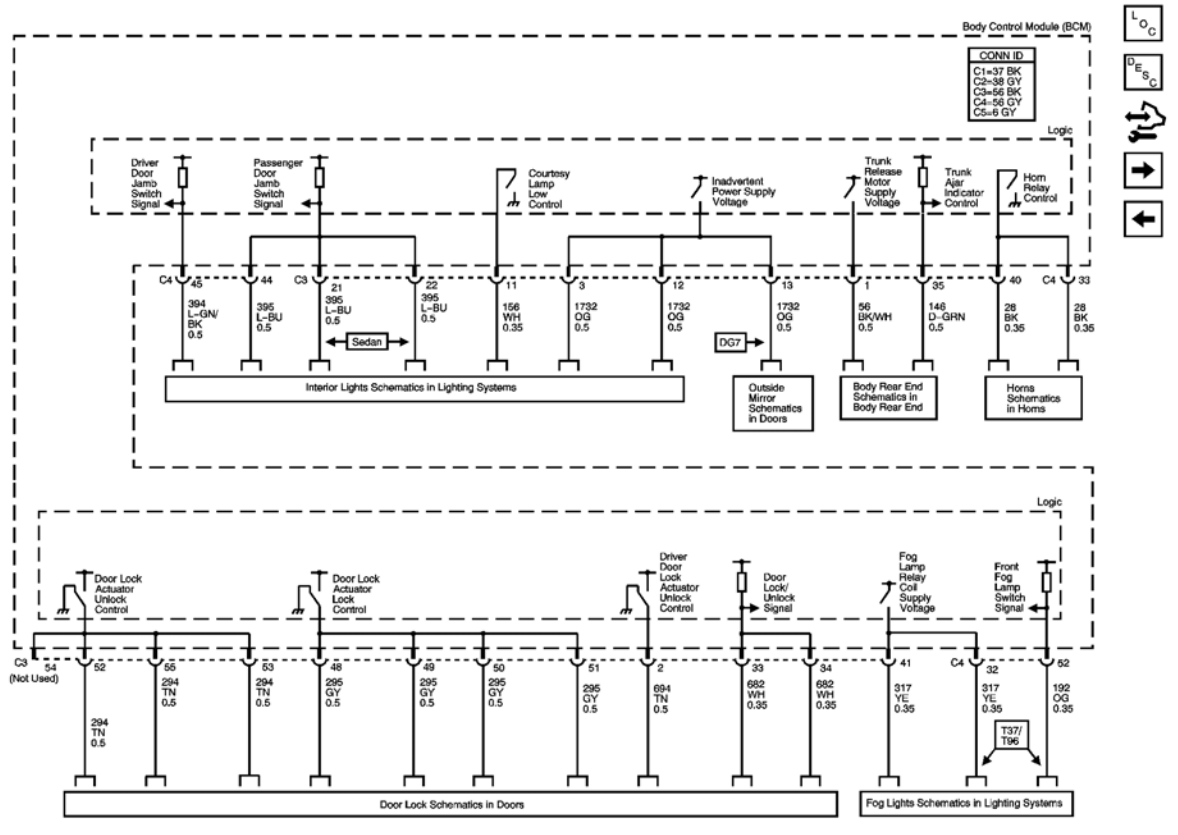


Fig. 3: References to Body Rear End, Doors, Horns, and Lighting 2 of 2
Courtesy of GENERAL MOTORS CORP.

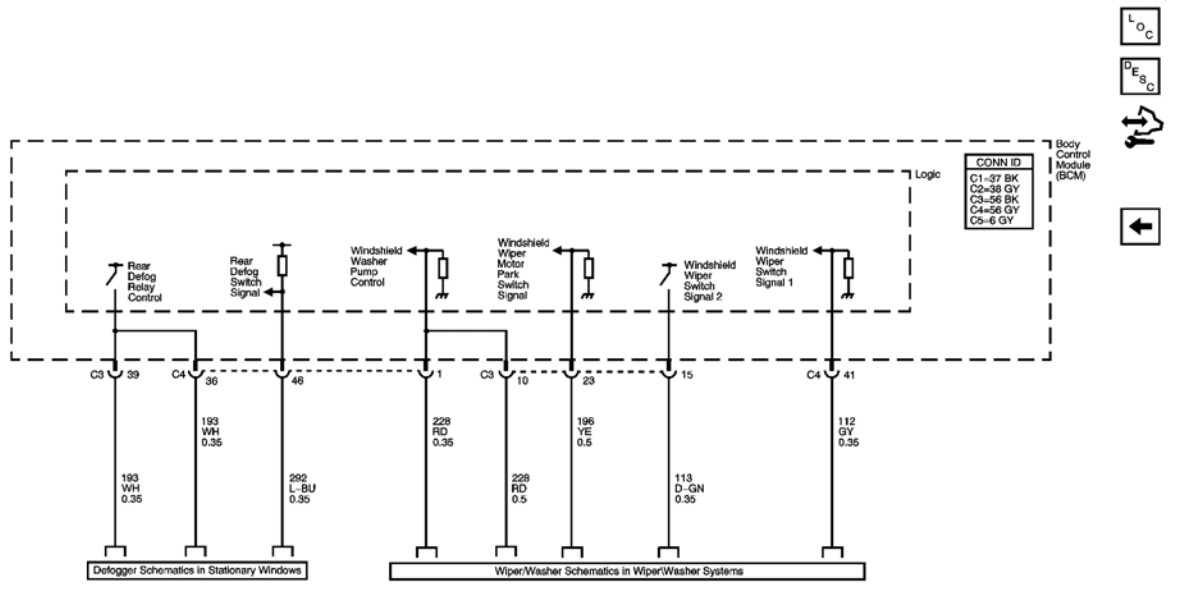


Fig. 4: References to Rear Defogger and Wiper/Washer
Courtesy of GENERAL MOTORS CORP.

DATA LINK CONNECTOR (DLC) SCHEMATICS

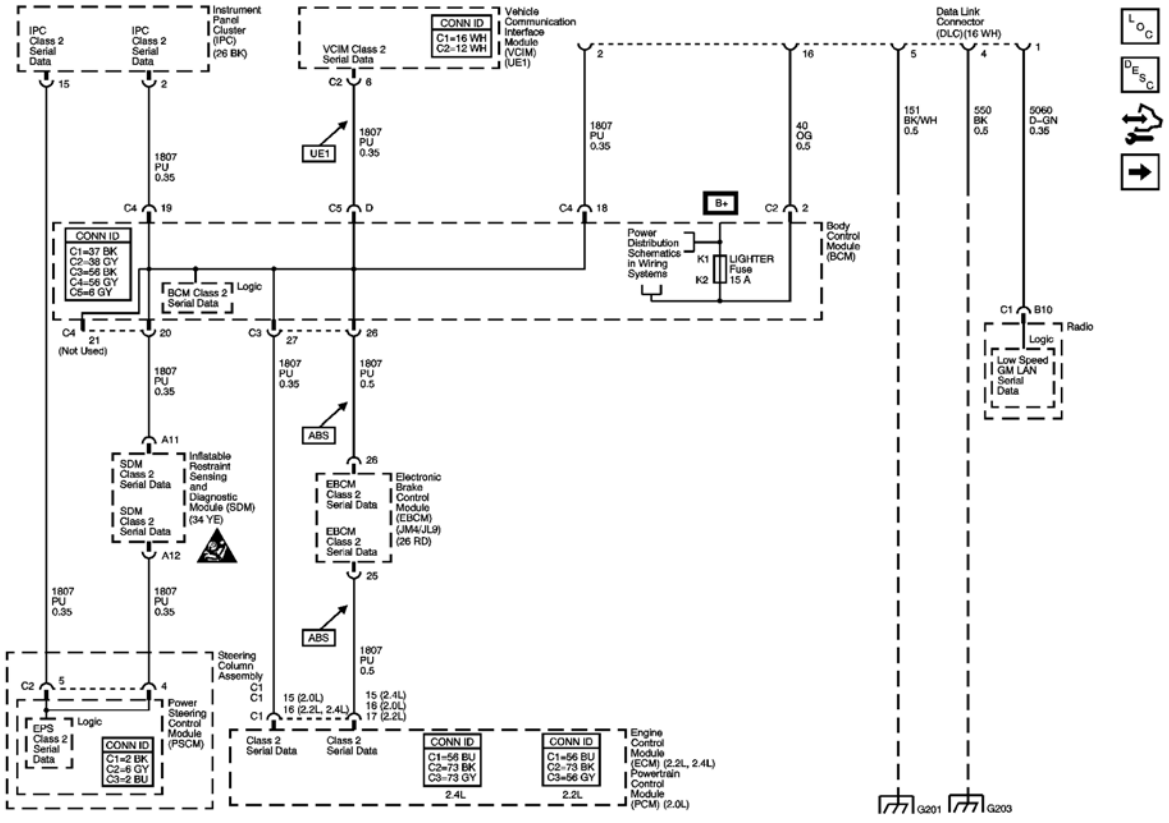


Fig. 5: DLC Power, Ground, Class 2, and Low Speed GM LAN
Courtesy of GENERAL MOTORS CORP.

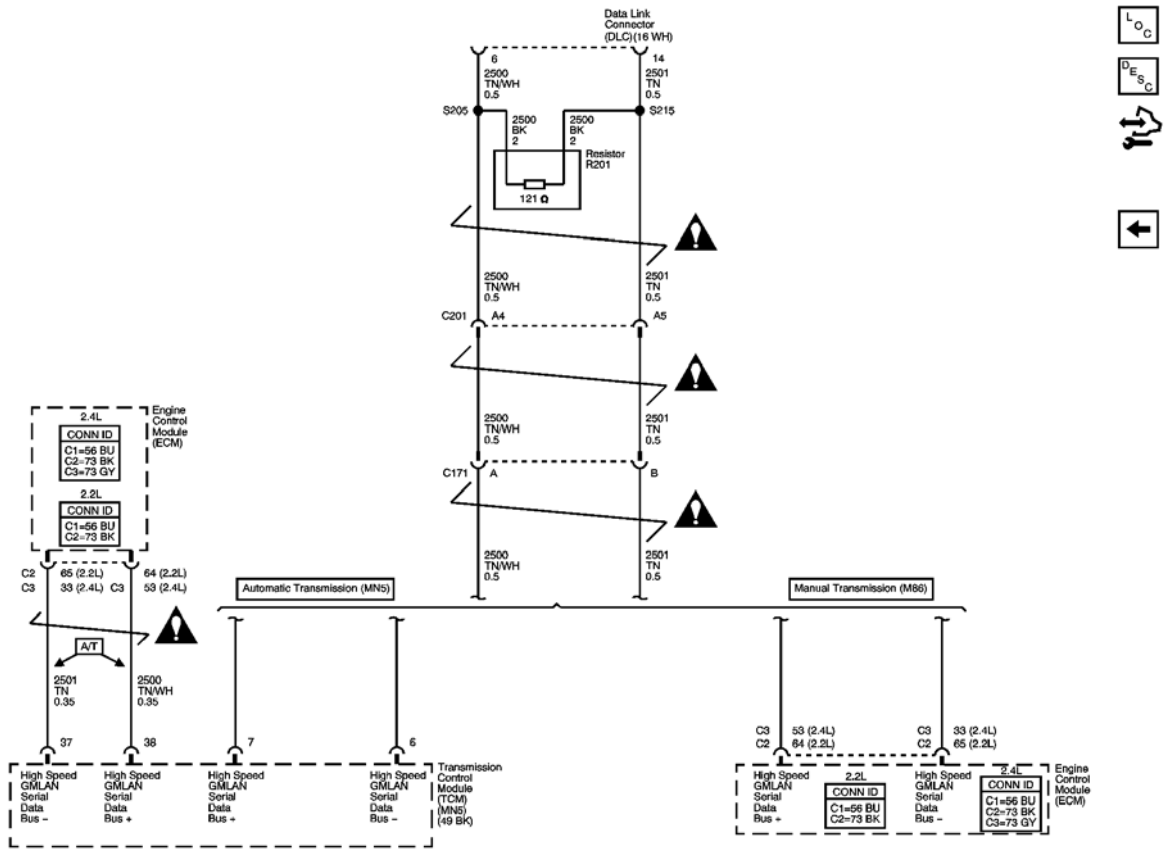


Fig. 6: High Speed GM LAN - 2.2L, 2.4L
Courtesy of GENERAL MOTORS CORP.

RETAINED ACCESSORY POWER (RAP) SCHEMATICS

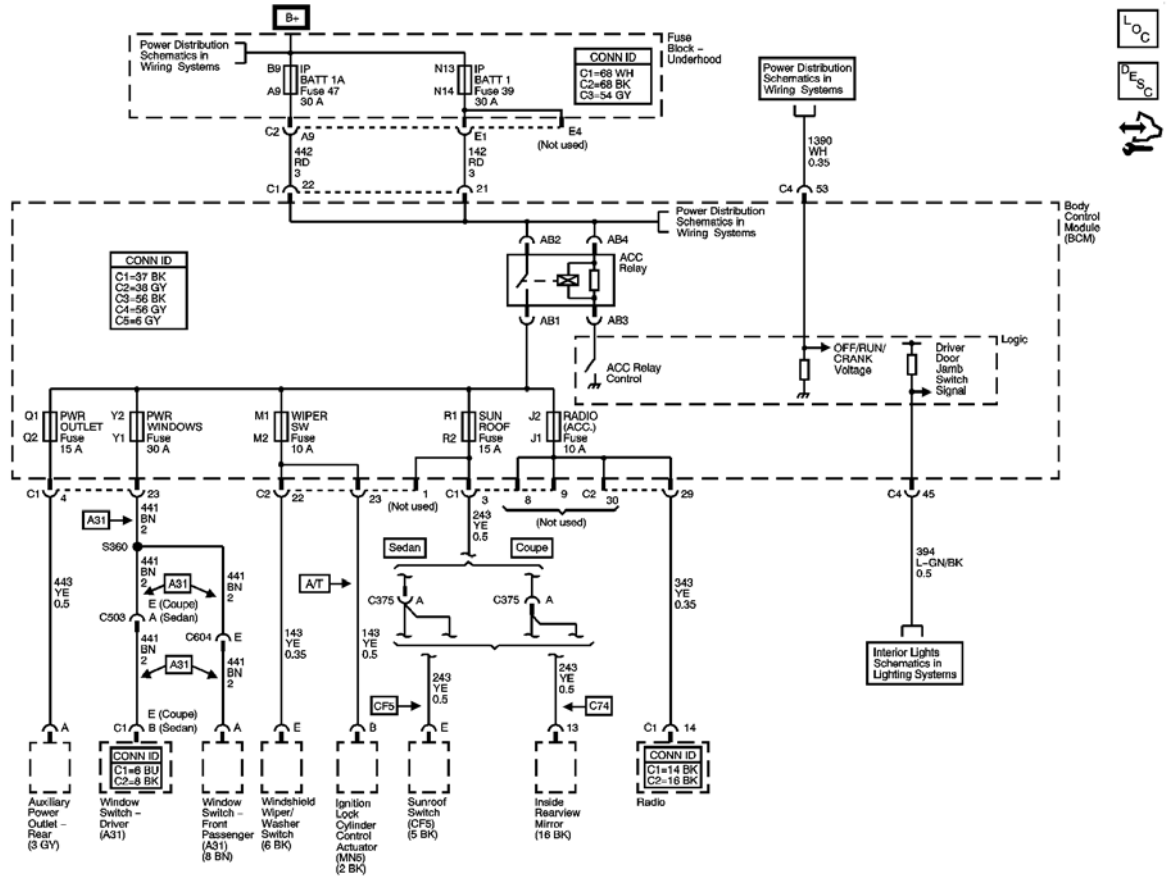


Fig. 7: RAP Schematic

Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

COMPUTER/INTEGRATING SYSTEMS COMPONENT VIEWS

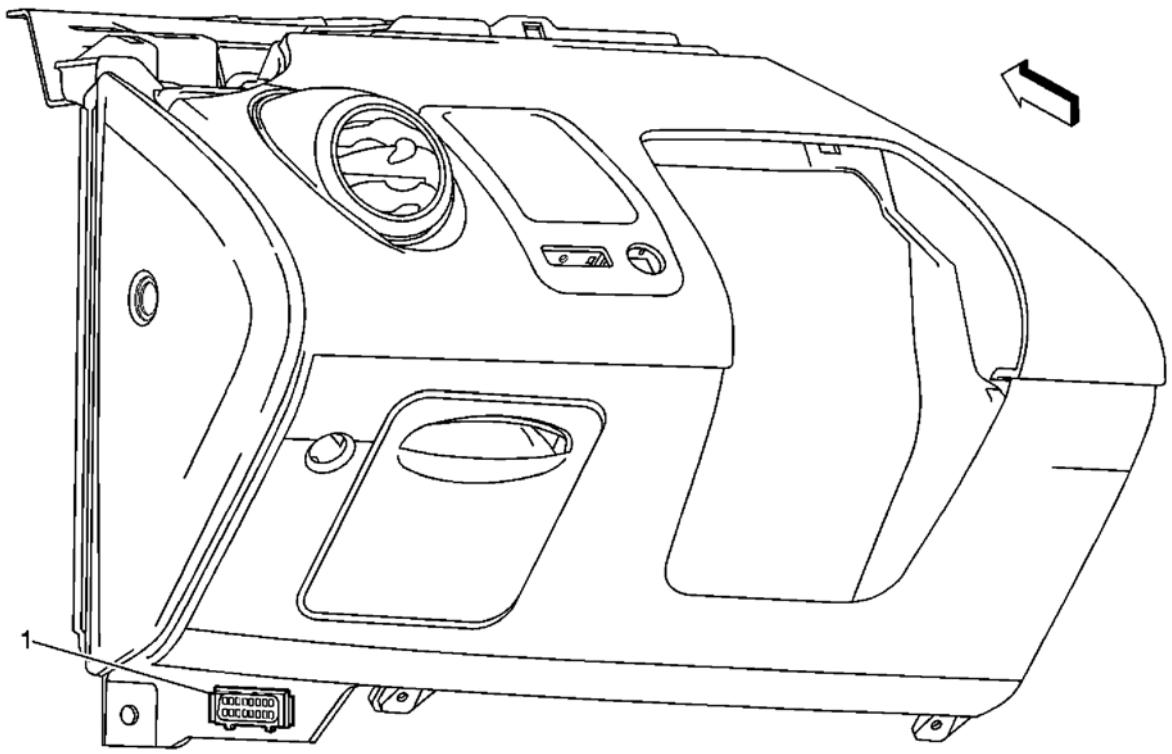


Fig. 8: Left Side of the I/P
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 8

Callout	Component Name
1	Data Link Connector (DLC)

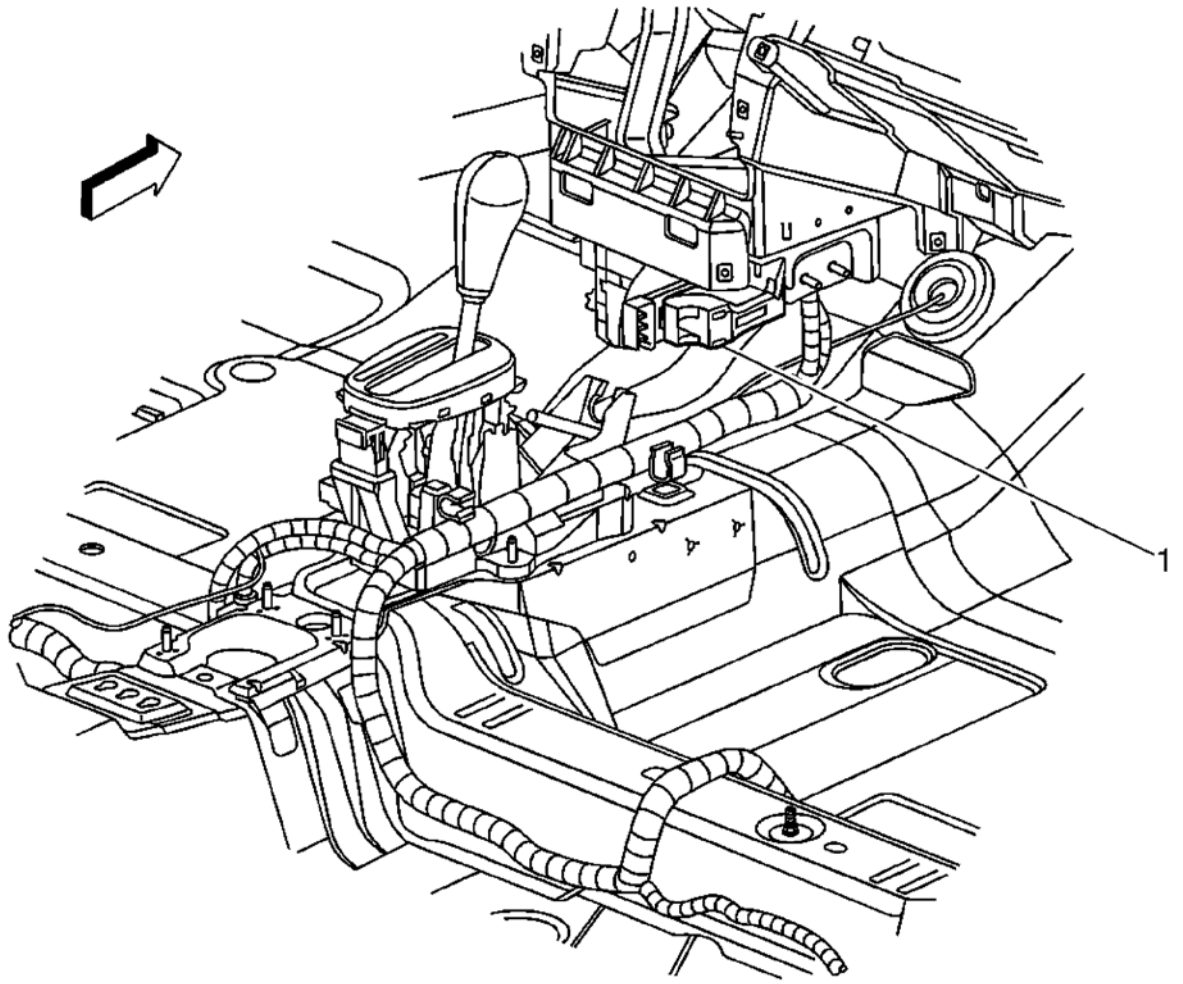


Fig. 9: Lower Center Of I/P Component View
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 9

Callout	Component Name
1	Body Control Module (BCM)

COMPUTER/INTEGRATING SYSTEMS CONNECTOR END VIEWS

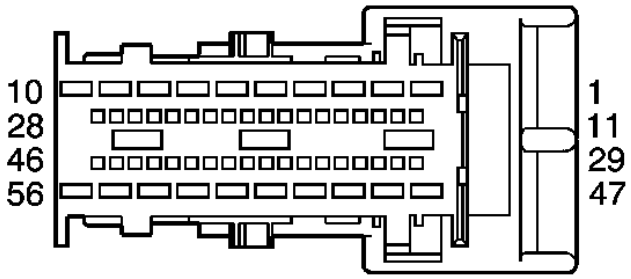
Body Control Module (BCM) C1

Connector Part Information		• 1326143-2 • 37-Way F Amp (BK)	
Pin	**Wire Color**	**Circuit No.**	**Function**
1	-	-	Not Used
2	OG	840	Battery Positive Voltage
3	YE	243	Accessory Voltage
4	YE	443	Accessory Voltage
5	D-BU	1307	Power Window Master Switch Lockout Control (Sedan)
6	D-BU	1307	Power Window Master Switch Lockout Control (Sedan w/A31)
7	D-BU	1307	Power Window Master Switch Lockout Control (Sedan w/A31)
8-16	-	-	Not Used
17	OG	1140	Battery Positive Voltage
18	GY	120	Fuel Pump Supply Voltage
19	D-GN/WH	465	Fuel Pump Relay Control
20	OG	1140	Battery Positive Voltage
21	RD	142	Battery Positive Voltage
22	RD	442	Battery Positive Voltage
23	BN	441	Ignition 3 Voltage (A31)
24	-	-	Not Used
25	PK	1200	Headlamp High Beam Signal
26	L-BU	20	Stop Lamp Switch Signal
27	L-BU	20	Stop Lamp Switch Signal
28	L-BU	20	Stop Lamp Switch Signal
29	L-BU	20	Stop Lamp Switch Signal
30	L-BU	20	Stop Lamp Switch Signal
31	-	-	Not Used
32	PK	3	Ignition 1 Voltage
33	-	-	Not Used
34	RD	342	Battery Positive Voltage
35-36	-	-	Not Used
37	RD	242	Battery Positive Voltage

Body Control Module (BCM) C2

Connector Part Information		• 1326143-1 • 38-Way F Amp (GY)	
Pin	**Wire Color**	**Circuit No.**	**Function**
1	-	-	Not Used
2	OG	40	Battery Positive Voltage
3	OG	240	Battery Positive Voltage
4	-	-	Not Used
5	BN	9	Park Lamp Supply Voltage (T82)
6	OG	840	Battery Positive Voltage
7	PK	1200	Headlamp High Beam Signal
8	L-BU	20	Stop Lamp Switch Signal
9	PK	339	Ignition 1 Voltage (w/o Redline)
10	PK	339	Ignition 1 Voltage (M/T)
11	PK	339	Ignition 1 Voltage
12	-	-	Not Used
13	OG	52	Blower Motor Supply Voltage
14	BN	41	Ignition 3 Voltage
15	BN	141	Ignition 3 Voltage
16	-	-	Not Used
17	OG	1040	Battery Positive Voltage
18	OG	1440	Battery Positive Voltage
19	OG	1440	Battery Positive Voltage
20	-	-	Not Used
21	OG	40	Battery Positive Voltage
22	YE	143	Accessory Voltage
23	YE	143	Accessory Voltage (A/T)
24-27	-	-	Not Used
28	PK	339	Ignition 1 Voltage (2.2L, 2.4L w/M/T)
29	YE	343	Accessory Voltage
30	PK	343	Accessory Voltage (UXE)
31	OG	52	Blower Motor Supply Voltage
32	OG	52	Blower Motor Supply Voltage
33	YE	1139	Ignition 1 Voltage
34	YE	1139	Ignition 1 Voltage (w/o Redline)
35	PK	1539	Ignition 1 Voltage
36	-	-	Not Used
37	OG	1140	Battery Positive Voltage
38	OG	140	Battery Positive Voltage

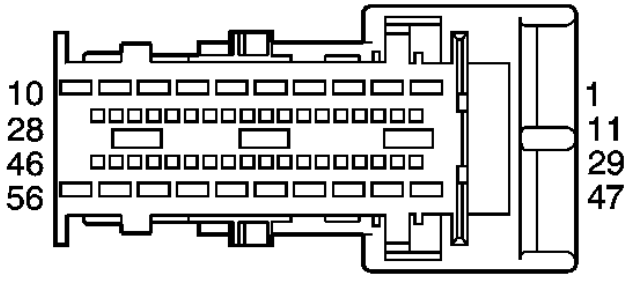
Body Control Module (BCM) C3



Connector Part Information	• **1326144-1** • **56-Way F Amp (BK)**		
Pin	**Wire Color**	**Circuit No.**	**Function**
1	BK/WH	56	Trunk Release Motor Supply Voltage
2	TN	694	Driver Door Lock Actuator Unlock Control
3	OG	1732	Inadvertent Power Supply Voltage
4	D-BU	338	Run/Crank Voltage
5	BN	4	Accessory Voltage
6	BN	9	Park Lamp Supply Voltage
7	BN	9	Park Lamp Supply Voltage
8	BN	9	Park Lamp Supply Voltage
9	BN	9	Park Lamp Supply Voltage
10	RD	228	Windshield Washer Pump Control
11	WH	156	Courtesy Lamp Low Control
12	-	-	Not Used
13	OG	1732	Inadvertent Power Supply Voltage (DG7)
14	-	-	Not Used
15	D-GN	113	Windshield Wiper Switch Signal 2
16	-	-	Not Used
17	YE/BK	68	Low Coolant Level Indicator Signal
18	BK/WH	151	Ground (Sedan)
19	-	-	Not Used
20	BK/WH	151	Ground (Sedan)
21	L-BU	395	Passenger Door Jamb Switch Signal (Sedan)
22	L-BU	395	Passenger Door Jamb Switch Signal (Sedan)
23	YE	196	Windshield Wiper Motor Park Switch Signal
24	-	-	Not Used
25	PK	849	Brake Fluid Level Sensor Signal

26	PU	1807	BCM Class 2 Serial Data (JM4/JL9)
27	PU	1807	BCM Class 2 Serial Data
28-32	-	-	Not Used
33	WH	682	Driver Door Lock Actuator Unlock Control
34	WH	682	Driver Door Lock Actuator Unlock Control
35	D-GN	146	Trunk Ajar Indicator Control
36-38	-	-	Not Used
39	WH	193	Rear Defog Relay Control
40	BK	28	Horn Relay Control
41	YE	317	Fog Lamp Relay Coil Supply Voltage (T37/T96)
42	-	-	Not Used
43	YE	18	Left Turn Signal Lamps Supply Voltage
44	L-BU	14	Left Turn Signal Lamp Supply Voltage
45	D-GN	19	Right Turn Signal Lamps Supply Voltage
46	D-BU	15	Right Turn Signal Lamp Supply Voltage
47	BK	650	Ground
48	GY	295	Door Lock Actuator Lock Control (Sedan)
49	GY	295	Door Lock Actuator Lock Control (Sedan)
50	GY	295	Door Lock Actuator Lock Control
51	GY	295	Door Lock Actuator Lock Control
52	TN	294	Door Lock Actuator Unlock Control
53	TN	294	Door Lock Actuator Unlock Control (Sedan)
54	-	-	Not Used
55	TN	294	Door Lock Actuator Unlock Control (Sedan)
56	D-BU	1201	Headlamp Low Beam Signal

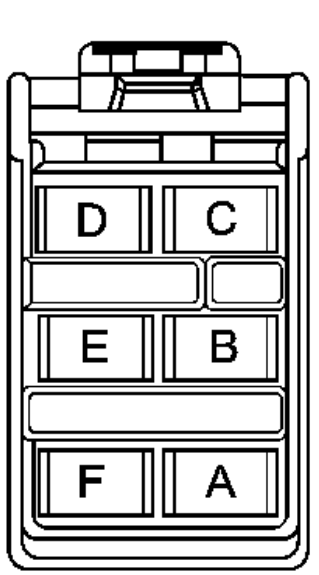
Body Control Module (BCM) C4

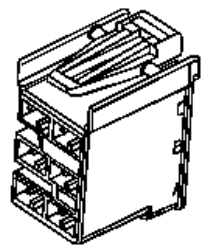


Connector Part Information		• 1326144-2 • 56-Way F Amp (GY)	
Pin	**Wire Color**	**Circuit No.**	**Function**
1	RD	228	Windshield Washer Pump Control
2	BN	9	Park Lamp Supply Voltage
3	-	-	Not Used
4	BN	9	Park Lamp Supply Voltage
5	BN	9	Park Lamp Supply Voltage (T82)
6	BN	4	Accessory Voltage
7	D-BU	338	Run/Crank Voltage
8	-	-	Not Used
9	BN/WH	230	Instrument Panel Lamps Dimming Control
10	-	-	Not Used
11	YE	18	Left Turn Signal Lamps Supply Voltage
12	D-GN	19	Right Turn Signal Lamps Supply Voltage
13	GY	8	Instrument Panel Lamps Supply Voltage
14	GY	8	Instrument Panel Lamps Supply Voltage
15	GY	8	Instrument Panel Lamps Supply Voltage
16	GY	8	Instrument Panel Lamps Supply Voltage
17	GY	8	Instrument Panel Lamps Supply Voltage
18	PU	1807	BCM Class 2 Serial Data
19	PU	1807	BCM Class 2 Serial Data
20	PU	1807	BCM Class 2 Serial Data
21	-	-	Not Used
22	L-GN	66	A/C Request Signal
23	PK/WH	1970	Headlamp Low Beam Relay Control (T82)
24-26	-	-	Not Used
27	BK/WH	151	Ground
28	PU	719	Low Reference
29	GY	8	Instrument Panel Lamps Supply Voltage (UXE)
30	GY	8	Instrument Panel Lamps Supply Voltage
31	GY	8	Instrument Panel Lamps Supply Voltage (T37/T96)
32	YE	317	Fog Lamp Relay Coil Supply Voltage (T37/T96)
33	BK	28	Horn Relay Control
34	BN	323	Shift Lock Solenoid Supply Voltage (A/T)
35	PU	5234	Passenger Seat Belt Indicator
36	WH	193	Rear Defog Relay Control
37	PU/WH	549	Headlamp Switch Headlamps Off Signal (T82)
38	-	-	Not Used
39	PU/WH	1572	Traction Control Indicator Control (NW7)
40	L-BU	1508	Turn/Hazard Switch Supply Voltage
41	GY	112	Windshield Wiper Switch Signal 1

42	BN/WH	1571	Traction Control Switch Signal (NW7)
43	L-BU	1134	Park Brake Switch Signal
44	L-BU	395	Passenger Door Jamb Switch Signal
45	L-GN/BK	394	Driver Door Jamb Switch Signal
46	L-BU	292	Rear Defog Switch Signal
47	D-BU	1201	Headlamp Low Beam Signal
48	WH/BK	1073	5-Volt Reference
49	GY	728	Security Indicator Control
50	L-GN/BK	1137	DRL Ambient Light Sensor Signal 5-Volt (T82)
51	-	-	Not Used
52	OG	192	Front Fog Lamp Switch Signal (T37/T96)
53	WH	1390	Off/Run/Crank Voltage
54	-	-	Not Used
55	YE/BK	1138	DRL Ambient Light Sensor Low Reference (T82)
56	-	-	Not Used

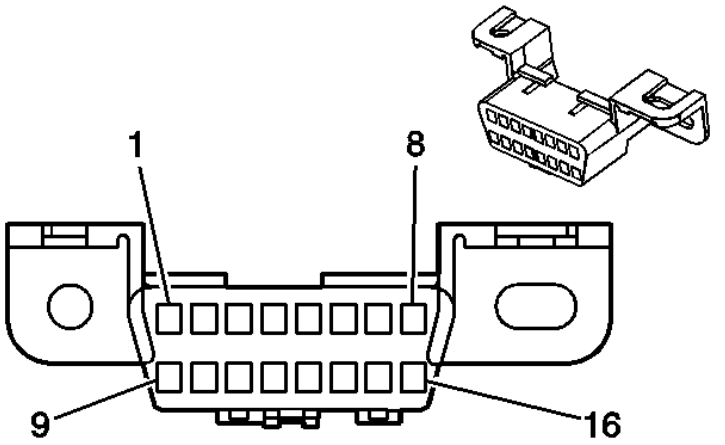
Body Control Module (BCM) C5 (UE1 or U2K)





Connector Part Information		• **12193928** • **6-Way F Metri-Pack 280 Series Flexlock (GY)**	
Pin	**Wire Color**	**Circuit No.**	**Function**
A	OG	1340	Battery Positive Voltage
B-C	-	-	Not Used
D	PU	1807	Class 2 Serial Data (UE1)
E-F	-	-	Not Used

Data Link Connector (DLC)



Connector Part Information	• **179631-1** • **16-Way F (WH)**		
Pin	**Wire Color**	**Circuit No.**	**Function**
1	D-GN	5060	Low Speed GMLAN Serial Data
2	PU	1807	Class 2 Serial Data
3	-	-	Not Used
4	BK	550	Ground
5	BK/WH	151	Ground
6	TN/WH	2500	High Speed GM LAN Serial Data Bus+ (2.2L, 2.4L)
7-13	-	-	Not Used
14	TN	2501	High Speed GM LAN Serial Data Bus- (2.2L, 2.4L)
15	-	-	Not Used
16	OG	40	Battery Positive Voltage

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B1000	Electronic Control Unit (ECU) Performance
DTC B1001	Option Configuration Error
DTC B1004	Electronic Control Unit Identification Circuit
DTC B1009	EEPROM Checksum Mismatch
DTC B1372, B1373, or B1374	** MULTIPLE VALUES **
DTC B1382, B1383, or B1384	** MULTIPLE VALUES **
DTC B1441, B1442, or B1443	** MULTIPLE VALUES **

DTC	Description
DTC C0550	Electronic Control Unit (ECU) Performance
DTC U1000 and U1255	** MULTIPLE VALUES **
DTC U1001-U1254	** MULTIPLE VALUES **
DTC U1300, U1301, or U1305	** MULTIPLE VALUES **
DTC U2100	Controller Area Network (CAN) Bus Communication
DTC U2105-U2199	** MULTIPLE VALUES **

DIAGNOSTIC STARTING POINT - COMPUTER/INTEGRATING SYSTEMS

Begin the system diagnosis with **Diagnostic System Check - Vehicle** in Vehicle DTC Information. The Diagnostic System Check - Vehicle will provide the following information:

- The identification of the control modules which are not communicating.
- The identification of any stored diagnostic trouble codes (DTCs) and their status.

The use of the Diagnostic System Check - Vehicle will identify the correct procedures to begin vehicle diagnosis. These must be performed before system DTC or symptom diagnosis.

SCAN TOOL OUTPUT CONTROLS

Scan Tool Output Controls

Scan Tool Output Control	Additional Menu Selection(s)	Description
Accessory Relay	Miscellaneous Test	Commands the Accessory relay to activate or deactivate.

SCAN TOOL DATA LIST

Body Control Module (BCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Ignition ON/Engine OFF			
Accessory	Ignition	Off/ On	On
Battery Voltage	Data	Volts	12.00
Battery 1	Ignition	Volts	12.00
Driver Door Switch	Door Lock Data	Open/Closed	Closed
Ignition Accessory	Ignition	Active/Inactive	Active
Ignition Mode Switch	Ignition	Volts	4.37
Ignition Run/Crank	Ignition	Low/High	High
Key in Ignition	Ignition	Yes/No	Yes
Last 4 Digits of Part No.	ID Information/Module Information	Numeric	8617
Last 4 Digits of SDM Part No.	ID Information/Module Information	Numeric	5283
Pass Door Switches	Door Lock Data	Open/Closed	Closed
Power Mode	Ignition	Off/Accy/Run	Run
Run/Crank Relay Command	Ignition	Off/On	On
Vin Number.	ID Information/Vin Information	Alphanumeric	1GAL52F93Z0072EX

SCAN TOOL DATA DEFINITIONS

Data

Battery Voltage

The scan tool displays the battery voltage of the vehicle.

ID Information

VIN Number

The scan tool displays the vehicle identification number.

Ignition Data

Accessory

The scan tool displays On when the accessory relay is active.

Battery 1

The scan tool displays the value of the vehicle battery voltage.

Ignition Accessory

The scan tool displays Active when the ignition switch is in the Accessory or Run position.

Ignition Mode Switch

The scan tool displays the value of the Passlock data voltage, which is the signal at the Off/Run/Crank circuit of the Ignition switch output and the BCM input.

Ignition Run/Crank

The scan tool displays High when the vehicle ignition switch is in the Run or Crank position.

Key in Ignition

The scan tool displays Yes when the key is in the ignition.

Power Mode

The scan tool displays Run when the ignition switch is in the Run position. Accy will be displayed in the Accessory position. Accy will also be displayed when the vehicle is in the RAP power mode. Off will be displayed when the ignition switch is in the Off position after the RAP function has timed out or has been overridden by a door switch.

Run/Crank Relay Command

The scan tool displays On when the Run/Crank relay is active.

Input

Driver Door Switch

The scan tool displays the state of the drivers door.

Pass Door Switches

The scan tool displays the state of any of the passengers doors.

Module Information

Last 4 Digits of Part No.

The scan tool displays the last four digits of the BCM part number.

Last 4 Digits of SDM Part No.

The scan tool displays the last four digits of the SDM part number.

DTC B1000

Circuit Description

The internal fault detection is handled inside the control module. No external circuits are involved.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1000 Electronic Control Unit (ECU) Performance

Conditions for Running the DTC

The microprocessor runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground. This program runs even if the voltage is out of the valid operating range.

Conditions for Setting the DTC

- The control module detects an internal write malfunction.
- The control module detects an internal checksum malfunction.

Action Taken When the DTC Sets

The microprocessor 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 module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

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

DTC B1000

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System**

Step	Action	Yes	No
			Check - Vehicle in Vehicle DTC Information
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Retrieve DTCs. Is the DTC retrieved as a current DTC?	Go to **Step 3**	Go to Diagnostic Aids
3	Replace the control module setting the DTC as current. Refer to Control Module References for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 4**	-
4	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B1001

Circuit Description

Some control modules must be configured with serial numbers, vehicle options, or other information. If a control module was not properly configured after installation, that module may set DTC B1001.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1001 Option Configuration Error

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The control module is not configured properly.

Action Taken When the DTC Sets

- The SERVICE VEHICLE SOON indicator illuminates.
- The check gages chime sounds.

Conditions for Clearing the DTC

- A current DTC B1001 will clear when the module is correctly programmed.
- A history DTC B1001 will clear after the ignition has been cycled 100 times, without a repeat of the malfunction.

Diagnostic Aids

The most likely reasons for DTC B1001 being set are incorrect calibration files were downloaded to the module, or the module was replaced without the recalibration

having been performed.

Test Description

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

3: If DTC B1001 is set as current, reprogram the module.

DTC B1001

Step	Action	Yes	No
Connector End View Reference: Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Retrieve current DTCs with the scan tool. Is DTC B1001 retrieved as current?	Go to **Step 3**	Go to **Diagnostic Aids**
3	Perform the programming or setup procedure for the module that set DTC B1001. Refer to **Control Module References** for the proper procedure. Does DTC 1001 reset?	Go to **Step 4**	System OK
4	IMPORTANT: Perform the programming or setup procedure for the module. Replace the module that set DTC B1001. Refer to **Control Module References** for the proper procedure.Did you complete the replacement?	System OK	-

DTC B1004

Circuit Description

The internal fault detection is handled inside the control module. No external circuits are involved.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1004 Electronic Control Unit Identification Circuit

Conditions for Running the DTC

The module microprocessor must be active/awake.

Conditions for Setting the DTC

This DTC indicates the keep alive memory (KAM) in the module has been reset. It is a normal occurrence when battery positive voltage or ground is removed from the module, such as a battery disconnect.

Action Taken When the DTC Sets

The microprocessor reverts back to the base programmed critical operating data until new data is learned and stored in KAM.

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

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

DTC B1004

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Retrieve DTCs. Is the DTC retrieved as a current DTC?	Go to **Step 3**	Go to **Diagnostic Aids**
3	Replace the control module setting the DTC as current. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 4**	-
4	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B1009

Circuit Description

The electrically erasable programmable read-only memory (EEPROM) checksum error detection is handled inside the control module. No external circuits are involved.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B1009 EEPROM Checksum Mismatch

Conditions for Running the DTC

The module runs the program to detect an EEPROM checksum error after each wake-up. The only requirements are battery positive voltage and ground. This program runs even if the voltage is out of the valid operating range.

Conditions for Setting the DTC

The module retains an inverse copy of the digital value stored in certain blocks of memory in the EEPROM. The module then reads the information from those certain

blocks and adds the stored inverse value to the current value. If they do not equal 0, the module sets the DTC.

Action Taken When the DTC Sets

The module reverts to base operation values programed for those blocks of data that have failed the checksum test. The blocks of data that have not failed the checksum test are not affected.

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

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

DTC B1009

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Retrieve DTCs. Is the DTC retrieved as a current DTC?	Go to **Step 3**	Go to **Diagnostic Aids**
3	Replace the control module setting the DTC as current. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 4**	-
4	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC B1372, B1373, OR B1374

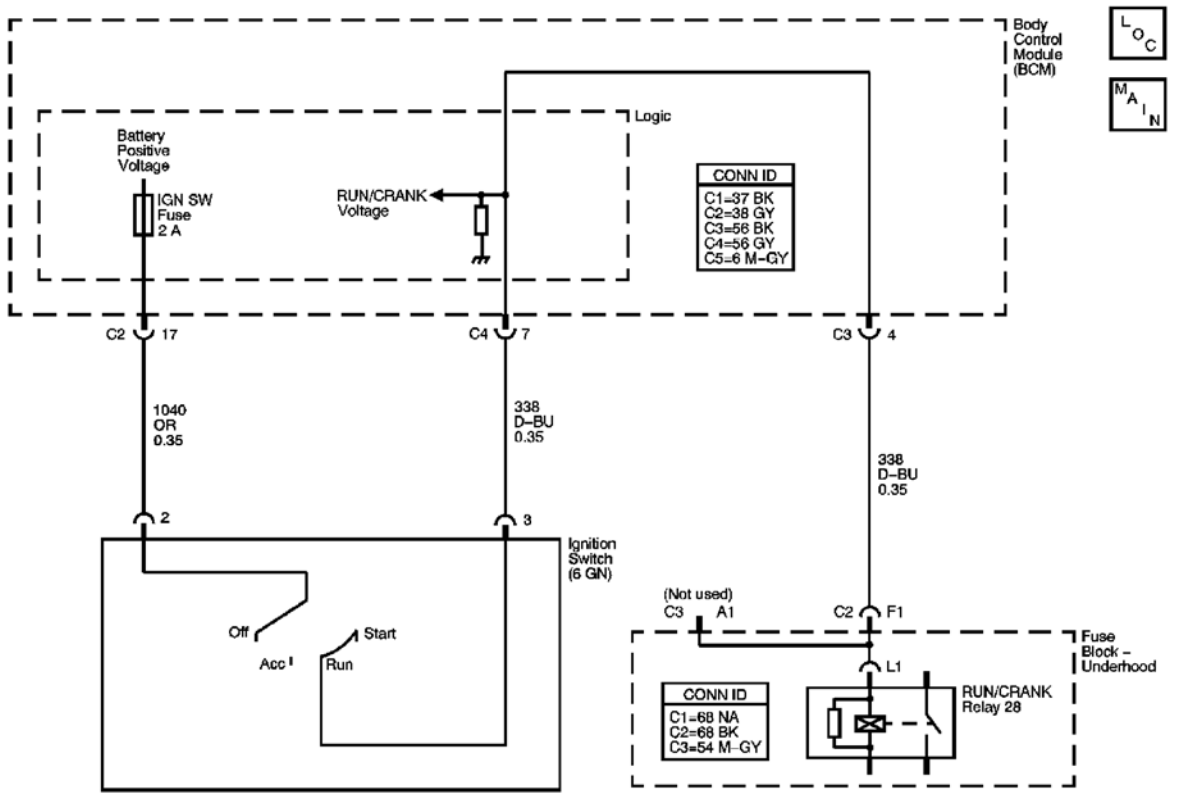


Fig. 10: BCM Circuit

Courtesy of GENERAL MOTORS CORP.

Circuit Description

The body control module (BCM), monitors the ignition inputs Off/Run/Crank, Run/Crank and the accessory signals supplied from the ignition switch. The BCM uses the sequence that the signals appear and their voltage levels to determine the power mode called for by the vehicle operator using the ignition switch. A fuse protected B+ voltage source is supplied by the BCM to the ignition switch over a discrete circuit. The ignition switch uses this voltage for Run/Crank signal discrimination. The Run/Crank signal is also routed to the vehicles Run/Crank relay control coil.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC B1372 Device Ignition 1 (ON and START) Circuit Low
- DTC B1373 Device Ignition 1 (ON and START) Circuit High
- DTC B1374 Device Ignition 1 (ON and START) Circuit Open

Conditions for Running the DTC

- The BCM must be powered and must detect a change in the ignition switch circuit states.
- The vehicles battery must be fully charged.

Conditions for Setting the DTC

DTC B1372

The BCM detects that the Run/Crank signal is shorted to ground for more than 10 seconds in the current ignition cycle.

DTC B1373

The BCM detects that the Run/Crank signal is shorted to B+ for more than 10 seconds in the current ignition cycle.

DTC B1374

The BCM does not detect the Run/Crank signal for more than 10 seconds in the current ignition cycle.

Action Taken When the DTC Sets

- The BCM stores DTC to memory.
- The BCM operates in a fail-safe power mode dependent on the last valid power mode detected and the state of the engine run flag data on the class 2 serial data communications circuits.
- The other modules on the vehicle operate in a fail safe power mode dependent on the last valid power mode transmitted by the BCM and the state of the engine run flag on the class 2 serial data communications circuits.

Conditions for Clearing the DTC

- A current DTC clears on the next malfunction free cycle.
- A history DTC clears when the module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

A history DTC maybe caused by an intermittent short or open in the Off/Run/Crank circuit. Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

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

3: This tests the ignition switch for a short circuit between the B+ supply circuit and the Run/Crank circuit in the Off position.

4: This tests the wiring of the Run/Crank circuit for a short to ground or voltage. This test may be expedited using the DTC to direct the testing. DTC B1372 short to ground or DTC B1373 short to voltage.

5: This tests the ignition switch for a closed circuit between the ignition switch B+ supply circuit and the Run/Crank circuit in the Run and Crank switch positions. Care must be taken as the engine may crank during this test.

DTC B1372, B1373, or B1374

Step	Action	Yes	No
Schematic Reference: Body Control System Schematics **Connector End View Reference:** Computer/Integrating Systems Connector End Views and Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Install a scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Check for DTCs in the range of DTC B1372 to DTC B1374 in the Body Control menu.	Go to **Step 3**	Go to **Diagnostic Aids**

Step	Action	Yes	No
3	Does the scan tool display DTC B1372 to DTC B1374 as current? 1. Disconnect the body control module (BCM) harness connectors C2 and C4. 2. Place the ignition switch in the OFF position, leaving the key in the ignition. 3. Test for a short to ground and a short to B+ between the Run/Crank circuit and the ignition switch B+ supply circuit at the BCM harness connector. Refer to **Body Control System Schematics** and **Circuit Testing** in Wiring Systems. Did you find a short between the two circuits?	Go to **Step 4**	Go to **Step 5**
4	1. Disconnect the ignition switch harness connector. 2. Test the Run/Crank ignition switch circuit and the ignition switch B+ supply circuit for a short to ground or voltage at the BCM harness connector. Refer to the following: • **Body Control System Schematics** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 9**	Go to **Step 7**
5	IMPORTANT: The engine may crank during this procedure. 1. Turn the ignition switch to the RUN position. 2. Test for continuity between the Run/Crank terminal and the ignition switch B+ supply terminal on the BCM harness connector. Refer to **Circuit Testing** in Wiring Systems. 3. Turn the ignition switch to CRANK. 4. Test for continuity between the Run/Crank terminal and the ignition switch B+ supply terminal on the BCM harness connector. Can you measure continuity in both Run and Crank?	Go to **Step 8**	Go to **Step 6**
6	Test the Run/Crank and the ignition switch B+ supply terminals of the ignition switch harness connector, for intermittent or poor connections, and an open condition. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 7**
7	Replace the ignition switch. Refer to **Ignition Lock Cylinder Case Replacement** in Steering Wheel and Column. Did you complete the replacement?	Go to **Step 9**	-
8	Replace the BCM. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 9**	-
9	1. Reconnect all disconnected connectors. 2. Install the scan tool. 3. Turn the ignition ON, with the engine OFF. 4. Use the scan tool in order to clear the DTCs. 5. Operate the vehicle within the conditions for running the DTCs as specified in	Go to **Step 1**	System OK

Step	Action	Yes	No
	the supporting text. Does the DTC reset?		

DTC B1382, B1383, OR B1384

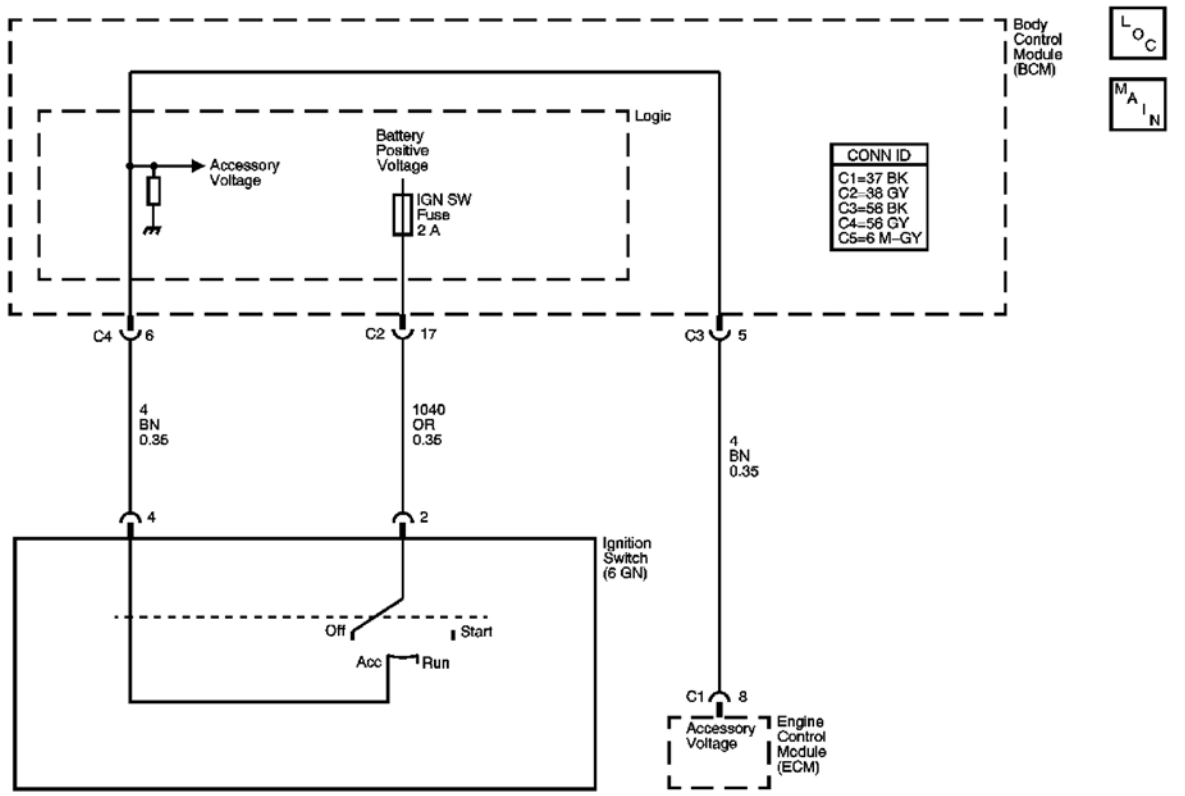


Fig. 11: BCM Circuit (DTC B1382 - B1384)
Courtesy of GENERAL MOTORS CORP.

Circuit Description

The body control module (BCM) monitors the ignition inputs Off/Run/Crank, Run/Crank and the accessory signals supplied from the ignition switch. The BCM uses the sequence that the signals appear and their voltage levels to determine the power mode called for by the vehicle operator using the ignition switch. A fuse protected B+ voltage source is supplied by the BCM to the ignition switch over a discrete circuit. The ignition switch uses this voltage for accessory signal discrimination. The accessory signal is also routed to the vehicles electronic control unit (ECU) and is used as a digital signal reference.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC B1382 Device Ignition ACCESSORY Circuit Low
- DTC B1383 Device Ignition ACCESSORY Circuit High
- DTC B1384 Device Ignition ACCESSORY Circuit Open

Conditions for Running the DTC

- The BCM must be powered and must detect a change in the ignition switch circuit states.
- The vehicles battery must be fully charged.

Conditions for Setting the DTC

DTC B1382

The BCM detects that the accessory signal is shorted to ground for more than 10 seconds in the current ignition cycle.

DTC B1383

The BCM detects that the accessory signal is shorted to B+ for more than 10 seconds in the current ignition cycle.

DTC B1384

The BCM does not detect the accessory signal for more than 10 seconds in the current ignition cycle.

Action Taken When the DTC Sets

- The BCM stores DTC to memory.
- The BCM operates in a fail-safe power mode dependent on the last valid power mode detected and the state of the engine run flag data on the class 2 serial data communications circuits.
- The other modules on the vehicle operate in a fail-safe power mode dependent on the last valid power mode transmitted by the BCM and the state of the engine run flag on the class 2 serial data communications circuits.

Conditions for Clearing the DTC

- A current DTC clears on the next malfunction free cycle.
- A history DTC clears when the module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

A history DTC may be caused by an intermittent short or open in the accessory circuit. Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

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

3: This tests the ignition switch for a short circuit between the B+ supply circuit and the accessory circuit in the Off position.

4: This tests the wiring of the accessory circuit for a short to ground or voltage. This test may be expedited using the DTC to direct the testing. DTC B1382 short to ground or DTC B1383 short to voltage.

5: This tests the ignition switch for a closed circuit between the B+ supply circuit and the accessory circuit.

DTC B1382, B1383, or B1384

Step	Action	Yes	No
Schematic Reference: Body Control System Schematics **Connector End View Reference:** Computer/Integrating Systems Connector End Views and Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information

Step	Action	Yes	No
2	1. Install a scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Check for DTCs in the range of B1382 to B1384 in the Body Control menu. Does the scan tool display DTC B1382 to DTC B1384 as current?	Go to **Step 3**	Go to **Diagnostic Aids**
3	1. Disconnect the body control module (BCM) harness connectors C2 and C4. 2. Place the ignition switch in the OFF position, leaving the key in the ignition. 3. Test for a short to ground and a short to B+ between the accessory circuit and the ignition switch B+ supply circuit at the BCM harness connector. Refer to **Body Control System Schematics** and **Circuit Testing** in Wiring Systems. Did you find a short between the two circuits?	Go to **Step 4**	Go to **Step 5**
4	1. Disconnect the ignition switch harness connector. 2. Test the accessory ignition switch circuit and the ignition switch B+ supply circuit for a short to ground or voltage at the BCM harness connector. Refer to the following: • **Body Control System Schematics** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 9**	Go to **Step 7**
5	1. Turn the ignition switch to the RUN position. 2. Test for continuity between the accessory terminal and the ignition switch B+ supply terminal on the BCM harness connector. Can you measure continuity?	Go to **Step 8**	Go to **Step 6**
6	Test the accessory and the ignition switch B+ supply terminals of the ignition switch harness connector, for intermittent or poor connections, and an open condition. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 7**
7	Replace the ignition switch. Refer to **Ignition Lock Cylinder Case Replacement** in Steering Wheel and Column. Did you complete the replacement?	Go to **Step 9**	-
8	Replace the BCM. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 9**	-
9	1. Connect all disconnected connectors. 2. Install the scan tool. 3. Turn the ignition ON, with the engine OFF. 4. Use the scan tool in order to clear the DTCs. 5. Operate the vehicle within the conditions for running the DTCs as specified in the supporting text. Does the DTC reset?	Go to **Step 1**	System OK

DTC B1441, B1442, OR B1443

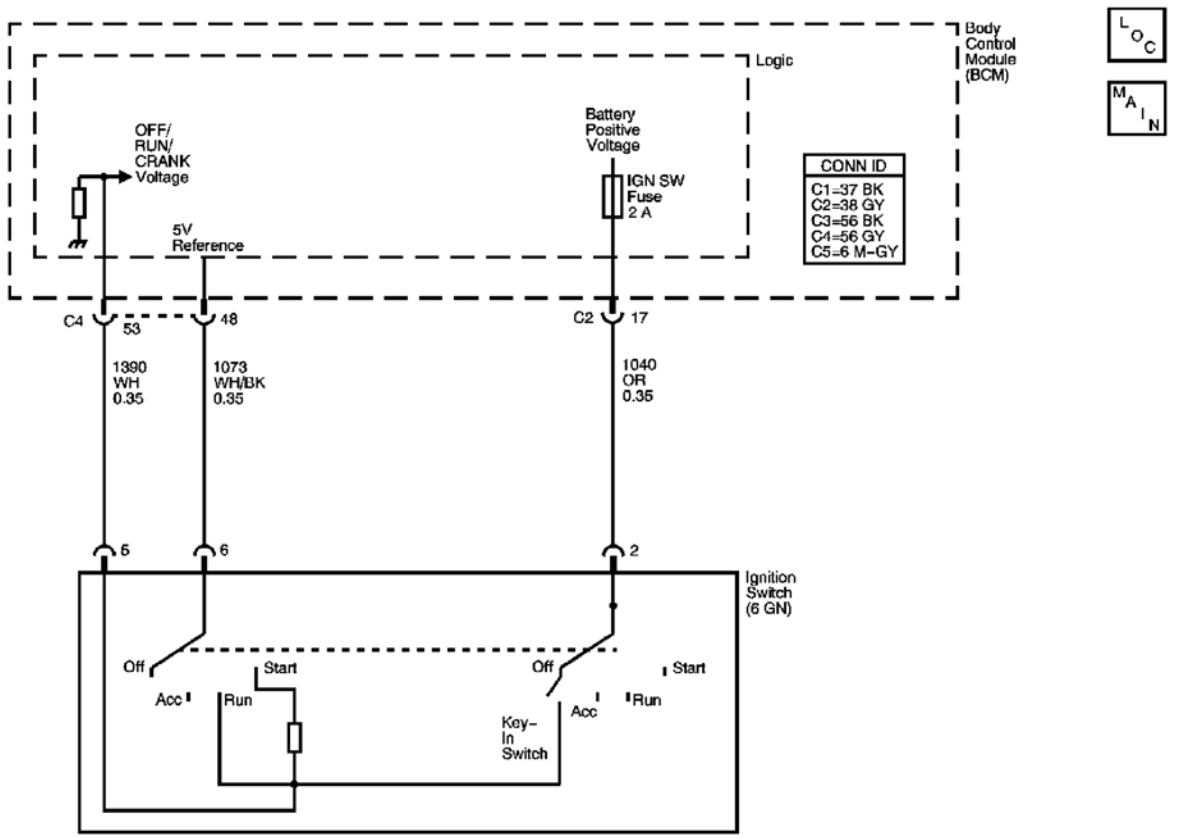


Fig. 12: BCM Circuit
Courtesy of GENERAL MOTORS CORP.

Circuit Description

The body control module (BCM) monitors the inputs Off/Run/Crank, Run/Crank and the Accessory signals supplied from the ignition switch. The BCM uses the sequence that the signals appear and their voltage levels to determine the power mode called for by the vehicle operator and the ignition switch. A +5 volt regulated voltage source is supplied by the BCM to the ignition switch over a discrete circuit. The ignition switch uses this voltage for Off/Run/Crank signal discrimination and the anti theft reference voltage generation. A constant battery positive voltage is also supplied to the ignition switch to generate the Run/Crank, Accessory and Key In signals. These signals are transmitted to the BCM over discrete circuits. The Accessory signal is also routed to the vehicles electronic control unit (ECU) and is used as a digital signal reference. The Run/Crank signal in conjunction with being supplied to the BCM is sent directly to the Run/Crank relay control coil.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC B1441 Device Ignition OFF, RUN, and CRANK Circuit
- DTC B1442 Device Ignition OFF, RUN, and CRANK Circuit Low
- DTC B1443 Device Ignition OFF, RUN, and CRANK Circuit High

Conditions for Running the DTC

- The BCM must be powered and must detect a change in the ignition switch circuit states.
- The vehicle battery must be fully charged.

Conditions for Setting the DTC

DTC B1441

The BCM does not detect the Off/Run/Crank signal for more than 10 seconds in the current ignition cycle.

DTC B1442

The BCM detects that the Off/Run/Crank signal is shorted to ground for more than 10 seconds in the current ignition cycle.

DTC B1443

The BCM detects that the Off/Run/Crank signal is shorted to B+ for more than 10 seconds in the current ignition cycle.

Action Taken When the DTC Sets

- The BCM stores the DTC to memory.
- The BCM operates in a fail-safe power mode dependent on the last valid power mode detected and the state of the engine run flag data on the serial data communications circuits.
- The other modules on the vehicle operate in a fail-safe power mode dependent on the last valid power mode transmitted by the BCM and the state of the engine run flag on the serial data communications circuits.

Conditions for Clearing the DTC

- A current DTC clears on the next malfunction free cycle.
- A history DTC clears when the module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

- A history DTC maybe caused by an intermittent short or open in the Off/Run/Crank circuit.
- The BCM supplies a +5-regulated voltage source to the ignition switch to develop the Off/Run/Crank signal.

Test Description

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

5: This step test for an open circuit in the wiring between the ignition switch and the BCM.

6: This tests the +5-volt regulated supply in the BCM.

7: This tests the ignition switch for a closed circuit between the +5-volt regulated supply and the Off/Run/Crank circuit.

10: This tests the wiring of the Off/Run/Crank circuit for a shot to ground or voltage. This test may be expedited using the DTC to direct the testing. DTC B1442 short to ground or DTC B1443 short to voltage.

11: This tests for an internal short to ground or voltage in the ignition switch. The key must be removed and installed as directed or a false diagnosis will occur.

DTC B1441, B1442, or B1443

Step	Action	Yes	No
Schematic Reference: Body Control System Schematics **Connector End View Reference:** Computer/Integrating Systems Connector End Views and Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information

Step	Action	Yes	No
2	1. Install a scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Check for DTCs in the range of B1441 to B1443 in the Body Control menu. Does the scan tool display DTC B1441 as current?	Go to **Step 5**	Go to **Step 3**
3	Does the scan tool display DTC B1442 as current?	Go to **Step 10**	Go to **Step 4**
4	Does the scan tool display DTC B1443 as current?	Go to **Step 10**	Go to **Diagnostic Aids**
5	1. Disconnect the body control module (BCM) harness connectors C2 and C4. 2. Disconnect the ignition switch harness connector. 3. Test the Off/Run/Crank ignition switch circuit for an open. Refer to the following: • **Body Control System Schematics** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 14**	Go to **Step 6**
6	1. Reconnect the BCM harness connectors. 2. Measure for voltage at the +5-volt regulated power supply terminal of the ignition switch harness connector. Refer to **Circuit Testing** in Wiring Systems. Does the voltage measure +5 volts?	Go to **Step 7**	Go to **Step 13**
7	1. Disconnect the BCM harness connectors C2 and C4. 2. Reconnect the ignition switch harness connector. 3. Turn the ignition switch to the RUN position. 4. Test for continuity between Off/Run/Crank terminal and +5-volt regulated power supply terminal on the BCM harness connector. Can you measure continuity?	Go to **Step 9**	Go to **Step 8**
8	Test the Off/Run/Crank and the +5-volt regulated power supply terminals of the ignition switch harness connector, for intermittent or poor connections. Did you find and repair the malfunction?	Go to **Step 14**	Go to **Step 12**
9	Test the Off/Run/Crank and the +5-volt regulated power supply terminals of the BCM harness connector, for an intermittent or poor connections. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 13**
10	1. Disconnect the BCM harness connectors C2 and C4. 2. Disconnect the ignition switch harness connector. 3. Test the Off/Run/Crank ignition switch circuit for a short to ground or voltage. Refer to the following: • **Body Control System Schematics** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems	Go to **Step 14**	Go to **Step 11**

Step	Action	Yes	No
	Did you find and correct the condition?		
11	1. Reconnect the ignition switch harness connector. 2. Remove the key from the ignition switch. 3. Test for a short to ground or voltage at the Off/Run/Crank terminal of the BCM harness connector. 4. Install the key and place the ignition switch in the RUN position. 5. Test for a short to ground or voltage at the Off/Run/Crank terminal of the BCM harness connector. Did you observe a short to ground or voltage?	Go to **Step 12**	Go to **Step 13**
12	Replace the ignition switch. Refer to **Ignition Lock Cylinder Case Replacement** in Steering Wheel and Column. Did you complete the replacement?	Go to **Step 14**	-
13	Replace the BCM. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 14**	-
14	1. Connect all disconnected connectors. 2. Install the scan tool. 3. Turn the ignition ON, with the engine OFF. 4. Use the scan tool in order to clear the DTCs. 5. Operate the vehicle within the Conditions for Running the DTCs as specified in the supporting text. Does the DTC reset?	Go to **Step 1**	System OK

DTC C0550

Circuit Description

The internal fault detection is handled inside the control module. No external circuits are involved.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC C0550 Electronic Control Unit (ECU) Performance

Conditions for Running the DTC

The microprocessor runs the program to detect an internal fault when power up is commanded. The only requirements are voltage and ground. This program runs even if the voltage is out of the valid operating range.

Conditions for Setting the DTC

- The control module detects an internal write malfunction.
- The control module detects an internal checksum malfunction.

Action Taken When the DTC Sets

If equipped, the following module specific actions may occur:

- The ABS indicator turns on.
- The BRAKE Warning indicator turns on.
- The SERVICE 4WD indicator turns on and the system will be disabled.
- The Service 4 Wheel Steering indicator turns on and the system will be disabled.
- The SERVICE RIDE SYS or SERVICE RIDE CONTROL message is displayed.
- The SERVICE SUSPENSION SYS message is displayed.
- The traction control system (TCS) indicator turns ON.

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

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

DTC C0550

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Retrieve DTCs. Is the DTC retrieved as a current DTC?	Go to **Step 3**	Go to **Diagnostic Aids**
3	Replace the control module setting the DTC as current. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 4**	-
4	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	Go to **Step 2**	System OK

DTC U0073

Circuit Description

The GMLAN serial data circuits are controller area network (CAN) high and/or low speed serial data buses used to communicate information between the control modules. Typical data transmission speeds must be high enough to ensure that a required real-time response is maintained. There are two different types of GMLAN serial data circuits, the High speed 2-wire circuit and Low speed single wire circuit. Refer to **Data Link Communications Description and Operation** for the complete description of the buses used on this vehicle. The GMLAN serial data circuits also communicate directly to the data link connector (DLC). Messages are interpreted by the externally

connected CANdi module which acts as a transceiver for the scan tool.

Modules connected to the GMLAN serial data circuits monitor communications during normal vehicle operation, where operation information is exchanged among the modules. All the modules on the GMLAN networks, maintain a transmit error counter (TEC) and a receive error counter (REC). The counter values increase with detected errors and will decrease with error-free messages. If the TEC value exceeds 255, the controller removes itself from the network and DTC U0073 will result.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC U0073 Controller Area Network (CAN) Bus Communication

Conditions for Running the DTCs

- Supply voltage to the modules are in the normal operating range.
- The vehicle is in the RUN power mode.

Conditions for Setting the DTC

The module setting the DTC has attempted to establish communications on the GMLAN circuits for more than 7 times.

Action Taken When the DTCs Sets

- The module suspends all message transmission.
- The module uses default values for all parameters received on the serial data circuits.
- The module 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 module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

- This DTC cannot be retrieved with a current status. Diagnosis of a current DTC is accomplished via the symptom, Scan Tool Does Not Communicate with High and/or Low Speed GMLAN Device. Refer to Data Link References for the correct procedure for the specific module(s) and the busses they use to communicate.
- An intermittent condition is likely to be caused by a short on the GMLAN serial data circuits. Use the Scan Tool Does Not Communicate with High and/or Low Speed GMLAN Device procedure in order to isolate an intermittent condition. Refer to Data Link References for the correct procedure for the specific modules.

DTC U0100-U0299

Circuit Description

Modules connected to the high speed GMLAN serial data circuits monitor for serial data communications during normal vehicle operation. Operating information and commands are exchanged among the modules. The modules have prerecorded information about what messages are needed to be exchanged on the serial data circuits, for each virtual network. The messages are supervised; also, some periodic messages are used by the receiver module as an availability indication of the transmitter module. The supervision time-out period is 250 ms. Each message contains the identification number of the transmitter module.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC U0100 Lost Communication With Engine Control Module (ECM)

- DTC U0101 Lost Communication With Transmission Control Module (TCM)
- DTC U0121 Lost Communication With Electronic Brake Control Module (EBCM)
- DTC U0140 Lost Communication With Body Control Module (BCM)

This vehicle has DTCs which include DTC Symptoms. For more information on DTC Symptoms refer to DTC Symptom Description .

DTC Descriptors

DTC Symptom	DTC Symptom Descriptor
00	No Additional Information

Conditions for Running the DTCs

- Voltage supplied to the modules is in the normal operating voltage range.
- The vehicle power mode requires serial data communication to occur.
- The DTC U0001 does not have a current status.

Conditions for Setting the DTC

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

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

- A poor connection at the inoperative module may cause this code to set.
- An improperly powered module may cause this code to set.

Test Description

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

3. The scan tool communicate with OnStar(R) via class 2, so for high speed GMLAN data link diagnostic the OnStar(R) will not be considered.

15. The module which was not communicating due to an open in the GMLAN serial data circuits may have set Loss of Communication DTCs for those modules that it was monitoring.

17. The modules which can communicate indicate the module which cannot communicate. You must clear the DTC from these modules to avoid future misdiagnosis.

DTC U0100-U0299

Step	Action	Yes	No
Schematic Reference: Data Link Connector (DLC) Schematics **Connector End View Reference:** Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle**

Step	Action	Yes	No
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Attempt to communicate with the body control module (BCM). Were you able to communicate with BCM?	Go to **Step 3**	Go to **Step 8**
3	Attempt to communicate with the electronic suspension control (ESC) module. Were you able to communicate with ESC module?	Go to **Step 8**	Go to **Step 4**
4	1. Turn OFF the ignition. 2. Disconnect the vehicle OnStar(R). 3. Bypass the OnStar(R) installing jumpers between high speed GMLAN serial data circuits at the OnStar(R) connector: • Connect a jumper between high speed GMLAN bus (+) circuit to BCM and high speed GMLAN bus (+) circuit to the ESC module. • Connect a jumper between high speed GMLAN bus (-) circuit to BCM and high speed GMLAN bus (-) circuit to the ESC module. 4. Attempt to communicate with ESC module. Were you able to communicate with ESC module?	Go to **Step 5**	Go to **Step 7**
5	Test the high speed GMLAN serial data circuits of the OnStar(R) for poor connections. Refer to **TESTING FOR INTERMITTENT CONDITIONS AND POOR CONNECTIONS** and **CONNECTOR REPAIRS** . Did you find and correct the condition?	Go to **Step 17**	Go to **Step 6**
6	Replace the OnStar(R). Refer to **Control Module References** for replacement, setup, and programming.. Did you complete the replacement?	Go to **Step 17**	--
7	1. Turn OFF the ignition. 2. Test all the high speed GMLAN serial data circuits between BCM and ESC module for an open. Refer to the following: • **CIRCUIT TESTING** • **GMLAN WIRING REPAIRS** Did you find and correct the condition?	Go to **Step 17**	Go to **Step 8**
8	Replace the module that is not communicating. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the repair?	Go to **Step 11**	-
9	1. Turn OFF the ignition. 2. Test the ground circuits of the module that is not communicating, for an open. Refer to the following: • **Control Module References** for replacement, setup, and programming • **CIRCUIT TESTING**	Go to **Step 17**	Go to **Step 10**

Step	Action	Yes	No
	• **WIRING REPAIRS** Did you find and correct the condition?		
10	Test the high speed GMLAN serial data circuits of the module that is not communicating, for an open. Refer to the following: • **Control Module References** for replacement, setup, and programming • **CIRCUIT TESTING** • **GMLAN WIRING REPAIRS** Did you find and correct the condition?	Go to **Step 15**	Go to **Step 11**
11	Test the following circuits of the module that is not communicating, for poor connections: • The battery positive voltage circuits • The battery voltage output circuits • The switched battery positive voltage circuits • The ground circuits • The GMLAN serial data circuits Refer to **TESTING FOR INTERMITTENT CONDITIONS AND POOR CONNECTIONS** and **CONNECTOR REPAIRS** . Did you find and correct the condition?	Go to **Step 17**	Go to **Step 12**
12	Replace the module that is not communicating. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 17**	--
13	Inspect for poor connections at the harness connector of the BCM. Refer to **TESTING FOR INTERMITTENT CONDITIONS AND POOR CONNECTIONS** and **CONNECTOR REPAIRS** . Did you find and correct the condition?	Go to **Step 17**	Go to **Step 14**
14	Replace the BCM. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 17**	--
15	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Retrieve DTCs from the module that was not communicating. Does the scan tool display any DTCs which do not begin with a "U"?	Go to the **Diagnostic System Check - Vehicle**	Go to **Step 16**
16	Use the scan tool in order to clear the DTCs. Did you complete the action?	Go to **Step 17**	--
17	Retrieve DTCs from the modules which had the Loss of Communications DTC set. Does the scan tool display any DTCs which do not begin with a "U"?	Go to the **Diagnostic System Check - Vehicle**	Go to **Step 18**

Step	Action	Yes	No
18	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. Did you complete the action?	System OK	--

DTC U1000 AND U1255

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 (SOH) 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 about 5 seconds of beginning serial data communication, DTC U1000 or U1255 is set. If more than one critical parameter does not have an identification number association, the DTC will only be reported once.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC U1000 Class 2 Data Link Malfunction
- DTC U1255 Lost Communications

Conditions for Running the DTC

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

Conditions for Setting the DTC

At least one critical operating parameter has not been associated with an identification number within about 5 seconds after beginning 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 U1000 will clear when all critical operating parameters for the module have been associated with an identification number, or at the end of the current ignition cycle.
- A history DTC U1000 will clear after 50 ignition switch ON/OFF cycles with no repeat of the failure.

Diagnostic Aids

When a malfunction, such as an open fuse to a module occurs while modules are communicating, a Lost Communication DTC for a specific module 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 DTC U1000 is set current by the other modules. If the malfunction occurs when the modules are not communicating, only DTC U1000 or U1255 is set.

Test Description

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

1: A Lost Communication with XXX DTC with a history status may indicate the cause of U1000.

2: The module that is not communicating is the likely cause of U1000 or U1255 being set.

5: The module which was not communicating may have set Lost Communication with XXX DTCs for those modules that it was monitoring.

6: The module which was not communicating may have set Lost Communication with XXX DTCs for those modules that it was monitoring.

7: The module that was not communicating may have set Lost Communication with XXX DTCs for those modules that the module was monitoring.

11: The modules that communicate indicate the module that cannot communicate. You must clear the DTC from the modules in order to avoid future misdiagnosis.

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

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

DTC U1000 and U1255

Step	Action	Yes	No
Schematic Reference: Data Link Connector (DLC) Schematics **Connector End View Reference:** Master Electrical Component List in Wiring Systems			
1	Did you record any DTCs in the range of U1001-U1254 with a history status?	Go to **DTC U1001-U1254**	Go to **Step 2**
2	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 recorded modules to the modules populated on the vehicle. Refer to **Control Module References** for the vehicle module content. Do any modules on the class 2 serial data circuit not communicate?	Go to **Step 3**	Go to **Step 13**
3	Test the battery positive voltage circuits, the ignition voltage input circuits and ignition voltage output circuits of the module that is not communicating for an open or a short to ground. Refer to **Control Module References** for the applicable schematic. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 4**
4	1. Turn OFF the ignition. 2. Test the ground circuits of the module that is not communicating for an open. Refer to **Control Module References**, **Circuit Testing** and **Wiring Repairs** in Wiring Systems for the applicable schematics and procedures. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 5**
5	1. Disconnect the star connector. 2. Inspect for poor connection at the star connector. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 6**

Step	Action	Yes	No
6	Test the class 2 serial data circuit of the module that is not communicating for an open. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 7**
7	Inspect for poor connections at the battery positive voltage circuits, the ignition voltage input circuits, the ignition voltage output circuits, the ground circuits, and the class 2 serial data circuit of the module that is not communicating. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 8**
8	Replace the module that is not communicating. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the repair?	Go to **Step 11**	-
9	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Select the Display DTCs function for the module that was not communicating. Does the scan tool display any DTCs that do not begin with a "U"?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	Go to **Step 10**
10	Use the scan tool in order to clear the DTCs. Did you complete the action?	Go to **Step 11**	-
11	Select the Display DTCs function for the modules which had U1000 or U1255 set as a current DTC. Does the scan tool display DTCs which do not begin with a "U"?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	Go to **Step 12**
12	Use the scan tool in order to clear the DTCs. Did you complete the action?	System OK	-
13	Did you record any other DTCs for the modules which had U1000 or U1255 set as a current DTC?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	Go to **Step 14**
14	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. Wait 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 or U1255 set as a current DTC?	Go to **Step 15**	Go to **Diagnostic Aids**
15	Replace to the module that had U1000 or U1255 set as a current DTC. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the repair?	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, Node Alive messages. 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 modules 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 2-5 seconds. When no message is detected from a learned identification number for 5 seconds, a DTC U1xxx, where xxx is equal to the three digit identification number.

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 cannot communicate.

Control Module ID

Control Module	ID Number
Body Control Module (BCM)	064
Electronic Brake Control Module (EBCM)	040
Electronic Power Steering (EPS)	048
Engine Control Module (ECM)	016
Instrument Panel Cluster (IPC)	096
Sensing and Diagnostic Module (SDM)	088
Vehicle Communication Module (VCIM)	151

When more than one Loss of Communication DTC is set in either one 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.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC U1001 Lost Communications With Powertrain Multiple Control System
- DTC U1254 Unassigned

Conditions for Running the DTC

- The vehicle power mode, ignition switch position, requires serial data communication to occur.
- The module supply voltage is in the normal operating range of 9-16 volts.

Conditions for Setting the DTC

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

Conditions for Clearing the DTC

- A current DTC will clear when a Node Alive message from the failed identification number is detected on the class 2 serial data circuit or at the end of the current ignition cycle.
- A history DTC clears when the module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

When multiple Loss of Communication DTCs are set concurrently, the likely cause is a bad connection at the fuse block-left instrument panel (I/P) class 2 serial data connector. Refer to **Control Module References**.

Test Description

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

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

DTC U1001-U1254

Step	Action	Yes	No
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	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 7**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	IMPORTANT: Use the control module ID number list in order to determine which module is not communicating. A short to ground on the following circuits may cause the body control module (BCM) ELECT fuse to open. If the BCM ELECT fuse is open, the BCM will be unable to communicate. • Inadvertent power supply for the dome lamp circuit • Inadvertent power supply for the power mirrors circuit • Inadvertent power supply for the trunk lamp circuit Test the following circuits of the module that is not communicating for an open or a short to ground: • 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 Refer to the following: • **Control Module References** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 7**	Go to **Step 3**
3	1. Turn the ignition OFF. 2. Test the ground circuits of the module that is not communicating for an open. Refer to the following: • **Control Module References** • **Circuit Testing** in Wiring Systems	Go to **Step 7**	Go to **Step 4**

Step	Action	Yes	No
	• **Wiring Repairs** in Wiring Systems Did you find and correct the condition?		
4	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. Did you find and correct the condition?	Go to **Step 7**	Go to **Step 5**
5	Inspect the harness connectors of the module that is not communicating for poor connections and terminal tension at the following circuits: • 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 Refer to the following: • **Control Module References** • **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems • **Connector Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 7**	Go to **Step 6**
6	Replace the module that is not communicating. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 7**	-
7	1. Install a scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Select the Display DTCs function for the module which was not communicating. Does the scan tool display any DTCs which do not begin with a U?	Go to **Control Module References**	Go to **Step 8**
8	Select the Display DTCs function for the modules which had the Loss of Communications DTC set. Does the scan tool display any DTCs which do not begin with a U?	Go to **Control Module References**	Go to **Step 9**
9	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. Did you complete the action?	Go to **Control Module References**	-

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.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC U1300 Class 2 Data Link Low
- DTC U1301 Class 2 Data Link High
- DTC U1305 Class 2 Data Link Low or High

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 DTC 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**.

DTC U2100

Circuit Description

The controller area network (CAN) serial data line is a high speed serial data bus used to communicate information between the engine control module (ECM), body control module (BCM), and the transmission control module (TCM). Typical data-transmission speeds must be high enough to ensure the required real-time response is maintained. The CAN serial data line does not communicate with the scan tool via the data link connector (DLC). CAN serial data information is interpreted by the BCM and transmitted to the serial data line by the BCM.

Modules connected to the CAN serial data circuit monitors communication during normal vehicle operation, where operation information is exchanged among the modules. Each module on the CAN network maintains a transmit error counter (TEC) and a receive error counter (REC). The counter values increase with detected errors and will decrease with error-free messages. If the TEC value exceeds 255, the controller removes itself from the network and DTC U2100 will result.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC U2100 Controller Area Network (CAN) Bus Communication

Conditions for Running the DTCs

- Supply voltage to the modules are in the normal operating range.
- The vehicle is in the RUN power mode.

Conditions for Setting the DTC

The module setting the DTC has attempted to establish communications on the CAN circuits for more than 7 times.

Action Taken When the DTCs Sets

- The module suspends all message transmission.
- The module uses default values for all parameters received on the serial data circuits.
- The module 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 module ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

- This DTC cannot be retrieved with a current status. Diagnosis of current DTC is accomplished via the symptom, Scan Tool Does Not Communicate with High Speed GMLAN Device.
- An intermittent condition is likely to be caused by a short on the GMLAN serial data circuits. Use the Scan Tool Does Not Communicate with High Speed GMLAN Device procedure in order to isolate an intermittent condition.

DTC U2100

Step	Action	Yes	No
Schematic Reference: Data Link Connector (DLC) Schematics **Connector End View Reference:** Master Electrical Component List in Wiring Systems.			

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Turn the ignition OFF. 2. Disconnect the body control module (BCM), engine control module (ECM), electronic brake control module (EBCM), and transmission control module (TCM) connectors. 3. Test both the controller area network (CAN) high and low circuits for the following conditions: • A short to ground • A short to voltage • A short to each other Turn the ignition ON, with the engine OFF when you test 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 5**	Go to **Step 3**
3	1. Using the scan tool, clear the DTCs. 2. Turn the ignition OFF. 3. Reconnect each module one at a time, starting with the TCM, then the BCM, the EBCM, and finally the ECM. 4. After each module is connected, check for U2100 in the ECM and EBCM. Does DTC U2100 reset after reconnecting each module one at a time?	Go to **Step 5**	Go to **Step 4**
4	Replace the module that resets U2100. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 5**	-
5	1. Reconnect all modules not already connected. 2. Use the scan tool in order to clear the DTCs. 3. Turn the ignition switch OFF. 4. Wait at least 10 seconds. 5. Turn the ignition ON, with the engine OFF. 6. Retrieve DTCs from the ECM and EBCM. Does the DTC reset ?	Go to **Step 2**	System OK

DTC U2105-U2199

Circuit Description

The controller area network (CAN) serial data line is a high speed serial data bus used to communicate information between the engine control module (ECM), body control module (BCM), and the transmission control module (TCM). Typical data-transmission speeds must be high enough to ensure the required real-time response is maintained. The CAN serial data line does not communicate with the scan tool via the data link connector (DLC). CAN serial data information is interpreted by the BCM and transmitted to the serial data line by the BCM.

The CAN bus is continuously monitored by the serial data bus. Each module on the CAN serial data circuit learns the identity of the other modules on the circuit. If a module stops communicating after all modules have initiated for the igniting cycle, other module set a DTC specific for the module not communicating:

- DTC U2105, can not communicate with the ECM
- DTC U2106, can not communicate with the TCM
- DTC U2172, can not communicate with the Radio

DTC U2105-U2199

Control Module	ID Number
Engine Control Module (ECM)	05
Transmission Control Module (TCM)	06
Radio	72

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC U2105 Lost Communications With Engine Control System
- DTC U2199 Unassigned

Conditions for Running the DTC

- Supply voltage to the modules are in the normal operating range.
- The vehicle is in the RUN power mode.

Conditions for Setting the DTC

The module setting the DTC has attempted to establish communications on the CAN circuits for more than 7 times.

Action Taken When the DTC Sets

Besides storing the DTC as both current and history, and using default values for missing parameters, the modules on the CAN network each take separate actions as listed:

- ECM
  - Turn ON the malfunction indicator lamp (MIL) during the second consecutive drive cycle with the error detected.
  - Record the operating conditions at the time of turning ON the MIL and store the data as Freeze Frame information.
- TCM

  Send a request to the ECM to turn ON the MIL during the second consecutive drive cycle with the error detected.

- BCM
  - Turn ON the MIL during the second consecutive drive cycle with the error detected.
  - Record the operating conditions at the time of turning ON the MIL and store the data as Freeze Frame information.

Conditions for Clearing the DTC

The MIL is cleared, turned OFF, and the DTC is cleared by a different strategy for each module.

- ECM
  - If the fault is not detected 3 consecutive drive cycles, the current DTC is cleared and the MIL is turned OFF.
  - The history DTC is cleared if the malfunction does not reoccur for 40 consecutive drive cycles.
  - The history DTC is cleared if there is a keep alive memory (KAM) reset (battery disconnected).

- TCM
  - If the fault is not detected one consecutive drive cycle, the current DTC is cleared.
  - The history DTC is cleared if the malfunction does not reoccur for 40 consecutive drive cycles.
- BCM
  - If the fault is not detected 3 consecutive drive cycles, the current DTC is cleared and the MIL is turned OFF.
  - The history DTC is cleared if the malfunction does not reoccur for 40 consecutive drive cycles.
  - The history DTC is cleared if there is a KAM reset, battery disconnected.

Test Description

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

7: The module which was not communicating due to an open in the GMLAN serial data circuits may have set Loss of Communication DTCs for those modules that it was monitoring.

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

DTC U2105-U2199

Step	Action	Yes	No
Schematic Reference: Data Link Connector (DLC) Schematics **Connector End View Reference:** Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	1. Turn the ignition OFF. 2. Test the following circuits of the module that is not communicating for an open or a short to ground. • The battery positive circuits • The battery voltage output circuits • The ignition positive voltage circuits • The ignition voltage output circuits Refer to the following: • Data Link Connector (DLC) Schematics • Circuit Testing in Wiring Systems • Wiring Repairs in Wiring Systems Did you find and correct the condition?	Go to **Step 9**	Go to **Step 3**
3	Test the ground circuits of the module that is not communicating for an open. Refer to the following: • Data Link Connector (DLC) Schematics • Circuit Testing in Wiring Systems • Wiring Repairs in Wiring Systems Did you find and correct the condition?	Go to **Step 9**	Go to **Step 4**

Step	Action	Yes	No
4	Test the GMLAN serial data circuits of the module that is not communicating for an open. Refer to the following: • **Data Link Connector (DLC) Schematics** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 7**	Go to **Step 5**
5	Test the following circuits of the module that is not communicating for poor connections: • The battery positive voltage circuits • The battery voltage output circuits • The ignition positive voltage circuits • The ignition voltage output circuits • The ground circuits • The GMLAN serial data circuits Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 9**	Go to **Step 6**
6	Replace the module that is not communicating. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 9**	-
7	1. Install a scan tool. 2. Turn the ignition ON, with the engine OFF. 3. Select the Display DTCs function for the module which was not communicating. Does the scan tool display any DTCs which do not begin with a "U"?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	Go to **Step 8**
8	Use the scan tool in order to clear the DTCs. Did you complete the action?	Go to **Step 9**	-
9	Select the Display DTCs function for the modules which had the Loss of Communications DTC set. Does the scan tool display any DTCs which do not begin with a "U"?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	Go to **Step 10**
10	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. Did you complete the action?	System OK	-

SYMPTOMS - COMPUTER/INTEGRATING SYSTEMS

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

1. Perform the **Diagnostic System Check - Vehicle** in Vehicle DTC Information before using the symptom tables in order to verify that all of the following are true:
   - There are no DTCs set.
   - The control modules 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**
   - **Body Control System Description and Operation**
   - **Retained Accessory Power (RAP) Description and Operation**

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the 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 Communicate with High Speed GMLAN Device**
- **Retained Accessory Power (RAP) On After Timeout**
- **Retained Accessory Power (RAP) Inoperative**

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: Data Link Connector (DLC) Schematics **Connector End View Reference:** Computer/Integrating Systems Connector End Views			
1	Test the battery positive voltage circuit of the data link connector (DLC) for an open or a short to ground. Refer to **Circuit Testing** or **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	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 **Diagnostic System Check - Vehicle** in Vehicle DTC Information	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 **Diagnostic System Check - Vehicle** in Vehicle DTC Information	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 **Diagnostic System Check - Vehicle** in Vehicle DTC Information	-

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 data link connector (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 serial data bus can not be used to analyze a malfunction on the class 2 serial data bus. The following conditions will cause a total loss of class 2 serial data communication:

- A class 2 serial data circuit shorted to ground. A history U1300 will set in all modules. Refer to **DTC U1300, U1301, or U1305**.
- A class 2 serial data circuit shorted to voltage. A history U1301 will set in all modules. Refer to **DTC U1300, U1301, or U1305**.
- 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 loss of communication in the class 2 serial data circuit uses a different procedure than a total loss of communication of the class 2 serial data circuit.

4: The following DTCs may be retrieved with a history status. These DTCs are not the cause of the present condition.

- U1300
- U1301
- U1305

6: A State of Health (SOH) DTC with a history status may be present along with a U1000 or U1255 with a current status. This indicates that the malfunction occurred when the ignition was on.

10: Normal class 2 serial data communication cannot take place until the power mode master (PMM) module sends the appropriate power mode message. If the PMM does not send a wake-up message, other modules on the class 2 serial data circuit may not communicate.

12: This step will isolate a wiring problem or a module malfunction.

13: An open circuit at this point will cause a loss of communication with the vehicle.

14: This step analyzes the specific branch circuit for a malfunction.

19: If there are no current DTCs that begin with the letter "U", the communication concern has been repaired.

20: The communication concern may have prevented diagnosis of the customer complaint.

Scan Tool Does Not Communicate with Class 2 Device

Step	Action	Yes	No
Schematic Reference: Data Link Connector (DLC) Schematics **Connector End View Reference:** Master Electrical Component List in Wiring Systems			
1	Install a scan tool. Does the scan tool power up?	Go to **Step 2**	Go to **Scan Tool Does Not Power Up**
2	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. Does the scan tool communicate with any module on the class 2 serial data circuit?	Go to **Step 3**	Go to **Step 8**
3	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. Did you record any DTCs in the range of U1000 to U1305?	Go to **Step 4**	Go to **Step 7**
4	Are history DTCs U1300, U1301 or U1305 retrieved from any module?	Go to **Step 5**	Go to **Step 6**
5	IMPORTANT: Turn the ignition ON, with the engine OFF, when testing for a short to voltage. Use the DMM MIN/MAX function to capture intermittent conditions. Test the class 2 serial data circuit for an intermittent short to ground or an intermittent short to voltage. Refer to the following in Wiring Systems: • **Testing for Intermittent Conditions and Poor Connections** • **Circuit Testing** • **Connector Repairs** • **Wiring Repairs** Did you find and correct the condition?	Go to **Step 18**	Go to **Step 6**
6	Are U1000 or U1255 the only DTCs displayed in the previously specified range?	Go to **DTC U1000 and U1255**	Go to **DTC U1001-U1254**
7	Diagnose the non communicating module by using the DTC U1001 - U1254 Lost Communications with XXX procedure for the module which is not communicating. The DTC U1001 - U1254 Lost Communications with XXX procedure will determine which module is not communicating. Refer to **DTC U1001-U1254**. Did you complete the action?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	-

Step	Action	Yes	No
8	1. Turn the ignition OFF. 2. Disconnect the scan tool from the data link connector (DLC). 3. Inspect for poor connections and terminal tension at the DLC. Refer to **Testing for Intermittent Conditions and Poor Connections** and**Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	Go to **Step 9**
9	Test the ground circuits of the DLC for an open or high resistance. Refer to **Testing for Intermittent Conditions and Poor Connections** and**Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	Go to **Step 10**
10	1. Isolate the power mode master (PMM) module from all other modules on the class 2 serial data circuit by backing out only the class 2 serial data terminals from the PMM harness connectors, except for the one class 2 serial data circuit that is routed to the DLC, pin 2. To identify which module is the PMM refer to **Body Control System Description and Operation**, also refer to **Data Link Connector (DLC) Schematics** for the circuit ID. 2. Connect all of the PMM harness connectors with the extracted class 2 serial data circuit terminals. 3. Turn the ignition ON, with the engine OFF. 4. Attempt to communicate with the PMM. Does the scan tool communicate with the PMM?	Go to **Step 12**	Go to **Step 11**
11	1. Test the class 2 serial data circuits between the DLC and the PMM for the following conditions. Turn ON the ignition when testing for a short to voltage: • High resistance • Open • Short to ground • Short to voltage 2. Test the following circuits of the PMM for an open or high resistance: • 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 Refer to **Circuit Testing** and **Wiring Repairs** in Wiring SystemsDid you find and correct the condition?	Go to **Step 18**	Go to Step **Step 17**
12	Perform the following for each class 2 serial data branch circuit, in order to determine if the concern is located within the class 2 serial data branch circuits or the modules connected to the class 2 bus:	Go to **Step 13**	Go to **Step 14**

Step	Action	Yes	No
	1. Turn the ignition OFF. 2. One at a time, replace each terminal in the PMM harness connectors. 3. Turn the ignition ON, with the engine OFF. 4. Attempt to communicate with any module connected to the class 2 serial data branch circuit after reinstalling it's class 2 serial data terminal. 5. Record which branch of the class 2 serial data circuit causes a loss of communication if one occurs in the above items. Does the scan tool communicate with all modules connected to the class 2 serial data circuit after all the branch circuits have been reconnected?		
13	Inspect for poor connections and terminal tension at the harness connector of the PMM harness connector that contains the discreet class 2 serial data circuit for the DLC. Did you complete the action?	Go to **Step 18**	-
14	1. Turn the ignition OFF. 2. Using the record made in step 12, identify each module on that branch of the class 2 serial data circuit and disconnect there harness connectors containing the class 2 serial data circuits. 3. Using the record made in step 12 again, test the branch circuits that caused a No Comm with class 2 for the following. Turn the ignition ON when testing for a short to voltage or short to ground. Did you find and correct the problem?	Go to **Step 18**	Go to **Step 15**
15	The concern is a malfunctioning module on the class 2 serial data branch circuit recorded in step 12. 1. Turn the ignition OFF. 2. One at a time, starting with the first module on the malfunctioning class 2 serial data branch circuit closest to the PMM, start attaching modules back onto that branch circuit. 3. Turn the ignition ON, with the engine OFF. 4. Attempt to communicate with the reinstalled modules connected to the malfunctioning branch. 5. Repeat items 1 through 4 attempting to lose communication. If communication is lost, record the last module reconnected proceed down the table and discontinue the repeating of items 1 through 4. Does the scan tool communicate with all the modules connected to the class 2 serial data circuit?	Go to **Step 18**	Go to **Step 1**
16	Inspect for poor connections and terminal tension at the harness connector of the reconnected module that causes a loss of communication. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems.	Go to **Step 18**	Go to **Step 17**

Step	Action	Yes	No
	Did you find and correct the condition?		
17	Replace the suspect module. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 18**	-
18	1. Connect all of the modules. 2. Connect all the connectors. 3. Install a scan tool. 4. Turn the ignition ON leaving the engine OFF. IMPORTANT: 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 or disconnect the scan tool before you display DTCs. 5. Wait for 10 seconds. 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. Did your record any DTCs which begin with a letter U and with a current status?	Go to **Step 20**	Go to **Step 19**
19	Did you record any DTCs which do not begin with a letter "U"?	Go to **Step 20**	Go to **Step 22**
20	Diagnose the DTCs as directed by the diagnostic procedures for the particular module or concern. Did you complete the action?	Go to **Step 21**	-
21	Did you diagnose all of the DTCs?	Go to **Step 22**	Go to **Step 20**
22	Clear the DTCs using the scan tool. Did you complete the action?	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information	-

SCAN TOOL DOES NOT COMMUNICATE WITH HIGH SPEED GMLAN DEVICE

Modules connected to the GMLAN serial data circuit monitor for serial data communications on the GMLAN network during normal vehicle operation. Operating information and commands are exchanged among the modules. When a module detects a bus-off condition a DTC U2100 will be set. This DTC can be retrieved as history only.

Diagnostic Aids

The engine will not start when there is a total malfunction of the GMLAN serial data circuits while the engine is not running. The following conditions may cause a total loss of GMLAN data communication:

- Any of the serial data circuits shorted to ground.
- Any of the serial data circuits shorted to voltage.
- A short between serial data circuits.
- An internal malfunction of a module on the GMLAN network that causes a short to voltage or ground.

Scan Tool Does Not Communicate with High Speed GMLAN Device

Step	Action	Yes	No
Schematic Reference: **Data Link Connector (DLC) Schematics** **Connector End View Reference:** **Master Electrical Component List** in Wiring Systems			
1	Does the scan tool power up?	Go to **Step 2**	Go to **Scan Tool Does Not Power Up**
2	1. Turn the ignition ON, with the engine OFF. 2. Attempt to communicate with each module on the GMLAN serial data circuit using a scan tool with a CANdi adaptor inline module properly installed. Does the scan tool communicate with all modules on the GMLAN serial data circuits?	Go to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems	Go to **Step 3**
3	1. Disconnect the scan tool from the data link connector (DLC). 2. Turn the ignition OFF. 3. Disconnect all non-communicating modules on the high speed GMLAN serial data circuit. 4. Turn the ignition ON, with the engine OFF. 5. Test the high speed GMLAN serial data circuit between the DLC and all the modules on the high speed GMLAN serial data circuit, for the following conditions: • An open • A short to ground • A short to voltage Refer to the following: • **Control Module References** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 7**	Go to **Step 4**
4	Test the following circuits of the module that is not communicating for an open or high resistance: • The battery positive voltage input circuits • The battery voltage output circuits • The ignition voltage input circuits • The ignition voltage output circuits • The switched battery positive voltage supply circuits • The ground circuits Refer to the following: • **Control Module References** • **Circuit Testing** in Wiring Systems	Go to **Step 7**	Go to **Step 5**

Step	Action	Yes	No
	• **Wiring Repairs** in Wiring Systems Did you find and correct the condition?		
5	Inspect for poor connections and terminal tension at the following harness connector circuits of the module that is not communicating: • 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 high speed GMLAN serial data circuits Refer to the following: • **Control Module References** • **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems • **Connector Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 7**	Go to **Step 6**
6	Replace the module that is not communicating on the high speed GMLAN serial data circuit. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 7**	-
7	1. Connect all modules and connectors. 2. Connect the scan tool to the DLC. 3. Turn the ignition ON, with the engine OFF. 4. Perform the Diagnostic System Check for the system exhibiting symptoms. Refer to **Control Module References**. Did you complete the operation?	System OK	Go to **Step 2**

SCAN TOOL DOES NOT COMMUNICATE WITH LOW SPEED GMLAN DEVICE

Modules connected to the GMLAN serial data circuit monitor for serial data communications on the GMLAN network during normal vehicle operation. Operating information and commands are exchanged among the modules. When a module detects a bus-off condition a DTC U2100 will be set. This DTC can be retrieved as history only.

Diagnostic Aids

The engine will not start when there is a total malfunction of the GMLAN serial data circuits while the engine is not running. The following conditions may cause a total loss of GMLAN data communication:

- Any of the serial data circuits shorted to ground
- Any of the serial data circuits shorted to voltage
- A short between serial data circuits
- An internal malfunction of a module on the GMLAN network that causes a short to voltage or ground

Scan Tool Does Not Communicate with Low Speed GMLAN Device

Step	Action	Yes	No
Schematic Reference: Data Link Connector (DLC) Schematics **Connector End View Reference:** Master Electrical Component List in Wiring Systems			
1	Does the scan tool power up?	Go to **Step 2**	Go to **Scan Tool Does Not Power Up**
2	1. Turn the ignition ON, with the engine OFF. 2. Attempt to communicate with each module on the GMLAN serial data circuit using a scan tool with an inline CANdi adaptor module properly installed. Does the scan tool communicate with all modules on the GMLAN serial data circuits?	Go to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems	Go to **Step 3**
3	1. Disconnect the scan tool from the data link connector (DLC). 2. Turn the ignition OFF. 3. Disconnect all non-communicating modules on the low speed GMLAN serial data circuit. 4. Turn the ignition ON, with the engine OFF. 5. Test the low speed GMLAN serial data circuit between the DLC and all the modules on the low speed GMLAN serial data circuit, for the following conditions: • An open • A short to ground • A short to voltage Refer to the following: • **Control Module References** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 7**	Go to **Step 4**
4	Test the following circuits of the module that is not communicating for an open or high resistance: • The battery positive voltage input circuits • The battery voltage output circuits • The ignition voltage input circuits • The ignition voltage output circuits • The switched battery positive voltage supply circuits	Go to **Step 7**	Go to **Step 5**

Step	Action	Yes	No
	• The ground circuits Refer to the following: • **Control Module References** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct the condition?		
5	Inspect for poor connections and terminal tension at the following harness connector circuits of the module that is not communicating: • 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 low speed GMLAN serial data circuits Refer to the following: • **Control Module References** • **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems • **Connector Repairs** in Wiring Systems Did you find and correct the condition?	Go to **Step 7**	Go to **Step 6**
6	Replace the module that is not communicating on the low speed GMLAN serial data circuit. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 7**	-
7	1. Connect all modules and connectors. 2. Connect the scan tool to the DLC. 3. Turn the ignition ON, with the engine OFF. 4. Perform the Diagnostic System Check for the system exhibiting symptoms. Refer to **Control Module References**. Did you complete the operation?	System OK	Go to **Step 2**

POWER MODE MISMATCH

Circuit Description

Normal vehicle serial data communications and module operations will not begin until the system power mode has been identified. Discrete wires from the ignition switch contacts are monitored by a module which acts as the power mode master (PMM) in order to determine the correct power mode. The module which is the PMM communicates the system power mode to all modules on the serial data lines. Refer to **Body Control System Description and Operation** to identify which module is the PMM and the applicable power mode look up table.

Test Description

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

- **6:** This step tests for battery voltage on the incorrect signal circuits.
- **7:** This step tests for no battery voltage on the required signal circuits.
- **8:** If any ignition switch parameters that should be inactive in the present ignition switch position are active, 2 ignition switch signal circuits may be shorted together.
- **9:** This step eliminates open circuits as the cause of the malfunction.

Power Mode Mismatch

Step	Action	Yes	No
Schematic Reference: Body Control System Schematics **Connector End View Reference:** Computer/Integrating Systems Connector End Views and Master Electrical Component List in Wiring Systems IMPORTANT: Open the driver door and leave it open during this test. This will disable the retained accessory power (RAP) mode and eliminate this power mode from the power mode parameter list.			
1	1. Install a scan tool. 2. Turn OFF the ignition. 3. With a scan tool, under the Diagnostic Circuit Check menu observe the Class 2 Power Mode parameter. Does the displayed Power Mode parameter match the actual ignition switch position?	Go to **Step 2**	Go to **Step 6**
2	1. Turn the ignition switch to the UNLOCK position. 2. With a scan tool, under the Diagnostic Circuit Check menu observe the Class 2 Power Mode parameter. Does the displayed Power Mode parameter match the actual ignition switch position?	Go to **Step 3**	Go to **Step 6**
3	1. Turn the ignition switch to the RUN position, with the engine OFF. 2. With a scan tool, under the Diagnostic Circuit Check menu observe the Class 2 Power Mode parameter. Does the displayed Power Mode parameter match the actual ignition switch position?	Go to **Step 4**	Go to **Step 6**
4	IMPORTANT: The engine may start during this procedure. Turn the ignition OFF after verifying this power mode. 1. Turn the ignition switch to the CRANK position.	Go to **Step 5**	Go to **Step 6**

Step	Action	Yes	No
	2. With a scan tool, under the Diagnostic Circuit Check menu observe the Class 2 Power Mode parameter. Does the displayed Power Mode parameter match the actual ignition switch position?		
5	1. Turn the ignition switch to the ACCY position. 2. With a scan tool, under the Diagnostic Circuit Check menu observe the Class 2 Power Mode parameter. Does the displayed Power Mode parameter match the actual ignition switch position?	Go to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems	Go to **Step 6**
6	IMPORTANT: The engine may start during this procedure. Turn the ignition OFF after verifying this power mode. 1. Turn OFF the ignition. 2. Disconnect the power mode master (PMM), body control module (BCM) on this vehicle. 3. Hold the ignition switch in the position that indicated the incorrect power mode. 4. With a DMM attached to a good ground, test all the PMM ignition switch inputs for positive voltage. Refer to **Body Control System Description and Operation** for the state of the input circuits at a specified ignition switch position. Is voltage present on only the inputs selected by the ignition switch position?	Go to **Step 7**	Go to **Step 8**
7	IMPORTANT: The engine may start during this procedure. Turn the ignition OFF after verifying this power mode. 1. Hold the ignition switch in the position that indicated the incorrect power mode. 2. With a DMM attached to a good ground, test the PMM ignition switch inputs for voltage. Refer to **Body Control System Description and Operation**. Is voltage not present on only inputs specified for the ignition switch position?	Go to **Step 9**	Go to **Step 11**
8	1. Disconnect the ignition switch. 2. Test the PMM ignition switch input circuits for a short to voltage. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. 3. Test the PMM ignition switch circuits for a short between circuits. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 10**
9	1. Disconnect the ignition switch. 2. Test the PMM ignition switch input circuits for an open. Refer to **Circuit**	Go to **Step 14**	Go to **Step 10**

Step	Action	Yes	No
	Testing and **Wiring Repairs** in Wiring Systems. Did you find and correct the condition?		
10	Inspect for poor connections and terminal tension at the harness connector of the ignition switch. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 12**
11	Inspect for poor connections and terminal tension at the harness connector of the PMM. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 14**	Go to **Step 13**
12	Replace the ignition switch. Refer to **Ignition Switch Replacement** in Steering Wheel and Column. Did you complete the replacement?	Go to **Step 14**	-
13	Replace the PMM. Refer to **Control Module References** in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 14**	-
14	1. Connect all disconnected components. 2. With a scan tool, under the Diagnostic Circuit Check menu, observe the Class 2 Power Mode parameter. 3. Cycle the ignition switch through all possible positions one at a time. Does the displayed Power Mode parameter match the actual ignition switch position?	System OK	Go to **Step 1**

RETAINED ACCESSORY POWER (RAP) ON AFTER TIMEOUT

Retained Accessory Power (RAP) On After Timeout

Step	Action	Yes	No
Schematic Reference: Retained Accessory Power (RAP) Schematics			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	1. Install a scan tool. 2. With the scan tool, observe all door jamb switches. 3. Open and close each door. Does the scan tool display change from active to inactive?	Go to **Step 3**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
3	1. Close all of the doors. 2. Turn the ignition switch to the ON position, then to the OFF position. 3. Wait 10 minutes. 4. Attempt to operate the radio and/or the power windows after 10 minutes has elapsed. Do any of the items operate after 10 minutes has elapsed?	Go to **Step 4**	Go to **Step 10**

Step	Action	Yes	No
4	1. Remove the accessory (ACC) relay from the body control module (BCM). 2. Test the ACC relays + control terminal on the BCM for battery voltage, after the 10 minute timer has elapsed. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Does battery voltage exist after 10 minutes has expired?	Go to **Step 8**	Go to **Step 5**
5	With the ACC relay removed from the BCM, does the radio or power windows operate?	Go to **Step 6**	Go to **Step 7**
6	Repair the short to voltage in the battery positive voltage relay output circuit, which feeds the radio and power windows. Refer to **Wiring Repairs** and **Circuit Testing** in Wiring Systems. Is the repair complete?	Go to **Step 10**	-
7	Replace the ACC relay on the BCM. Is the repair complete?	Go to **Step 10**	-
8	Inspect the BCM for poor connections and intermittent faults. Refer to the following in Wiring Systems: • **Testing for Intermittent Conditions and Poor Connections** • **Connector Repairs** • **Inducing Intermittent Fault Conditions** • **Testing for Electrical Intermittents** Did you find and correct the condition?	Go to **Step 10**	Go to **Step 9**
9	Replace the BCM. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 10**	-
10	Operate the system in order to verify the repair. Does retained accessory power (RAP) power mode function normally?	System OK	Go to **Step 2**

RETAINED ACCESSORY POWER (RAP) INOPERATIVE

Retained Accessory Power (RAP) Inoperative

Step	Action	Yes	No
Schematic Reference: Retained Accessory Power (RAP) Schematics			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to **Step 2**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
2	Test the following circuits of the body control module (BCM) for an open or a short to ground: • The battery input voltage • The ignition input voltage • The ignition output voltage	System OK	Go to **Step 3**

Step	Action	Yes	No
	Refer to the following: • **Body Control System Schematics** • **Circuit Testing** in Wiring Systems • **Wiring Repairs** in Wiring Systems Did you find and correct condition?		
3	1. Connect a scan tool. 2. With the scan tool, observe all door jamb switches. 3. Open and close each door. Does the scan tool display change from active to inactive?	Go to **Step 4**	Go to **Diagnostic System Check - Vehicle** in Vehicle DTC Information
4	1. With all doors closed, turn the ignition ON with the engine OFF. 2. Turn the ignition OFF. 3. Operate the radio and power windows during the 10 minute retained accessory power (RAP) time period. Do any of the items operate after 10 minutes has elapsed?	Go to **Step 11**	Go to **Step 5**
5	Test for a battery voltage supply, before the accessory (ACC) relay contacts. Refer to **Circuit Testing** and **Wiring Repairs** in Wiring Systems. Is battery voltage present?	Go to **Step 7**	Go to **Step 6**
6	Locate and repair the supply voltage malfunction to the ACC relay. Refer to **Testing for a Short to Voltage** in Wiring Systems. Was there a inactive supply circuit to the BCM and did you repair it?	Go to **Step 11**	Go to **Step 9**
7	With RAP power mode enabled, test for a battery voltage supply output, after the ACC relay. Refer to **Circuit Testing** and**Wiring Repairs** in Wiring Systems. Did you locate and repair the fault?	Go to **Step 11**	Go to **Step 8**
8	Replace the ACC relay. Is the replacement complete?	Go to **Step 11**	-
9	Inspect for poor connections or terminal damage at the BCM. Refer to **Testing for Intermittent Conditions and Poor Connections** and **Connector Repairs** in Wiring Systems. Did you find and correct the condition?	Go to **Step 11**	Go to **Step 10**
10	Replace the BCM. Refer to **Control Module References** for replacement, setup, and programming. Did you complete the replacement?	Go to **Step 11**	-
11	Enable RAP power mode to verify the repair. Did you correct the condition?	System OK	Go to **Step 2**

CONTROL MODULE REFERENCES

Control Module References

Control Module	Schematic	Repair Instruction	Programming and Setup
• **Diagnostic System Check - Vehicle**			

Control Module	Schematic	Repair Instruction	Programming and Setup
• **Diagnostic Trouble Code (DTC) List - Vehicle** • **Symptoms - Vehicle**			
Audio Amplifier	**Radio/Audio System Schematics**	**Amplifier Replacement**	This device requires no programming or setup.
Body Control Module	**Body Control System Schematics**	**Body Control Module Replacement**	**Body Control Module Programming and Setup**
Communication Interface Module (OnStar (R))	**OnStar Schematics**	**Communication Interface Module Replacement**	**OnStar Reconfiguration** after communication interface module replacement
Digital Radio Receiver (DRR)	**Radio/Audio System Schematics**	**Receiver Replacement - Digital Radio**	**Digital Radio Receiver Setup** after DRR replacement
Electronic Brake Control Module (Antilock Brake System)	**ABS Schematics**	**Electronic Brake Control Module Replacement**	This device requires no programming or setup.
Engine Control Module	**Engine Controls Schematics** for the 2.2L (L61) engine or **Engine Controls Schematics** for the 2.4L engine	**Engine Control Module (ECM) Replacement** for the 2.2L (L61) engine or **Engine Control Module (ECM) Replacement** for the 2.4L engine	**Engine Control Module Programming and Setup**
Ignition Control Module	**Engine Controls Schematics** for the 2.2L engine	**Ignition Control Module Replacement**	This device requires no programming or setup.
Inflatable Restraint Passenger Presence System	**SIR Schematics**	**Inflatable Restraint Passenger Presence System Replacement - Front (without Heated Seat)**	**Passenger Presence System Programming and Setup**
Inflatable Restraint Sensing and Diagnostic Module (Supplemental Inflatable Restraint)	**SIR Schematics**	**Inflatable Restraint Sensing and Diagnostic Module Replacement**	**Inflatable Restraint Sensing and Diagnostic Module Programming and Setup**
Instrument Panel Cluster	**Instrument Cluster Schematics**	**Instrument Panel Cluster (IPC) Replacement**	This device requires no programming or setup.
Power Steering Control Module (Electric Power Steering)	**Power Steering System Schematics**	**Steering Column Replacement**	**Power Steering Control Module Programming and Setup**
Powertrain Control Module	**Engine Controls Schematics** for the 2.0L engine	**Powertrain Control Module (PCM) Replacement** for the 2.0L engine	**Powertrain Control Module Programming and Setup**
Radio	**Radio/Audio System Schematics**	**Radio Replacement**	**Radio Setup** after radio replacement
Transmission Control Module	**Automatic Transmission Controls Schematics** for the 4T45-E transaxle	**Transmission Control Module (TCM) Replacement** for the 4T45-E transaxle	**Transmission Control Module Programming and Setup**

DATA LINK REFERENCES

This table identifies which serial data link that a particular module uses for in-vehicle data transmission. Some modules may use more than one data link to communicate. Some modules 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. For the description and operation of these serial data communication circuits refer to **Data Link Communications Description and Operation**.

Data Link References

Control Module	Data Link Type	Diagnostic Procedure

Control Module	Data Link Type	Diagnostic Procedure
Schematic Reference: Data Link Connector (DLC) Schematics		
Body Control Module (BCM)	• High Speed GMLAN • Class 2	• **Scan Tool Does Not Communicate with High Speed GMLAN Device** • **Scan Tool Does Not Communicate with Class 2 Device**
Electronic Brake Control Module (EBCM)	• High Speed GMLAN • Class 2	• **Scan Tool Does Not Communicate with High Speed GMLAN Device** • **Scan Tool Does Not Communicate with Class 2 Device**
Engine Control Module (ECM)	• High Speed GMLAN • Class 2	• **Scan Tool Does Not Communicate with High Speed GMLAN Device** • **Scan Tool Does Not Communicate with Class 2 Device**
Inflatable Restraint Sensing and Diagnostic Module (SDM)	Class 2	**Scan Tool Does Not Communicate with Class 2 Device**
Instrument Panel Cluster (IPC)	Class 2	**Scan Tool Does Not Communicate with Class 2 Device**
Power Steering Control Module (PSCM)	Class 2	**Scan Tool Does Not Communicate with Class 2 Device**
Radio	Low Speed GMLAN	**Scan Tool Does Not Communicate with Low Speed GMLAN Device**
Transmission Control Module (TCM)	High Speed GMLAN	**Scan Tool Does Not Communicate with High Speed GMLAN Device**
Vehicle Communication Interface Module (VCIM)	Class 2	**Scan Tool Does Not Communicate with Class 2 Device**

REPAIR INSTRUCTIONS

BODY CONTROL MODULE REPLACEMENT

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnect/Connect Procedure** in Engine Electrical.
2. Remove the front floor console. Refer to **Console Replacement - Front Floor** in Instrument Panel, Gages, and Console.

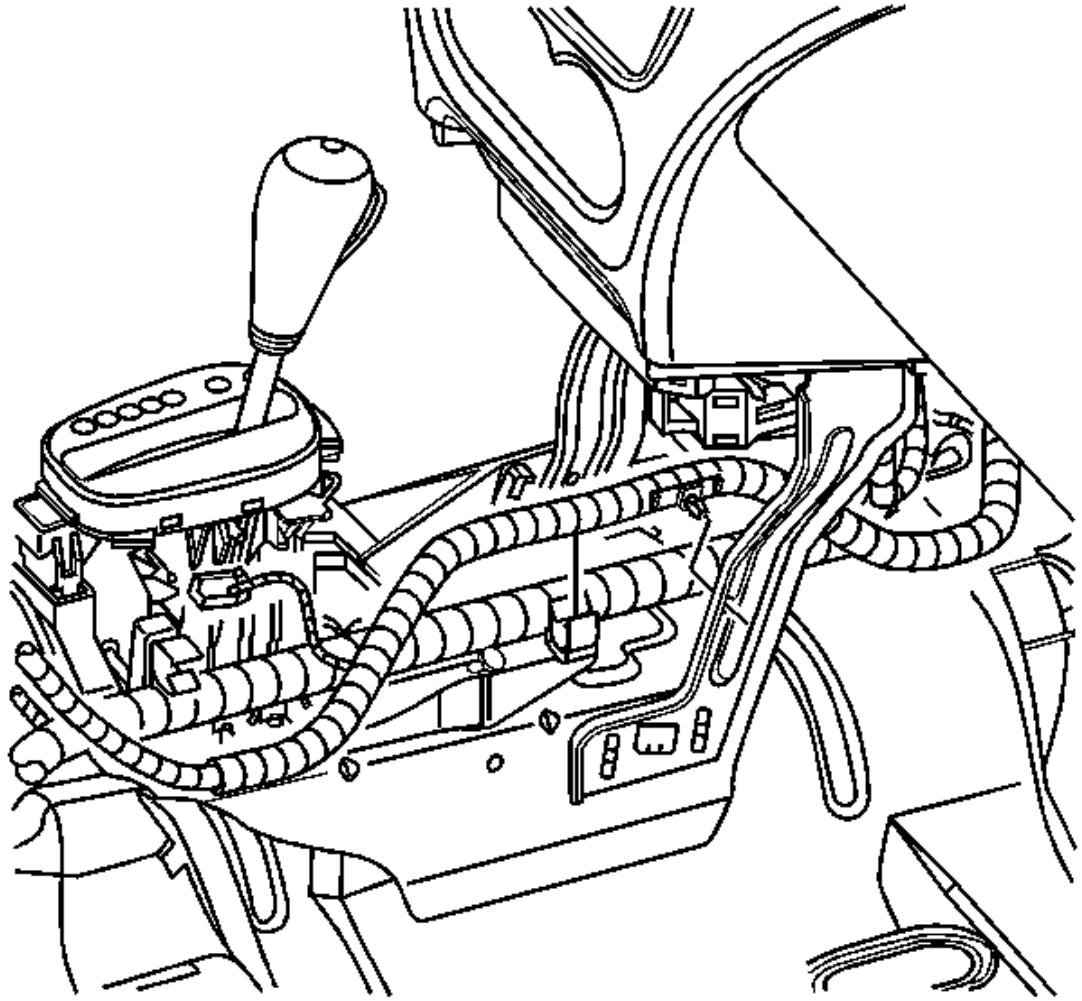


Fig. 13: View Of Wiring Harness Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

3. Remove the wiring harness rosebud from the right center support bracket.

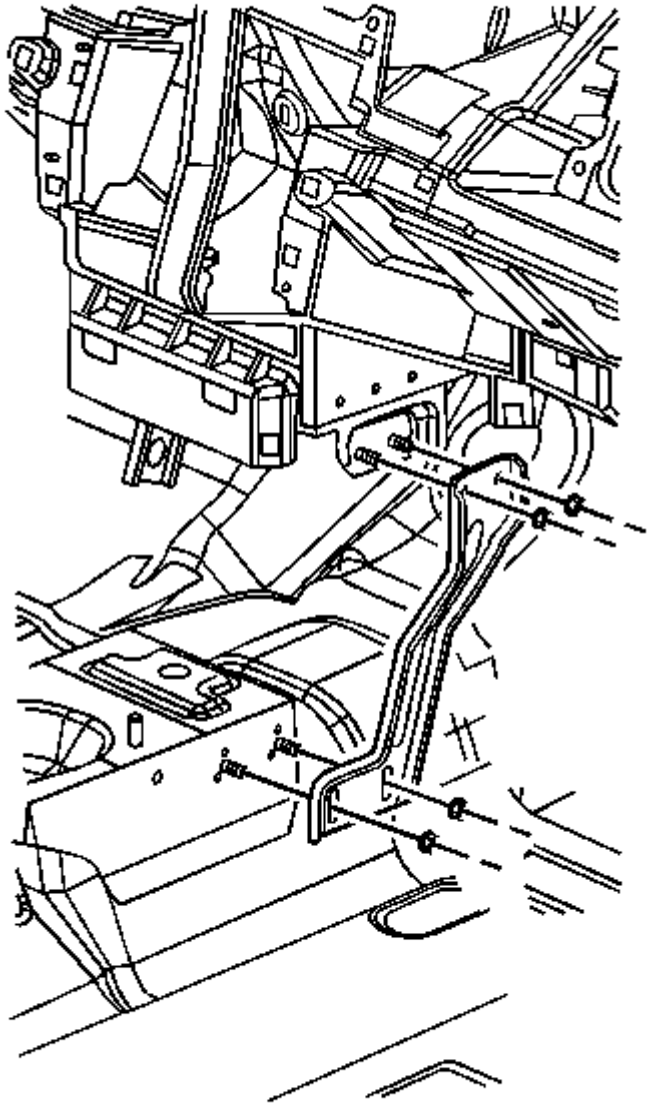


Fig. 14: View Of Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

4. Pull back the carpet at the bottom of the support bracket and remove the lower nuts.
5. Remove the nuts and remove the bracket.

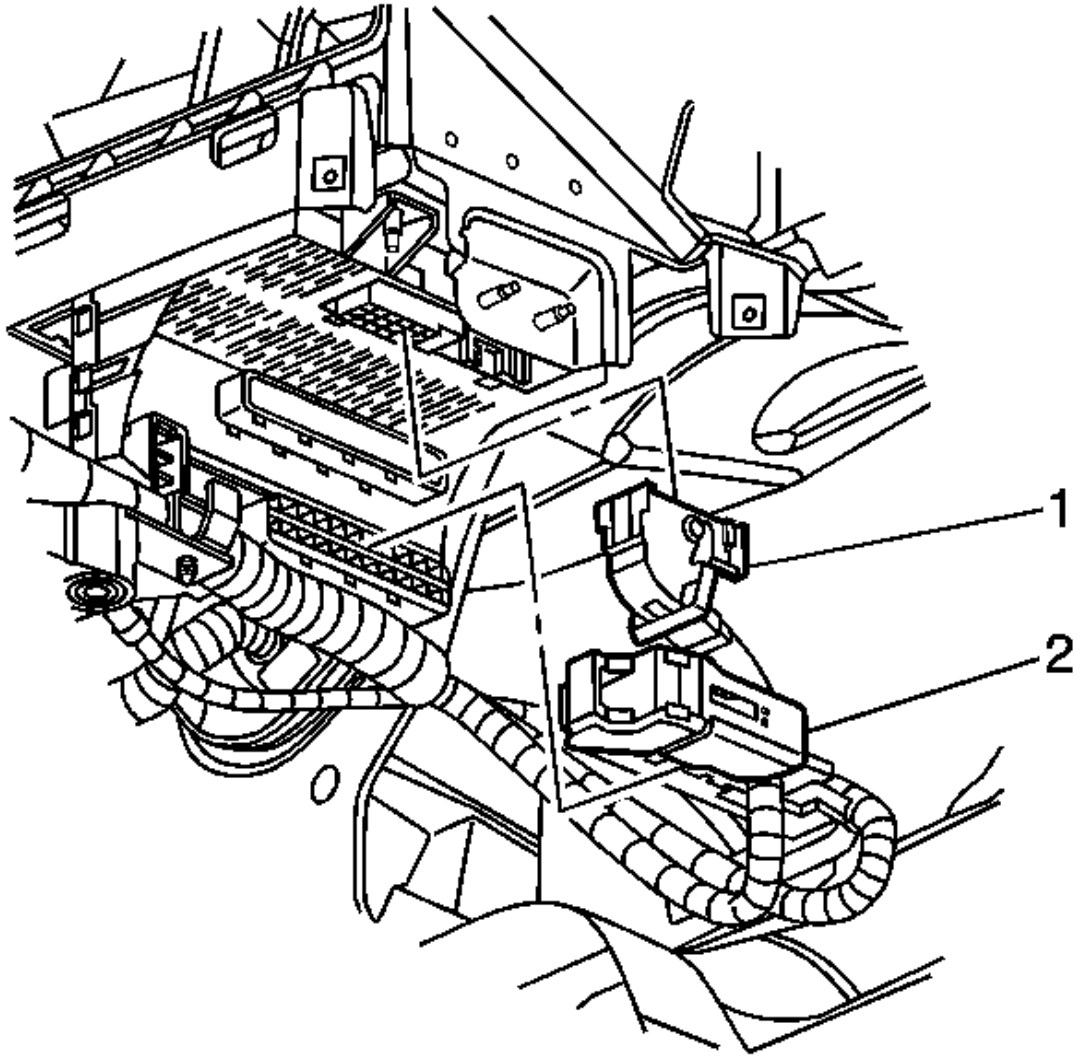


Fig. 15: View Of BCM Body Harness Connectors
Courtesy of GENERAL MOTORS CORP.

6. Disconnect the small body harness connector (1) from the body control module (BCM).
7. Disconnect the large body harness connector (2) from the BCM.

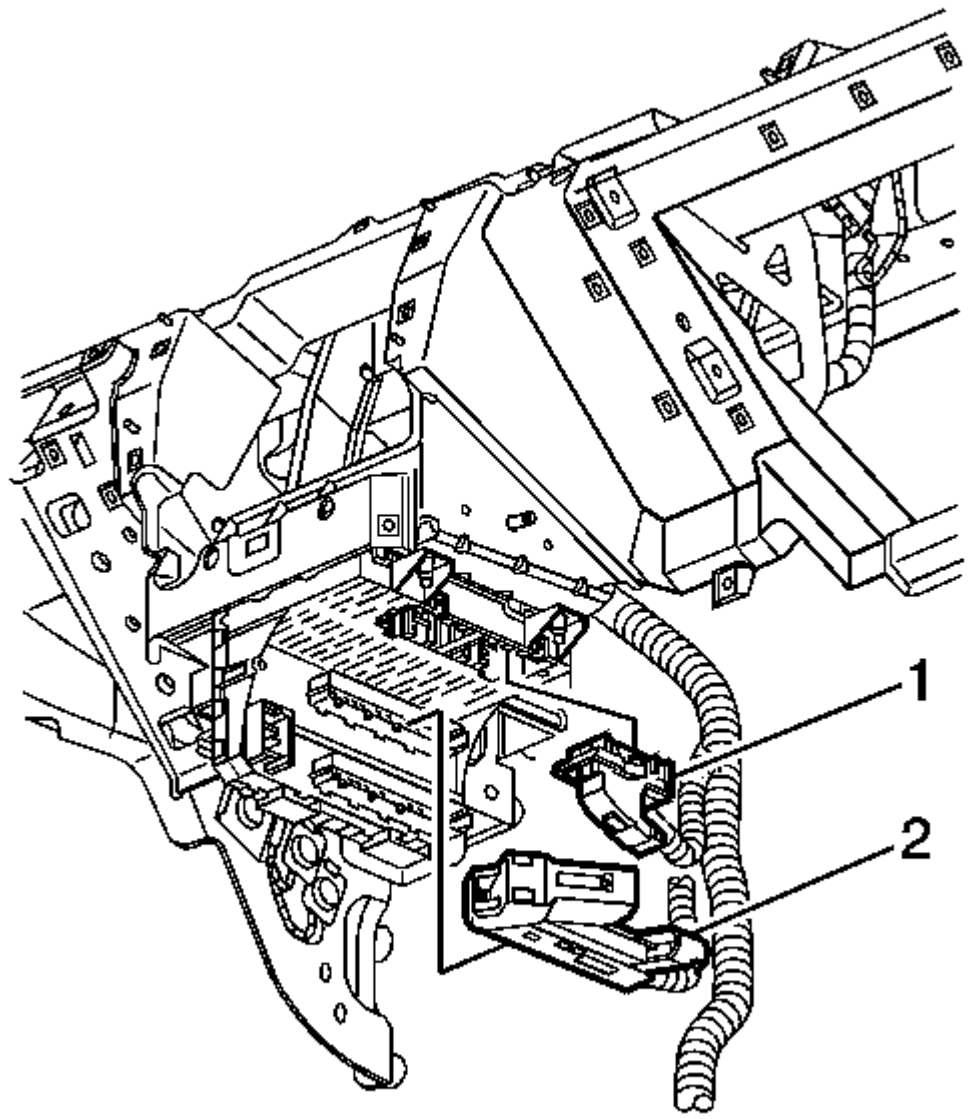


Fig. 16: View Of BCM I/P Wiring Harness Connectors
Courtesy of GENERAL MOTORS CORP.

8. Disconnect the small instrument panel (I/P) wiring harness connector (1) from the BCM.
9. Disconnect the large I/P wiring harness connector (2) from the BCM.
10. If equipped with Onstar(R), disconnect the OnStar(R) connector.

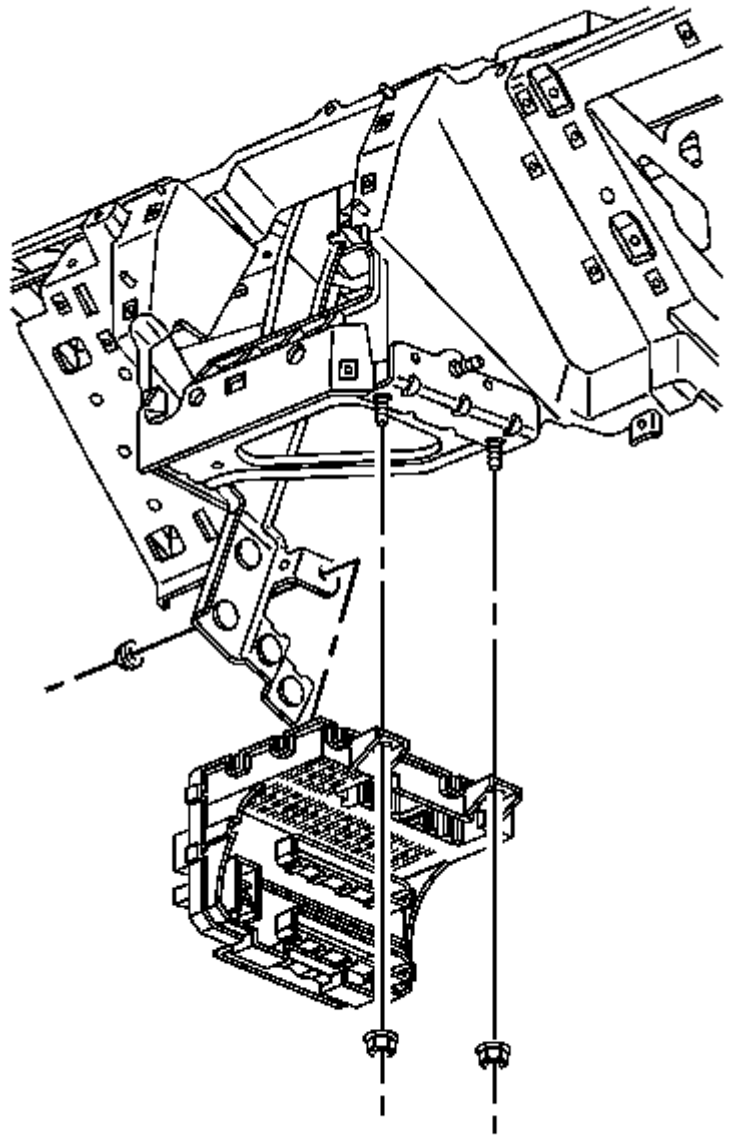


Fig. 17: View Of BCM
Courtesy of GENERAL MOTORS CORP.

11. Remove the BCM nuts and remove the BCM from the vehicle.

Installation Procedure

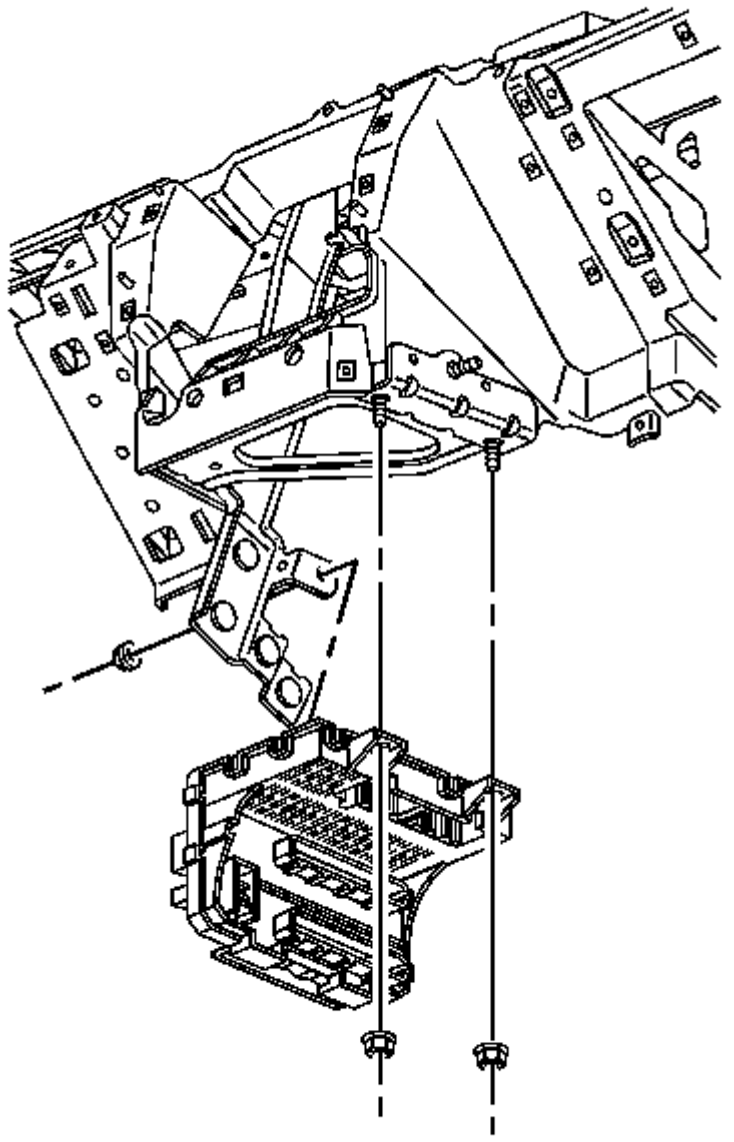


Fig. 18: View Of BCM
Courtesy of GENERAL MOTORS CORP.

NOTE: **Refer to Fastener Notice in Cautions and Notices.**

1. Install the BCM to the vehicle and install the retaining nuts.

   Tighten: Tighten the nuts to 10 N.m (88 lb in).

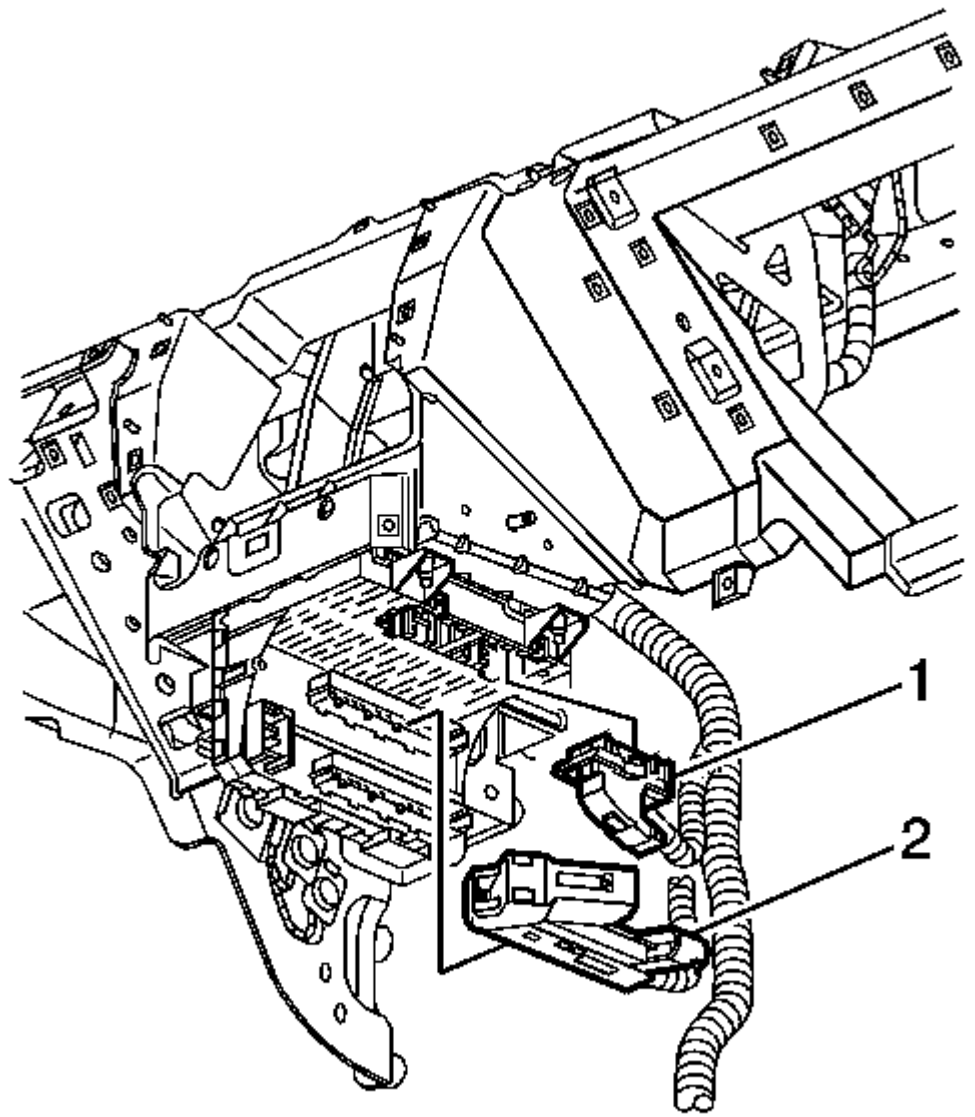


Fig. 19: View Of BCM I/P Wiring Harness Connectors
Courtesy of GENERAL MOTORS CORP.

2. Connect the large I/P wiring harness connector (2) to the BCM.
3. Connect the small I/P wiring harness connector (1) to the BCM.

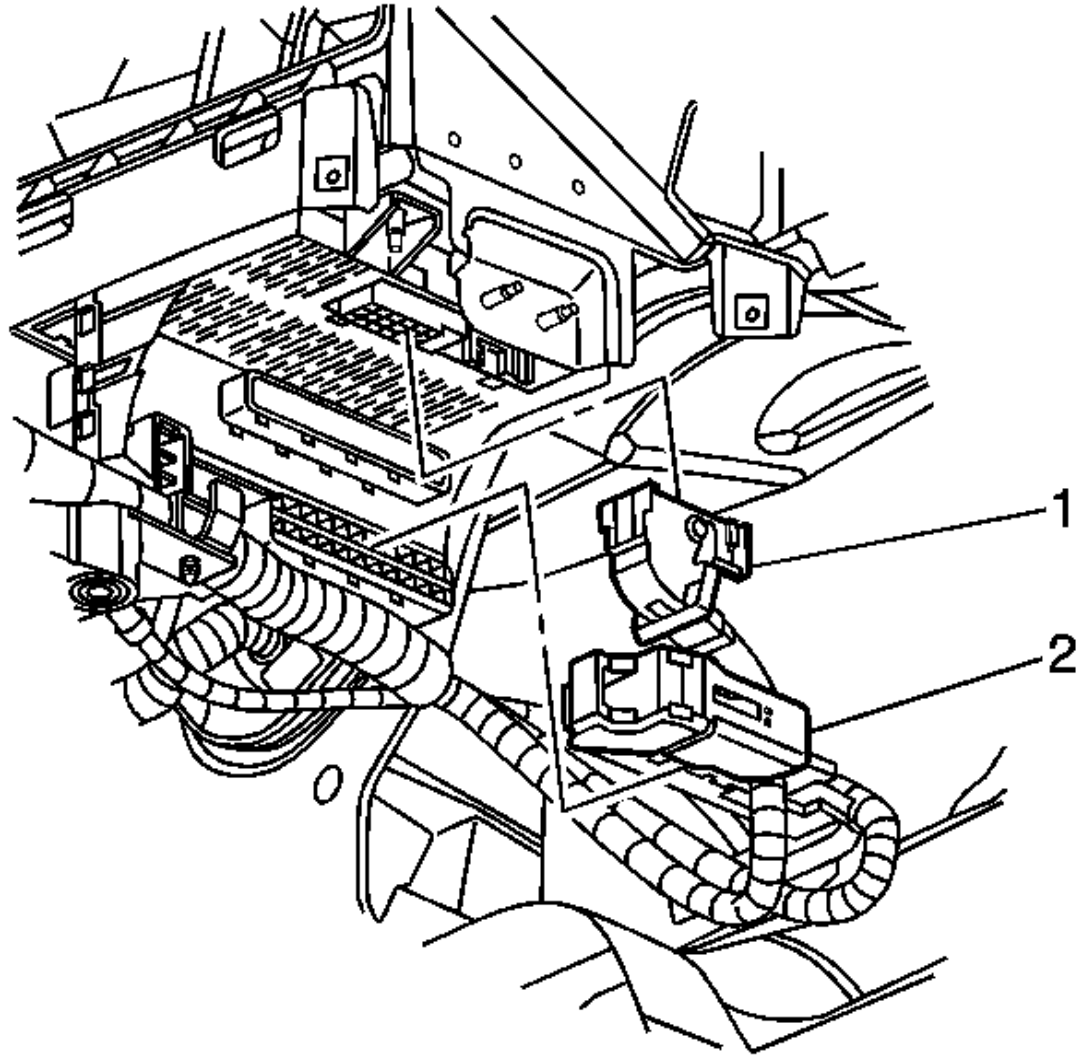


Fig. 20: View Of BCM Body Harness Connectors
Courtesy of GENERAL MOTORS CORP.

4. Connect the large body wiring harness connector (2) to the BCM.
5. Connect the small body wiring harness connector (1) to the BCM.
6. Connect the OnStar(R) connector.

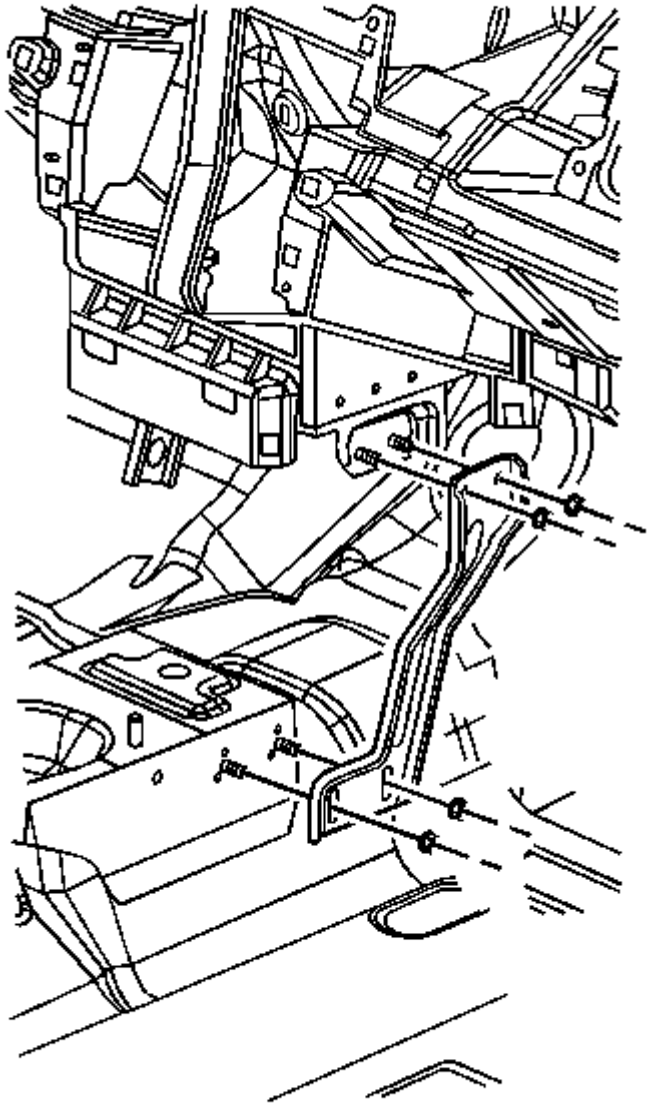


Fig. 21: View Of Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

7. Pull back the carpet and position the center support bracket into position.
8. Install the center support bracket nuts.

   Tighten: Tighten the nuts to 10 N.m (88 lb in).

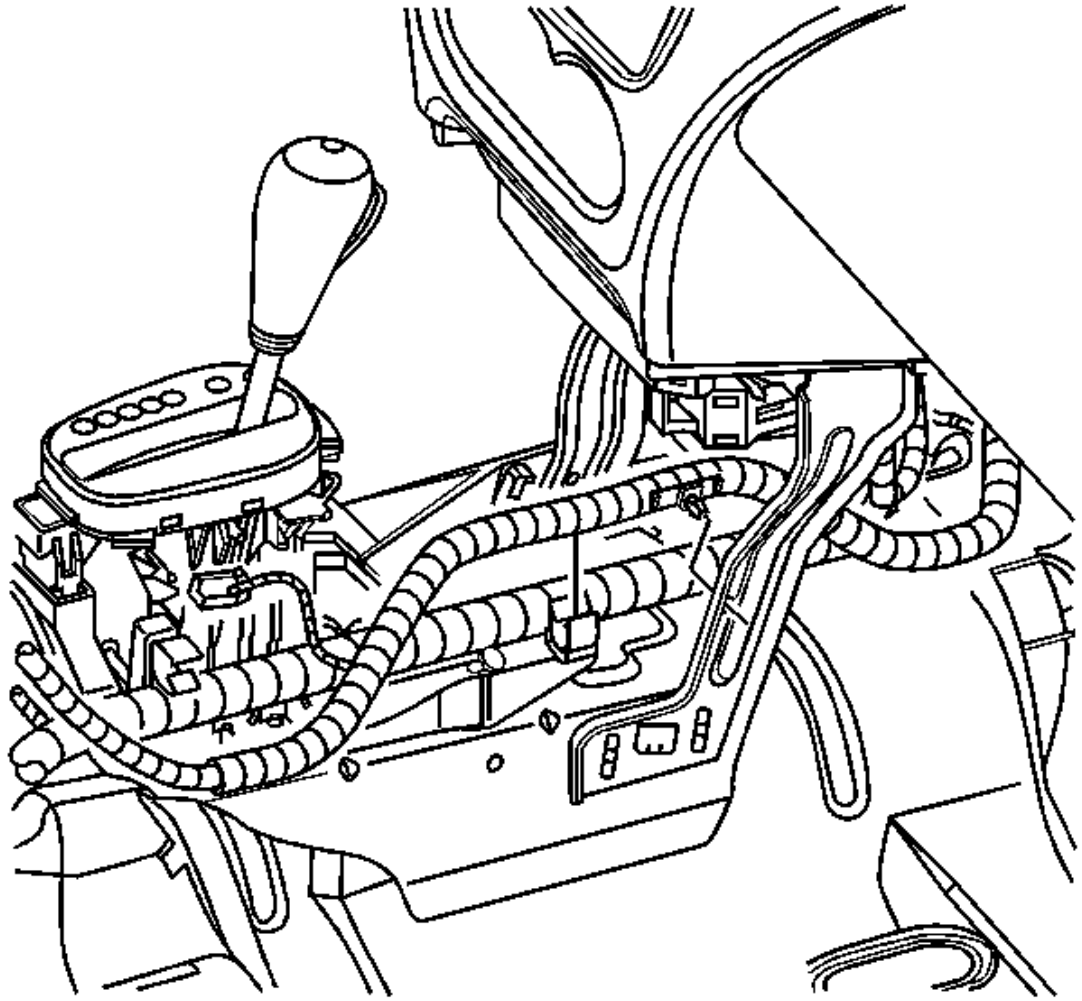


Fig. 22: View Of Wiring Harness Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

9. Install the wiring harness rosebud to the center support bracket.
10. Install the front floor console. Refer to **Console Replacement - Front Floor** in Instrument Panel, Gages, and Console.
11. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnect/Connect Procedure** in Engine Electrical.
12. Program a new or a remanufactured BCM. Refer to **Control Module References**.

BODY CONTROL MODULE (BCM) PROGRAMMING/RPO CONFIGURATION

1. The body control module (BCM) must be programmed with the proper RPO configurations. The BCM stores the information regarding the vehicle options and if the BCM is not properly configured with the correct RPO codes, the BCM will not control all of the features properly. Ensure that the following conditions exist in order to prepare for BCM programming:
   - The battery is fully charged.
   - The ignition switch is in the ON position.

- The data link connector (DLC) is accessible.
- All disconnected modules and devices are reconnected before programming.

2. To setup a new BCM, use the Tech 2 in conjunction with the Saturn Service Stall System. Refer to **Service Programming System (SPS)** in Programming and Setup.
3. If the BCM fails to accept the program, perform the following steps:
   - Inspect all BCM connections.
   - Verify that the scan tool has the latest software version.

Passlock Learn Procedures

IMPORTANT: If any module or device listed is replaced, programming of the module must be done prior to performing the Passlock Learn procedure.

Perform the Learn Procedure if any of the following components have been replaced:

- The body control module (BCM)
- The ignition switch
- The engine control module (ECM)

Refer to **Programming Theft Deterrent System Components** in Theft Deterrent for the proper procedure.

IMPORTANT: After programming, perform the following to avoid future misdiagnosis:

1. Turn the ignition OFF for 10 seconds.
2. Connect the scan tool to the data link connector.
3. Turn the ignition ON with the engine OFF.
4. Use the scan tool in order to retrieve history DTCs from all modules.
5. Clear all history DTCs.

DESCRIPTION AND OPERATION

DATA LINK COMMUNICATIONS DESCRIPTION AND OPERATION

Circuit Description

There are 2 different communication networks on this vehicle: The class 2 network and the GMLAN network. The class 2 serial data circuit is the low speed link, and the GMLAN serial data circuit is the high speed link. Modules that need real time communications are attached to the high speed network. The engine control module (ECM) is the gateway between the networks. The purpose of the gateway is to transfer information from one network to another.

GMLAN Circuit Description

The data link connector (DLC) allows a scan tool to communicate with the GMLAN serial data circuit. On this vehicle, only GMLAN high speed is used. That means that the serial data is transmitted on 2 wires at an average of 500 Kbps. The high speed dual wire GMLAN is a differential bus. That means that two bus lines, GMLAN high and GMLAN low are driven to opposite extremes from a rest or idle level. The idle level which is approximately 2.5 volts is considered a recessive transmitted data and is interpreted as a logic 1. Driving the lines to their extremes means adding 1 volt to GMLAN high wire and subtracting 1 volt from GMLAN low wire. This dominant state is interpreted as a logic 0. GMLAN network management supports selective start up and is based on virtual networks. A virtual network is a collection of signals started in response to a vehicle event. The starting of a virtual network signifies that a particular aspect of the vehicles functionality has been requested. A virtual network is supported by virtual devices which represents a collection of signals owned by a single physical device. So, any physical device can have one or more virtual devices. The signal supervision is the process of determining whether an expected signal is being received or not. Failsofting is the ability to substitute a signal with a default value or a default algorithm, in the absence of a valid signal. Some messages are also interpreted as a, heartbeat, of a virtual device. If such a signal is lost, the application will set a no communication code against the respective virtual device. This code is mapped on the Tech 2 screen as a code against the physical device. Note that a loss of serial data

DTC does not normally represent a failure of the module that set it.

Class 2 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 that are connected to it 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. The bus is active at 7.0 volts nominal and inactive at ground potential. 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 body control module (BCM) SOH message disappears, several modules set DTC U1064. Note that a loss of serial data DTC does not normally represent a failure of the module that set it.

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
- GMLAN high circuit at terminal 6
- GMLAN low circuit at terminal 14

GMLAN Serial Data Line

The GMLAN serial data communications circuit used on this vehicle is in a linear topology. The following modules are connected to the link, in order from DLC to the end of the linear configuration:

The following modules communicate on the GMLAN serial data circuit:

- The engine control module (ECM)
- The radio
- The transmission control module (TCM)

Class 2 Serial Data Line

The class 2 serial data communications circuit on this vehicle is in a ring star configuration.

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

- The body control module (BCM)
- The electronic brake control module (EBCM)
- The electric power steering (EPS)
- The instrument panel cluster (IPC)
- The inflatable restraint sensing and diagnostic module (SDM)
- The vehicle communication interface module (VCIM)

BODY CONTROL SYSTEM DESCRIPTION AND OPERATION

The body control module (BCM) has a bussed electrical center integrated into the housing. Body control relays and fuses are installed directly on the BCM which simplifies wiring and junction blocks on the vehicle. The body control system consists of the BCM and its associated controls. Battery positive voltage is provided to the BCM from the instrument panel (I/P) BATT 2 fuse in the underhood fuse block. The module grounds are wired to ground G201 and G301. The BCM is wired to the class 2 serial data communication bus as well as discrete input and output terminals to control the functions of the vehicles body.

Power Mode Master

This vehicles BCM functions as the Power Mode Master (PMM). Refer to **Power Mode Description and Operation** for a complete description of the power mode functions.

Body Control Module

The various body control module (BCM) input and output circuits are described in the corresponding functional areas indicated on the BCM electrical schematics. The BCM functions include the following:

- A/C compressor request-Refer to **Air Temperature Description and Operation** in HVAC Systems - Manual.
- A/C cooling fan-Refer to **Air Delivery Description and Operation** in HVAC Systems - Manual.
- Battery rundown protection (inadvertent power)-Refer to **Interior Lighting Systems Description and Operation** in Lighting Systems.
- Brake fluid level sensing-Refer to **Brake Warning System Description and Operation** in Hydraulic Brakes.
- Bulb check-Refer to **Instrument Panel Cluster (IPC) Description and Operation** in Instrument Panel, Gages, and Console.
- Chimes-Refer to **Audible Warnings Description and Operation** in Instrument Panel, Gages, and Console.
  - Check gages
  - Door ajar warning
  - Headlamps ON
  - Key-in-ignition
  - Oil reset
  - Park brake warning
  - Seat belt not fastened
  - Turn signal ON
- Door lock interface-Refer to **Power Door Locks Description and Operation** in Doors.
- Electronic steering control (ESC)-Refer to **Power Steering System Description and Operation** in Power Steering System.
- Engine coolant level sensing-Refer to **Cooling System Description and Operation** in Engine Cooling.
- Exterior and interior lighting control-Refer to **Exterior Lighting Systems Description and Operation** in Lighting Systems.
  - Automatic lighting control
  - Daytime running lights (DRL)
  - Fog lamps
  - Park brake lights
  - Turn hazard lamps
- Gage control-Refer to **Instrument Panel Cluster (IPC) Description and Operation** in Instrument Panel, Gages, and Console.
- Horn interface-Refer to **Horns System Description and Operation** in Horns.
- Instrument cluster indicator control-Refer to **Instrument Panel Cluster (IPC) Description and Operation** in Instrument Panel, Gages, and Console.
- Interior lighting-Refer to **Interior Lighting Systems Description and Operation** in Lighting Systems.

- Key-in-ignition sensing-Refer to **Audible Warnings Description and Operation** in Instrument Panel, Gages, and Console.
- Parking brake state sensing-Refer to **Brake Warning System Description and Operation** in Hydraulic Brakes.
- Retained accessory power (RAP)-Refer to **Retained Accessory Power (RAP) Description and Operation**.
- Rear compartment interface-Refer to **Power Door Locks Description and Operation** in Doors.
- Rear defogger-Refer to **Rear Window Defogger Description and Operation** in Stationary Windows.
- Remote function control-Refer to **Keyless Entry System Description and Operation** in Keyless Entry.
- Seat belt use sensing-Refer to **Seat Belt System Description and Operation** in Seat Belts.
- Theft deterrent-Refer to **Theft Systems Description and Operation** in Theft Deterrent.
- Washer solvent level sensing-Refer to **Wiper/Washer System Description and Operation** in Wipers/Washer Systems.
- Wiper/washer-Refer to **Wiper/Washer System Description and Operation** in Wipers/Washer Systems.

POWER MODE DESCRIPTION AND OPERATION

Power to many of this vehicle's circuits are controlled by the module that is designated the Power Mode Master (PMM). This vehicle's PMM is the Body Control Module (BCM). The PMM controls which power mode (Run, Accessory, Crank, Retained Accessory Power, or Off) is active.

Serial Data Power Mode Master

On vehicles that have several control modules connected by serial data circuits, one module is the power mode master (PMM). On this vehicle the PMM is the body control module (BCM). The PMM receives 3 discrete ignition switch signals to differentiate which power mode will be sent over the Serial Data circuits. The table below illustrates the state of these inputs in correspondence to the ignition switch position:

3-Wire Ignition Switch Table

Ignition Switch Position	Accessory	Run/Crank	Off/Run/Crank	Power Mode Transmitted
IMPORTANT: States marked with the * indicate the positive Passlock(tm) voltage level not vehicle positive battery voltage.				
Off	0	0	0 Key out 1 Key in	OFF/Awake or RAP
Start	0	1	1*	Crank
Accessory	1	0	0	Accessory
Run	1	1	1	Run

Relay Controlled Power Mode

The body control module (BCM) uses the discrete ignition switch inputs Off/Run/Crank, Accessory and Run/Crank to distinguish the correct power mode. These circuits are also routed to the Run/Crank and Accessory relays for relay controlled power feeds during the appropriate power mode.

Run/Crank Relay

The relay uses a hot at all times B+ power source derived from the underhood electrical center. The Run/Crank relay supplies a power signal to the following circuits when the a Run or Crank power mode is selected:

- Backup lamp circuit
- Electronic brake control module (EBCM)
- Engine control module (ECM)
- Ignition control module (ICM)
- Park neutral position switch
- Transmission circuit 1 and 2

Accessory (ACC) Relay

The accessory (ACC) relay is energized when the Run or Accessory power mode has been selected. The relay uses a Hot At All Times B+ power source derived from the underhood electrical center. The ACC relay is also energized by the BCM to supply power during the retained accessory power (RAP) power mode. The following devices are controlled by this relay:

- Auxiliary power outlets
- EC mirrors
- Ignition lock solenoid
- Power windows
- Power mirrors
- Radio
- Rear compartment lid release
- Sunroof
- Wiper washers

Fail-Safe Operation

Since the operation of the vehicle systems depends on the power mode, there is a fail-safe plan in place should the power mode master (PMM) fail to send a power mode message. The fail-safe plan covers those modules using exclusively serial data control of power mode as well as those modules with discrete ignition signal inputs.

Serial Data Messages

The modules that depend exclusively on serial data messages for power modes stay in the state dictated by the last valid PMM message until they can check for the engine run flag status on the serial data circuits. If the PMM fails, the modules monitor the serial data circuit for the engine run flag serial data. If the engine run flag serial data is True, indicating that the engine is running, the modules fail-safe to RUN. In this state the modules and their subsystems can support all operator requirements. If the engine run flag serial data is False, indicating that the engine is not running, the modules fail-safe to OFF-AWAKE. In this state the modules are constantly checking for a change status message on the serial data circuits and can respond to both local inputs and serial data inputs from other modules on the vehicle.

Discrete Ignition Signals

Those modules that have discrete ignition signal inputs also remain in the state dictated by the last valid PMM message received on the serial data circuits. They then check the state of their discrete ignition input to determine the current valid state. If the discrete ignition input is active, battery positive voltage, the modules will fail-safe to the RUN power mode. If the discrete ignition input is not active, open or 0 volts, the modules will fail-safe to OFF-AWAKE. In this state the modules are constantly checking for a change status message on the serial data circuits and can respond to both local inputs and serial data inputs from other modules on the vehicle.

BCM Wake-Up/Sleep States

The body control module (BCM) is able to control or perform all of the BCM functions in the wake-up state. The BCM enters the sleep state when active control or monitoring of system functions has stopped, and the BCM has become idle again. The BCM must detect certain wake-up inputs before entering the wake-up state. The BCM monitors for these inputs during the sleep state, where the BCM is able to detect switch transitions that cause the BCM to wake-up when activated or deactivated. Multiple switch inputs are needed in order to sense both the insertion of the ignition key and the power mode requested. This would allow the BCM to enter a sleep state when the key is IN or OUT of the ignition.

The BCM will enter a wake-up state if any of the following wake-up inputs are detected:

- Activity on the serial data line
- Detection of a battery disconnect and reconnect condition
- Headlamps are ON.
- Ignition is turned ON.

- Key-in-ignition switch
- Park lamps are ON.

The BCM will enter a sleep state when all of the following conditions exist:

- The ignition switch is OFF.
- No activity exists on the serial data line.
- No outputs are commanded.
- No delay timers are actively counting.
- No wake-up inputs are present.

If all these conditions are met the BCM will enter a low power or sleep condition. This condition indicates that the BCM, which is the PMM of the vehicle, has sent an OFF-ASLEEP message to the other systems on the serial data line.

RETAINED ACCESSORY POWER (RAP) DESCRIPTION AND OPERATION

Retained Accessory Power (RAP) Power Mode

Retained accessory power (RAP) is a power mode that permits the operation of selected customer convenience items for approximately 10 minutes after the ignition switch is turned OFF. RAP power mode is enabled by the body control module (BCM) and controls certain BCM features.

The BCM monitors the ignition switch position, battery voltage and passenger compartment door status to determine whether RAP power mode should enable. If the ignition switch transitions from ON to OFF, the battery voltage is within the acceptable range, and the passenger compartment doors are closed, the BCM enables RAP power mode. After the 10 minutes have elapsed, the BCM will cease to produce the RAP power mode.

Some BCM features, such as the interior courtesy lamps, will function after the 10 minute RAP time limit has elapsed. This is normal and does not mean RAP power mode is malfunctioning. The BCM enables the following functions in RAP power mode:

- The radio
- The sunroof, internal to BCM-if equipped
- The power windows, internal to BCM-if equipped

RAP is disabled when:

- A door is opened.
- The BCM detects low battery voltage.
- The transition of ignition switch from OFF to ON or ACC.
- 10 minutes have elapsed after the ignition was turned OFF.

IMPORTANT: There may be some functions of the vehicle that are hard-wired straight to the battery; these are the exceptions.

ACC Relay

The accessory (ACC) relay switches the accessory power to the vehicle and also severs as the retained accessory power (RAP) relay when the body control module (BCM) commands a RAP power mode. The ACC relay is installed directly on the BCM and its supply current is derived from the fuse block underhood junction box. The BCM on this vehicle is integrated with a bussed electrical center (BEC), because the BCM and the BEC are integrated. Replacement of the BCM may be the only way to repair certain RAP malfunctions, e.g., internal short to B+ or ground.