

2004 ACCESSORIES & EQUIPMENT

Body Control System - Ion

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

BODY CONTROL SYSTEM SCHEMATICS

Refer to System Wiring Diagrams .

COMPONENT LOCATOR

BODY CONTROL SYSTEM COMPONENT VIEWS

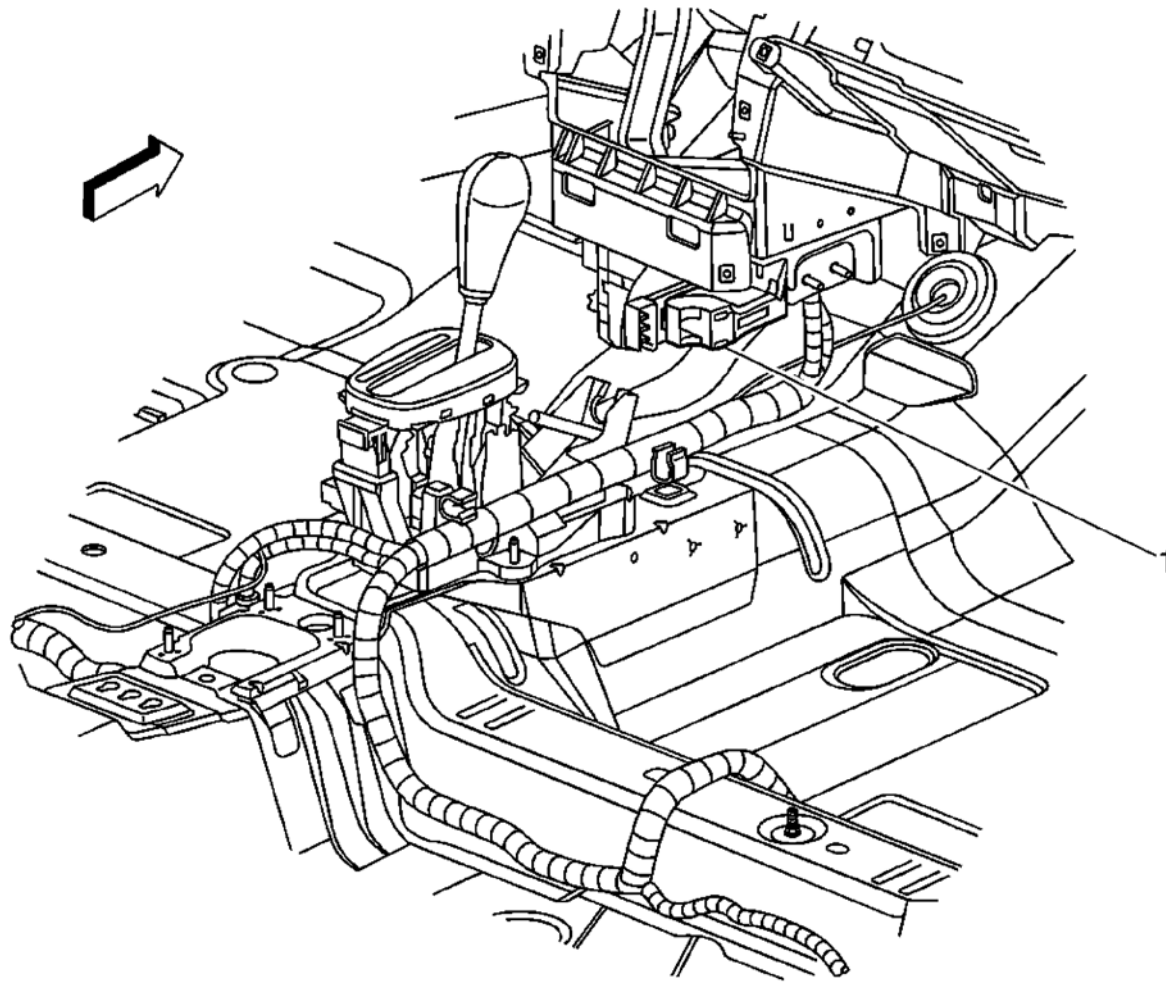


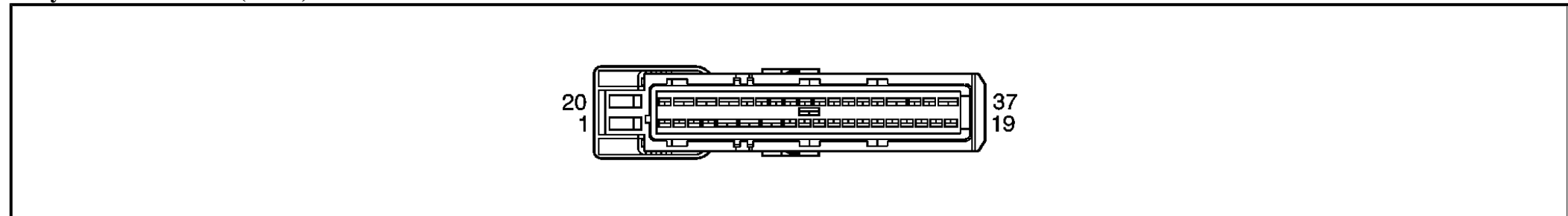
Fig. 1: Lower Center Of I/P Component View
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 1

Callout	Component Name
1	Body Control Module (BCM)

BODY CONTROL SYSTEM CONNECTOR END VIEWS

Body Control Module (BCM) C1 Terminal Identification



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 (2.0L)
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)
8-17	-	-	Not Used
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

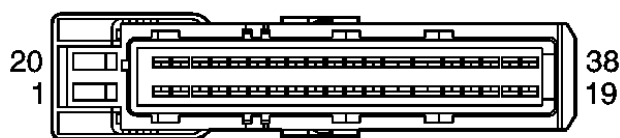
Body Control Module (BCM) C2 Terminal Identification



Connector Part Information

- 1326143-1
- 38-Way F AMP (GY)

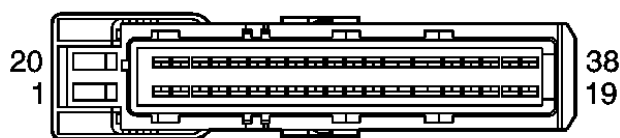
Pin	Wire Color	Circuit No.	Function
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Connector Part Information

- 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	-	-	Not Used
10	PK	339	Ignition 1 Voltage (M86 or MU3)
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
19-20	-	-	Not Used
21	OG	40	Battery Positive Voltage
22	YE	143	Accessory Voltage
23	YE	143	Accessory Voltage (M43 or M75)
24-27	-	-	Not Used
28	PK	339	Ignition 1 Voltage (2.2L w/K34)
29	YE	343	Accessory Voltage
30	-	-	Not Used
31	OG	52	Blower Motor Supply Voltage
32	OG	52	Blower Motor Supply Voltage
33	YE	1139	Ignition 1 Voltage
34	-	-	Not Used
35	PK	1539	Ignition 1 Voltage
36-37	-	-	Not Used

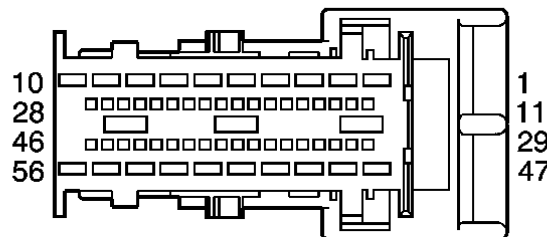


Connector Part Information

- 1326143-1
- 38-Way F AMP (GY)

Pin	Wire Color	Circuit No.	Function
38	OG	140	Battery Positive Voltage

Body Control Module (BCM) C3 Terminal Identification



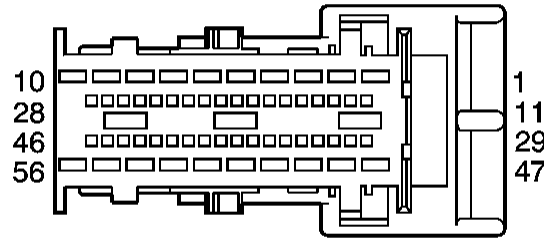
Connector Part Information

- 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 (AU3)
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	OG	1732	Inadvertent Power Supply Voltage (2.2L)
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 (AU3)
34	WH	682	Driver Door Lock Actuator Unlock Control (AU3)
35	D-GN	146	Trunk Ajar Indicator Control (AU3)
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 (2.2L)
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 w/AU3)
49	GY	295	Door Lock Actuator Lock Control (Sedan w/AU3)
50	GY	295	Door Lock Actuator Lock Control (AU3)
51	GY	295	Door Lock Actuator Lock Control (AU3)
52	TN	294	Door Lock Actuator Unlock Control (AU3)
53	TN	294	Door Lock Actuator Unlock Control (Sedan w/AU3)
54	-	-	Not Used
55	TN	294	Door Lock Actuator Unlock Control (Sedan w/AU3)
56	D-BU	1201	Headlamp Low Beam Signal

Body Control Module (BCM) C4 Terminal Identification



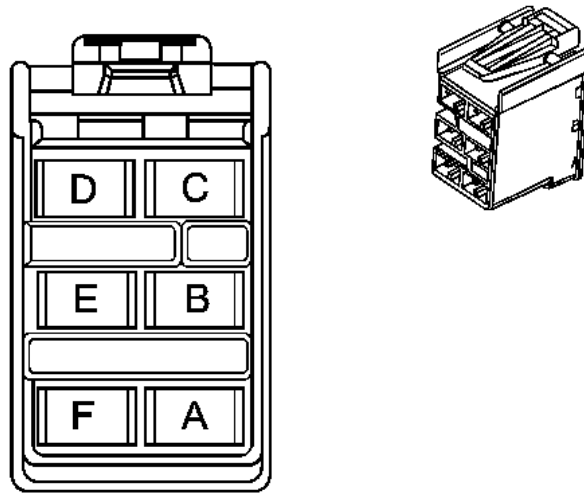
Connector Part Information

- 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 (NW7)
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	-	-	Not Used

30	GY	8	Instrument Panel Lamps Supply Voltage (M43 or M75)
31	GY	8	Instrument Panel Lamps Supply Voltage (T37)
32	YE	317	Fog Lamp Relay Coil Supply Voltage (T37)
33	BK	28	Horn Relay Control
34	BN	323	Shift Lock Solenoid Supply Voltage (M43 or M75)
35	-	-	Not Used
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	Low Beam Switched Ground
48	WH/BK	1073	5-Volt Reference
49	GY	728	Security Indicator Control
50	L-GN/BK	1137	DRL Ambient Light Sensor Signal 5V (T82)
51	-	-	Not Used
52	OG	192	Front Fog Lamp Switch Signal (T37)
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) Terminal Identification



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

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - BODY CONTROL SYSTEM

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

SCAN TOOL DATA LIST

Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Battery 1	Volts	Varies
Brake Fluid Level	Volts	Varies
Brake Fluid Level Status	Normal/Open Ckt.	Normal
BTSI	Unlocked/Locked	Locked
Coolant Level	Low/OK	OK
Park Brake Switch	On/Off	OFF
Traction Switch	On/Off	OFF
Traction Switch LED	On/Off	ON

Wiper/Washer Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Battery 1	Volts	Varies
Washer Switch	On/Off	OFF
Wiper Ground	On/Off	OFF
Wiper Park Switch	On/Off	ON
Wiper Replay Cmd.	On/Off	OFF
Wiper Switch	Volts	Varies
Wiper Switch State	On/Off	OFF

Door Lock Data Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Battery 1	Volts	Varies
Decoded Switch State	Lock/Unlock/Off	OFF
Door Lock Switch	Volts	Varies
Driver Door Switch	Open/Closed	Closed
Driver Door Unlock Fdbk.	On/Off	OFF
Fob ID	None/Fob1/Fob2	Varies
Lock All Doors Fdbk.	On/Off	OFF
Pass Door Switches	Open/Closed	Closed
RKE Lock Button	On/Off	Varies
RKE Low Battery	Yes/No	Varies
RKE Panic Button	On/Off	Varies
RKE Trunk Button	On/Off	Varies
RKE Unlock Button	On/Off	Varies
Trunk Release	On/Off	OFF
Unlock All Doors Fdbk.	On/Off	Off

Security Data Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Auto. Learn Timer	Seconds	Varies
Battery 1	Volts	Varies
CTD Security LED Request	On/Off/Flash	OFF
Horn Relay	On/Off	OFF
Last Alarm Cause	Default/Driver Door/Pass Door/Trunk/Power Mode	Default
Lockout Timer Status	Seconds	Varies
Passlock Data Voltage	Volts	Varies
Passlock Telltale	On/Off	OFF
Security LED	On/Off	OFF
Seed and Key Timer	Seconds	Varies

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Theft Previously Alarmed	Yes/No	No
Theft System Status	Disabled/Disarmed/Pre-Arm/Armed/Alarm/Passive Arm	Disarmed
2nd to Last Alarm Cause	Default/Driver Door/Pass Door/Trunk/Power Mode	Default
3rd to Last Alarm Cause	Default/Driver Door/Pass Door/Trunk/Power Mode	Default

Exterior Lamps Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
ALC Headlamp Relay	On/Off	OFF
ALC Parklamp Relay	On/Off	OFF
ALC Light Sensor	Volts	Varies
ALC Switch	On/Off	ON
Battery 1	Volts	Varies
Day/Night Status	Day/Night/Off/Delay Off	Night
DRL Status		Not Allowed
Fob Lamp Relay	On/Off	OFF
Fog Lamp Switch	On/Off	OFF
High Beam Switch	On/Off	OFF
LF Turn Signal	On/Off	OFF
LR Turn Signal	On/Off	OFF
Low Beam Switch	On/Off	OFF
Park Lamp Switch	On/Off	OFF
RF Turn Signal	On/Off	OFF
RR Turn Signal	On/Off	OFF
Turn/Hazard Input	Volts	Varies

Interior Lamps Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Battery 1	Volts	Varies
Inadvertent Power Cmd.	On/Off	ON
Inadvertent Power Input	On/Off	ON
Interior Lighting Cmd.	%	Varies
Interior Lighting Relay	On/Off	OFF
I/P Dimmer Input	Volts	Varies
I/P Dimmer Output	%	Varies

HVAC Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
A/C Switch	On/Off	Varies
Battery 1	Volts	Varies

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Rear Defog Relay Cmd.	On/Off	OFF
Rear Defog Switch	On/Off	OFF

Ignition Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Accessory	On/Off	ON
Battery 1	Volts	Varies
Ignition Accessory	Active/Inactive	Active
Ignition Mode Switch	Volts	Varies
Ignition Run/Crank	High/Low	High
Key in Ignition	Yes/No	YES
Power Mode	Crank/Run/Accessory/Off	RUN
Run/Crank Relay Command	On/Off	ON

Chime Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
Operating Conditions: Ignition in RUN Position, Engine OFF, All Doors Closed, DRLs OFF		
Battery 1	Volts	Varies
Chime State	No Request/ON/On Queued/Off Queued	No Request
Last Chime Active	Seat Belt/Key In/Oil Reset/Delayed Lock/Head Lamp/Park Brake/Check Gauges/Turn Signal	Seat Belt

SCAN TOOL DATA DEFINITIONS

Accessory

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

A/C Switch

The scan tool displays No/Yes. The BCM displays Yes when it receives an input from the HVAC control head indicating an A/C request.

ALC Headlamp Relay

The scan tool displays On/Off. The scan tool indicates ON when DRLs are requested On.

ALC Light Sensor

The scan tool displays voltage. The BCM indicates the voltage from the solar sensor.

ALC Parklamp Relay

The scan tool displays On/Off. The scan tool indicates ON when DRLs are requested On.

Auto. Learn Timer

The scan tool displays the time in seconds used by the BCM to learn valid code from the Passlock(tm) sensor using the techline terminal reprogramming procedure.

Battery 1

The scan tool displays the vehicles battery voltage.

Brake Fluid Level

The scan tool displays Voltage. This input varies depending on Power Mode.

Brake Fluid Level Status

The scan tool displays Open Ckt/Normal. This BCM input displays whether brake fluid level is low (Open Ckt) or Normal.

BTSI (Brake Transmission Shift Interlock)

The scan tool displays Unlocked/Locked. The BCM indicates whether the shifter unlock control circuit is Unlocked or Locked.

Chime State

The scan tool displays No Request/On/On Queued/Off Queued. The chime state is commanded by the IPC.

Coolant Level

The scan tool displays Low/Ok, depending on the amount of coolant that is in the vehicle.

CTD Security LED Request

The scan tool displays On/Off. The BCM indicates which LED status is active. The scan tool indicates OFF when the security LED is Off.

Day/Night Status

The scan tool displays Day/Night. The BCM determines whether the vehicle is under Day or Night conditions.

Decoded Switch State

The BCM interprets the voltage drop across the door lock switch and displays the decoded value as Lock/Unlock/Off.

Door Lock Switch

The scan tool displays Voltage. The BCM indicates varying voltage depending on lock switch status.

Driver Door Switch

The scan tool displays Open/Closed. The scan tool displays the current state of the drivers door ajar switch as either Open or Closed. When the driver door is open, the scan tool will display Closed.

Driver Door Unlock Fdbk.

The scan tool displays On/Off. When the BCM recognizes a request to UNLOCK the Drivers Door, the scan tool displays ON.

DRL Status

The scan tool displays the status of the daytime running lamps (DRL).

Fob ID

The scan tool displays Fob 1/Fob 2/None. The BCM displays which Fob last sent a request.

Fog Lamp Relay

The scan tool displays On/Off. The BCM indicates whether the Fog Lamp Relay is On or Off.

Fog Lamp Switch

The scan tool displays On/Off. This input displays ON when the Fog Lamps are ON.

High Beam Switch

The scan tool displays On/Off. This input displays ON when the High Beams are ON.

Horn Relay

The scan tool displays On/Off. The BCM indicates if it is commanding the horn relay On or Off.

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(tm) 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/Low. When the ignition switch is in the Run/Crank position, the scan tool shows High.

Inadvertent Power Cmd.

The scan tool displays On/Off. The BCM will indicate if it is commanding the inadvertent power On or Off.

Inadvertent Power Input

The scan tool displays On/Off. The BCM indicates if conditions for inadvertent power are On or Off.

Interior Lighting Cmd.

The scan tool displays the percentage. The BCM will indicate the percentage of interior light dimming.

Interior Lighting Relay

The scan tool displays On/Off. The BCM indicates whether the interior lighting relay On or Off.

I/P Dimmer Input

The scan tool displays the IPC dimmer input in volts.

I/P Dimmer Output

The scan tool displays the IPC dimmer output in percentage.

Key in Ignition

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

Last Alarm Cause

The scan tool displays Default/Driver Door/Pass Door/Trunk/Power Mode for which area caused an alarm.

2nd to Last Alarm Cause

The scan tool displays Default/Driver Door/Pass Door/Trunk/Power Mode for which area caused an alarm.

3rd to Last Alarm Cause

The scan tool displays Default/Driver Door/Pass Door/Trunk/Power Mode for which area caused an alarm.

Last Chime Active

The scan tool displays Default/Driver Door/Pass Door/Trunk/Power Mode. The IPC stores the last chime active.

LF Turn Signal

The scan tool displays On/Off. The scan tool indicates if the left front turn signal is commanded On or Off.

Lock All Doors Fdbk.

The scan tool displays On/Off. When the BCM recognizes a command to LOCK all doors, the scan tool displays ON.

Lockout Timer Status

The scan tool displays Seconds, which indicates time remaining when in tamper mode. The timer starts when the ignition switch is turned to the ON position and the BCM receives a Passlock(tm) data voltage difference from the last learned voltage. The timer has a delay of 10 minutes and will stay active even if the ignition switch is cycled from the ON to the OFF position.

Low Beam Switch

The scan tool displays On/Off. This input displays ON when the Low Beams are ON.

LR turn Signal

The scan tool displays On/Off. The scan tool indicates if the left rear turn signal is commanded On or Off.

Park Brake Switch

The scan tool displays On/Off. The BCM receives an input from the park brake switch indicating On when the switch is closed, park brake applied.

Park Lamp Switch

The scan tool displays On/Off. This input displays ON when the Park Lamps are ON.

Pass Door Switches

The scan tool displays Open/Closed. The scan tool displays the current state of the passengers door ajar switch as either Closed or Open. When any door (other than driver) is open the scan tool will display Closed.

Passlock(tm) Data Voltage

The scan tool displays the voltage from the Passlock(tm) sensor to the BCM. The BCM determines if the voltage received is a valid or invalid code voltage.

Passlock(tm) Telltale

The scan tool displays On/Off. The BCM indicates if the Passlock(tm) lamp is illuminated on the instrument panel.

Power Mode

The scan tool displays Run when the ignition switch is in the Run position. Accessory displays when in the Accessory position. Accessory will also display when the vehicle is in the RAP power mode. The scan tool will indicate Crank during an engine crank condition. OFF will display when the ignition switch is in the OFF position, and after the RAP function has timed out or overridden by a door switch.

Rear Defog Relay Cmd

The scan tool displays On/Off. The BCM will indicate if it is commanding the rear defog relay On or Off.

Rear Defog Switch

The scan tool displays On/Off. The BCM receives an input from the HVAC control head indicating the rear defog system is turned ON.

RF Turn Signal

The scan tool displays On/Off. The scan tool indicates if the right front turn signal is commanded On or Off.

RKE Lock Button

The scan tool displays On/Off, depending on which Fob last transmitted a LOCK request.

RKE Low Battery

The scan tool displays Yes/No, depending on which Fob has low transmitting power.

RKE Panic Button

The scan tool displays On/Off, depending on which Fob last transmitted a PANIC request.

RKE Trunk Button

The scan tool displays On/Off, depending on which Fob last transmitted a TRUNK release request.

RKE Unlock Button

The scan tool displays On/Off, depending on which Fob last transmitted an UNLOCK request.

RR Turn Signal

The scan tool displays On/Off. The scan tool indicates if the right rear turn signal is commanded On or Off.

Run/Crank Relay Command

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

Security LED

The scan tool displays On/Off/Flash as commanded by the BCM.

Seed and KEY Timer

The scan tool displays seconds, in which the BCM learns a valid code from the Passlock(tm) sensor. The learn procedure consists of 3 consecutive periods.

Theft Previously Alarmed

The scan tool displays Yes/No. The scan tool indicates whether the theft system sounded its alarm.

Theft System Status

The scan tool displays Disabled/Disarmed/Pre Arm/Armed/Pre Alarm/Alarm/Passive Arm. The scan tool indicates the current state of theft system readiness.

Traction Switch

The scan tool displays On/Off. The BCM will indicate if it is commanding the traction LED On or Off.

Traction Switch LED

The scan tool displays On/Off. This input to the BCM displays the state of the traction LED feedback circuit. ON indicates the BCM is providing a ground for the traction LED.

Trunk Release

The scan tool displays On/Off. This input displays ON when the trunk release switch is activated.

Turn/Hazard Input

The scan tool displays On/Off. The scan tool indicates if the right front turn signal is requested On or Off.

Unlock All Doors Fdbk.

The scan tool displays On/Off. When the BCM recognizes a request to UNLOCK all doors, the scan tool indicates ON.

VIN Number

The scan tool displays the vehicle identification number.

Washer Switch

The scan tool displays On/Off. The scan tool displays ON when the windshield washers are requested.

Wiper Ground

The scan tool displays On/Off. The BCM displays whether the ground circuit for the windshield wipers is requested.

Wiper Park Switch

The scan tool displays On/Off. The BCM indicates wiper park switch input.

Wiper Relay Cmd.

The scan tool displays On/Off. The BCM displays the state of the relay as commanded.

Wiper Switch

The scan tool displays Voltage. The BCM indicates voltage depending on windshield wiper switch position.

Wiper Switch State

The scan tool displays On/Off. The scan tool indicates ON with windshield wiper operation.

DIAGNOSTIC TROUBLE CODE (DTC) LIST

Diagnostic Trouble Code (DTC) List

DTC Code	Diagnostic Procedure	Module
B0285	<u>DTC B0285</u> in Stationary Windows	BCM
B1000	<u>DTC B1000</u>	BCM, SDM, ECM, IPC, EBCM, VCIM, EPS
B1001	<u>DTC B1001</u>	BCM, EBCM, SDM
B1004	<u>DTC B1004</u>	VCIM
B1009	<u>DTC B1009</u>	VCIM
B1372	<u>DTC B1372, B1373, or B1374</u>	BCM
B1373	<u>DTC B1372, B1373, or B1374</u>	BCM
B1374	<u>DTC B1372, B1373, or B1374</u>	BCM
B1382	<u>DTC B1382, B1383, or B1384</u>	BCM
B1383	<u>DTC B1382, B1383, or B1384</u>	BCM
B1384	<u>DTC B1382, B1383, or B1384</u>	BCM
B1441	<u>DTC B1441, B1442, or B1443</u>	BCM
B1442	<u>DTC B1441, B1442, or B1443</u>	BCM
B1443	<u>DTC B1441, B1442, or B1443</u>	BCM
B2558	<u>DTC B2558</u> in Lighting Systems	BCM
B2613	<u>DTC B2613</u> in Lighting Systems	BCM
B2627	<u>DTC B2627</u> in Lighting Systems	BCM
B2647	<u>DTC B2647</u> in Lighting Systems	BCM
B2648	<u>DTC B2648</u> in Lighting Systems	BCM
B2707	<u>DTC B2707</u> in Shift Lock Control	BCM
B2709	<u>DTC B2709</u> in Shift Lock Control	BCM
B2957	<u>DTC B2957</u> in Theft Deterrent	BCM
B2958	<u>DTC B2958</u> in Theft Deterrent	BCM
B2960	<u>DTC B2960</u> in Theft Deterrent	BCM
B3031	<u>DTC B3031</u> in Theft Deterrent	BCM
B3033	<u>DTC B3033</u> in Theft Deterrent	BCM
B3109	<u>DTC B3109</u> in Keyless Entry	BCM, RFA
B3127	<u>DTC B3127</u> in Doors	BCM
B3132	<u>DTC B3132</u> in Doors	BCM
B3137	<u>DTC B3137</u> in Doors	BCM
B3267	<u>DTC B3267</u> in Body Rear End	BCM
B3268	<u>DTC B3268</u> in Body Rear End	BCM

DTC Code	Diagnostic Procedure	Module
B3715	<u>DTC B3715, B3716, B3717, B3718, or B3719</u> in Wipers/Washer System	BCM
B3717	<u>DTC B3715, B3716, B3717, B3718, or B3719</u> in Wipers/Washer System	BCM
B3718	<u>DTC B3715, B3716, B3717, B3718, or B3719</u> in Wipers/Washer System	BCM
B3948	<u>DTC B3948</u> in Lighting Systems	BCM
B3949	<u>DTC B3949</u> in Lighting Systems	BCM
B3950	<u>DTC B3950</u> in Lighting Systems	BCM
B3951	<u>DTC B3951</u> in Lighting Systems	BCM
C0267 or C0129	<u>DTC C0267</u> in Hydraulic Brakes	BCM
C0550	<u>DTC C0550</u>	EPS, EBCM
U1000	<u>DTC U1000 and U1255</u> in Data Link Communications	BCM, EBCM, ECM, EPS, IPC, SDM, VCIM
U1016	<u>DTC U1001-U1254</u> in Data Link Communications	BCM, EBCM, EPS, IPC, SDM
U1040	<u>DTC U1001-U1254</u> in Data Link Communications	BCM, ECM, EPS, IPC, SDM
U1048	<u>DTC U1001-U1254</u> in Data Link Communications	BCM
U1064	<u>DTC U1001-U1254</u> in Data Link Communications	ECM, EPS, SDM
U1088	<u>DTC U1001-U1254</u> in Data Link Communications	BCM, IPC
U1096	<u>DTC U1001-U1254</u> in Data Link Communications	BCM, SDM
U1151	<u>DTC U1001-U1254</u> in Data Link Communications	BCM
U1255	<u>DTC U1000 and U1255</u> in Data Link Communications	BCM, EBCM, ECM, EPS, IPC, SDM, VCIM
U1300	<u>DTC U1300, U1301, or U1305</u> in Data Link Communications	BCM, EBCM, EPS, IPC, SDM, VCIM
U1301	<u>DTC U1300, U1301, or U1305</u> in Data Link Communications	BCM, EBCM, EPS, IPC, SDM, VCIM
U1305	<u>DTC U1300, U1301, or U1305</u> in Data Link Communications	BCM, EBCM, EPS, IPC, SDM, VCIM
U2100	<u>DTC U2100</u> in Data Link Communications	ECM, Radio, TCM
U2103	<u>DTC U2103 or U2104</u> in Data Link Communications	Radio
U2104	<u>DTC U2103 or U2104</u> in Data Link Communications	ECM, TCM
U2105	<u>DTC U2105-U2199</u> in Data Link Communications	ECM
U2106	<u>DTC U2105-U2199</u> in Data Link Communications	ECM
U2172	<u>DTC U2105-U2199</u> in Data Link Communications	Radio

DTC B1000

Circuit Description

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

Conditions for Running the DTC

The module 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.

Action Taken When the DTC Sets

The module 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 with out 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 for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
2	<ol style="list-style-type: none">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	IMPORTANT: Perform the programming or setup procedure for the module if required. Replace the control module setting the DTC as current. Refer to Control Module References .Did you complete the replacement?	Go to Step 4	-
4	<ol style="list-style-type: none">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

Modules can be configured with the applicable vehicle options. This code implies that a module was not configured either at the assembly plant or after replacement.

Conditions for Running the DTC

The ignition switch is turned on.

Conditions for Setting the DTC

The DTC sets when a 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 properly programmed.
- A history DTC will clear after the modules ignition cycle counter reaches the reset threshold, without a repeat of the malfunction.

Diagnostic Aids

The most likely reason for this DTC being set is due to incorrect calibration files downloaded to the module installed in the vehicle 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.

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

DTC B1001

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
2	1. Install the scan tool. 2. Turn ON the ignition with the engine OFF. 3. Retrieve the DTCs. Is the DTC retrieved as current?	Go to Step 3	Go to Diagnostic Aids
3	Perform the programming or setup procedure for the control module. Refer to Control Module References for the proper procedure. Does the DTC reset?	Go to Step 4	System OK
4	IMPORTANT: Perform the programming or setup procedure for the control module, if required. Replace the control module. Refer to Control Module References .Did you complete the replacement?	System OK	-

DTC B1004

Circuit Description

The module contains a data storage area which can save pertinent data when the ignition is turned OFF. The keep alive memory (KAM) data is lost if battery power is removed from the module. The KAM area is an integral part of the microprocessor and cannot be serviced separately.

Conditions for Running the DTC

The module microprocessor must be active/awake.

Conditions for Setting the DTC

This DTC indicates the 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

- Interruptions to either the battery positive voltage circuit or the module ground circuit will cause the DTC to set.
- This DTC may be stored as a history DTC with out 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.
- This DTC will never set as current during testing unless there is a non-recoverable memory failure.
- If this DTC is retrieved as a current and history DTC, replace the module.

DTC B1004

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
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	IMPORTANT: Perform the programming or setup procedure for the module if required. Replace the control module setting the DTC as current. Refer to Control Module References .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 read only memory (EEPROM) check sum error detection is handled inside the control module. No external circuits are involved.

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 check sum test. The blocks of data that have not failed the check sum 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 retrieved as a history DTC without affecting the operation of the module. If the DTC is retrieved 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 for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
2	<ol style="list-style-type: none">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	IMPORTANT: Perform the programming or setup procedure for the module if required. Replace the control module setting the DTC as current. Refer to Control Module References .Did you complete the replacement?	Go to Step 4	-
4	<ol style="list-style-type: none">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

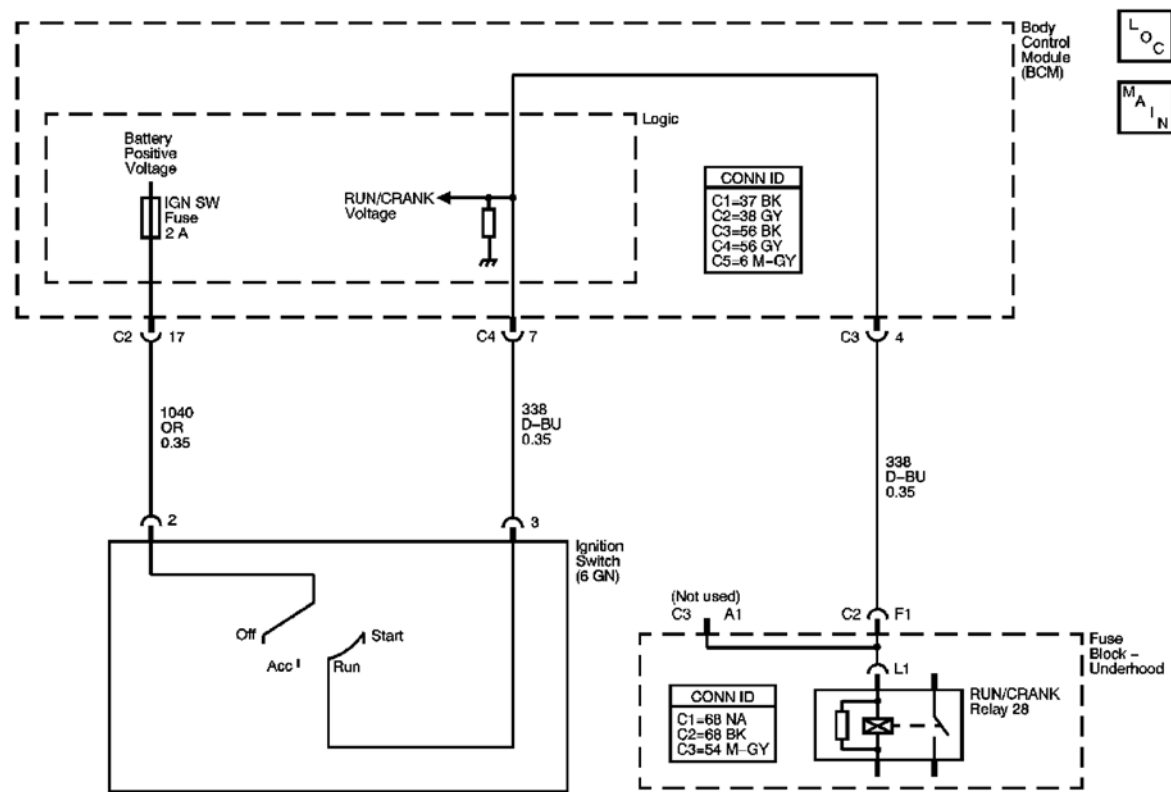


Fig. 2: BCM Circuit (DTC B1372, B1373, & B1374)
 Courtesy of GENERAL MOTORS CORP.

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.

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: Body Control System Connector End Views and Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
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. Does the scan tool display DTC B1372 to DTC B1374 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 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.	Go to Step 4	Go to Step 5

Step	Action	Yes	No
4	<p>Did you find a short between the two circuits?</p> <ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • Body Control System Schematics . • Circuit Testing in Wiring Systems. • Wiring Repairs in Wiring Systems. <p>Did you find and correct the condition?</p>	Go to Step 9	Go to Step 7
5	<p>IMPORTANT: The engine may crank during this procedure.</p> <ol style="list-style-type: none"> 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. <p>Can you measure continuity in both Run and Crank?</p>	Go to Step 8	Go to Step 6
6	<p>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?</p>	Go to Step 9	Go to Step 7
7	<p>Replace the ignition switch. Refer to Ignition Lock Cylinder Case Replacement in Steering Wheel and Column. Did you complete the replacement?</p>	Go to Step 9	-
8	<p>IMPORTANT: Perform the programming/RPO Configuration for the replacement BCM. Refer to Body Control Module (BCM) Programming/RPO Configuration .</p> <p>Replace the BCM. Refer to Body Control Module Replacement .Did you complete the replacement?</p>	Go to Step 9	-
9	<ol style="list-style-type: none"> 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 the supporting text. <p>Does the DTC reset?</p>	Go to Step 1	System OK

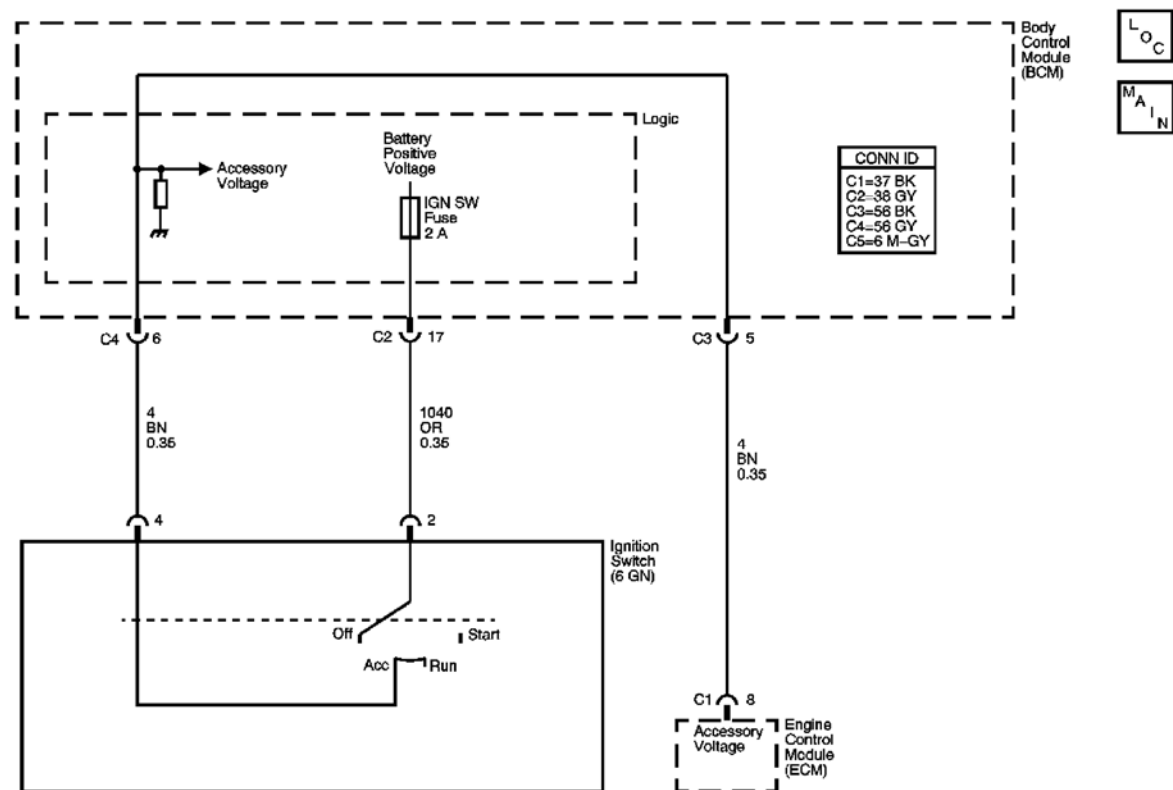


Fig. 3: BCM Circuit (DTC B1382 - B1384)
 Courtesy of GENERAL MOTORS CORP.

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.

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: Body Control System Connector End Views and Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
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

Step	Action	Yes	No
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: <ul style="list-style-type: none"> • 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	IMPORTANT: Perform the Programming/RPO Configuration for the replacement BCM. Refer to Body Control Module (BCM) Programming/RPO Configuration . Replace the BCM. Refer to Body Control Module Replacement .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

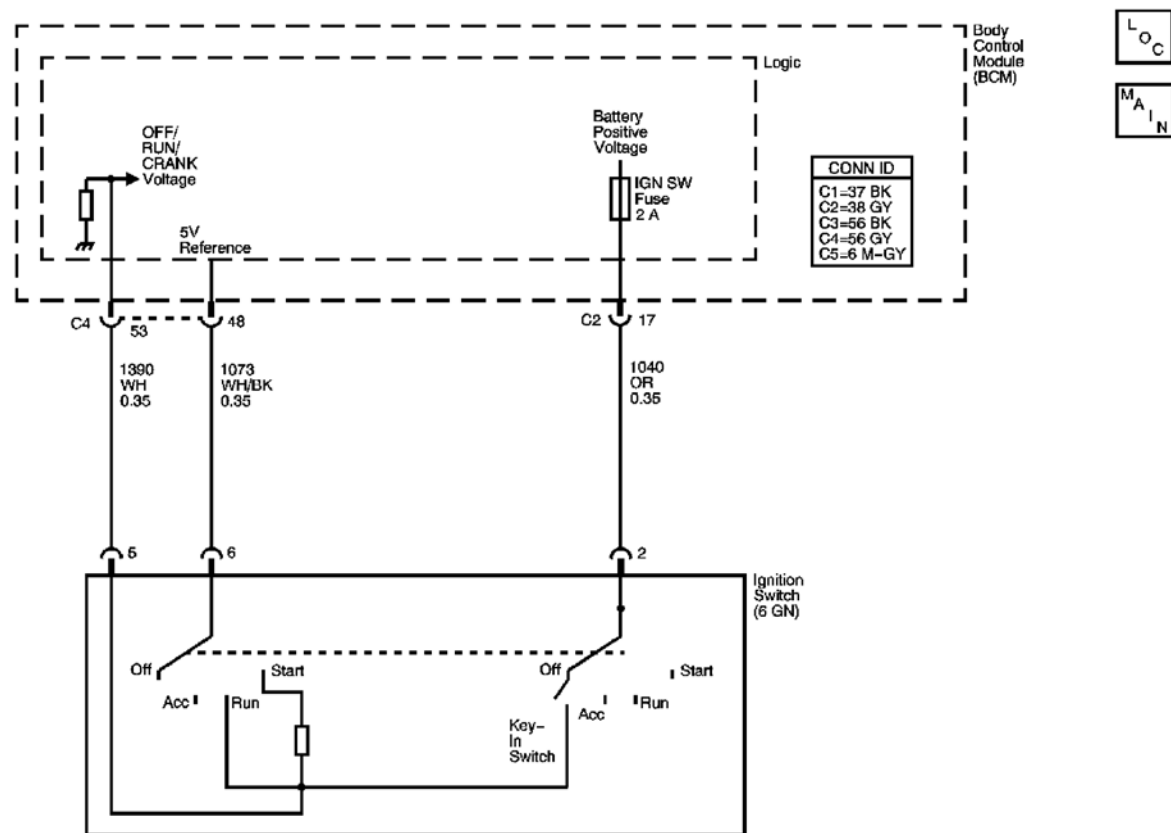


Fig. 4: BCM Circuit (DTC B1441 - B1443)
 Courtesy of GENERAL MOTORS CORP.

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.

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 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: Body Control System Connector End Views and Master Electrical Component List in Wiring Systems			
1	Did you perform the Diagnostic System Check for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
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

Step	Action	Yes	No
5	<ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • Body Control System Schematics • Circuit Testing in Wiring Systems • Wiring Repairs in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 14	Go to Step 6
6	<ol style="list-style-type: none"> 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. <p>Does the voltage measure +5-volt?</p>	Go to Step 7	Go to Step 13
7	<ol style="list-style-type: none"> 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. <p>Can you measure continuity?</p>	Go to Step 9	Go to Step 8
8	<p>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?</p>	Go to Step 14	Go to Step 12
9	<p>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?</p>	Go to Step 14	Go to Step 13
10	<ol style="list-style-type: none"> 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: <ul style="list-style-type: none"> • Body Control System Schematics • Circuit Testing in Wiring Systems • Wiring Repairs in Wiring Systems <p>Did you find and correct the condition?</p>	Go to Step 14	Go to Step 11
11	<ol style="list-style-type: none"> 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. 	Go to Step 12	Go to Step 13

Step	Action	Yes	No
	5. Test for a short to ground or voltage at the Off/Run/Crank terminal of the BCM harness connector.		
12	Did you observe a short to ground or voltage? 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	IMPORTANT: Perform the Programming/RPO Configuration for the replacement BCM. Refer to Body Control Module (BCM) Programming/RPO Configuration Replace the BCM. Refer to Body Control Module Replacement .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.

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 TCS indicator turns ON.
- The EBCM disables the ABS/DRP/TCS.

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.
- If this DTC continues to set intermittently, replace the module.

DTC C0550

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check for the system exhibiting the symptom?	Go to Step 2	Go to Control Module References for the applicable Diagnostic System Check
2	<ol style="list-style-type: none"> 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	IMPORTANT: Perform the programming or setup procedure for the module if required. Replace the control module setting the DTC as current. Refer to Control Module References .Did you complete the replacement?	Go to Step 4	-
4	<ol style="list-style-type: none"> 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

SYMPTOMS - BODY CONTROL SYSTEM

IMPORTANT: Review the system operation in order to familiarize yourself with the system functions. Refer to **Body Control System Description and Operation** .

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the body control system. 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:

Power Mode Mismatch

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: Body Control System 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 RAP power mode and eliminate this power mode from the power mode parameter list.			
1	<ol style="list-style-type: none">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. <p>Does the displayed Power Mode parameter match the actual ignition switch position?</p>	Go to Step 2	Go to Step 6
2	<ol style="list-style-type: none">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. <p>Does the displayed Power Mode parameter match the actual ignition switch position?</p>	Go to Step 3	Go to Step 6
3	<ol style="list-style-type: none">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. <p>Does the displayed Power Mode parameter match the actual ignition switch position?</p>	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.	Go to Step 5	Go to Step 6

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

Step	Action	Yes	No
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	IMPORTANT: After replacement of the PMM, perform the Programming/RPO Configuration for the module. Refer to Body Control Module (BCM) Programming/RPO Configuration . Replace the PMM. Refer to Control Module References .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

CONTROL MODULE REFERENCES

Control Module References

Control Module	Repair/Reprogramming Instructions	Diagnostic System Check	Schematic
Body Control Module (BCM)	Body Control Module Replacement Body Control Module (BCM) Programming/RPO Configuration	Diagnostic Starting Point - Body Control System	Body Control System Schematics
Electronic Brake Control Module (EBCM)	Electronic Brake Control Module Replacement in Antilock Brake System and Service Programming System (SPS) in Programming	Diagnostic System Check - ABS in Antilock Brake System	ABS Schematics in Antilock Brake System
Instrument Panel Cluster (IPC)	Instrument Panel Cluster (IPC) Replacement in Instrument Panel, Gages and Console and Service Programming System (SPS) in Programming	Diagnostic System Check - Instrument Cluster in Instrument Panel, Gages and Console	Instrument Panel Cluster (IPC) Replacement in Instrument Panel, Gages and Console
Engine Control Module (ECM)	Engine Control Module (ECM) Replacement in Engine Controls - 2.2 L (L61) and Service Programming System (SPS) in Programming	Diagnostic System Check - Engine Controls in Engine Controls - 2.2 L (L61)	Engine Controls Schematics in Engine Controls - 2.2 L (L61)

Control Module	Repair/Reprogramming Instructions	Diagnostic System Check	Schematic
Inflatable Restraint Sensing and Diagnostic Module (SDM)	<u>Inflatable Restraint Sensing and Diagnostic Module Replacement</u> in SIR and <u>Service Programming System (SPS)</u> in Programming	<u>Diagnostic System Check - SIR</u> in SIR	<u>SIR Schematics</u> in SIR
Electric Power Steering (EPS)	<u>Steering Column Replacement</u> in Steering Wheel and Column and <u>Service Programming System (SPS)</u> in Programming	<u>Diagnostic System Check - Power Steering System</u> in Power Steering System	<u>Power Steering System Schematics</u> in Power Steering System
Vehicle Communication Interface Module (VCIM)	<u>Communication Interface Module Replacement</u> in Cellular Communications and <u>Service Programming System (SPS)</u> in Programming	<u>Diagnostic System Check - Cellular Communication</u> in Cellular Communications	<u>OnStar Schematics</u> in Cellular Communications

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

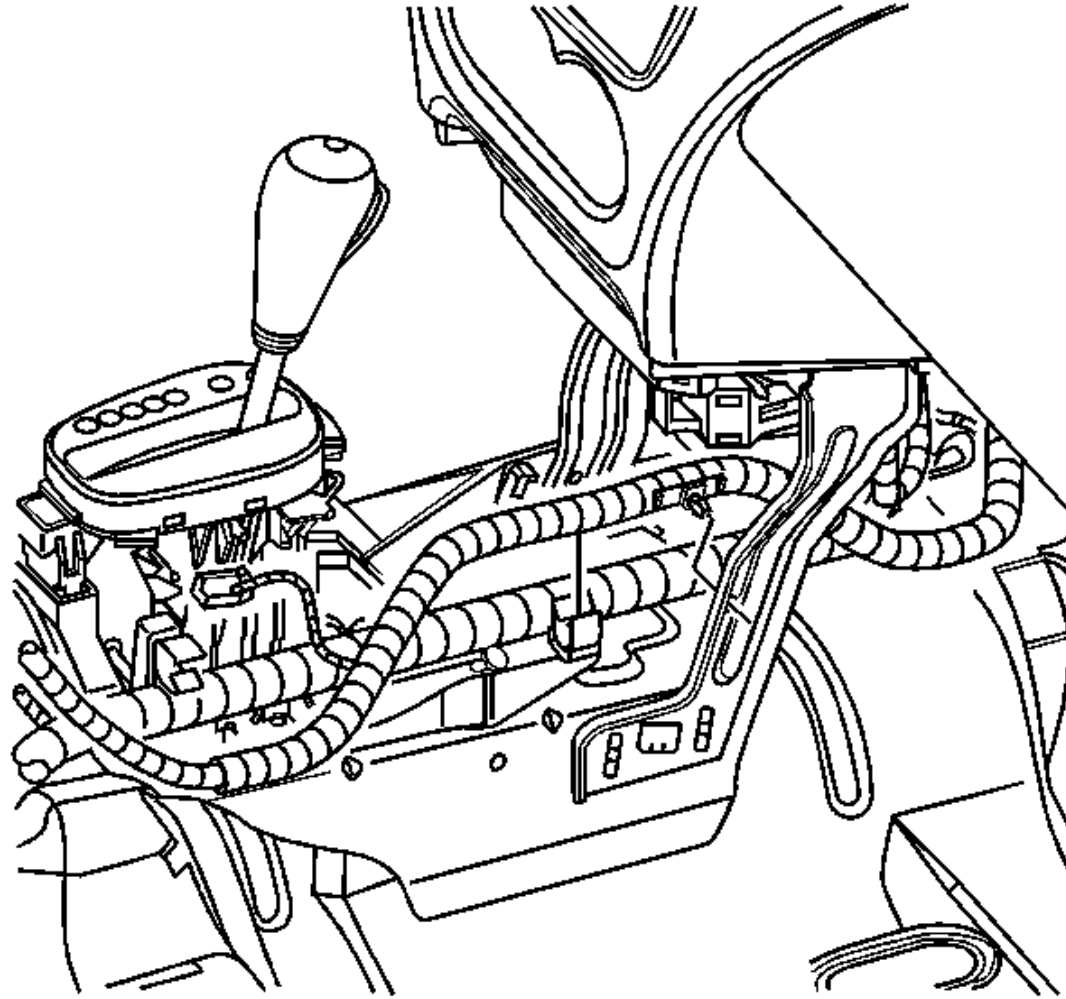


Fig. 5: View Of Wiring Harness Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

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

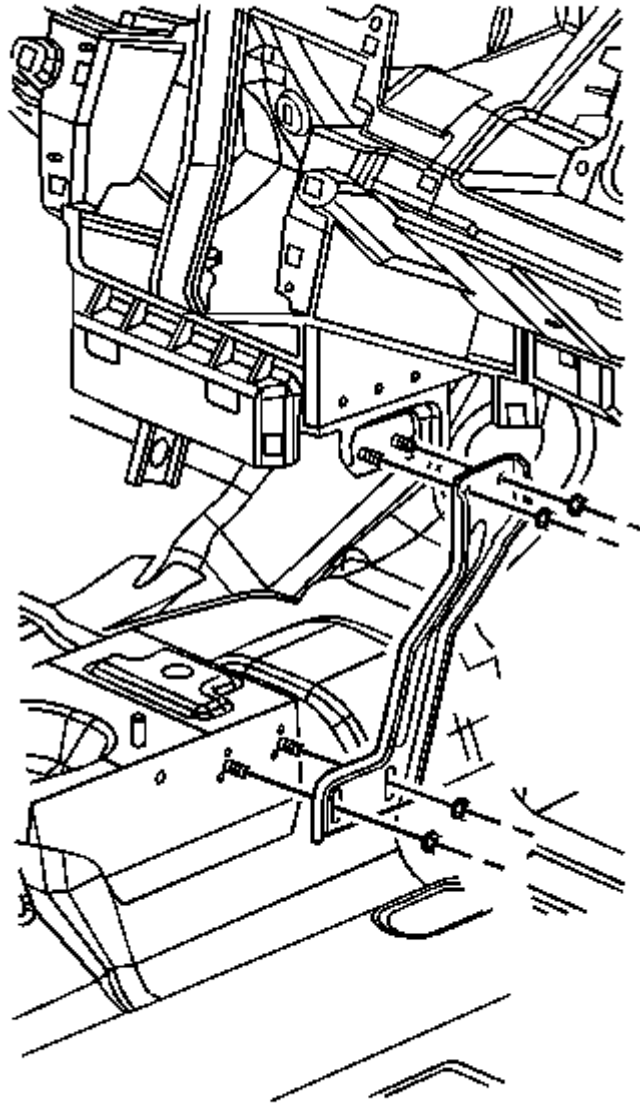


Fig. 6: View Of Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

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.

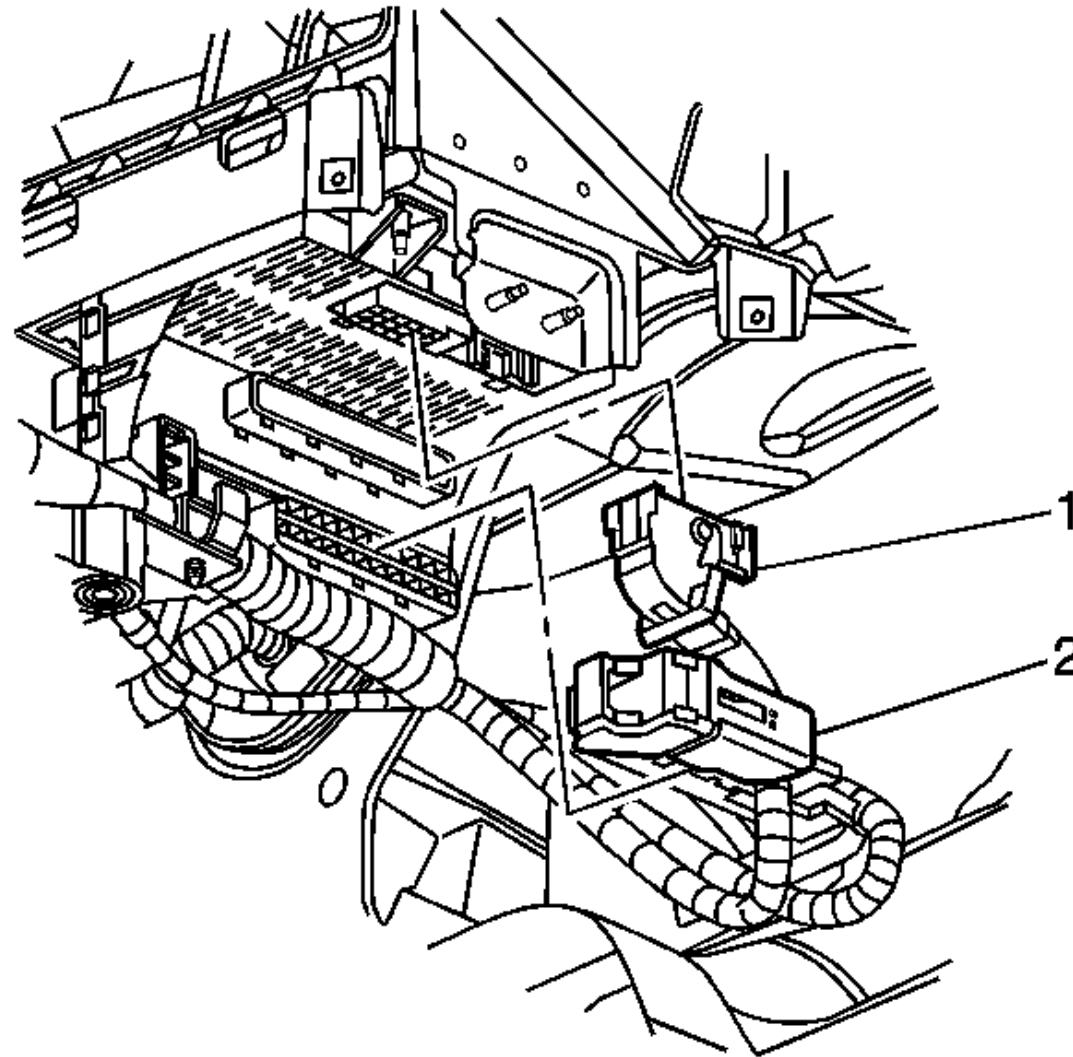


Fig. 7: View Of BCM Body Harness Connectors
Courtesy of GENERAL MOTORS CORP.

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.

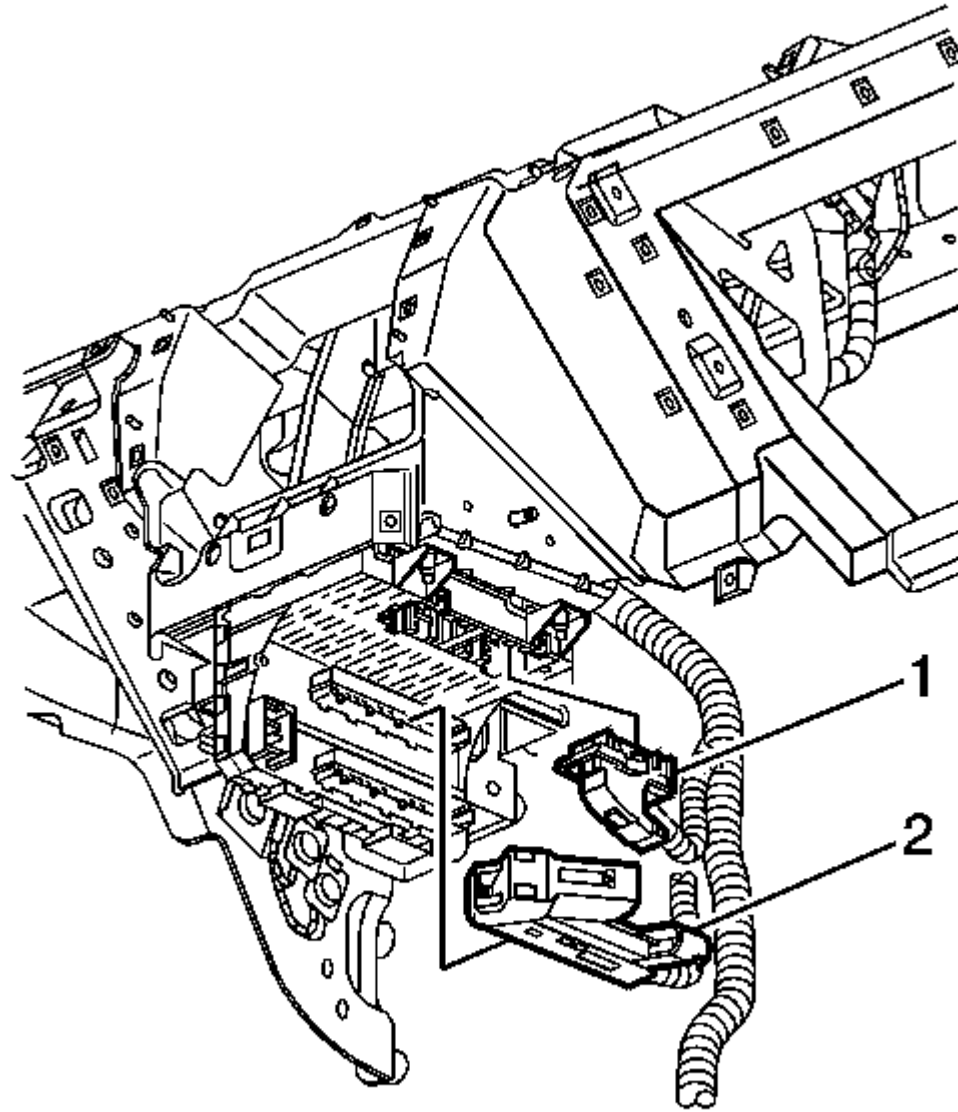


Fig. 8: View Of BCM I/P Wiring Harness Connectors
Courtesy of GENERAL MOTORS CORP.

10. If equipped with Onstar, disconnect the OnStar connector.
11. Remove the BCM nuts and remove the BCM from the vehicle.

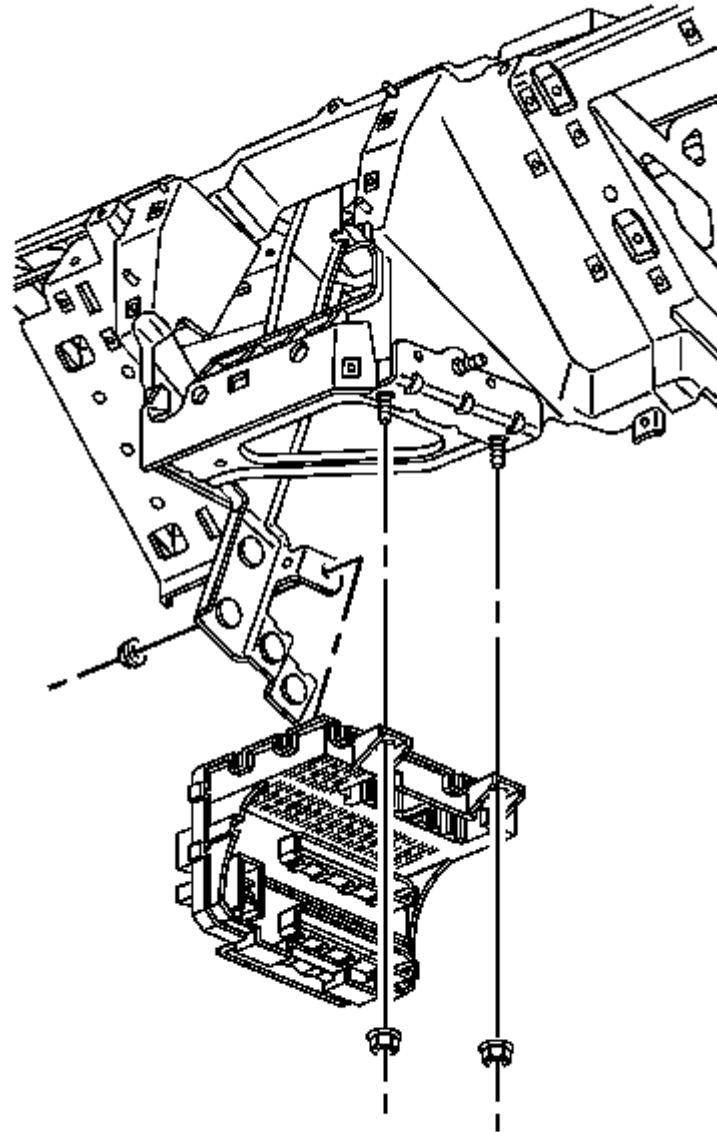


Fig. 9: View Of BCM

Courtesy of GENERAL MOTORS CORP.

Installation Procedure

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).

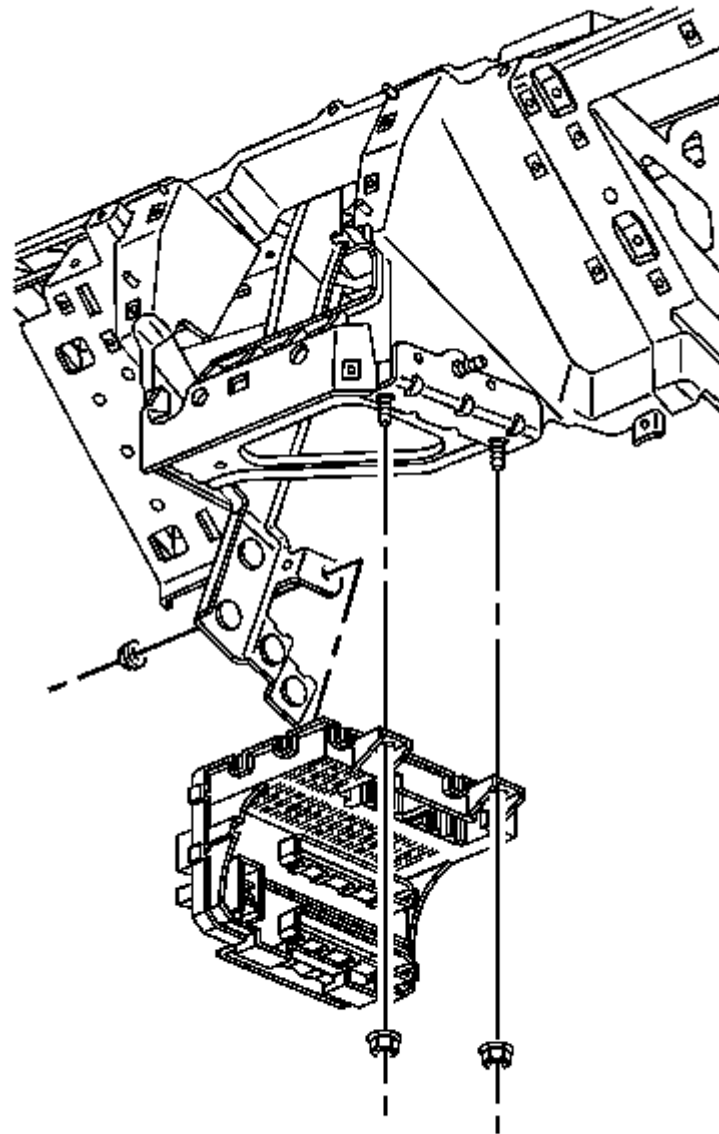


Fig. 10: View Of BCM

Courtesy of GENERAL MOTORS CORP.

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

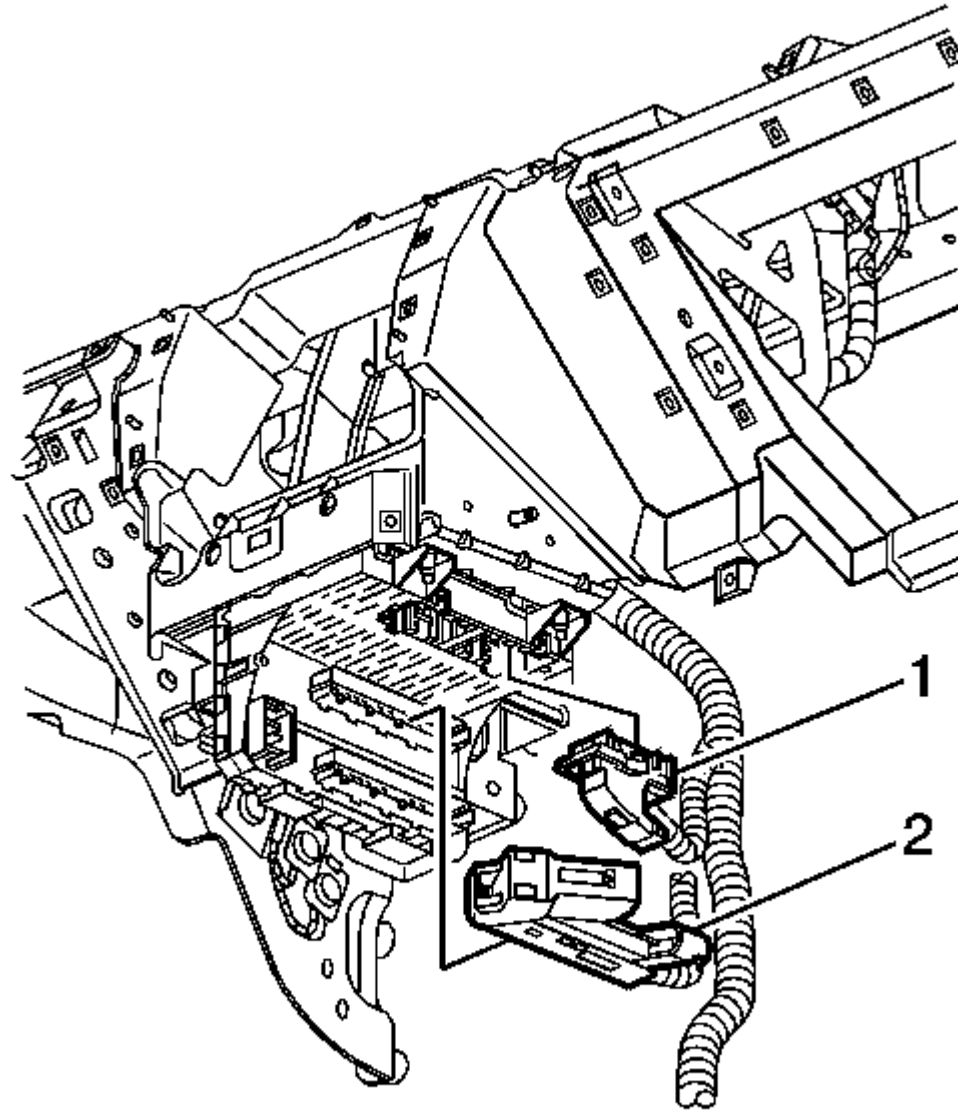


Fig. 11: View Of BCM I/P Wiring Harness Connectors
Courtesy of GENERAL MOTORS CORP.

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

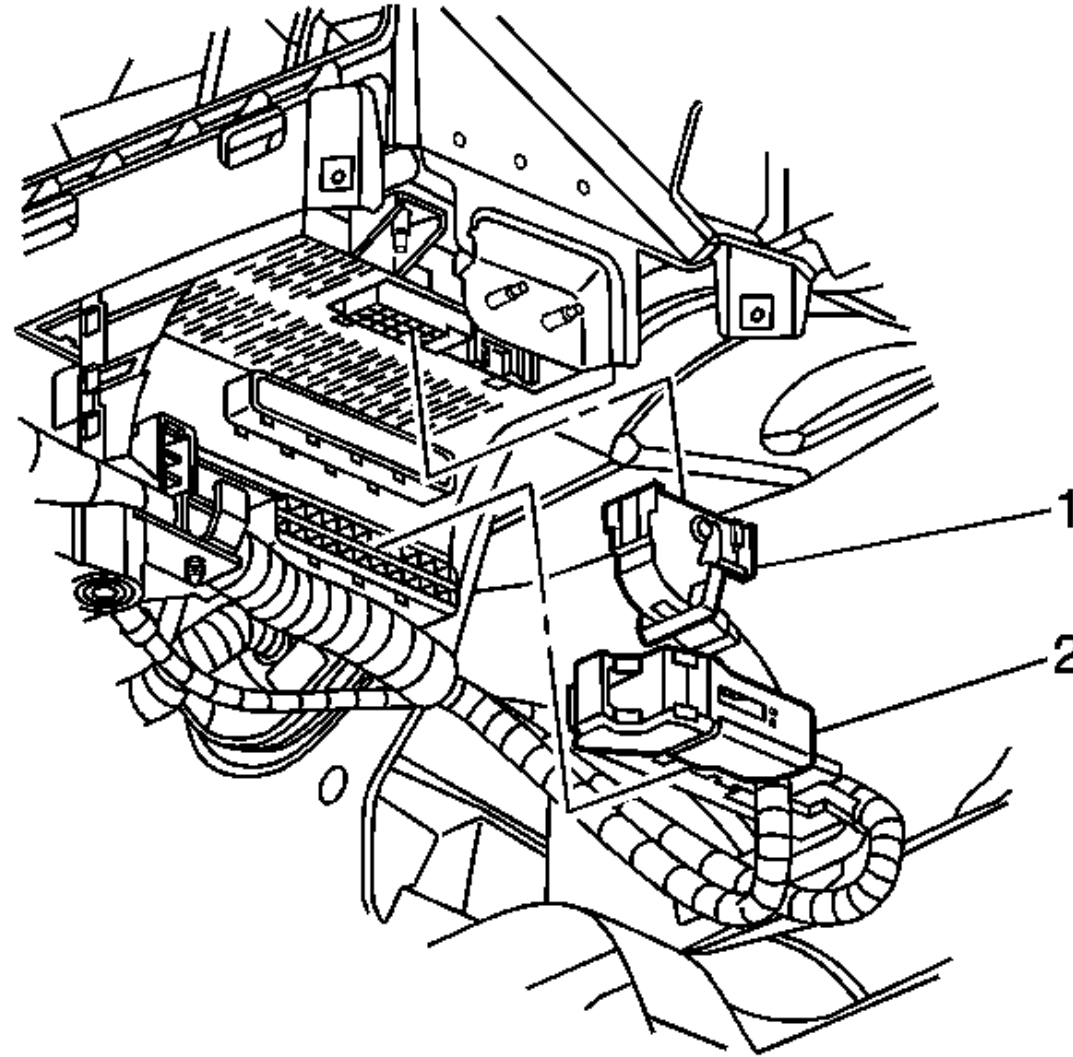


Fig. 12: View Of BCM Body Harness Connectors
Courtesy of GENERAL MOTORS CORP.

6. If equipped with Onstar, connect the OnStar connector.
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).

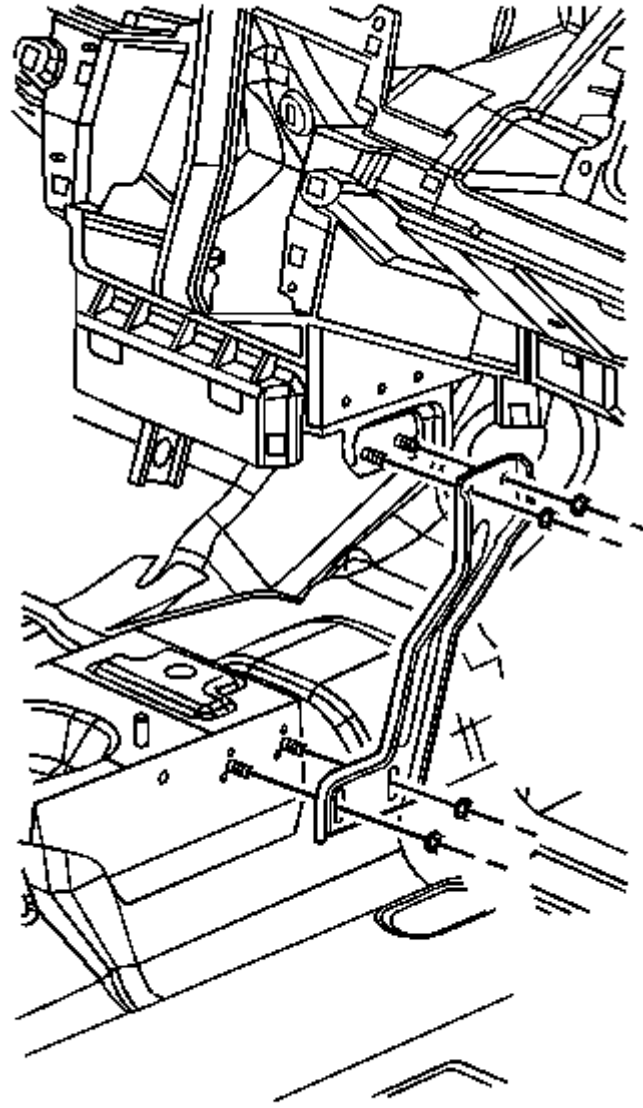


Fig. 13: View Of Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

9. Install the wiring harness rosebud to the center support bracket.

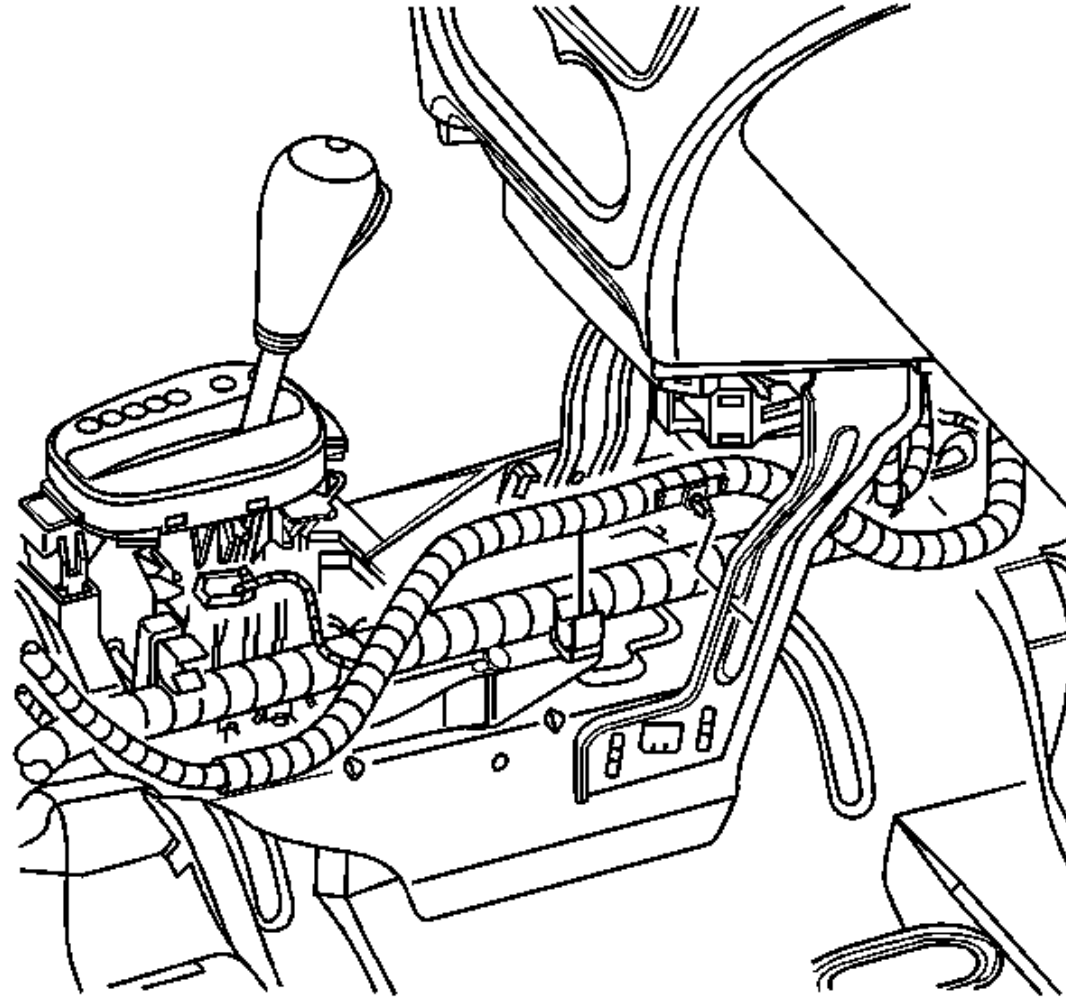


Fig. 14: View Of Wiring Harness Center Support Bracket
Courtesy of GENERAL MOTORS CORP.

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 [Body Control Module \(BCM\) Programming/RPO Configuration](#) .

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.
 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

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.

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 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

Ignition Switch Position	Accessory	Run/Crank	Off/Run/Crank	Power Mode Transmitted
Run	1	1	1	Run

Relay Controlled Power Mode

The 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 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 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 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 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.

Body Control Module

The various 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**](#) in Retained Accessory Power.
 - 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.
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