

2006 Chevrolet Equinox LS

2006 ACCESSORIES & EQUIPMENT Instrument Panel, Gages, and Console - Equinox & Torrent

2006 ACCESSORIES & EQUIPMENT

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SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Air Outlet Deflector Screw - Right	2 N.m	18 lb in
Air Outlet Duct Screw	2.5 N.m	22 lb in
Center Console Cup Holder Screw	2.5 N.m	22 lb in
Center Console Screw	2.5 N.m	22 lb in
Cluster Trim Panel Screw	2.5 N.m	22 lb in
Console Cup Holder Track Screw	2.5 N.m	22 lb in
Console Trim Panel Screw - Left	2.5 N.m	22 lb in
Console Trim Panel Screw - Right	2.5 N.m	22 lb in
Front Console Trim Panel Screw	2.5 N.m	22 lb in
Front Supplemental Inflatable Restraint Bolt - Passenger Side	10 N.m	89 lb in
Instrument Panel Cluster Screw	2 N.m	18 lb in
Instrument Panel Compartment Door Screw	2 N.m	18 lb in
Instrument Panel Retainer Nut	10 N.m	89 lb in
Radio Ground Strap Screw	10 N.m	89 lb in
Radio Screw	2.5 N.m	22 lb in
Steering Column Filler Panel Screw	2.5 N.m	22 lb in
Steering Column Shroud Screw	2.5 N.m	22 lb in
Storage Compartment Screw	2.5 N.m	22 lb in
Upper Trim Panel Bolt	10 N.m	89 lb in
Upper Trim Panel Screw	2.5 N.m	22 lb in

FUEL LEVEL SPECIFICATIONS

The information in this table is intended for use with the **J 33431-C** Signal Generator and Instrument Panel Tester. See **Special Tools**. The fuel level sensor values represent the test values to be used on the Signal Generator to drive the fuel gage display to the indicated positions. Vehicles that require more than one fuel level sensor calculate gage position from many possible resistance combinations of fuel levels between the two tanks. Therefore, the values in the table may not correlate directly to readings taken from the vehicle primary or secondary sending units.

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The values in the table are approximate values based on information obtained from properly operating vehicles. Actual results may vary slightly.

Fuel Level Specifications

Fuel Gage Display	Resistance (ohms)	Fuel Level (%)	Sender Voltage	Fuel Remaining
E	270-280 ohms	0-5%	2.6 V	0.4-3.7 L (0.1-1.0 gal)
1/4	212-222 ohms	25-30%	2.3 V	15.5 L (4.1 gal)
1/2	164-174 ohms	45-50%	1.9 V	33.3 L (8.8 gal)
3/4	117-127 ohms	68-73%	1.5 V	45.8 L (12.1 gal)
F	63-73 ohms	90-95%	0.9 V	58.7-62.8 L (15.5-16.6 gal)

SCHEMATIC AND ROUTING DIAGRAMS

INSTRUMENT PANEL, GAGES, AND CONSOLE SCHEMATIC ICONS

Instrument Panel, Gages, and Console 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.

INSTRUMENT CLUSTER SCHEMATICS

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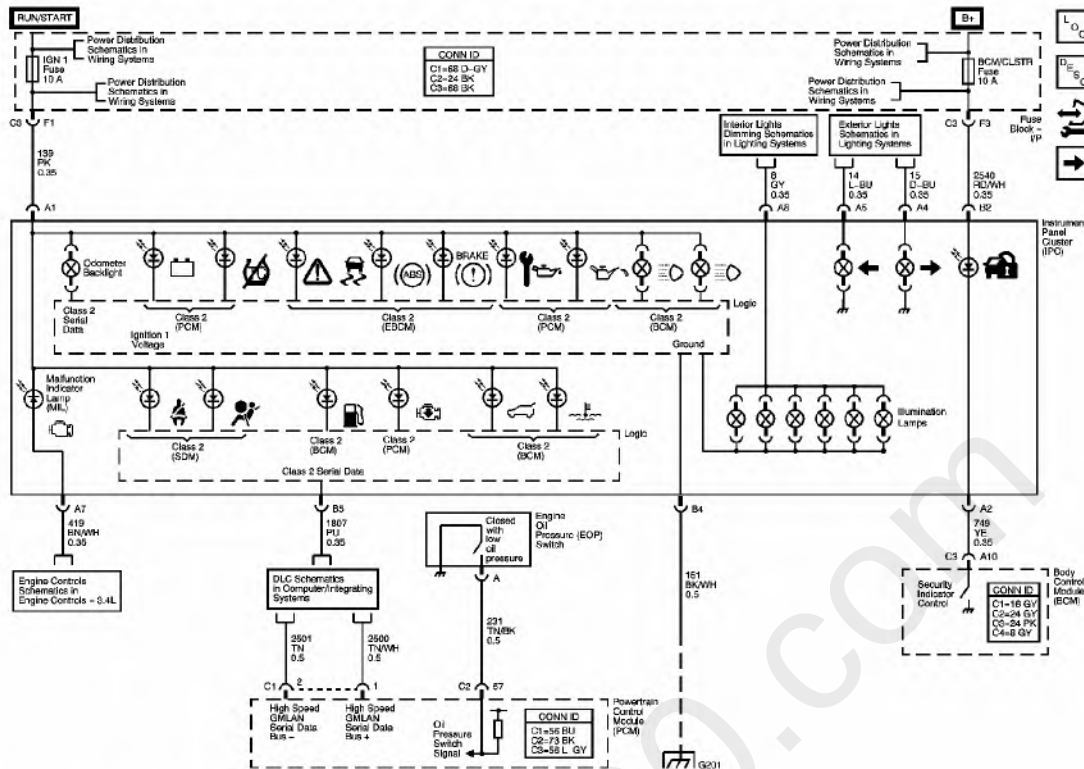


Fig. 1: IPC Indicators, IPC Communication
Courtesy of GENERAL MOTORS CORP.

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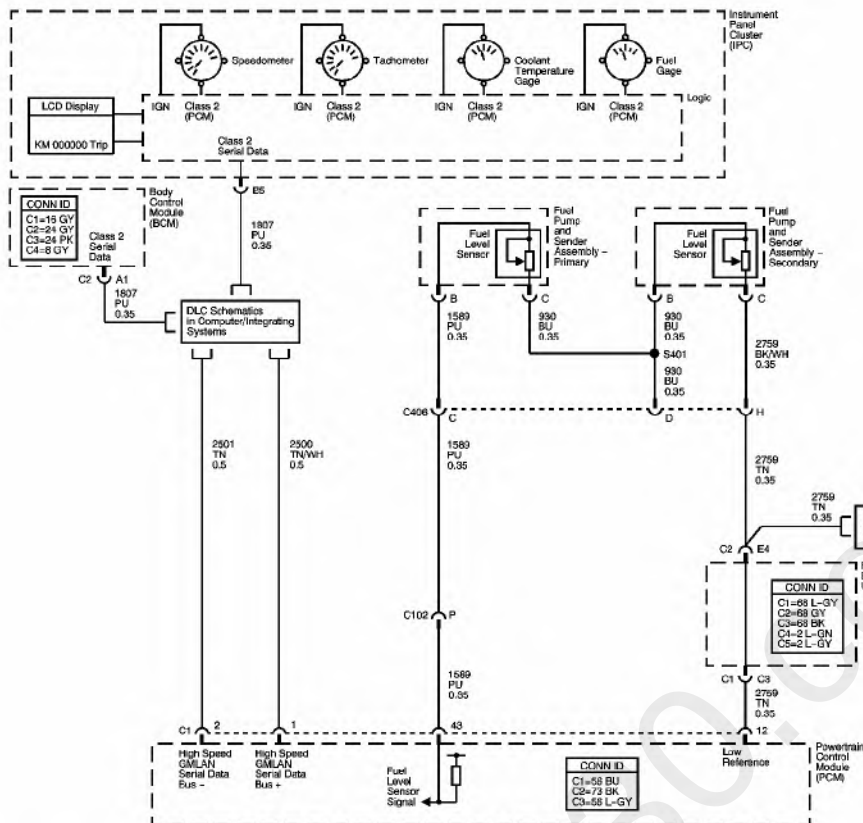


Fig. 2: IPC Gages

Courtesy of GENERAL MOTORS CORP.

AUDIBLE WARNINGS SCHEMATICS

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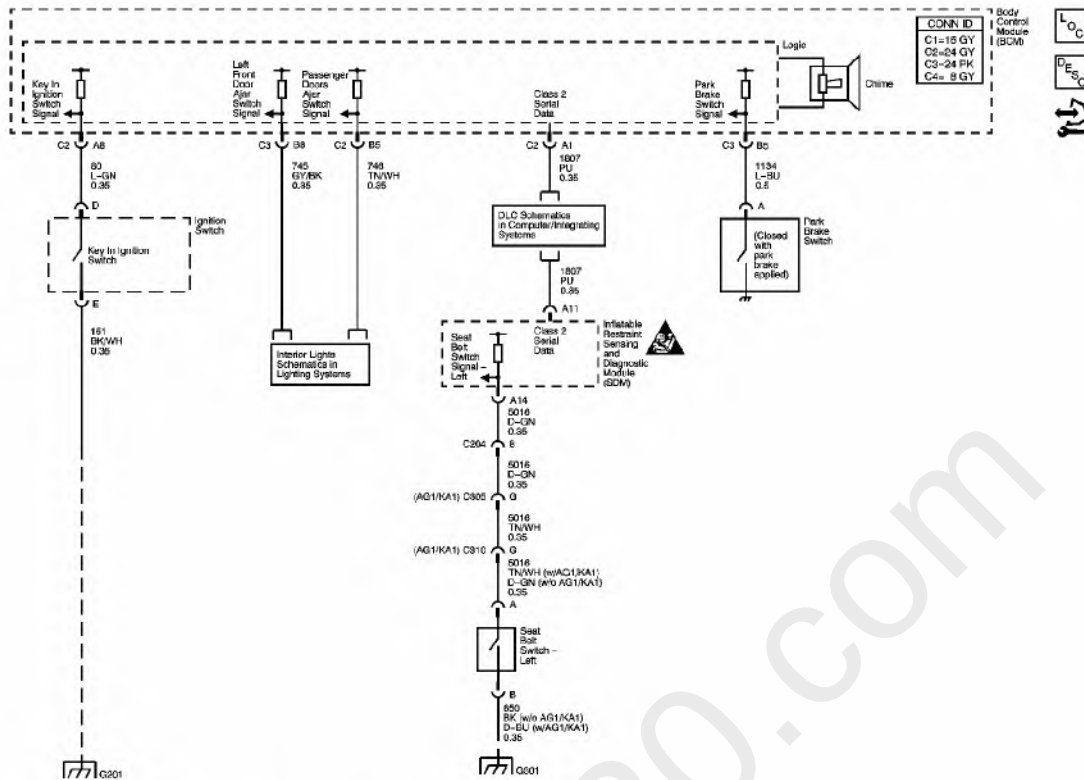


Fig. 3: Audible Warnings Schematics
 Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

INSTRUMENT PANEL, GAGES, AND CONSOLE COMPONENT VIEWS

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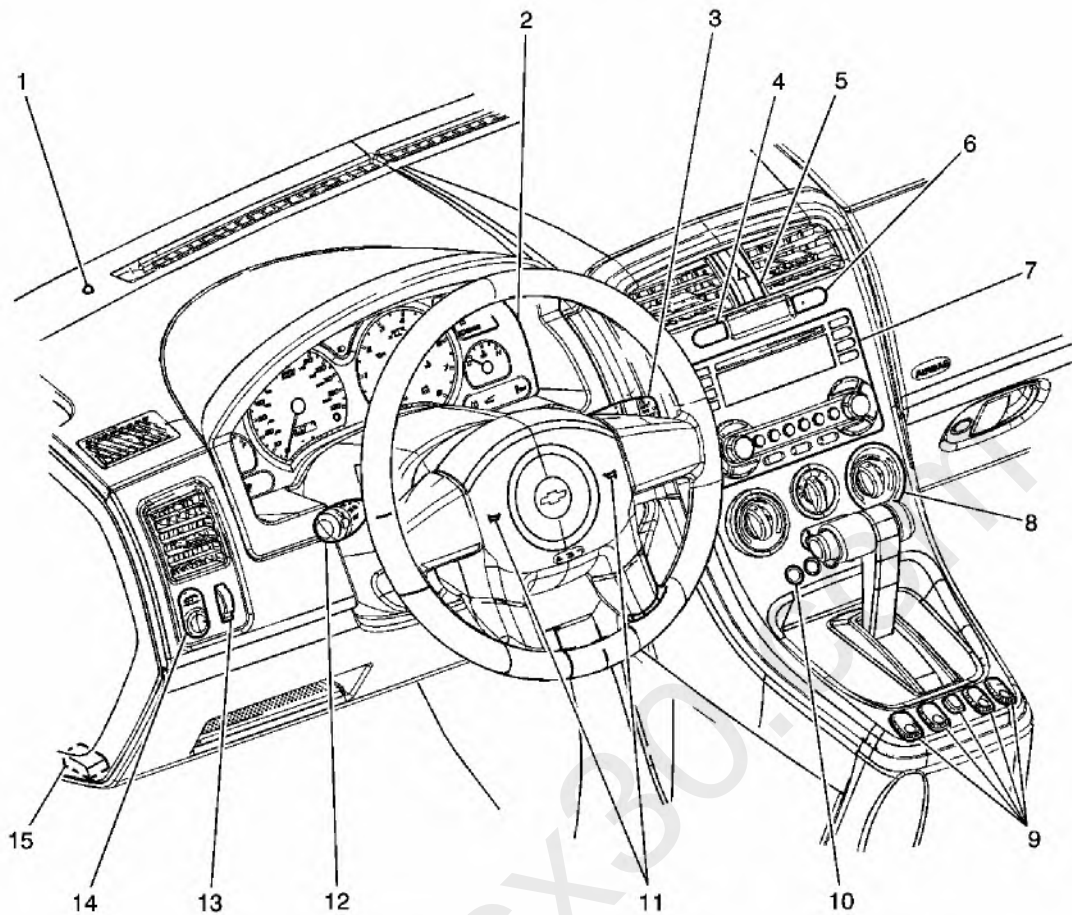


Fig. 4: Left Side of the I/P
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	Ambient Light Sensor
2	Instrument Panel Cluster (IPC)
3	Windshield Wiper/Washer Switch
4	Traction Control (TC) Switch (JM4)
5	Hazard Switch
6	Fog Lamp Switch (T96)
7	Radio
8	HVAC Control Module
9	Power Window Switch - Main
10	Transmission Range Indicator
11	Horn Switch/Pad - Part of the Inflatable Restraint Steering Wheel Module

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12	Headlamp Switch
13	Dimmer Switch
14	Outside Rearview Mirror Switch
15	Data Link Connector (DLC)

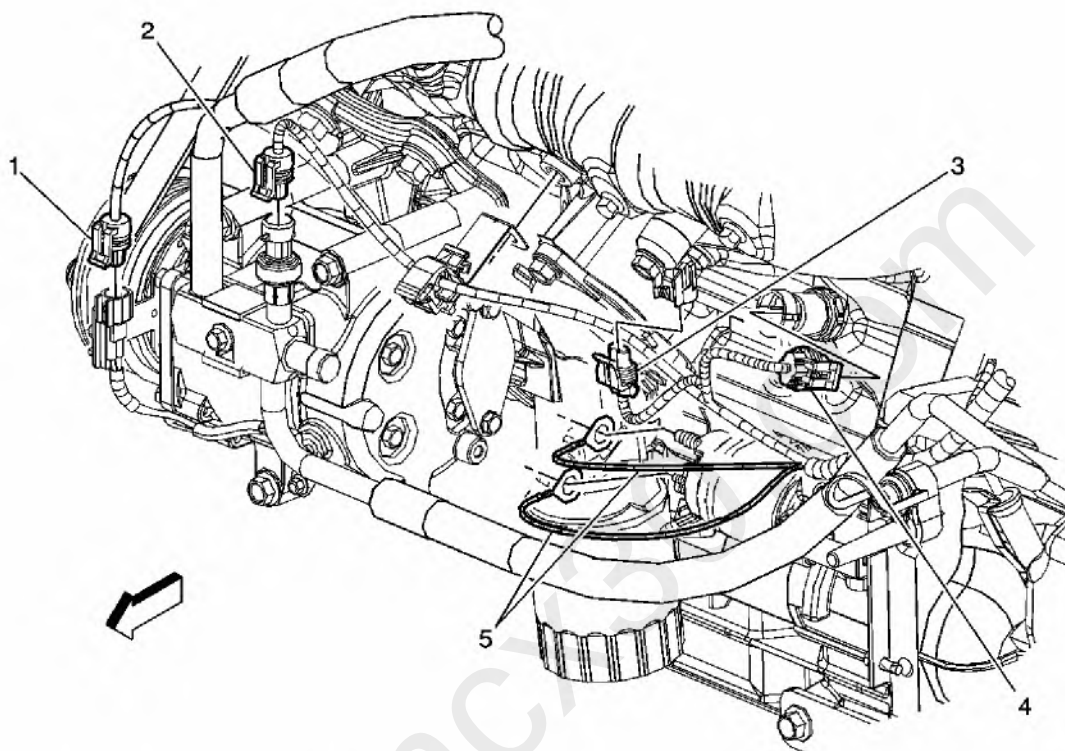


Fig. 5: View of Front of the Engine Harness Routing
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 5

Callout	Component Name
1	A/C Compressor Clutch
2	A/C Refrigerant Pressure Sensor
3	Knock Sensor (KS) 2
4	Engine Oil Pressure (EOP) Switch
5	Starter Motor Leads

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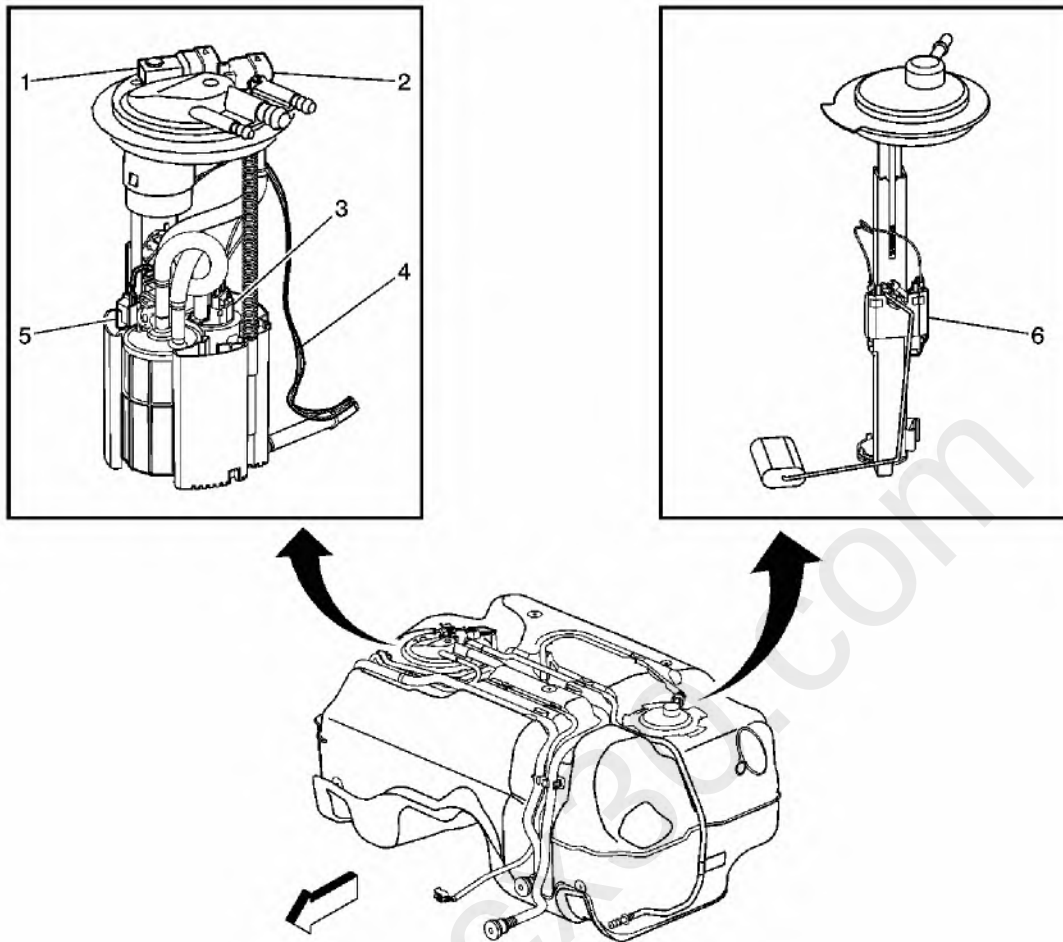


Fig. 6: Fuel Tank Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 6

Callout	Component Name
1	Fuel Tank Pressure (FTP) Sensor Connector
2	Fuel Pump and Sender Assembly Connector - Primary
3	Fuel Pump
4	Lead - Primary Sender to Secondary Sender Assmbly
5	Fuel Level Sensor
6	Fuel Pump and Sender Assembly Connector - Secondary

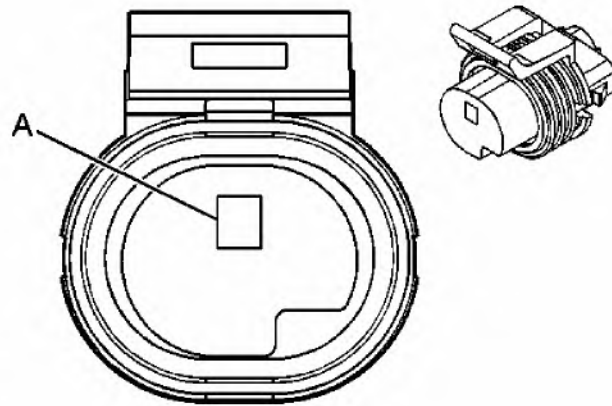
INSTRUMENT PANEL, GAGES, AND CONSOLE CONNECTOR END VIEWS

Engine Oil Pressure (EOP) Switch



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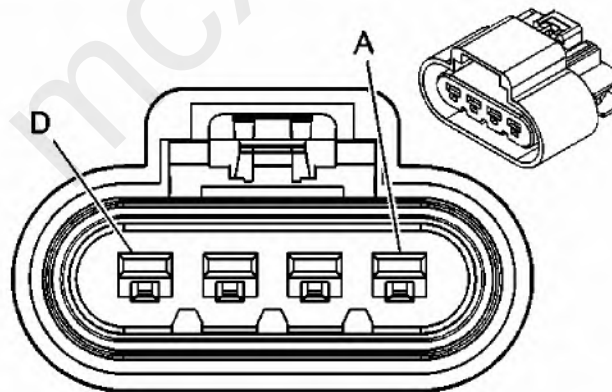


Connector Part Information

- OEM: 12065299
- Service: 12085500
- 1-Way F (GY)

Pin	Wire Color	Circuit No.	Function
A	TN/BK	231	Oil Pressure Switch Signal

Fuel Pump and Sender Assembly - Primary



Connector Part Information

- OEM: 15326631
- Service: 15306360
- 4-Way F GT 280 Sealed 5.8 Series (BK)

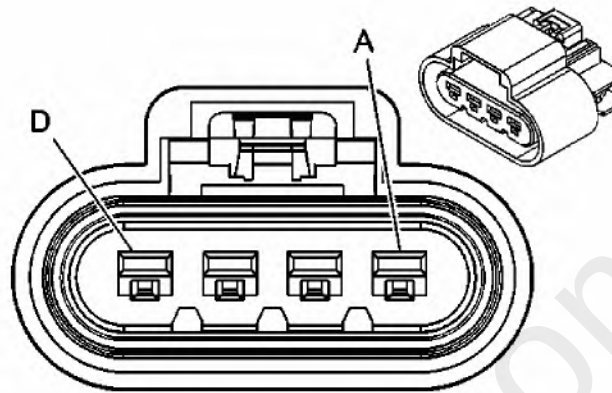
Pin	Wire Color	Circuit No.	Function
A	GY	120	Fuel Pump Supply Voltage
B	PU	1589	Fuel Level Sensor Signal
C	BU	930	Fuel Level Sensor Signal

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			- Common
D	BK	850	Ground

Fuel Pump and Sender Assembly - Secondary

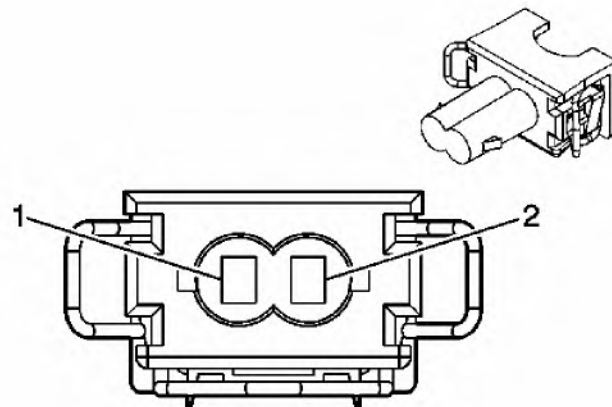


Connector Part Information

- OEM: 15326631
- Service: 15306360
- 4-Way F GT 280 Sealed 5.8 Series (BK)

Pin	Wire Color	Circuit No.	Function
A	-	-	Not Used
B	BU	930	Fuel Level Sensor Signal - Common
C	BK/WH	2759	Low Reference
D	-	-	Not Used

Instrument Panel Cluster (IPC)



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Connector Part Information		• OEM: 15305356 • Service: 15306251 • 16-Way F Micro-Pack 100 Series (GY)	
Pin	Wire Color	Circuit No.	Function
A1	PK	139	Ignition 1 Voltage
A2	YE	749	Security Indicator Control
A3	-	-	Not Used
A4	D-BU	15	Right Turn Signal Lamp Supply Voltage
A5	L-BU	14	Left Turn Signal Lamp Supply Voltage
A6	-	-	Not Used
A7	BN/WH	419	MIL Control
A8	GY	8	Instrument Panel Lamps Supply Voltage
B1	-	-	Not Used
B2	RD/WH	2540	Battery Positive Voltage
B3	-	-	Not Used
B4	BK/WH	151	Ground
B5	PU	1807	Class 2 Serial Data
B6-B8	-	-	Not Used

DIAGNOSTIC INFORMATION AND PROCEDURES**DIAGNOSTIC CODE INDEX****DIAGNOSTIC CODE INDEX**

DTC	Description
DTC B0728, B0733, B0738, or B0748	** MULTIPLE VALUES **
DTC B0729, B0734, B0739, or B0749	** MULTIPLE VALUES **
DTC B2965	Key in Ignition Circuit Open
DTC P0462	Fuel Level Sensor 1 Circuit Low Voltage
DTC P0463	Fuel Level Sensor 1 Circuit High Voltage
DTC P0464	Fuel Level Sensor 1 Circuit Intermittent
DTC P0520	Engine Oil Pressure (EOP) Switch Circuit

DIAGNOSTIC STARTING POINT - INSTRUMENT PANEL, GAGES AND CONSOLE

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Begin the Instrument Panel (I/P) System diagnosis with **Diagnostic System Check - Vehicle** in Vehicle DTC Information. The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored DTCs and their status

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

SCAN TOOL OUTPUT CONTROLS

Body Control Module (BCM)

Scan Tool Output Control	Additional Menu Selection(s)	Description
Interior Lamps	Output Control/Lamp Test	The body control module (BCM) turns the interior lamps ON when you select ON. The interior lamps should stay ON until commanded OFF.
I/P Illumination Lamps	Output Control/Lamp Test	The BCM turns the instrument panel illumination lamps on when you select ON. The illumination lamps should stay on until commanded OFF.
Transmission Range Indicator	Output Control/Lamp Test	The BCM turns the PRNDL indicators ON when you select ON. The PRNDL should stay ON until commanded OFF.

Instrument Panel Cluster (IPC)

Scan Tool Output Control	Additional Menu Selection(s)	Description
		The instrument panel cluster (IPC) illuminates the following indicators when you select ON: • ABS • Air Bag • BRAKE • Charge • Fasten Safety Belt • High Beam • Liftgate Ajar

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Lamp and Gauge Check	• Low Fuel • Low Oil Pressure • Low Traction • Reduced Engine Power • Security • Tire Pressure Monitor • Traction OFF The IPC drives the following gages to maximum position when you select ON: • Engine Coolant Temperature Gage • Fuel Gage • Speedometer • Tachometer The indicators should stay illuminated and all gages remain at maximum until commanded OFF. When commanded OFF, the indicators should turn OFF and all gages should remain at the minimum position until the test is exited or commanded ON.
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SCAN TOOL DATA LIST

The scan tool data lists contain all the instrument panel, gages, and console related parameters that are available on the scan tool. The parameters in the list are arranged in alphabetical order. The data list column indicates the location of the parameter within the scan tool menu selections.

Use the scan tool data lists as directed by a diagnostic table or in order to supplement the diagnostic procedures. Begin all of the diagnostic procedures with **Diagnostic System Check - Vehicle** in Vehicle DTC Information.

Use the scan tool data lists only after the following is determined:

- There is no published DTC procedure nor published symptom procedure for the customer concern.
- The DTC or symptom procedure indicated by the diagnostic system check does not resolve the customer concern.

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The typical data values are obtained from a properly operating vehicle under the conditions specified in the first row of the scan tool data list table. Comparison of the parameter values from the suspect vehicle with the typical data values may reveal the source of the customer concern.

Body Control Module (BCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/High Beams Off/Doors Closed/Trunk Closed/Park Brake Unapplied			
Battery 1	Accessory Switch Inputs Exterior Lamps Interior Lamps Door Locks Wiper/Washer Security Data	Volts	9-16 V (Varies)
Coolant Gage Position	Accessory	%	Varies
Driver Door Switch	Switch Inputs Interior Lamps	Open/Closed	Closed
Fuel Gauge Position	Accessory	%	Varies
High Beam Switch	Switch Inputs Exterior Lamps	On/Off	Off
I/P Dimmer Input	Interior Lamps	Volts	Varies
I/P Dimmer Output	Interior Lamps	%	Varies
Ignition 1 Input	Security Data	On/Off	On
Ignition 2 Input	Security Data	On/Off	On
Key in Ignition	Switch Inputs Interior Lamps	Yes/No	Yes
Liftgate Ajar Switch	Switch Inputs	Open/Closed	Closed
Low Beam Input	Exterior Lamps	Volts	Varies
Low Brake Fluid	Switch Inputs	Yes/No	No
Low Coolant	Switch Inputs	On/Off	Off
Oil Life Reset Switch	Switch Inputs	On/Off	Off
Park Brake Switch	Switch Inputs	On/Off	Off
Parklamp Switch	Switch Inputs Exterior Lamps	On/Off	Off
Pass Door Switches	Switch Inputs Interior Lamps	Open/Closed	Closed

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Instrument Panel Cluster (IPC)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Seat Belt Buckled/High Beams Off/Park Brake Unapplied			
Software Date - Day	ID Information	Numeric	Varies
Software Date - Month	ID Information	Numeric	Varies
Software Date - Year	ID Information	Numeric	Varies
Software ID	ID Information	Numeric	Varies

Powertrain Control Module (PCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Engine Idling/Normal Operating Temperature			
Engine Speed	Engine Data 1 Engine Data 2 Engine Data 3 Cruise Control Data EVAP Data HO2S Data Fuel Trim Data Misfire Data	RPM	100 RPM from Desired Idle Speed
ECT Sensor	Engine Data 1 Engine Data 2 Engine Data 3 EVAP Data Fuel Trim Data Misfire Data	Celsius (Fahrenheit)	85-105°C (185-220°F)
Engine Oil Life Remaining	Engine Data 2 Engine Data 3	%	Varies
Engine Oil Pressure Sensor	Engine Data 3	Volts	Varies
Engine Oil Pressure Switch	Engine Data 3	OK/Low	OK
Fuel Level Sensor	EVAP Data	%	Varies
Fuel Level Sensor	EVAP Data	Volts	Varies
Ignition 1 Signal	Engine Data 1 Engine Data 2 Engine Data 3 Cruise Control Data EVAP Data HO2S Data Fuel Trim Data	Volts	9-16 V (Varies)

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Reduced Engine Power	Engine Data 1 Engine Data 3 Cruise Control Data HO2S Data	Active/Inactive	Inactive
Vehicle Speed Sensor	Engine Data 1 Engine Data 2 Engine Data 3 Cruise Control Data EVAP Data HO2S Data Fuel Trim Data Misfire Data	km/h (mph)	0 km/h (0 mph)

SCAN TOOL DATA DEFINITIONS

Battery 1

The scan tool displays 0-19 volts. This is the voltage at the battery positive voltage circuit of the body control module (BCM).

Coolant Gauge Position

The scan tool displays 0-100%. The BCM receives a serial data message from the powertrain control module (PCM) regarding the engine coolant temperature and converts the data to percentage.

Driver Door Switch

The scan tool displays Open or Closed. The state of the driver door switch as commanded by the BCM.

ECT Sensor

The scan tool displays -40 to +151°C (-40 to +304°F). The PCM monitors the voltage at the signal circuit of the engine coolant temperature sensor. The voltage is inversely proportional to the engine coolant temperature.

Engine Oil Life Left Remaining

The scan tool displays 0-100%. The PCM calculates the remaining engine oil life.

Engine Oil Pressure Sensor

The scan tool displays 0-5 volts. The PCM monitors the engine oil pressure sensor signal circuit where a low voltage indicates low pressure.

Engine Oil Pressure Switch

The scan tool displays OK or Low. The state of the engine oil pressure switch as commanded by the PCM.

Engine Speed

The scan tool displays 0-9999 RPM. Engine speed is computed by the PCM. It should remain close to desired idle under various engine loads with the engine idling.

Fuel Gauge Position

The scan tool displays 0-100%. The BCM calculates the amount of fuel remaining in the tank based on the serial data messages from the PCM regarding fuel level.

Fuel Level Sensor

The scan tool displays the state of the fuel level in percent. The PCM monitors the signal circuit of the fuel level sensor and displays the current fuel percentage.

Fuel Level Sensor

The scan tool displays 0-5 volts. The PCM monitors the signal circuit of the fuel level sensor and displays the current voltage.

High Beam Switch

The scan tool displays On or Off. The state of the high beam switch as monitored by the BCM

I/P Dimmer Input

The scan tool displays Volts. The BCM monitors the voltage from the dimmer switch.

I/P Dimmer Output

The scan tool displays the % duty cycle. The BCM will indicate 0-100% of the dimmer switch duty cycle.

Ignition 1 Input

The scan tool displays On or Off. The state of the ignition 1 voltage circuit as monitored by the BCM.

Ignition 2 Input

The scan tool displays On or Off. The state of the ignition 2 voltage circuit as monitored by the BCM.

Ignition 1 Signal

The scan tool displays 0-16 V. The ignition 1 signal represents the system voltage detected by the PCM at the ignition voltage circuit.

Key in Ignition

The scan tool displays Yes or No. The state of the key in ignition switch as commanded by the BCM.

Liftgate Ajar Switch

The scan tool displays Open or Closed. The state of the liftgate ajar switch as monitored by the BCM.

Low Beam Input

The scan tool displays Volts. This input displays the voltage supplied to the body control module.

Low Brake Fluid

The scan tool displays Yes or No. The state of the brake fluid level switch as commanded by the BCM.

Low Coolant

The scan tool displays On or Off. The state of the coolant level switch as commanded by the BCM.

Oil Life Reset Switch

The scan tool displays On or Off. The BCM receives an input from the oil life reset switch (in the underhood fuse block) indicating On when the engine oil needs to be changed.

Pass Door Switches

The scan tool displays Open or Closed. The state of the passenger door switches as monitored by the BCM.

Park Brake Switch

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The scan tool displays On or Off. The state of the park brake switch as monitored by the BCM.

Parklamp Switch

The scan tool displays On or Off. The state of the parklamp switch as monitored by the BCM.

Reduced Engine Power

The scan tool displays Inactive or Active. This is the state of the Reduced Engine Power indicator as monitored by the PCM.

Software Date Day

The scan tool displays the day the software was created for the instrument panel cluster (IPC) installed in the vehicle.

Software Date Month

The scan tool displays the month the software was created for the IPC installed in the vehicle.

Software Date Year

The scan tool displays the year the software was created for the IPC installed in the vehicle.

Software ID

The scan tool displays a numeric value. The identification of the IPC software installed in the vehicle.

Vehicle Speed

The scan tool displays 0-255 km/h (0-155 mph). The PCM monitors the signal circuit of the vehicle speed sensor.

DTC B0728, B0733, B0738, OR B0748

Circuit Description

The transmission control module (TCM) communicates the park/neutral switch status to the body control module (BCM) via serial data. The BCM uses this data to control the Electronic PRNDL display on the shifter. The BCM controls the LEDs in the PRNDL display through 4 control circuits.

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DTC Descriptor

This diagnostic procedure supports the following DTCs:

- DTC B0728 Transmission Range Indicator Circuit A High
- DTC B0733 Transmission Range Indicator Circuit B High
- DTC B0738 Transmission Range Indicator Circuit C High
- DTC B0748 Transmission Range Indicator Circuit P High

Conditions for Running the DTC

- The ignition is ON.
- The ignition voltage is greater than 8.5 volts but less than 17 volts.

Conditions for Setting the DTC

- The BCM detects that the commanded state of the driver and the actual state of the control circuit do not match.
- The condition must be present for a minimum of 115 milliseconds.
- DTC B1327 and DTC B1328 are not set.

Action Taken When the DTC Sets

- The BCM stores the DTC information in memory.
- The BCM disables all PRNDL display outputs.
- The BCM illuminates the Service Vehicle Soon indicator.

Conditions for Clearing the DTC

- The history DTC clears after 100 malfunction free warm-up cycles.
- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The BCM receives the clear code command from the scan tool.

Diagnostic Aids

An open or short to ground in the instrument panel (I/P) lamps dimmer switch signal can disable the PRNDL display. Check for **DTC B2627** in Lighting Systems.

Refer to **Circuit Testing** and to **Wiring Repairs** in Wiring Systems.

DTC B0728, B0733, B0738, or B0748

Step	Action	Values	Yes	No
Schematic Reference: Body Control System Schematics and Automatic				

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Transmission Controls Schematics

Connector End View Reference: Computer/Integrating Systems Connector End Views

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 OFF the ignition. 2. Disconnect the shift indicator. 3. Turn ON the ignition, with the engine OFF. 4. Measure the voltage from one of the following shift indicator signal circuits to a good ground: • DTC B0728: PRNDL A signal circuit • DTC B0733: PRNDL B signal circuit • DTC B0738: PRNDL C signal circuit • DTC B0748: PRNDL P signal circuit Does the voltage measure within the specified range?	9-17 Volts	Go to Step 8	Go to Step 3
3	1. Install a scan tool. 2. Connect a 3-ampere fused jumper between the appropriate shift indicator signal circuit and a good ground. 3. With the scan tool observe the TR Sw. A/B/C/P parameter in the body control module (BCM) Switch Inputs data list. Does the scan tool display LOW?	-	Go to Step 4	Go to Step 5
	Inspect for poor connections at the harness connector of the shift indicator.			

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4	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 7
5	Inspect for poor connections at the harness connector of 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 9	Go to Step 6
6	Replace the BCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	-	Go to Step 9	-
7	Replace the shift indicator. Refer to Shift Indicator Replacement in Automatic Transaxle - AF33-5. Did you complete the replacement?	-	Go to Step 9	-
8	Repair the short to voltage in the suspect shift indicator signal circuit. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you complete the repair?	-	Go to Step 9	-
9	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 B0729, B0734, B0739, OR B0749

Circuit Description

The transmission control module (TCM) communicates the park/neutral switch status to the body control module (BCM) via serial data. The BCM uses this data to control the Electronic PRNDL display on the shifter. The BCM controls the LEDs in the PRNDL display through 4 control circuits.

DTC Descriptor

This diagnostic procedure supports the following DTCs:

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- DTC B0729 Transmission Range Indicator Circuit A Low
- DTC B0734 Transmission Range Indicator Circuit B Low
- DTC B0739 Transmission Range Indicator Circuit C Low
- DTC B0749 Transmission Range Indicator Circuit P Low

Conditions for Running the DTC

- The ignition is ON.
- The ignition voltage is greater than 8.5 volts but less than 17 volts.

Conditions for Setting the DTC

- The BCM detects that the commanded state of the driver and the actual state of the control circuit do not match.
- The condition must be present for a minimum of 115 milliseconds.
- DTC B1327 and DTC B1328 are not set.

Action Taken When the DTC Sets

- The BCM stores the DTC information in memory.
- The BCM disables all PRNDL display outputs.
- The BCM illuminates the Service Vehicle Soon indicator.

Conditions for Clearing the DTC

- The history DTC clears after 100 malfunction free warm-up cycles.
- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The BCM receives the clear code command from the scan tool.

Diagnostic Aids

An open or short to ground in the instrument panel (I/P) lamps dimmer switch signal can disable the PRNDL display. Check for **DTC B2627** in Lighting Systems.

Refer to **Circuit Testing** and to **Wiring Repairs** in Wiring Systems.

DTC B0729, B0734, B0739, or B0749

Step	Action	Values	Yes	No
Schematic Reference: <u>Body Control System Schematics</u> and <u>Automatic Transmission Controls Schematics</u>				
Connector End View Reference: <u>Computer/Integrating Systems Connector End Views</u>				

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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 OFF the ignition. 2. Disconnect the shift indicator. 3. Measure the resistance from one of the following shift indicator signal circuits to a good ground: • DTC B0729: PRNDL A signal circuit • DTC B0734: PRNDL B signal circuit • DTC B0739: PRNDL C signal circuit • DTC B0749: PRNDL P signal circuit Is the resistance less than the specified value?	5 ohms	Go to Step 9	Go to Step 3
3	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Connect a 3-ampere fused jumper between the appropriate shift indicator signal circuit and battery positive voltage. 4. With the scan tool observe the TR Sw. A/B/C/P parameter in the body control module (BCM) Switch Inputs data list. Does the scan tool display HI?	-	Go to Step 5	Go to Step 4
4	Test the suspect shift indicator signal circuit for an open. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 6

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5	Inspect for poor connections at the harness connector of the shift indicator. 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 10	Go to Step 8
6	Inspect for poor connections at the harness connector of 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 10	Go to Step 7
7	Replace the BCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	-	Go to Step 10	-
8	Replace the shift indicator. Refer to Shift Indicator Replacement in Automatic Transaxle - AF33-5. Did you complete the replacement?	-	Go to Step 10	-
9	Repair the short to ground in the suspect shift indicator signal circuit. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you complete the repair?	-	Go to Step 10	-
10	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 B2965

Circuit Description

The ignition switch closes, signal circuit is low, when the key is in the ignition and opens, signal circuit is high, when the key is not in the ignition. The body control module (BCM) monitors the key in ignition signal circuit in order to activate an audible warning.

DTC Descriptor

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This diagnostic procedure supports the following DTC:

DTC B2965 Key in Ignition Circuit Open

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

- The ignition 1 voltage circuit is active, high signal, and the key in ignition signal circuit is high.
- The conditions above must be present for more than 0.3 seconds.

Action Taken When the DTC Sets

The BCM stores DTC B2965 in memory.

Conditions for Clearing the DTC

- The DTC becomes history when the fault is no longer present.
- A history DTC will clear after 100 consecutive ignition cycles if the condition for the malfunction is no longer present.
- The BCM receives a clear code command from the scan tool.

DTC B2965

Step	Action	Yes	No
Schematic Reference: Audible Warnings 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. Turn ON the ignition, with the engine OFF. 3. With the scan tool, observe the Key in Ignition parameter in the BCM Switch Inputs data list. Does the Key in Ignition parameter display Low?	Go to Step 3	Go to Step 4

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3	1. Turn the ignition OFF and remove key. 2. Disconnect the instrument panel cluster (IPC) connector. 3. Connect a test lamp between the ignition 1 voltage circuit and a good ground. Does the test lamp illuminate?	Go to Step 6	Go to Step 8
4	Test the key in ignition switch signal circuit for an open, high resistance, or a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 11	Go to Step 5
5	Test the ground circuit of the ignition key alarm switch for an open or a high resistance. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 11	Go to Step 7
6	Test the ignition 1 voltage circuit 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 11	Go to Step 7
7	Inspect for poor connections 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 11	Go to Step 9
8	Inspect for poor connections at the harness connector of the body control module (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
9	Replace the ignition switch. Refer to Ignition Switch Replacement in Steering Wheel and Column. Did you complete the replacement?	Go to Step 11	-
10	Replace the BCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	Go to Step 11	-

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11	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 P0462

Circuit Description

The fuel level sender changes resistance based on the fuel level. The powertrain control module (PCM) monitors the signal circuit of the fuel level sender in order to determine fuel level. When the fuel tank is full, the sender resistance is low and the PCM senses a low signal voltage. When the fuel tank is empty, the sender resistance is high and the PCM senses a high signal voltage. The PCM uses the signal circuit of the fuel level sender in order to calculate the total remaining fuel percent in the tank. The PCM sends the fuel level message via the CAN serial data circuit to the body control module (BCM). The BCM sends the fuel level percent to the instrument panel cluster (IPC) via the class 2 data circuit to display on the fuel gage. The fuel level information is also used for misfire and evaporative emission (EVAP) diagnostics.

This diagnostic tests for a lower than normal fuel level sender signal.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P0462 Fuel Level Sensor 1 Circuit Low Voltage

Conditions for Running the DTC

The ignition is ON, with the engine ON.

Conditions for Setting the DTC

- The fuel level signal is greater than 98 percent.
- The above condition is present for greater than 20 seconds.

Action Taken When the DTC Sets

- The fuel gage defaults to empty.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM displays the failure information in the Failure Records on the scan tool.

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Conditions for Clearing the DTC

- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The history DTC clears after 40 malfunction free warm-up cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Aids

Use the Freeze Frame and/or Failure Records data in order to locate an intermittent condition. If you cannot duplicate the DTC, the information included in the Freeze Frame and/or Failure Records data may aid in determining the number of miles since the DTC set. The Fail Counter and Pass Counter can also aid in determining the number of ignition cycles that the diagnostic reported a pass and/or fail. Operate the vehicle within the same freeze frame conditions, i.e. RPM, engine load, vehicle speed, temperature, etc. This will isolate when the DTC failed.

Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

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

3: Tests for the proper operation of the circuit in the high voltage range.

DTC P0462

Step	Action	Values	Yes	No
Schematic Reference: Instrument Cluster 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. Turn ON the ignition, with the engine OFF. 3. With a scan tool, observe the Fuel Level Sensor parameter in the Powertrain EVAP Data list. Does the scan tool indicate that the Fuel Level Sensor parameter is greater than	98%	Go to Step	Go to Diagnostic

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	the specified value?		3	Aids
3	1. Turn OFF the ignition. 2. Disconnect C406. 3. Turn ON the ignition, with the engine OFF. 4. With a scan tool, observe the Fuel Level Sensor parameter. Does the scan tool indicate that the Fuel Level Sensor parameter is less than the specified value?	4%	Go to Step 5	Go to Step 4
4	Test the signal circuit of the fuel level sender for a short to ground between C406 and the powertrain control module (PCM). Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 7
5	Test the signal circuit of the fuel level sender for a short to ground between C406 and the fuel level sender. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 6
6	Inspect for poor connections at the harness connector of the fuel level senders. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 8
7	Inspect for poor connections at the harness connector of the PCM. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 9
8	Replace the malfunctioning fuel level sender that is internally shorted to ground. Refer to Fuel Level Sensor Replacement - Primary and Fuel Level Sensor Replacement -	-		

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	Secondary in Engine Controls - 3.4L. Did you complete the replacement?		Go to Step 10	-
9	Replace the PCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	-	Go to Step 10	-
10	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 P0463**Circuit Description**

The fuel level sender changes resistance based on the fuel level. The powertrain control module (PCM) monitors the signal circuit of the fuel level sender in order to determine fuel level. When the fuel tank is full, the sender resistance is low and the PCM senses a low signal voltage. When the fuel tank is empty, the sender resistance is high and the PCM senses a high signal voltage. The PCM uses the signal circuit of the fuel level sender in order to calculate the total remaining fuel percent in the tank. The PCM sends the fuel level message via the controller area network (CAN) serial data circuit to the body control module (BCM). The BCM sends the fuel level percent to the instrument panel cluster (IPC) via the class 2 data circuit to display on the fuel gage. The fuel level information is also used for misfire and evaporative emission (EVAP) diagnostics.

This diagnostic tests for a higher than normal fuel level sender signal.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P0463 Fuel Level Sensor 1 Circuit High Voltage

Conditions for Running the DTC

The ignition is ON, with the engine ON.

Conditions for Setting the DTC

- The fuel level signal is less than 3.5 percent.

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- The above condition is present for greater than 20 seconds.

Action Taken When the DTC Sets

- The fuel gage defaults to empty.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM displays the failure information in the Failure Records on the scan tool.

Conditions for Clearing the DTC

- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The history DTC clears after 40 malfunction free warm-up cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Aids

Use the Freeze Frame and/or Failure Records data in order to locate an intermittent condition. If you cannot duplicate the DTC, the information included in the Freeze Frame and/or Failure Records data may aid in determining the number of miles since the DTC set. The Fail Counter and Pass Counter can also aid in determining the number of ignition cycles that the diagnostic reported a pass and/or fail. Operate the vehicle within the same freeze frame conditions, i.e. RPM, engine load, vehicle speed, temperature, etc. This will isolate when the DTC failed.

Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

Test Description

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

3: Tests for the proper operation of the circuit in the low voltage range. If the fuse in the jumper opens when you perform this test, the signal circuit is shorted to voltage.

DTC P0463

Step	Action	Values	Yes	No
Schematic Reference: Instrument Cluster Schematics				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u> in Vehicle DTC Information

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2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With a scan tool, observe the Fuel Level Sensor parameter in the Powertrain EVAP Data list. Does the scan tool indicate that the Fuel Level Sensor parameter is less than the specified value?	4%	Go to Step 3	Go to Diagnostic Aids
3	1. Turn OFF the ignition. 2. Disconnect C406. 3. Connect a 3-amp fused jumper wire between the signal circuit of the fuel level sender and the low reference circuit of the fuel level sender on the female terminal side. 4. Turn ON the ignition, with the engine OFF. 5. With a scan tool, observe the Fuel Level Sensor parameter. Does the scan tool indicate that the Fuel Level Sensor parameter is greater than the specified value?	98%	Go to Step 5	Go to Step 4
4	Test the signal circuit of the fuel level sender and the low reference circuit of the fuel level sender between C406 and the powertrain control module (PCM) for an open, for a high resistance, or for a short to voltage. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 7
5	Test the signal circuit of the fuel level senders and the low reference circuit of the fuel level senders between C406 and the fuel level senders for an open, for a high resistance, or for a short to voltage. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 6

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6	Inspect for poor connections at the harness connector of the fuel level senders. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 8
7	Inspect for poor connections at the harness connector of the PCM. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 10	Go to Step 9
8	Replace the fuel level sender that internally has an open, an abnormally high resistance, or a short to voltage. Refer to Fuel Level Sensor Replacement - Primary and Fuel Level Sensor Replacement - Secondary in Engine Controls - 3.4L. Did you complete the replacement?	-	Go to Step 10	-
9	Replace the PCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	-	Go to Step 10	-
10	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 P0464

Circuit Description

The fuel level sender changes resistance based on the fuel level. The powertrain control module (PCM) monitors the signal circuit of the fuel level sender in order to determine fuel level. When the fuel tank is full, the sender resistance is low and the PCM senses a low signal voltage. When the fuel tank is empty, the sender resistance is high and the PCM senses a high signal voltage. The PCM uses the signal circuit of the fuel level sender in order

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to calculate the total remaining fuel percent in the tank. The PCM sends the fuel level message via the controller area network (CAN) serial data circuit to the body control module (BCM). The BCM sends the fuel level percent to the instrument panel cluster (IPC) via the class 2 data circuit to display on the fuel gage. The fuel level information is also used for misfire and evaporative emission (EVAP) diagnostics.

This diagnostic tests for an intermittent fuel level sender signal. If a change in fuel level is detected DTC P0442 is aborted due to a refueling event. A refueling event test is executed to confirm that a refueling event has occurred. If refueling is confirmed, the test is considered passing. Otherwise, the DTC will set indicating an intermittent signal problem.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P0464 Fuel Level Sensor 1 Circuit Intermittent

Conditions for Running the DTC

- The ignition is OFF.
- DTC P0442 is running.

Conditions for Setting the DTC

- The fuel level change is greater than 10 percent.
- The above condition is present for greater than 30 seconds.

Action Taken When the DTC Sets

- DTC P0442 is aborted.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM displays the failure information in the Failure Records on the scan tool.

Conditions for Clearing the DTC

- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The history DTC clears after 40 malfunction free warm-up cycles.
- The PCM receives the clear code command from the scan tool.

Diagnostic Aids

- Use the Freeze Frame and/or Failure Records data in order to locate an intermittent condition. If you cannot duplicate the DTC, the information included in the Freeze Frame and/or Failure Records data may aid in determining the number of miles since

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the DTC set. The Fail Counter and Pass Counter can also aid in determining the number of ignition cycles that the diagnostic reported a pass and/or fail. Operate the vehicle within the same freeze frame conditions, i.e. RPM, engine load, vehicle speed, temperature, etc. This will isolate when the DTC failed.

Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

- If the DTC sets without a refueling event, refer to **Fuel Gage Inaccurate or Inoperative**.

DTC P0520

Circuit Description

The powertrain control module (PCM) monitors the signal circuit of the engine oil pressure (EOP) sensor. When the oil pressure is high, the sensor is open, and the PCM senses a high signal voltage. When the oil pressure is low, the sensor is closed, and the PCM senses a low signal voltage.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P0520 Engine Oil Pressure (EOP) Switch Circuit

Conditions for Running the DTC

The ignition is ON, with the engine ON.

Conditions for Setting the DTC

- The PCM detects that the EOP sensor signal circuit is pulled low.
- The above condition is present for greater than 5 seconds.

Action Taken When the DTC Sets

- The PCM records the operating conditions at the time the diagnostic test fails. The PCM displays this information in the Failure Records on the scan tool.
- The instrument panel cluster (IPC) illuminates the engine oil pressure indicator.

Conditions for Clearing the DTC

- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The history DTC clears after 40 malfunction free warm-up cycles.

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- The ECM receives a clear code command from the scan tool.

Diagnostic Aids

Using the Failure Records data may help locate an intermittent condition. If you cannot duplicate the DTC, the information in the Failure Records can help determine how many miles since the DTC set. The Fail Counter and Pass Counter can help determine how many ignition cycles that the diagnostic test reported a pass and/or a fail.

Refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.

DTC P0520

Step	Action	Yes	No
Schematic Reference: Instrument Cluster 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. Disconnect the engine oil pressure switch. 2. Connect a test lamp from battery positive voltage to the engine oil pressure (EOP) switch terminal. 3. Start the engine. 4. Observe the test light.		
	Does the test light illuminate?	Go to Step 4	Go to Step 3
3	Test the signal circuit of the oil pressure switch for a short to ground. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems.		
	Did you find and correct the condition?	Go to Step 9	Go to Step 5
4	Inspect for poor connections at the harness connector of the engine oil pressure switch. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems.		
	Did you find and correct the condition?	Go to Step 9	Go to Step 6
	Inspect for poor connections at the harness connector of the ECM. Refer to Testing for		

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5	<u>Intermittent Conditions and Poor Connections</u> and to <u>Connector Repairs</u> in Wiring Systems. Did you find and correct the condition?	Go to Step 9	Go to Step 7
6	Replace the engine oil pressure switch. Refer to <u>Engine Oil Pressure Sensor and/or Switch Replacement</u> in Engine Mechanical - 3.4L. Did you complete the replacement?	Go to Step 9	-
7	Replace the ECM. Refer to <u>Control Module References</u> in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to Step 9	-
8	Replace the instrument panel cluster (IPC). Refer to <u>Control Module References</u> in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to Step 9	-
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

SYMPTOMS - INSTRUMENT PANEL, GAGES AND CONSOLE

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

1. Perform **Diagnostic System Check - Vehicle** 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 link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following:
 - **Instrument Panel Cluster (IPC) Description and Operation**
 - **Indicator/Warning Message Description and Operation**
 - **Audible Warnings Description and Operation**

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the instrument panel cluster or audible warnings system. Refer to **Checking Aftermarket Accessories**.

- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect for the proper fluid levels.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

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

Gages and Odometer

- **Engine Coolant Temperature Gage Inaccurate or Inoperative**
- **Fuel Gage Inaccurate or Inoperative**
- **Odometer Trip/Reset Switch Inoperative**
- **Speedometer and/or Odometer Inaccurate or Inoperative**
- **Tachometer Inaccurate or Inoperative**

Indicators

- **ABS Active Indicator Always On**
- **ABS Active Indicator Inoperative**
- **Air Bag Indicator Circuit Malfunction**
- **Brake Warning Indicator Always On**
- **Brake Warning Indicator Inoperative**
- **Charge Indicator Always On**
- **Charge Indicator Inoperative**
- **High Beam Indicator Inoperative**
- **Malfunction Indicator Lamp (MIL) Diagnosis**
- **Seat Belt Indicator Circuit Malfunction**
- **Shift Indicator Inaccurate or Inoperative**
- **Traction Control Indicator Always On**
- **Traction Control Indicator Inoperative**
- **Turn Signal Lamps and/or Indicators Inoperative**

Audible Warnings

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- **Chime Always On**
- **Chime Inoperative**

ENGINE COOLANT TEMPERATURE GAGE INACCURATE OR INOPERATIVE

Engine Coolant Temperature Gage Inaccurate or Inoperative

Step	Action	Yes	No
Schematic Reference: Instrument Cluster 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. Turn the ignition ON, with the engine OFF. 3. With the scan tool, perform the Lamp and Gauge Check in the IPC Special Functions list. Does the engine coolant temperature gage move up and down when commanded?	Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems	Go to Step 3
3	Replace the instrument panel cluster (IPC). Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	Go to Step 4	-
4	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

FUEL GAGE INACCURATE OR INOPERATIVE

Diagnostic Aids

- Ensure that the fuel level is in the same range as the customer concern.
- For intermittent diagnosis, refer to **Testing for Intermittent Conditions and Poor Connections** in Wiring Systems.
- Refer to **Fuel Level Specifications** in order to verify the correct fuel level sensor readings. The Fuel Level parameter is available on the scan tool in the Powertrain Fuel and Emissions data list. The Fuel Gage Position parameter is available in the Body

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Control Module Accessory data list.

Test Description

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

3: This step tests for a high resistance in the signal circuit and the low reference circuit of the fuel level sensor.

15: DTCs will be set in the PCM when you perform this diagnostic table.

Fuel Gage Inaccurate or Inoperative

Step	Action	Value(s)	Yes	No
Schematic Reference: Instrument Cluster 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. Disconnect C406. 2. Connect the J 33431-C Signal Generator and Instrument Panel Tester between the signal circuit of the fuel level sensor and the low reference circuit of the fuel level sensor on the male terminal side. See Special Tools. 3. Turn ON the ignition, with the engine OFF. IMPORTANT: Verify the J 33431-C resistance settings with a DMM. See Special Tools. 4. Vary the resistance on the J 33431-C from 40-250 ohms. See Special Tools. 5. Refer to Fuel Level Specifications in order to convert from resistance to fuel gage display.	-		

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	Does the fuel gage display the correct fuel level?		Go to Step 4	Go to Step 3
3	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. IMPORTANT: Verify the J 33431-C resistance settings with a DMM. See <u>Special Tools</u>. 3. Vary the resistance on the J 33431-C from 40-250 ohms. See <u>Special Tools</u>. 4. Refer to Fuel Level Specifications in order to convert from resistance to fuel level percent. IMPORTANT: Turn OFF the ignition momentarily between the resistance settings in order to quickly update the scan tool display. 5. With the scan tool, observe the Fuel Level Sensor parameter in the Powertrain EVAP Data, data list. Does the Fuel Level Sensor parameter display the correct fuel level amount?	-		
4	Inspect for the following items: • A poor connection at the harness connector of the fuel level sensors Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems. • A high resistance in the signal	-		

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	circuit or the low reference circuit between the fuel level sensor and C406 • A misaligned fuel level sender • A deformed fuel tank			
	Did you find and correct the condition?		Go to Step 15	Go to Step 7
5	Test the signal circuit of the fuel level sensor for a high resistance. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 15	Go to Step 6
6	Test the low reference circuit of the fuel level sensor for a high resistance. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	-	Go to Step 15	Go to Step 10
7	1. Remove the fuel level senders. 2. Inspect for the following items: • A stuck fuel level sensor, i.e. the fuel strainer interfering with the sender float arm. • Foreign material in the fuel tank, i.e. ice. Did you find and correct the condition?	-	Go to Step 15	Go to Step 8
8	1. With the J 39200 DMM, measure the resistance of both fuel level sensors while moving the float arm. 2. Observe both the analog and digital displays on the DMM. Does the resistance change smoothly across the specified range on both fuel level sensors?	20-125 ohms	Go to Diagnostic Aids	Go to Step 11
	1. Turn ON the ignition, with the engine OFF.			

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9	IMPORTANT: Verify the J 33431-C resistance settings with a DMM. See <u>Special Tools</u>. 2. Vary the resistance on the J 33431-C from 40-250 ohms. See <u>Special Tools</u>. 3. Refer to <u>Fuel Level Specifications</u> in order to convert from resistance to fuel level percent. IMPORTANT: Turn the ignition OFF momentarily between the resistance settings in order to quickly update the scan tool display. 4. With the scan tool, observe the Fuel Gage Position parameter in the Body Control Module (BCM) Accessory data list and the Fuel Level Sensor parameter in the Powertrain EVAP Data, data list. Does the Fuel Gage Position parameter match the Fuel Level Sensor parameter?	-	Go to Step 12	Go to Step 14
10	Inspect for poor connections at the harness connector of the powertrain control module (PCM). Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and to <u>Connector Repairs</u> in Wiring Systems. Did you find and correct the condition?	-	Go to Step 15	Go to Step 13
11	Replace the fuel level sensor with the abnormally high resistance. Refer to <u>Fuel Level Sensor Replacement - Primary</u> or to <u>Fuel Level Sensor Replacement - Secondary</u> in Engine Controls - 3.4L. Did you complete the replacement?	-	Go to Step 15	-
	Replace the instrument panel cluster			

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12	(IPC). Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	-	Go to Step 15	-
13	Replace the PCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	-	Go to Step 15	-
14	Replace the BCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	-	Go to Step 15	-
15	1. Use the scan tool in order to clear the PCM DTCs. 2. Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 2

ODOMETER TRIP/RESET SWITCH INOPERATIVE

Odometer Trip/Reset Switch Inoperative

Step	Action	Yes	No
Schematic Reference: Instrument Cluster 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	Replace the IPC. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	Go to Step 3	-
3	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

SPEEDOMETER AND/OR ODOMETER INACCURATE OR INOPERATIVE

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Speedometer and/or Odometer Inaccurate or Inoperative

Step	Action	Yes	No
Schematic Reference: Instrument Cluster Schematics			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u> in Vehicle DTC Information
2	1. Install a scan tool. 2. Raise the vehicles drive wheels. Refer to <u>Lifting and Jacking the Vehicle</u> in General Information. 3. Start the engine. 4. Place the transmission into drive for an automatic transmission or third gear for a manual transmission. 5. With the scan tool, observe the Vehicle Speed parameter in the Powertrain Engine Data 1 data list. Does the Vehicle Speed parameter match the speedometer display?	Go to Step 3	Go to Step 4
3	Does the odometer operate properly?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u> in Wiring Systems	Go to Step 4
4	Replace the instrument panel cluster (IPC). Refer to <u>Control Module References</u> in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	Go to Step 5	-
5	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

TACHOMETER INACCURATE OR INOPERATIVE

Tachometer Inaccurate or Inoperative

Step	Action	Yes	No
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Schematic Reference: Instrument Cluster 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. Start the engine. 3. With the scan tool, observe the Engine Speed parameter in the Powertrain Engine Data 1 data list. Does the Engine Speed parameter match the tachometer display?	Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems	Go to Step 3
3	Replace the instrument panel cluster (IPC). Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	Go to Step 4	-
4	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

ENGINE OIL PRESSURE INDICATOR ALWAYS ON

Engine Oil Pressure Indicator Always On

Step	Action	Yes	No
Schematic Reference: Instrument Cluster 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	Start the engine. Does the engine oil pressure indicator illuminate after the displays test?	Go to Step 3	Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems
	1. Install a scan tool.		

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3	2. With a scan tool, observe the Engine Oil Pressure Switch parameter in the Powertrain Engine Data 3 data list. Does the Engine Oil Pressure Switch parameter display No?	Go to Step 10	Go to Step 4
4	1. Turn OFF the ignition. 2. Disconnect the engine oil pressure switch. 3. Start the engine. 4. With the scan tool, observe the Engine Oil Pressure Switch parameter. Does the Engine Oil Pressure Switch parameter display Yes?	Go to Step 6	Go to Step 5
5	Test the signal circuit of the oil pressure switch signal for a short to ground. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 11	Go to Step 7
6	Inspect for poor connections at the harness connector of the engine oil pressure switch. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 11	Go to Step 8
7	Inspect for poor connections at the harness connector of the powertrain control module (PCM). Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 11	Go to Step 9
8	Replace the engine oil pressure switch. Refer to Engine Oil Pressure Sensor and/or Switch Replacement in Engine Mechanical - 3.5L. Did you complete the replacement?	Go to Step 11	-
9	Replace the PCM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	Go to Step 11	-

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10	Replace the IPC. Refer to Control Module References in Computer/Integrating Systems for replacement, setup and programming. Did you complete the replacement?	Go to Step 11	-
11	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

SHIFT INDICATOR INACCURATE OR INOPERATIVE

Diagnostic Aids

An open or short to ground in the instrument panel (I/P) lamps dimmer switch signal can disable the PRNDL display. Check for **DTC B2627** in Lighting Systems.

Refer to **Circuit Testing** and to **Wiring Repairs** in Wiring Systems.

Shift Indicator Inaccurate or Inoperative

Step	Action	Yes	No
Schematic Reference: <u>Body Control System Schematics</u> and <u>Automatic Transmission Controls Schematics</u> Connector End View Reference: <u>Computer/Integrating Systems Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	Is the shift indicator display inaccurate?	Go to Range Selector Displays Incorrect Range in Automatic Transaxle - AF3-5	Go to Step 3
3	1. Turn the park lamps ON. 2. Test the park lamp supply voltage circuit of the shift indicator for an open. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.		

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	Did you find and correct the condition?	Go to Step 8	Go to Step 4
4	Test the PRNDL/powertrain fuse supply voltage circuit of the shift indicator for an open. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 8	Go to Step 5
5	Test the ground circuit of the shift indicator for an open. Refer to Circuit Testing and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 8	Go to Step 6
6	Inspect for poor connections at the harness connector of the shift indicator. 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 8	Go to Step 7
7	Replace the shift indicator. Refer to Shift Indicator Replacement in Automatic Transaxle - AF33-5. Did you complete the replacement?	Go to Step 8	-
8	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

CHIME ALWAYS ON

Chime Always On

Step	Action	Yes	No
Schematic Reference: Audible Warnings 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	Are any indicators illuminated?	Go to Symptoms - Instrument Panel, Gages and Console	Go to Step 3
	1. Turn the ignition OFF. 2. Turn the headlamp switch to OFF.		Go to Testing

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3	3. Remove the key from the ignition. 4. Open the driver door. Does the chime sound?	Go to Step 4	for Intermittent Conditions and Poor Connections in Wiring Systems
4	1. Turn the ignition OFF. 2. Disconnect the ignition switch. 3. Install a scan tool. 4. Turn the ignition ON, with the engine OFF. 5. With a scan tool, observe the Key in Ignition parameter in the Body Control Module Switch Inputs data list. Does the Key in Ignition parameter display No?	Go to Step 6	Go to Step 5
5	Test the key in ignition signal circuit for a short to ground. Refer to Circuit Testing and to Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 8	Go to Step 7
6	Replace the ignition switch. Refer to Ignition Switch Replacement in Steering Wheel and Column. Did you complete the replacement?	Go to Step 8	-
7	Replace the body control module (BCM). Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to Step 8	-
8	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

CHIME INOPERATIVE

Chime Inoperative

Step	Action	Yes	No
Schematic Reference: Audible Warnings Schematics			
1	Did you perform the Diagnostic System Check - Vehicle?		Go to Diagnostic System Check - Vehicle in

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		Go to Step 2	Vehicle DTC Information
2	1. Place the key in the ignition. 2. Open the driver door. Does the chime sound?	Go to Step 3	Go to Step 4
3	Do the courtesy lamps illuminate when the driver door is opened?	Go to Testing for Intermittent Conditions and Poor Connections in Wiring Systems	Go to Courtesy Lamps Inoperative in Lighting Systems
4	Replace the body control module (BCM). Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	Go to Step 5	-
5	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

REPAIR INSTRUCTIONS**CLOSEOUT/INSULATOR PANEL REPLACEMENT - RIGHT**

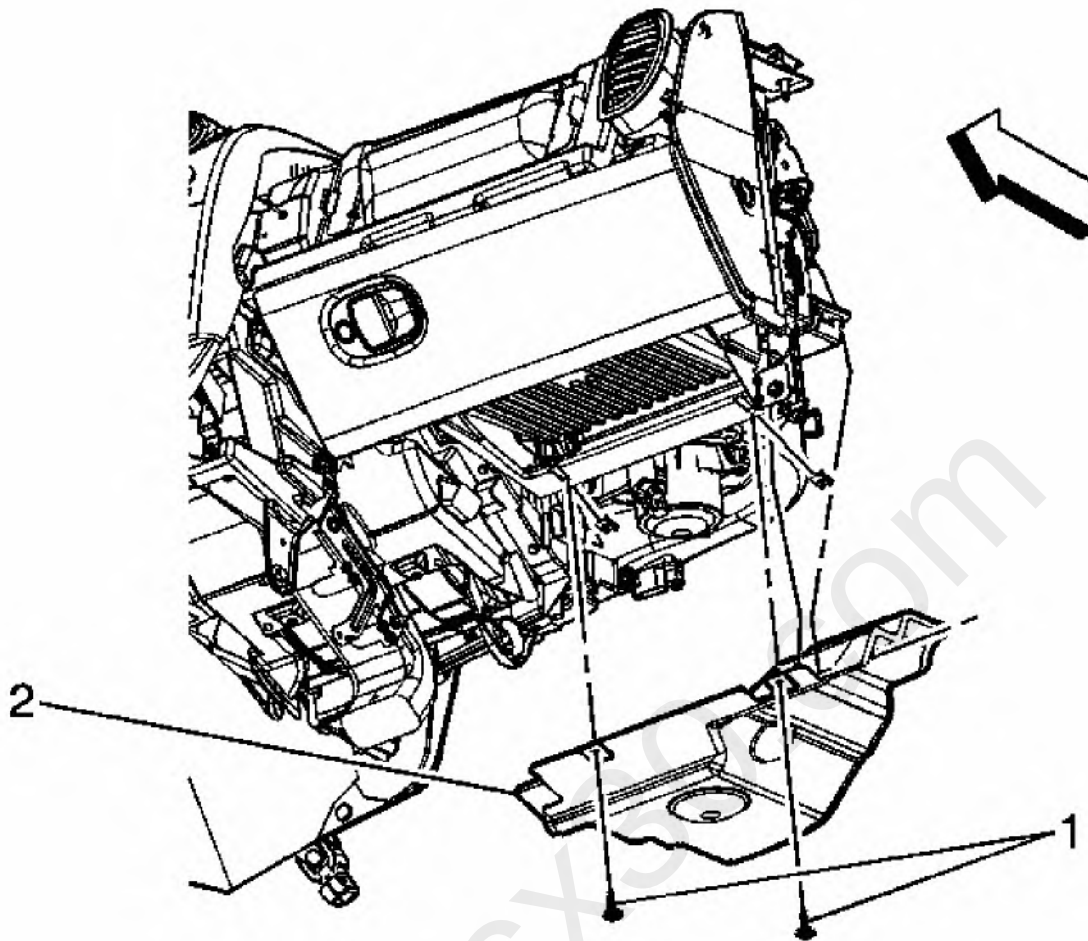


Fig. 7: View Of Right Closeout/Insulator Panel
 Courtesy of GENERAL MOTORS CORP.

Closeout/Insulator Panel Replacement - Right

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
1	Bolt, Instrument Panel Insulator Panel
2	Panel Assembly, Instrument Panel Insulator (Qty: 2)
	Tighten: 2 N.m (18 lb in)

CLOSEOUT/INSULATOR PANEL REPLACEMENT - LEFT

Removal Procedure

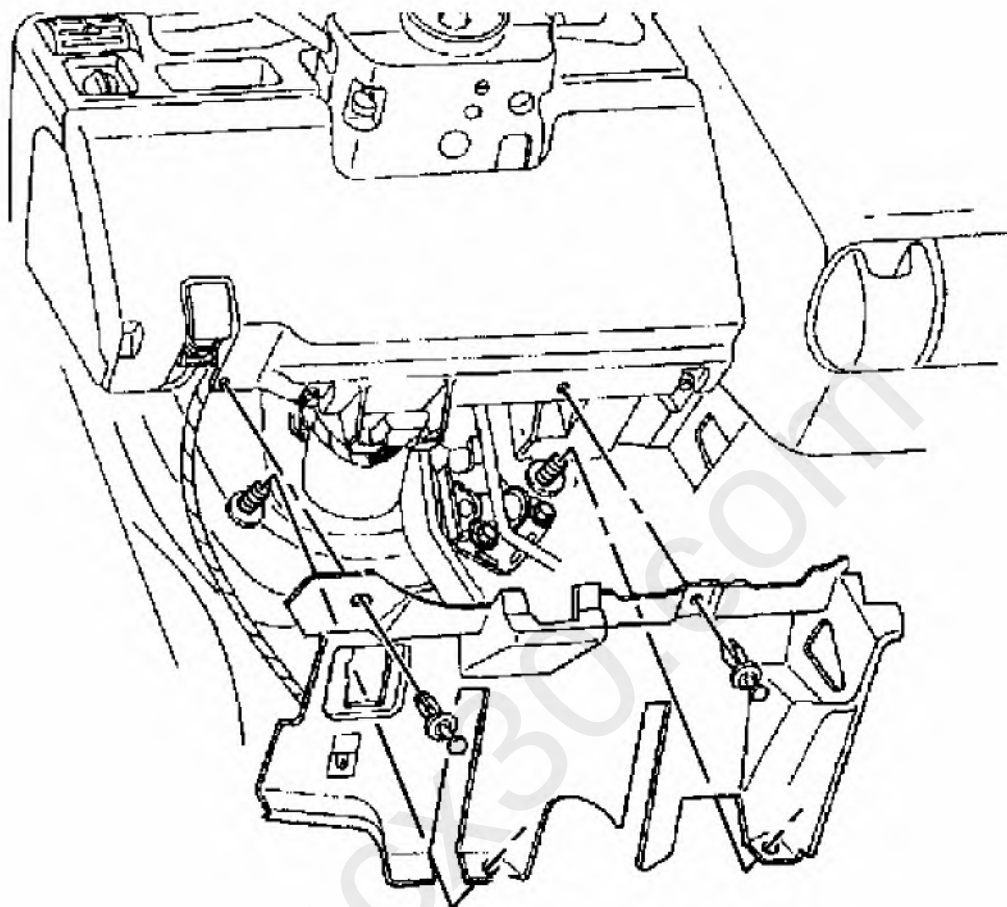


Fig. 8: Identifying Push-In Retainers From IP Insulator To Instrument Panel
Courtesy of GENERAL MOTORS CORP.

1. Remove the 2 fasteners holding the I/P insulator to the I/P.
2. Remove the closeout/insulator panel.

Installation Procedure

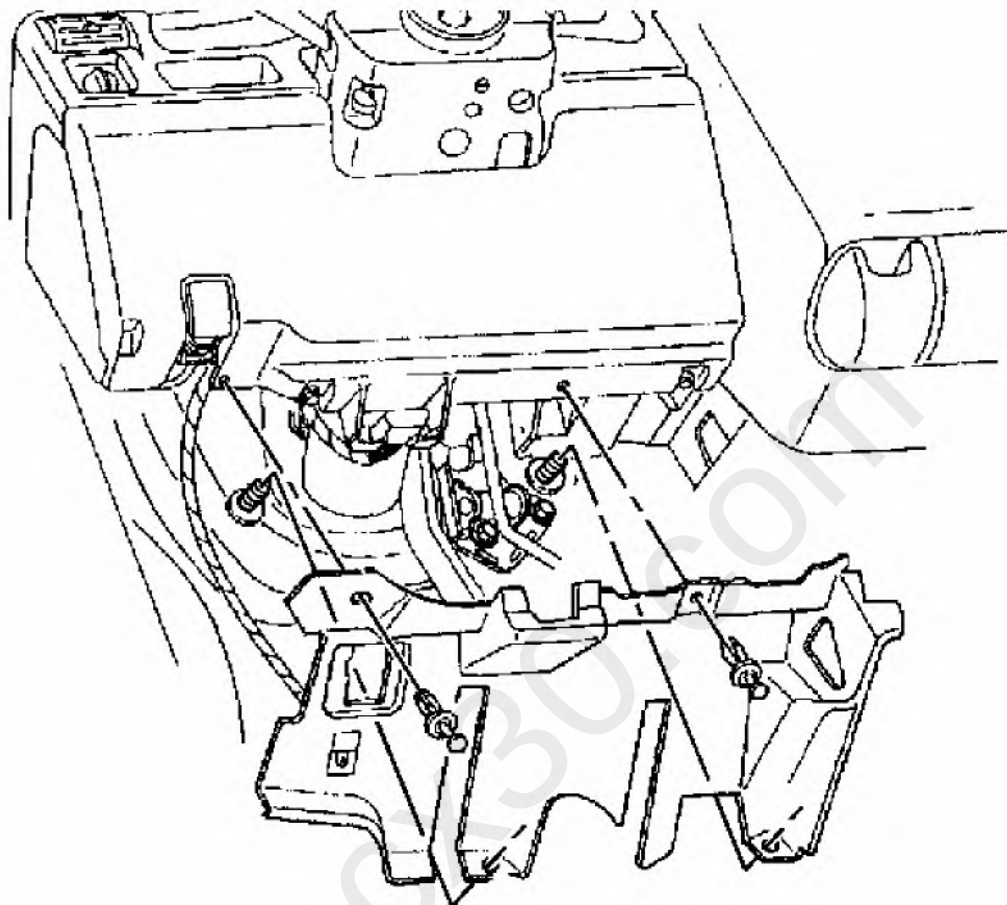


Fig. 9: Identifying Push-In Retainers From IP Insulator To Instrument Panel
Courtesy of GENERAL MOTORS CORP.

1. Align the closeout/insulator panel with the I/P.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the screws holding the insulator to the I/P.

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

KNEE BOLSTER REPLACEMENT

Removal Procedure

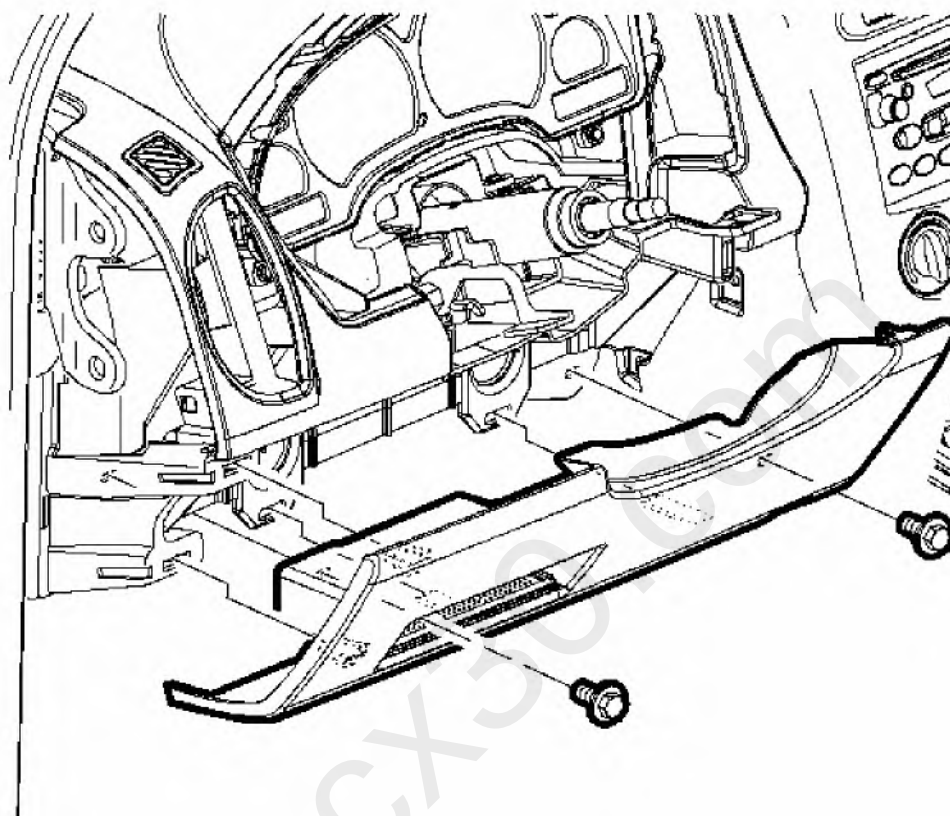


Fig. 10: View Of Knee Bolster (Filler Panel) & Screws
Courtesy of GENERAL MOTORS CORP.

1. Remove the screws from the trim panel.
2. Remove the filler panel by pulling until the trim clips disengage.
3. Remove the trim panel by pulling on the panel.

Installation Procedure

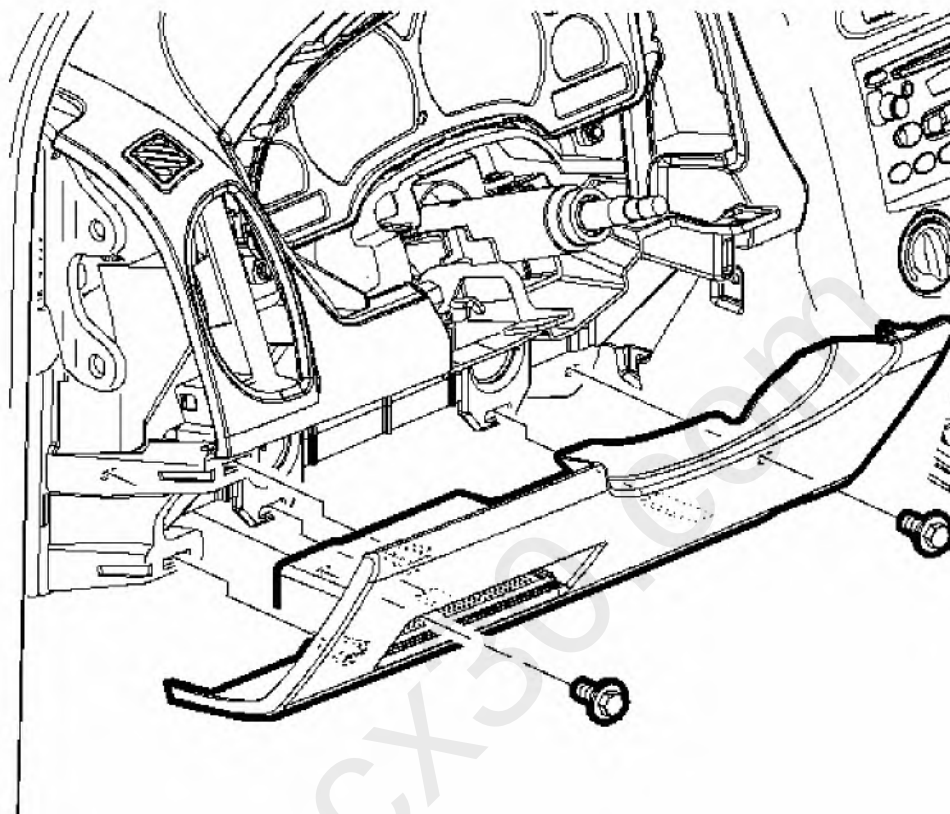


Fig. 11: View Of Knee Bolster (Filler Panel) & Screws
Courtesy of GENERAL MOTORS CORP.

1. Position the outer trim panel.
2. Push to install the panel.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Fasten the screws that hold the left side trim panel to the I/P.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

TRIM PANEL REPLACEMENT - INSTRUMENT PANEL (I/P) UPPER

Removal Procedure

1. Disable the frontal supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling Zone 3** and to **SIR Disabling and Enabling Zone 5** in SIR.
2. Remove the windshield garnish moldings. Refer to **Windshield Upper Garnish Molding Replacement** .

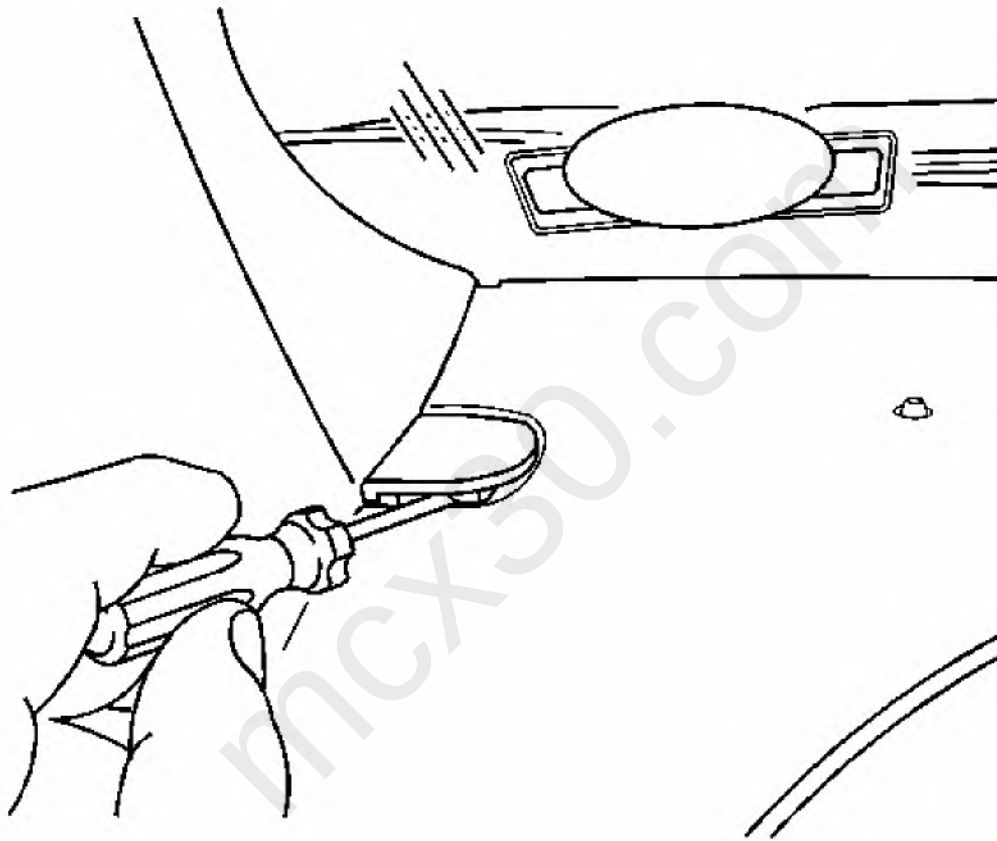


Fig. 12: Removing/Installing Access Panel Covers
Courtesy of GENERAL MOTORS CORP.

3. Using a flat-bladed tool, lift up the upper trim pad covers.
4. Remove the bolts holding the upper trim pad to the I/P retainer.

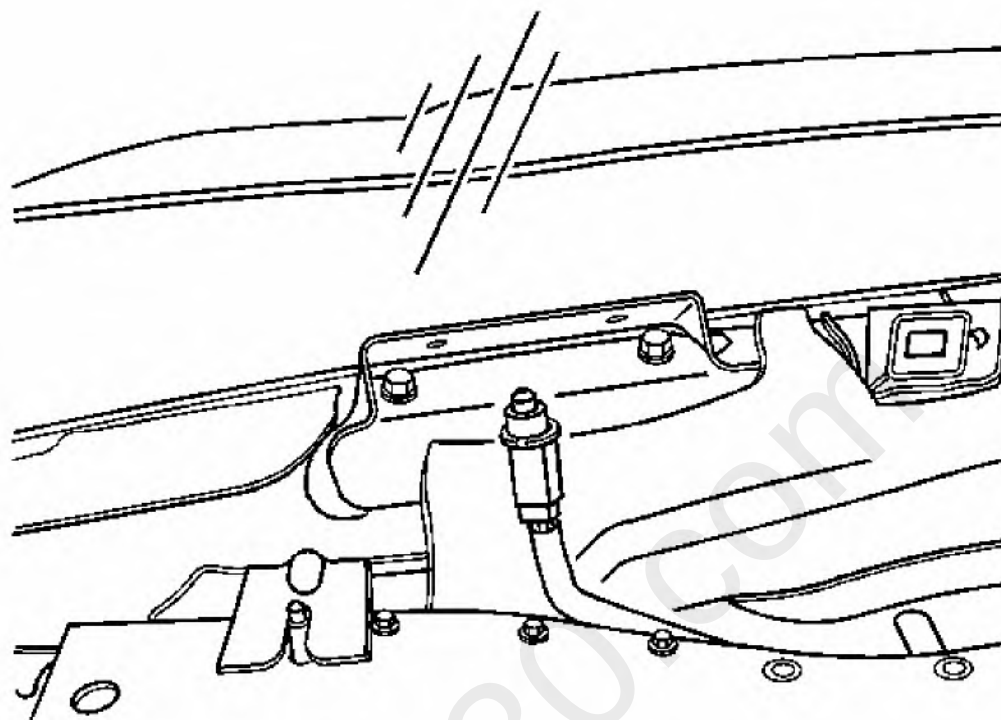


Fig. 13: View Of Ambient Light Sensor At I/P Upper Trim Panel
Courtesy of GENERAL MOTORS CORP.

5. Lift the I/P upper trim panel from the vehicle.

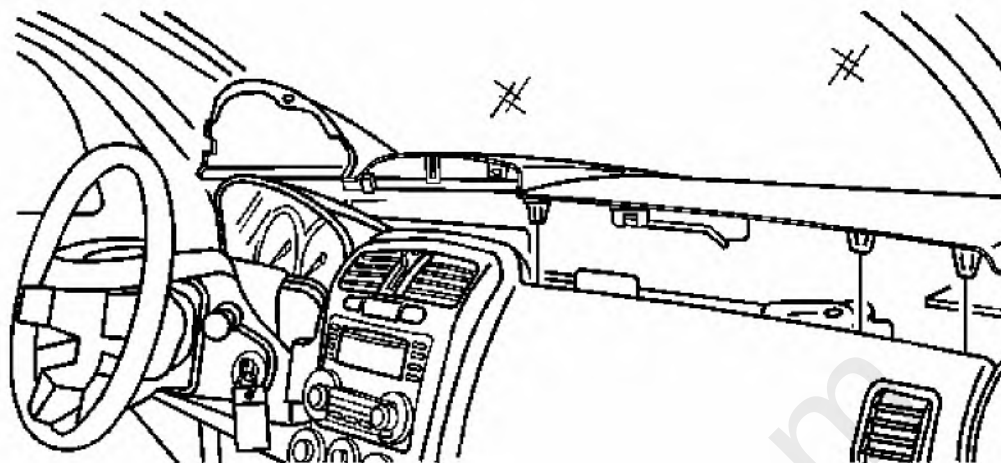


Fig. 14: Removing/Installing Upper Trim Pad
Courtesy of GENERAL MOTORS CORP.

6. Disconnect the ambient light sensor from the upper trim pad.
7. Remove the I/P upper trim panel from the vehicle.

Installation Procedure

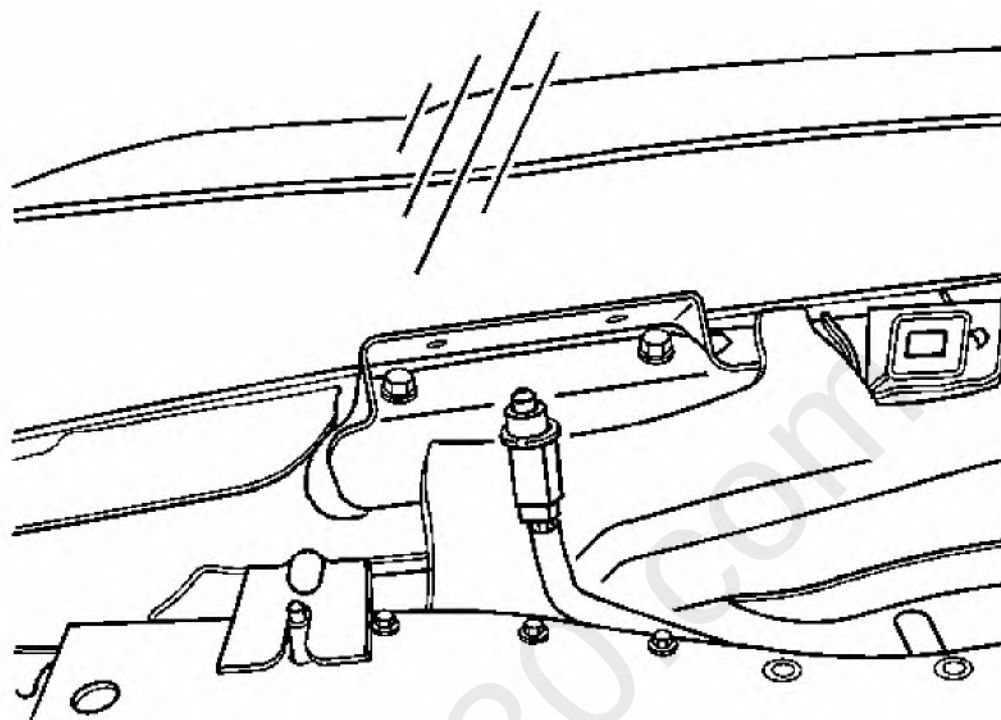


Fig. 15: View Of Ambient Light Sensor At I/P Upper Trim Panel
Courtesy of GENERAL MOTORS CORP.

1. Connect the ambient light sensor to the upper trim pad.

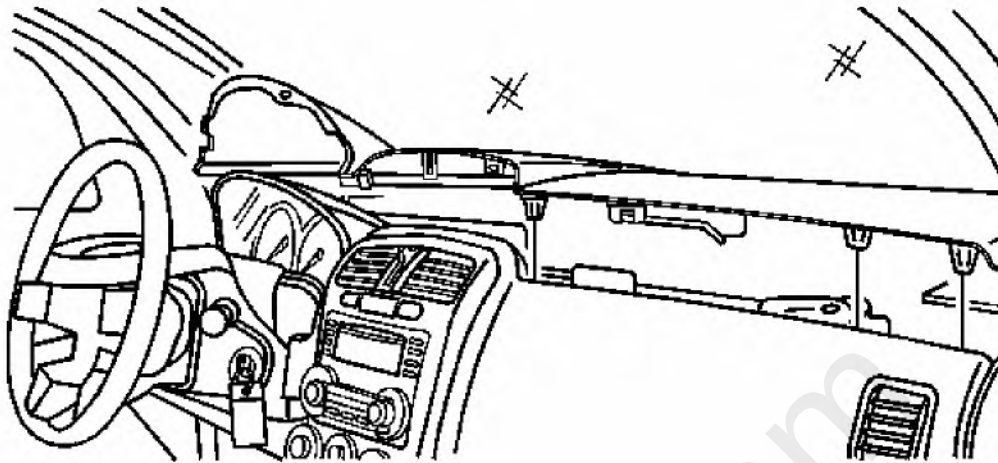


Fig. 16: Removing/Installing Upper Trim Pad
Courtesy of GENERAL MOTORS CORP.

2. Position the I/P upper trim panel in the vehicle. Snap the trim panel into place.

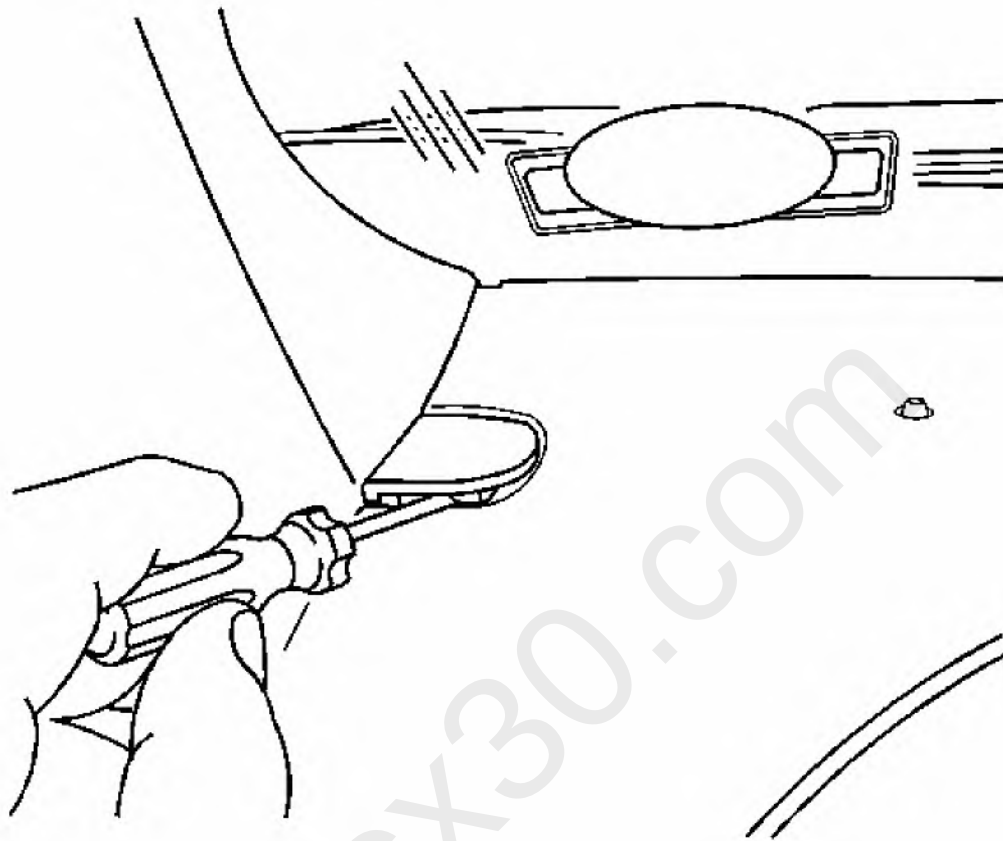


Fig. 17: Removing/Installing Access Panel Covers
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the bolts to the I/P upper trim panel.

Tighten: Tighten the bolts to 10 N.m (89 lb in).

4. Insert the bolt caps.
5. Install the windshield garnish moldings. Refer to Windshield Upper Garnish Molding Replacement.

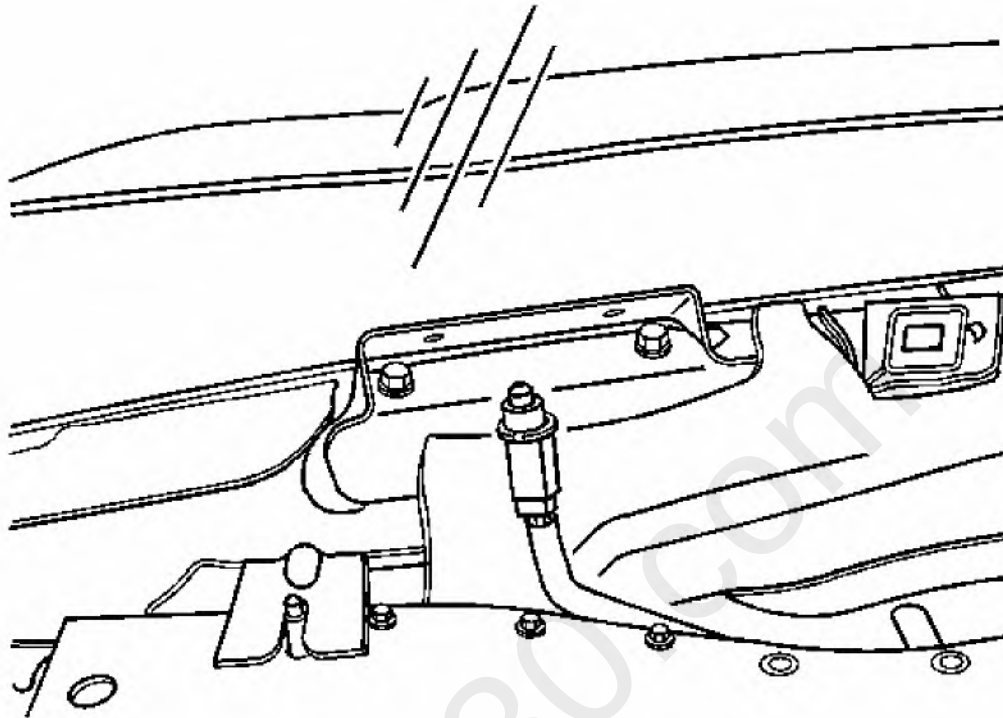


Fig. 18: View Of Ambient Light Sensor At I/P Upper Trim Panel
Courtesy of GENERAL MOTORS CORP.

6. Connect the ambient light sensor to the upper trim pad.
7. Install the windshield garnish moldings. Refer to **Windshield Upper Garnish Molding Replacement**.
8. Enable the frontal SIR system. Refer to **SIR Disabling and Enabling Zone 3** and to **SIR Disabling and Enabling Zone 5** in SIR.

TRIM PANEL REPLACEMENT - INSTRUMENT PANEL (I/P) CLUSTER

Removal Procedure

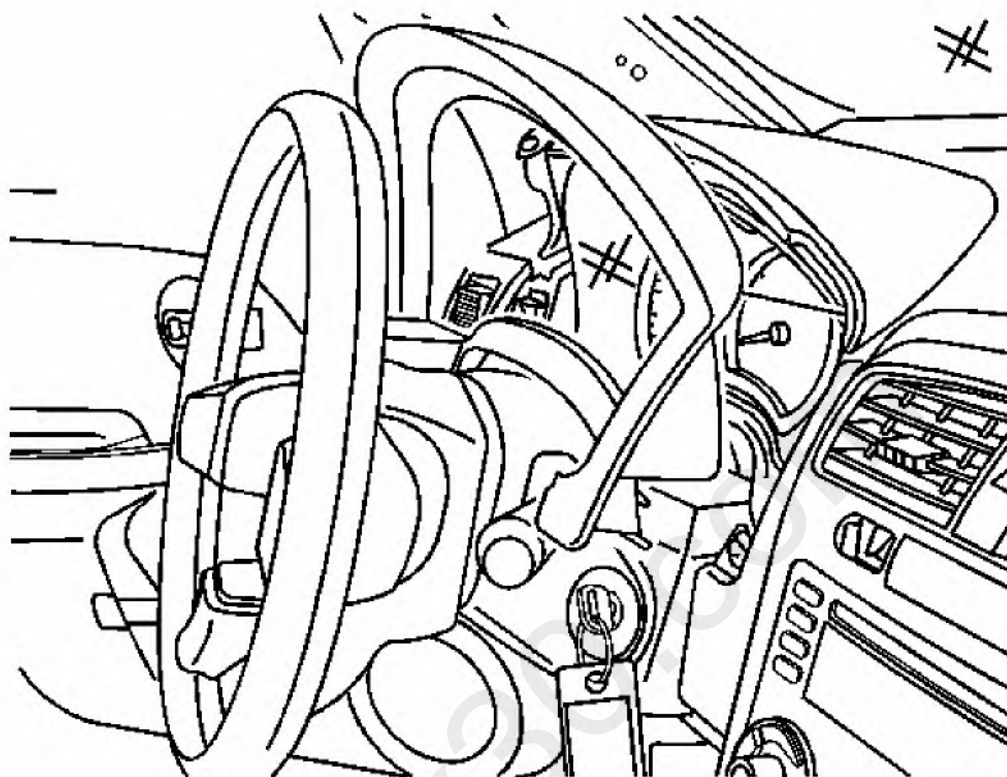


Fig. 19: View Of I/P Cluster Trim Panel
Courtesy of GENERAL MOTORS CORP.

1. Remove the cluster trim panel screws.
2. Pull out to remove the cluster trim panel.

Installation Procedure

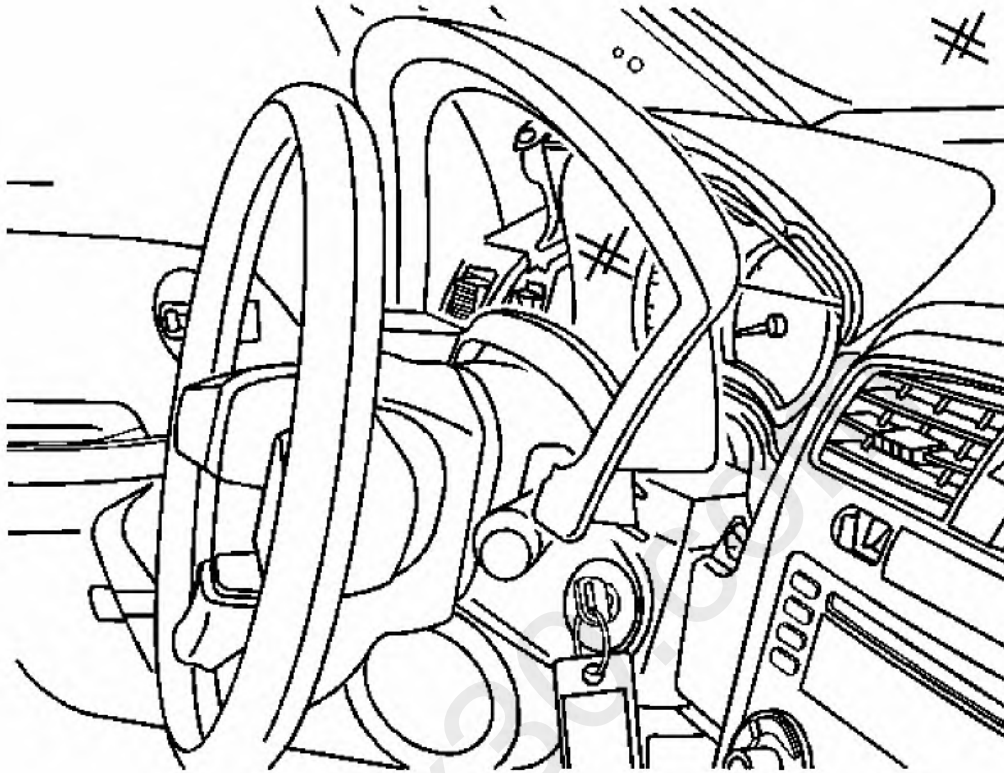


Fig. 20: View Of I/P Cluster Trim Panel
Courtesy of GENERAL MOTORS CORP.

1. Position the cluster trim panel. Push forward to install the panel.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the cluster trim panel screws.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

TRIM BEZEL REPLACEMENT - CENTER

Removal Procedure

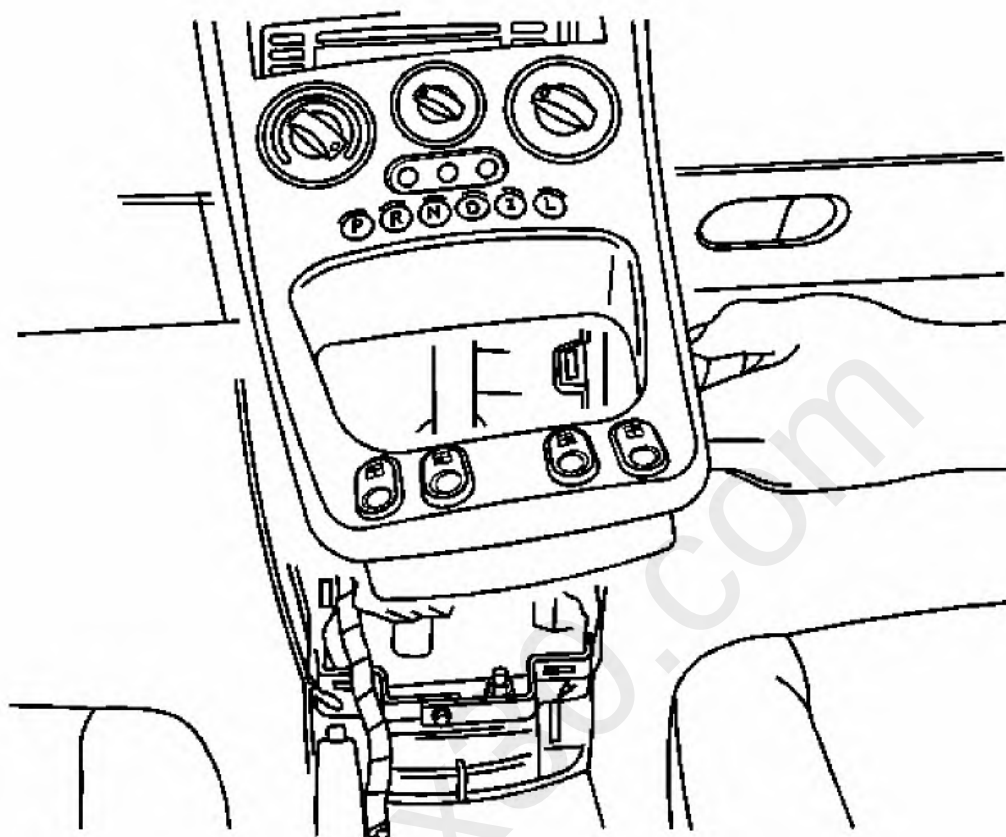


Fig. 21: Removing/Installing Center Trim Bezel
Courtesy of GENERAL MOTORS CORP.

1. Starting at the bottom, pull to disengage the trim bezel clips.
2. Disconnect the electrical connectors from the center trim bezel.

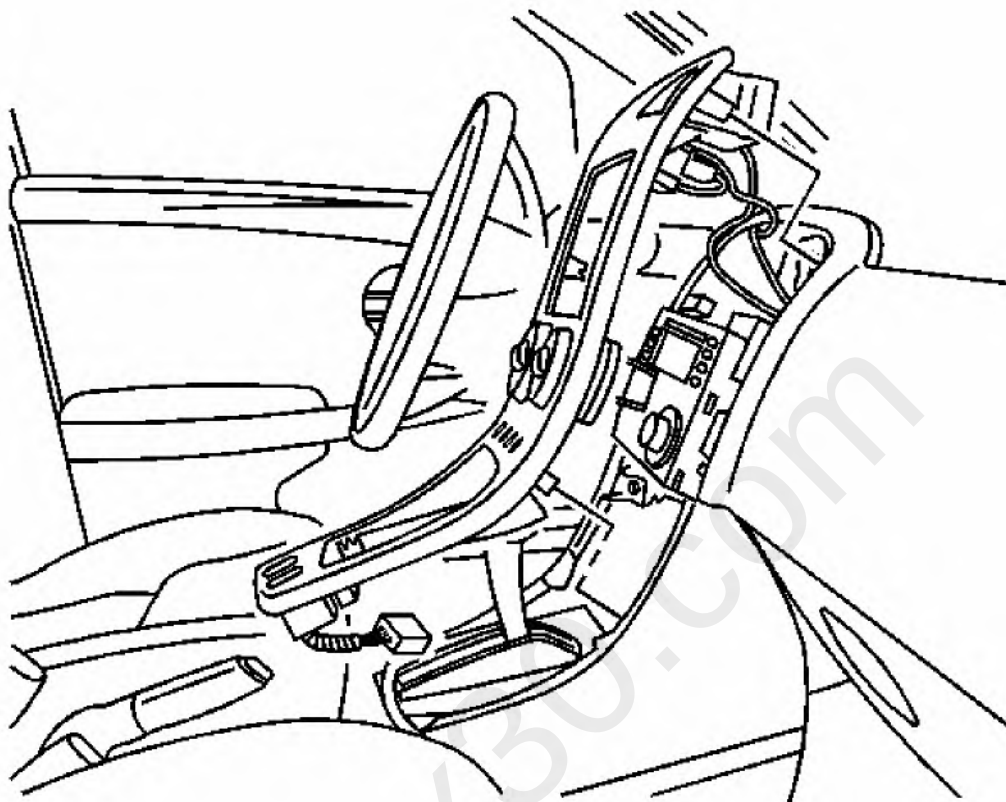


Fig. 22: View Of Center Trim Bezel
Courtesy of GENERAL MOTORS CORP.

3. Remove the center trim bezel from the vehicle.

Installation Procedure

1. Connect the electrical connectors from the center trim bezel.

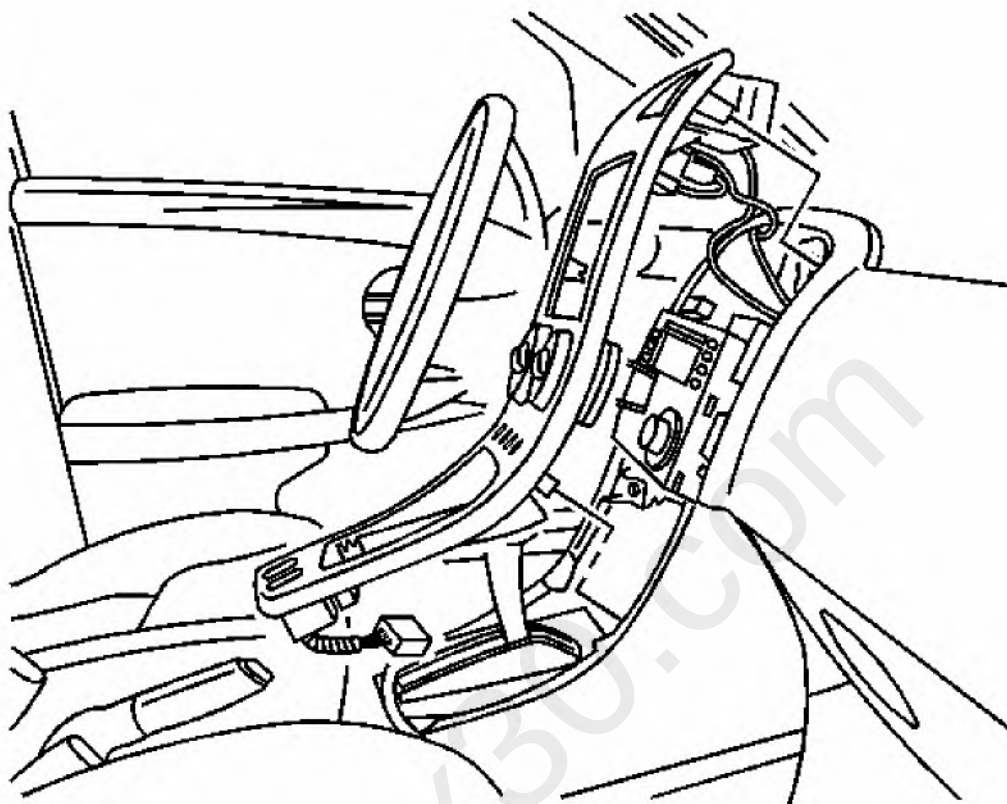


Fig. 23: View Of Center Trim Bezel
Courtesy of GENERAL MOTORS CORP.

2. Position the center trim bezel in the vehicle.

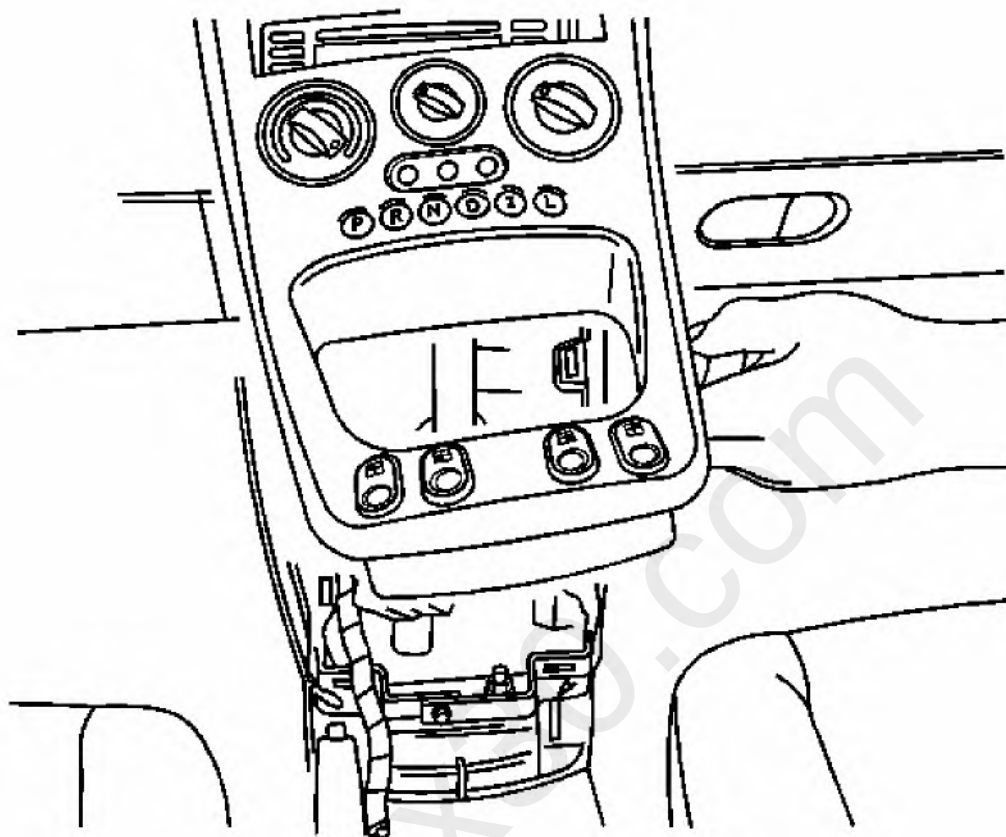


Fig. 24: Removing/Installing Center Trim Bezel
Courtesy of GENERAL MOTORS CORP.

3. Snap the center trim bezel in place.

INSTRUMENT PANEL (I/P) OUTER TRIM COVER REPLACEMENT - RIGHT

Removal Procedure

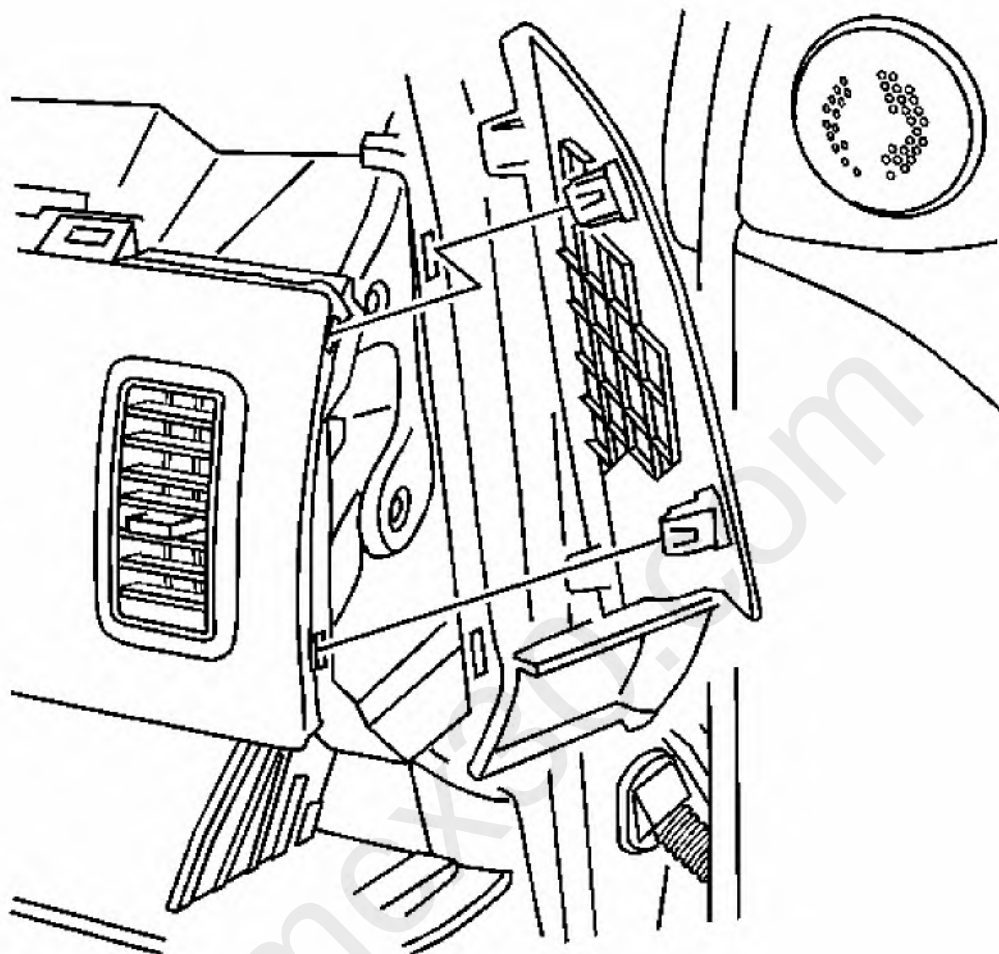


Fig. 25: Removing/Installing Right I/P Outer Trim Cover
Courtesy of GENERAL MOTORS CORP.

1. Open the I/P compartment door.
2. Pull the trim panel to disengage the trim clips.
3. Remove the right outer trim panel.

Installation Procedure

1. Position the outer trim panel.

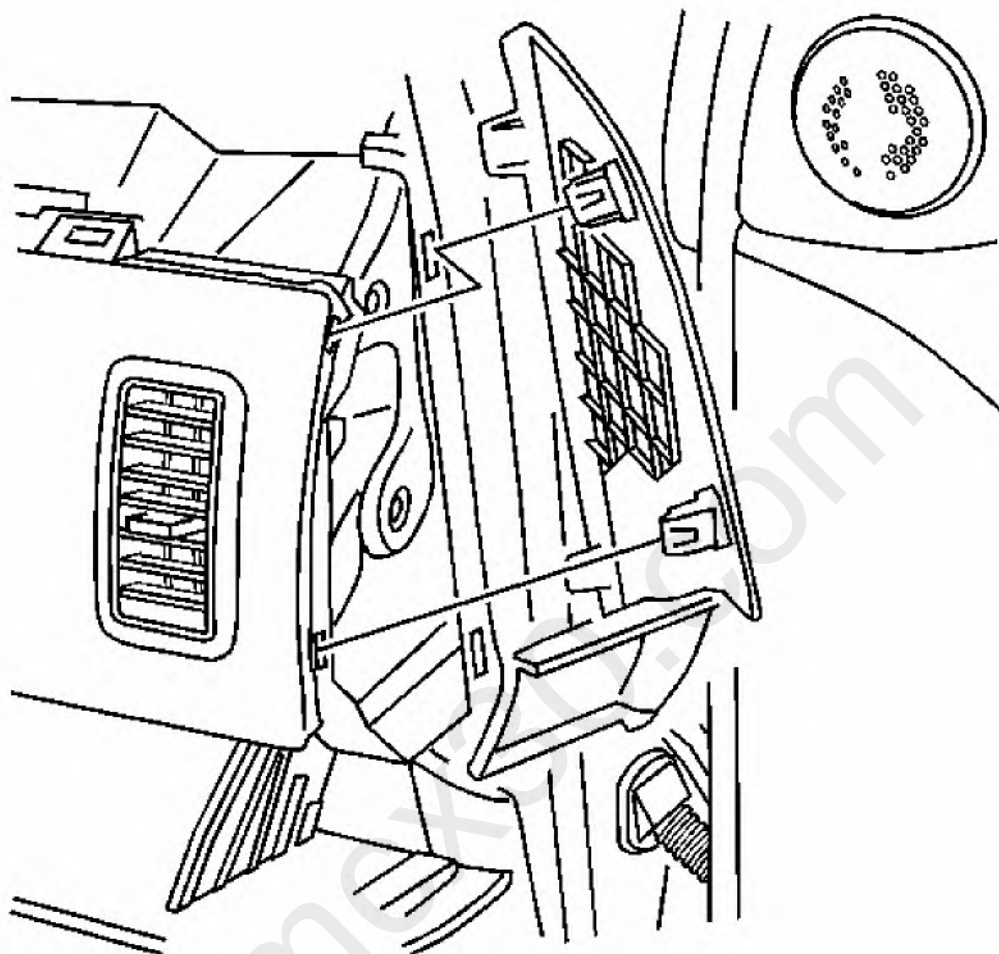


Fig. 26: Removing/Installing Right I/P Outer Trim Cover
Courtesy of GENERAL MOTORS CORP.

2. Push to install the outer trim panel.
3. Close the I/P compartment door.

COMPARTMENT REPLACEMENT - INSTRUMENT PANEL (I/P)

Removal Procedure

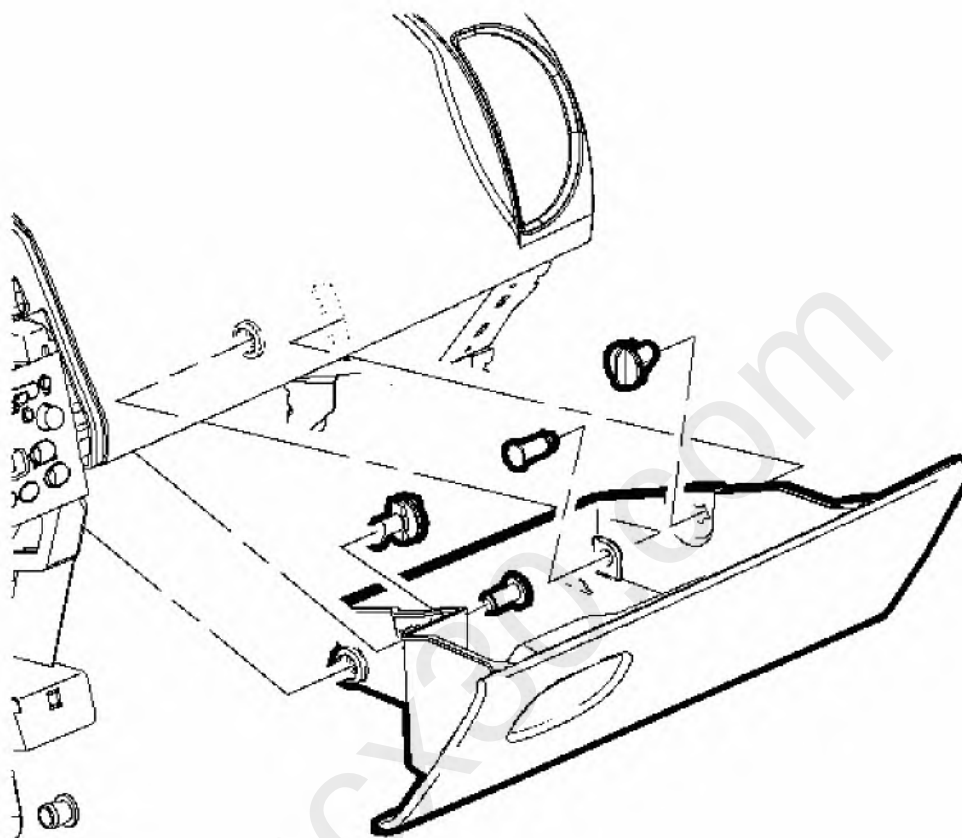


Fig. 27: View of Instrument Panel (IP) Compartment
Courtesy of GENERAL MOTORS CORP.

1. Open the compartment door.
2. Remove the compartment door pivot pins.
3. Rotate the compartment door stops and remove the stops.
4. Remove the I/P compartment.

Installation Procedure

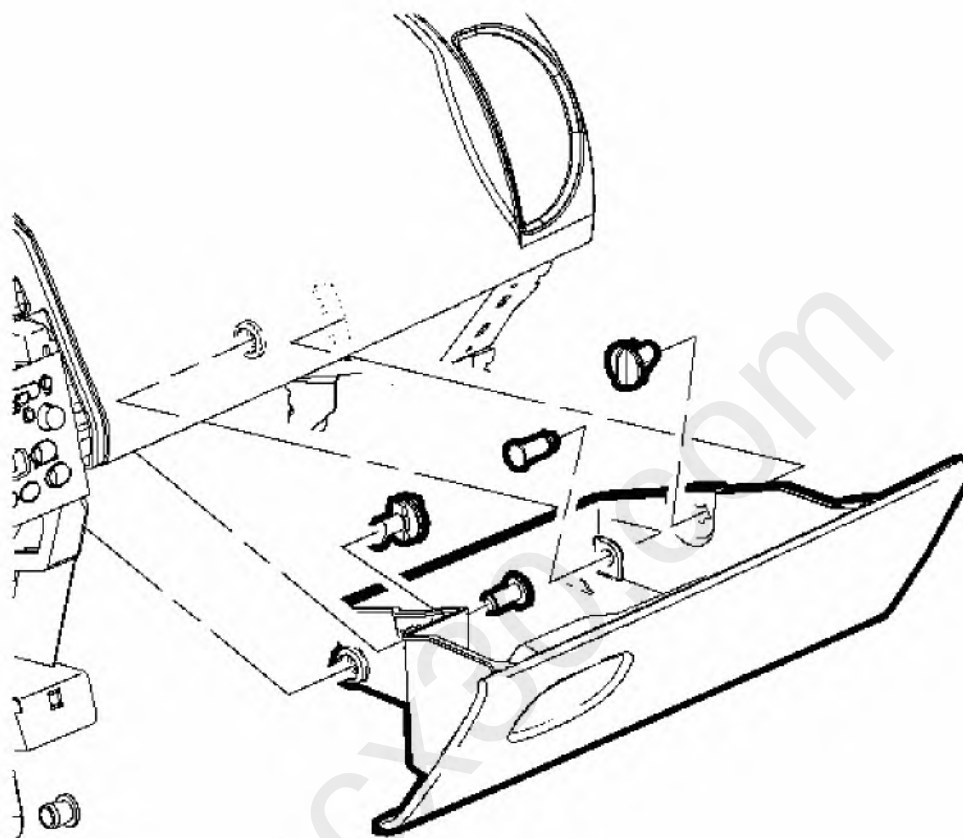


Fig. 28: View of Instrument Panel (IP) Compartment
Courtesy of GENERAL MOTORS CORP.

1. Position the I/P compartment.
2. Install the pivot pins.
3. Install the door stops.

DOOR REPLACEMENT - INSTRUMENT PANEL (I/P) COMPARTMENT

Removal Procedure

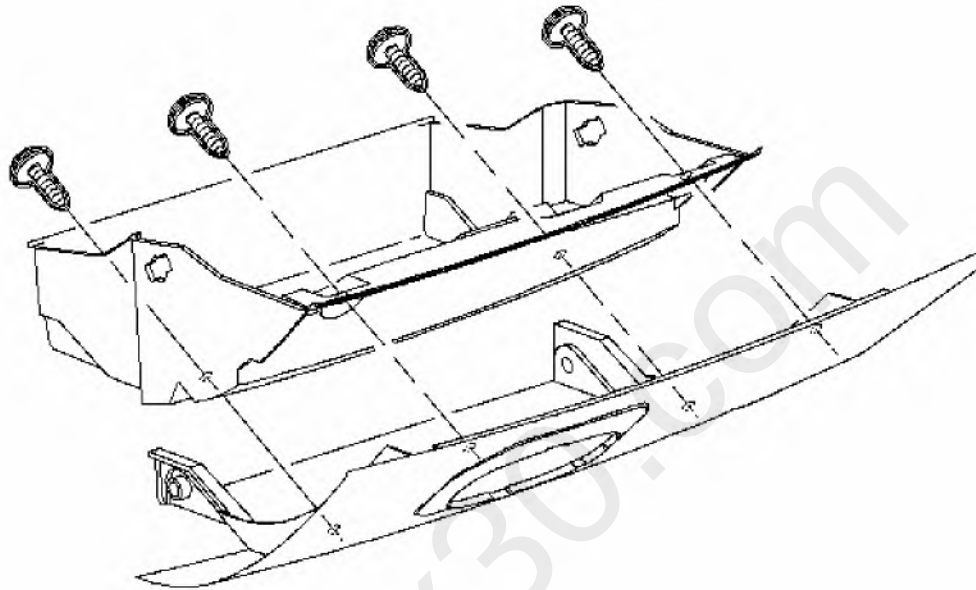


Fig. 29: View Of Instrumental Panel (I/P) Compartment Door
Courtesy of GENERAL MOTORS CORP.

1. Remove the I/P compartment. Refer to **Compartment Replacement - Instrument Panel (I/P)**.
2. Remove the compartment door screws.
3. Remove the compartment door.

Installation Procedure

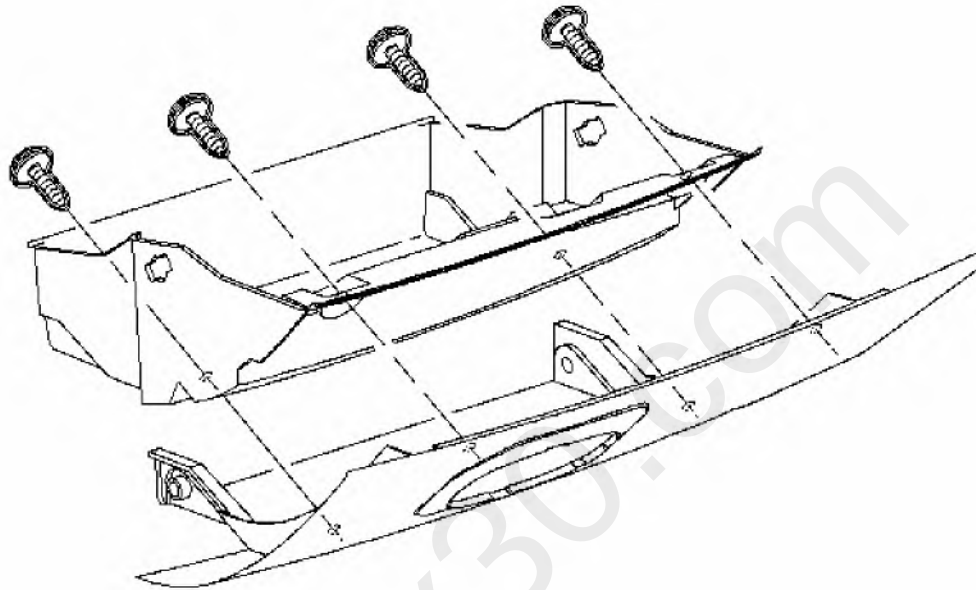


Fig. 30: View Of Instrumental Panel (I/P) Compartment Door
Courtesy of GENERAL MOTORS CORP.

1. Position the I/P compartment door.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the compartment door screws.

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

3. Install the I/P compartment. Refer to Compartment Replacement - Instrument Panel (I/P).

Removal Procedure

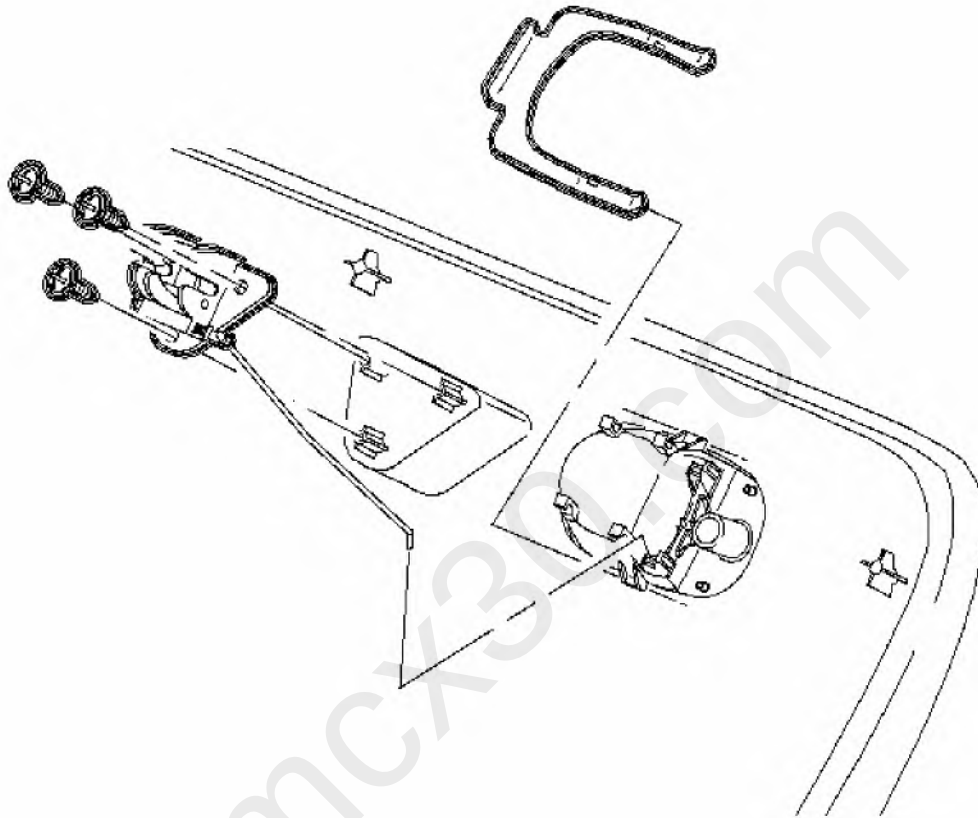


Fig. 31: View Of Instrument Panel (I/P) Compartment Door Handle
Courtesy of GENERAL MOTORS CORP.

1. Remove the I/P compartment door. Refer to **Door Replacement - Instrument Panel (I/P) Compartment**.
2. Remove the compartment latch screws.
3. Remove the latch and rod assembly from the compartment door handle assembly.
4. Remove the U-clip from the handle assembly.
5. Remove the handle assembly from the compartment.

Installation Procedure

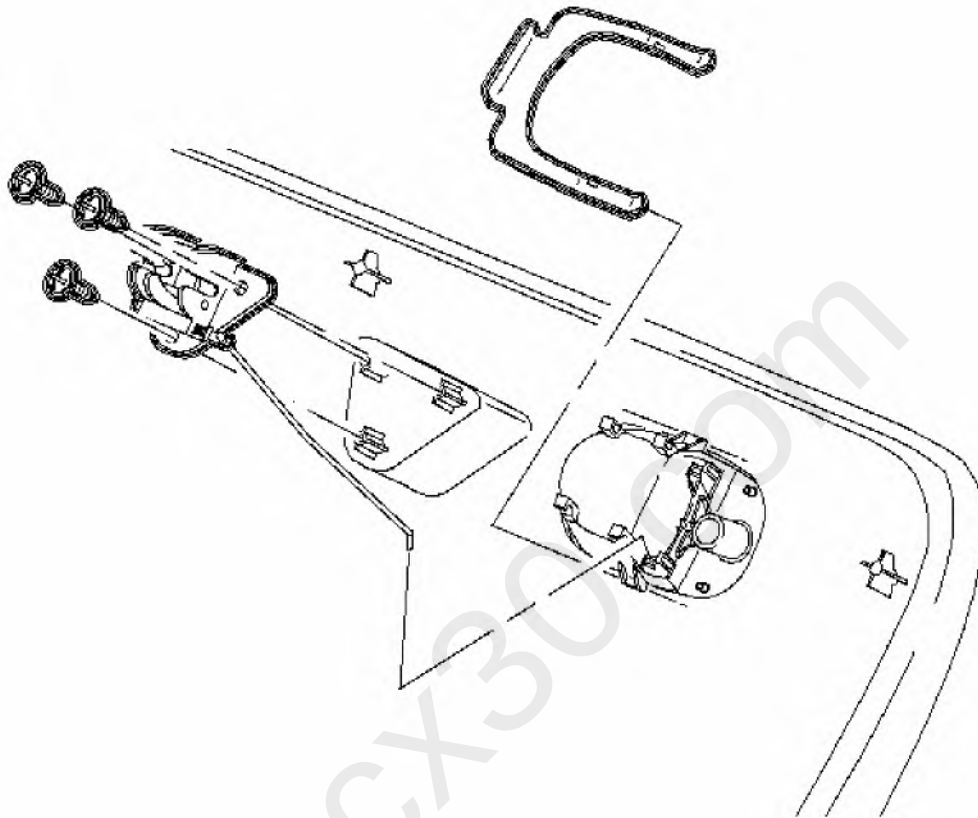


Fig. 32: View Of Instrument Panel (I/P) Compartment Door Handle
Courtesy of GENERAL MOTORS CORP.

1. Position the handle assembly to the I/P compartment door.
2. Install the U-clip.
3. Position the latch and rod assembly to the compartment door.

NOTE: Refer to Fastener Notice in Cautions and Notices.

4. Install the latch screws.

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

5. Install the I/P compartment door. Refer to Door Replacement - Instrument Panel

(I/P) Compartment.

LATCH REPLACEMENT - INSTRUMENT PANEL (I/P) COMPARTMENT

Removal Procedure

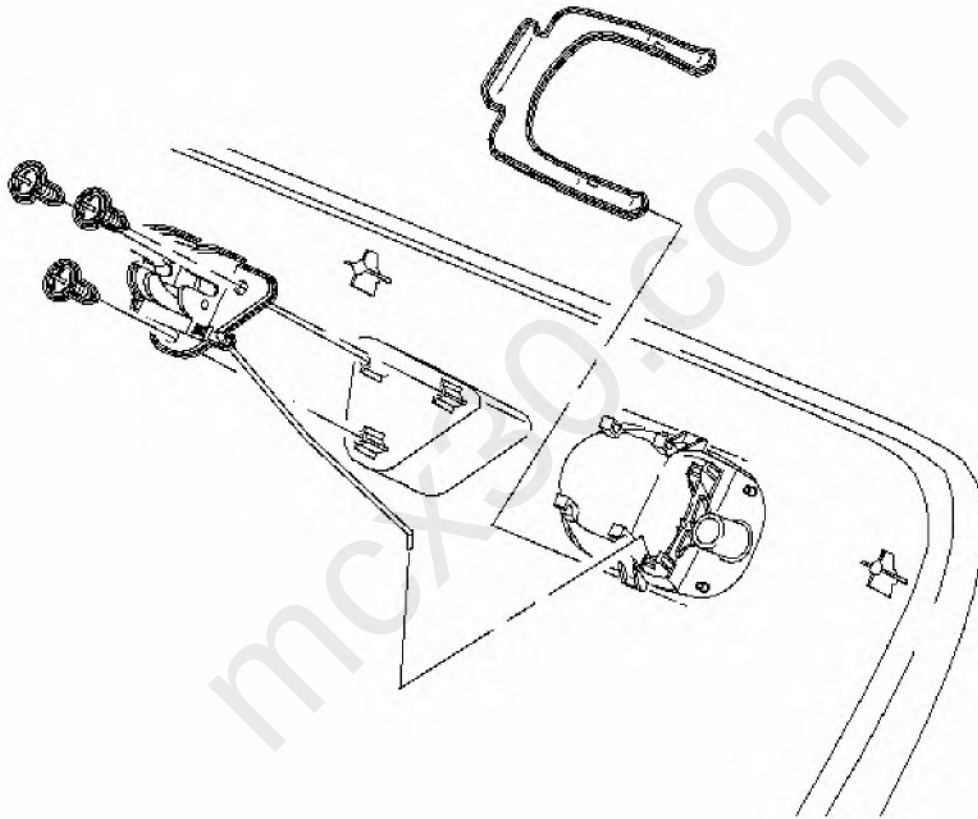


Fig. 33: View Of Instrument Panel (I/P) Compartment Door Handle
Courtesy of GENERAL MOTORS CORP.

1. Remove the I/P compartment door. Refer to **Door Replacement - Instrument Panel (I/P) Compartment.**
2. Remove the compartment latch screws.
3. Remove the latch and rod assembly from the compartment door.

Installation Procedure

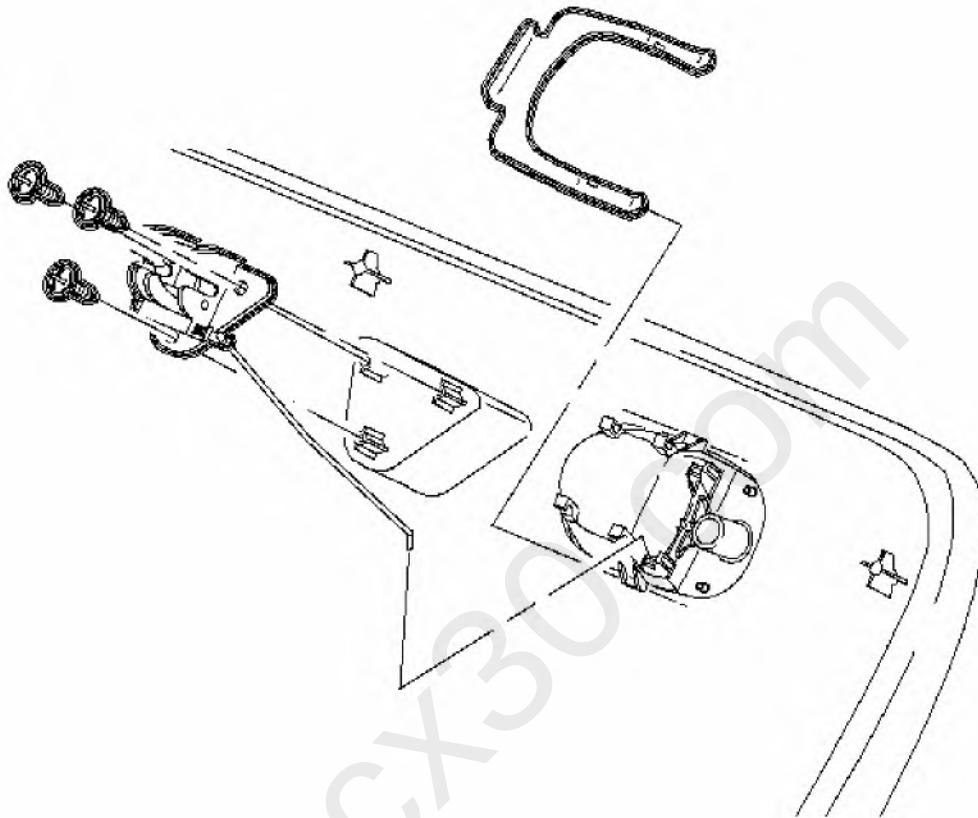


Fig. 34: View Of Instrument Panel (I/P) Compartment Door Handle
Courtesy of GENERAL MOTORS CORP.

1. Position the latch and rod assembly to the handle.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the latch screws.

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

3. Install the I/P compartment door. Refer to Door Replacement - Instrument Panel (I/P) Compartment.

Removal Procedure

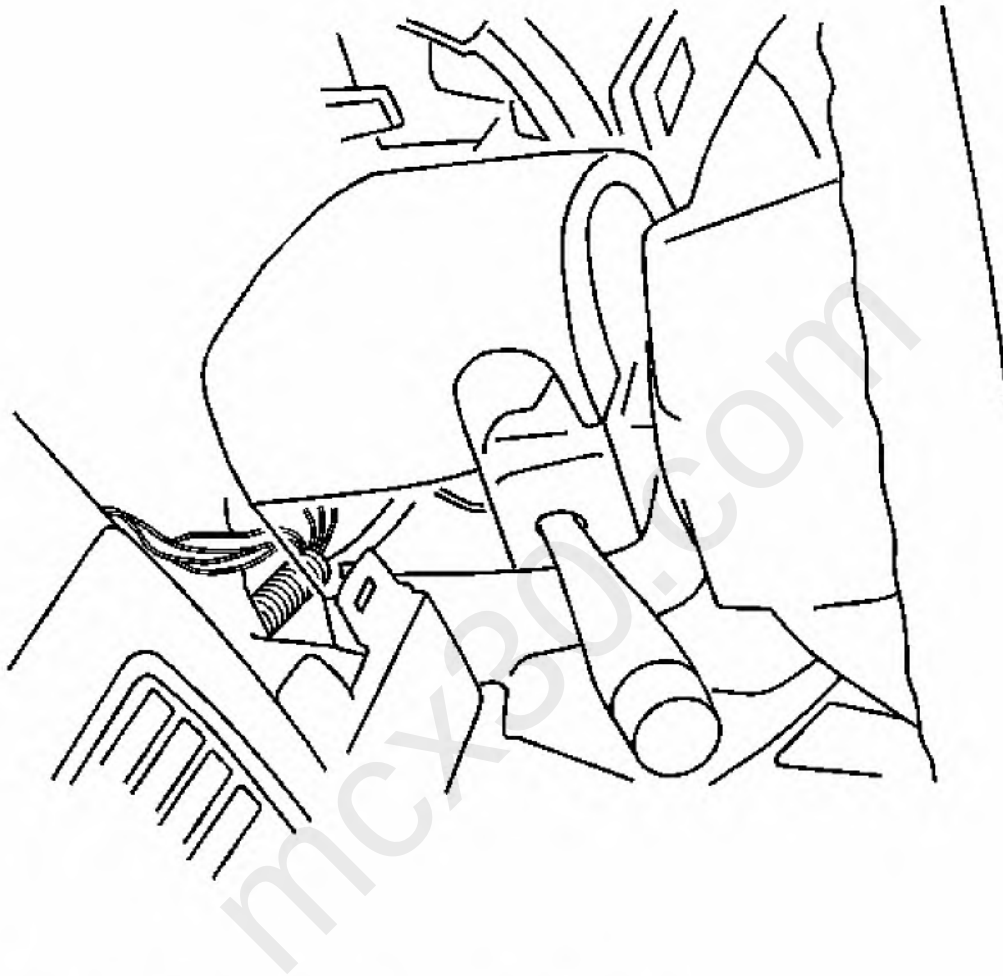


Fig. 35: View Of Steering Column Filler Panel
Courtesy of GENERAL MOTORS CORP.

1. Remove the screws from the steering column filler panel.
2. Pull on the trim panel to disengage the trim clips.
3. Remove the filler panel from the vehicle.

Installation Procedure

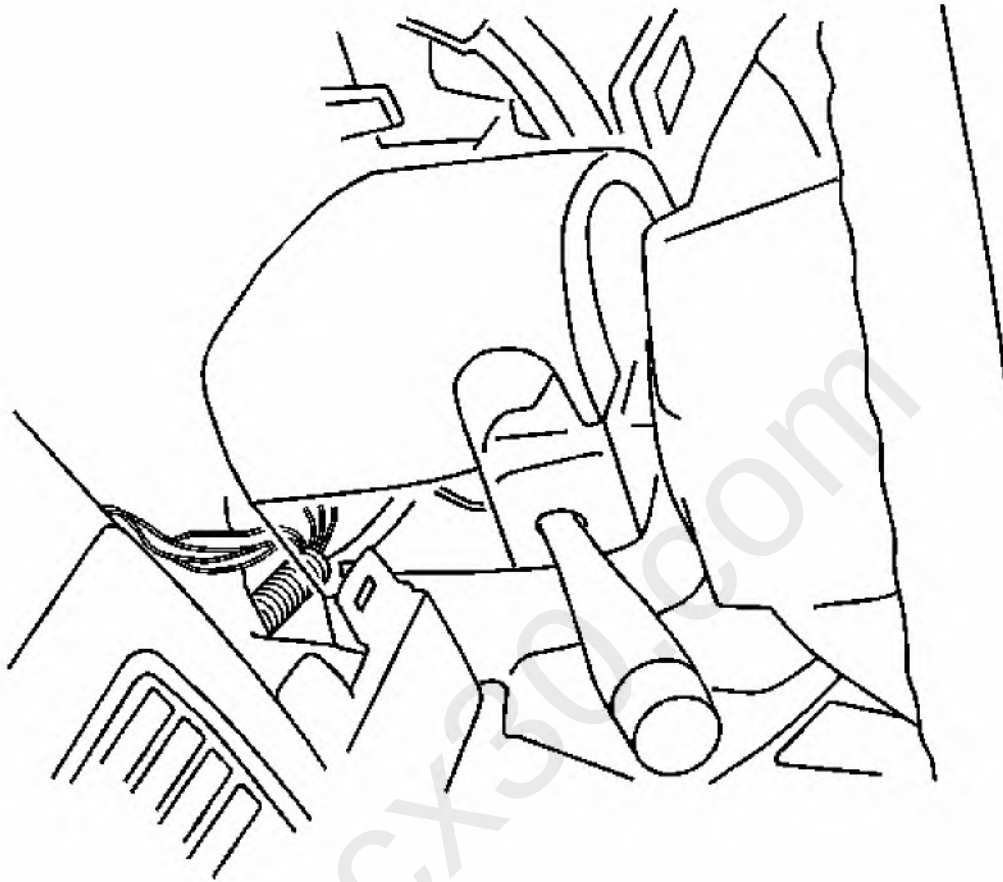


Fig. 36: View Of Steering Column Filler Panel
Courtesy of GENERAL MOTORS CORP.

1. Position the filler panel in the vehicle.
2. Push on the panel to engage the trim clips.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the screws to the steering column filler panel.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

INSTRUMENT PANEL (I/P) RETAINER REPLACEMENT

Removal Procedure

CAUTION: Refer to Battery Disconnect Caution in Cautions and

Notices.

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnect/Connect Procedure** in Engine Electrical.
2. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 5** in SIR.
3. Remove the window garnish moldings. Refer to **Windshield Upper Garnish Molding Replacement** in Interior Trim.
4. Remove the upper trim pad. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper**.
5. Remove the instrument cluster bezel. Refer to **Instrument Panel Cluster (IPC) Replacement**.
6. Remove the center trim bezel. Refer to **Trim Bezel Replacement - Center**.
7. Remove the radio. Refer to **Radio Replacement** in Entertainment.
8. Remove the BCM module from the I/P. Refer to **Body Control Module Replacement** in Computer/Integrating Systems.
9. Remove the I/P outer trim covers. Refer to **Console Trim Panel Replacement - Right** and to **Console Trim Panel Replacement - Left**.
10. Remove the I/P compartment. Refer to **Compartment Replacement - Instrument Panel (I/P)**.
11. Remove the steering column filler. Refer to **Steering Column Filler Replacement**.
12. Remove the right side I/P trim panel. Refer to **Console Trim Panel Replacement - Right**.

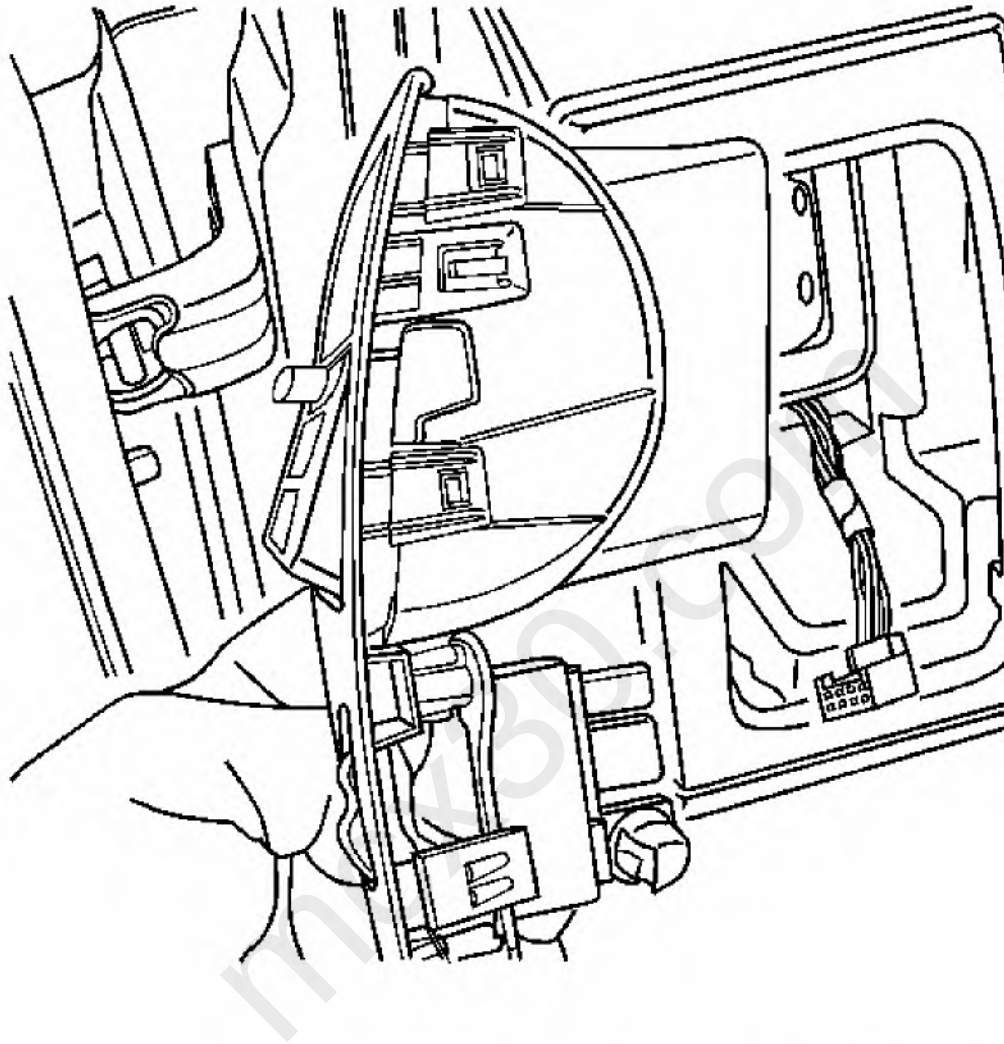


Fig. 37: View Of Power Mirror Switch & Dimmer Switch Panel
Courtesy of GENERAL MOTORS CORP.

13. Remove the panel which contains the power mirror switch and the dimmer switch.
14. Remove the inflatable restraint I/P module. Refer to **Inflatable Restraint Instrument Panel Module Replacement** in SIR.
15. Remove the left and the right carpet retainers. Refer to **Carpet Retainer Replacement - Front** in Interior Trim.

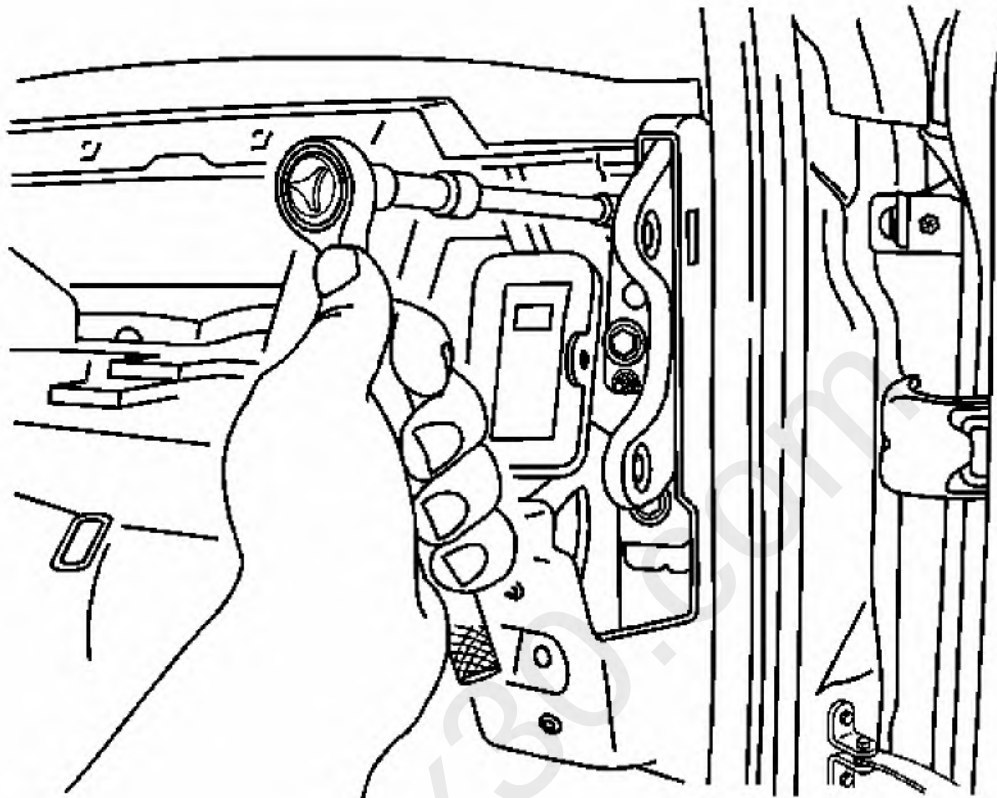


Fig. 38: Removing/Installing I/P Retainer Screws & Bolts
Courtesy of GENERAL MOTORS CORP.

16. Remove the screws and the bolts which hold the I/P retainer to the cross beam.

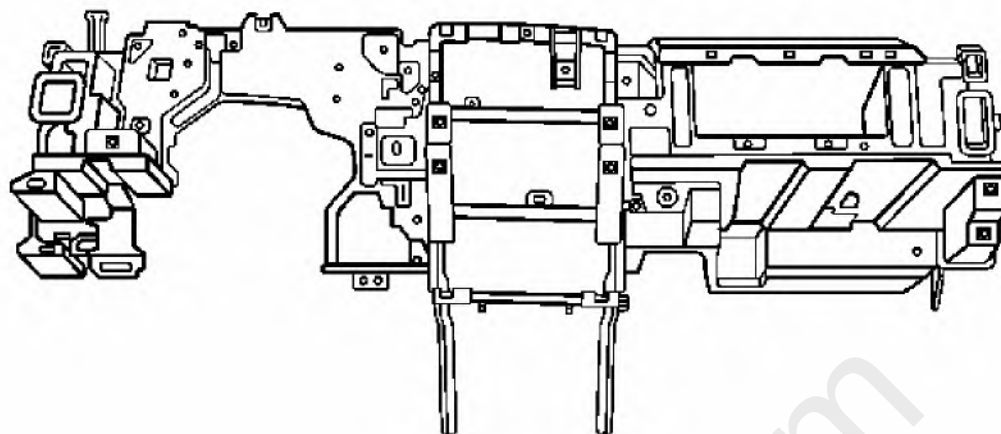


Fig. 39: View Of I/P Retainer
Courtesy of GENERAL MOTORS CORP.

17. Remove the I/P retainer from the vehicle.

Installation Procedure

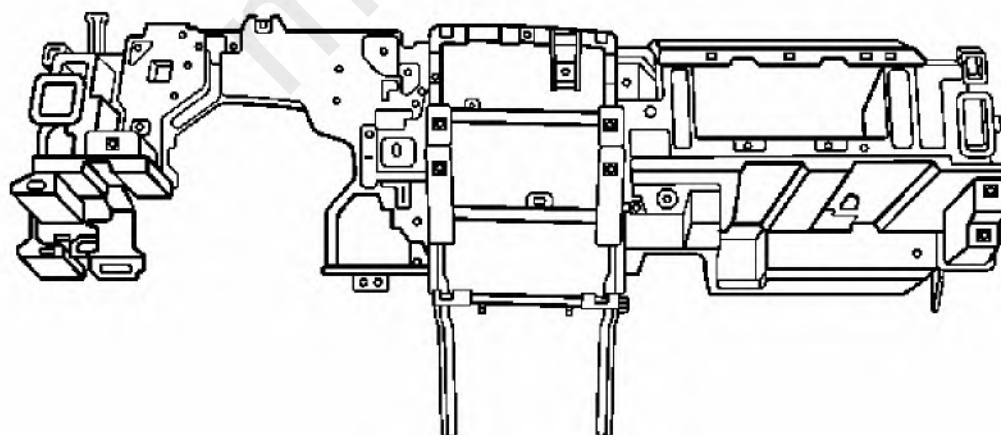


Fig. 40: View Of I/P Retainer
Courtesy of GENERAL MOTORS CORP.

1. Align the I/P retainer to the cross beam.

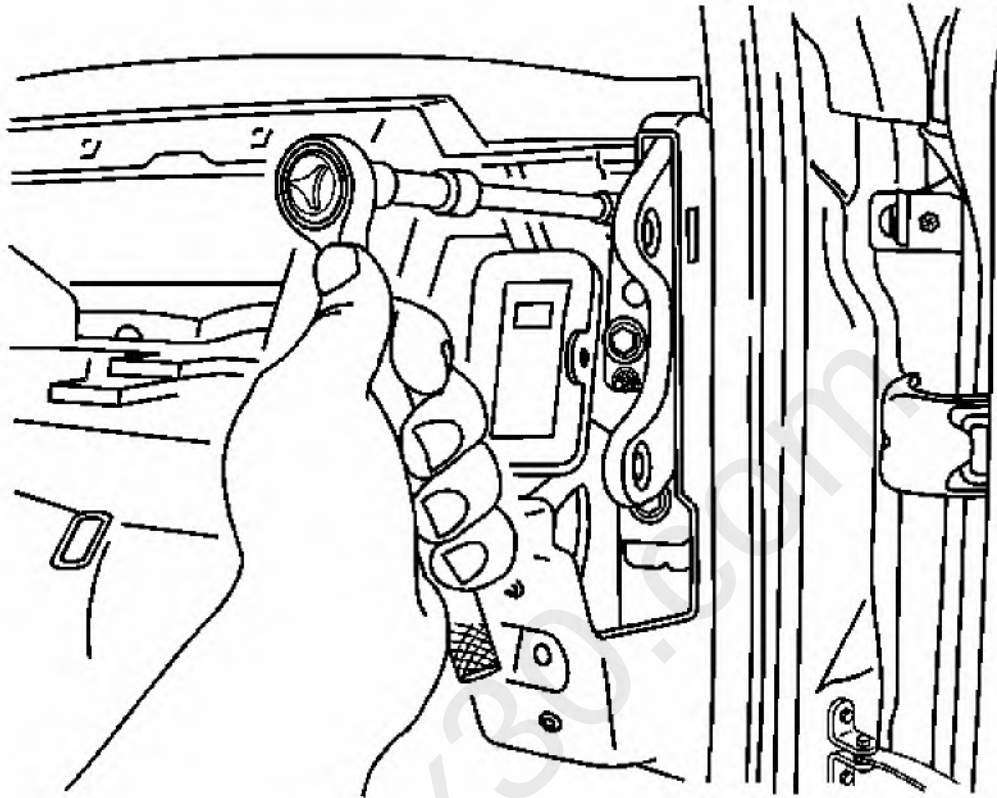


Fig. 41: Removing/Installing I/P Retainer Screws & Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the screws and the bolts which hold the I/P retainer to the cross beam. Begin at the center and work toward each side.

Tighten: Tighten the fasteners to 10 N.m (89 lb in).

3. Install the left and the right carpet retainers. Refer to Carpet Retainer Replacement - Front in Interior Trim.
4. Install the inflatable restraint I/P module. Refer to Inflatable Restraint Instrument Panel Module Replacement in SIR.

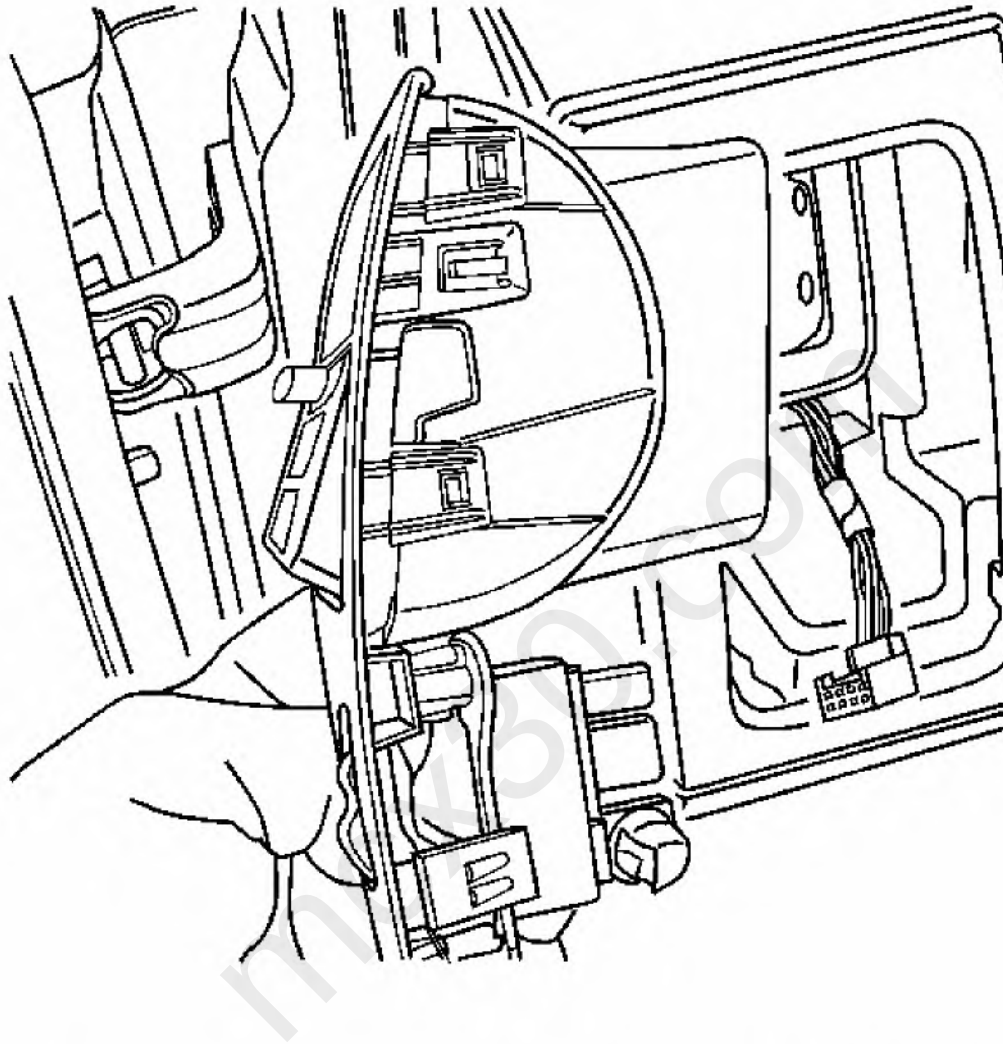


Fig. 42: View Of Power Mirror Switch & Dimmer Switch Panel
Courtesy of GENERAL MOTORS CORP.

5. Install the panel which contains the power mirror switch and the dimmer switch.
6. Install the right side I/P trim panel. Refer to **Console Trim Panel Replacement - Right**.
7. Install the steering column filler. Refer to **Steering Column Filler Replacement**.
8. Install the I/P compartment. Refer to **Compartment Replacement - Instrument Panel (I/P)**.
9. Install the I/P outer trim covers. Refer to **Console Trim Panel Replacement - Right** and to **Console Trim Panel Replacement - Left**.
10. Install the BCM module from the I/P. Refer to **Body Control Module Replacement** in Computer/Integrating Systems.

11. Install the radio. Refer to **Radio Replacement** in Entertainment.
12. Install the center trim bezel. Refer to **Trim Bezel Replacement - Center**.
13. Install the instrument cluster bezel. Refer to **Instrument Panel Cluster (IPC) Replacement**.
14. Install the upper trim pad. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper**.
15. Install the window garnish moldings. Refer to **Windshield Upper Garnish Molding Replacement** in Interior Trim.
16. Enable the SIR system. Refer to **SIR Disabling and Enabling Zone 5** in SIR.

CAUTION: Refer to Battery Disconnect Caution in Cautions and Notices.

17. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnect/Connect Procedure** in Engine Electrical.

INSTRUMENT PANEL CLUSTER (IPC) REPLACEMENT

Removal Procedure

1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 3** in SIR.
2. Place the steering column in the lowest position.
3. Remove the I/P cluster trim plate. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Cluster**.

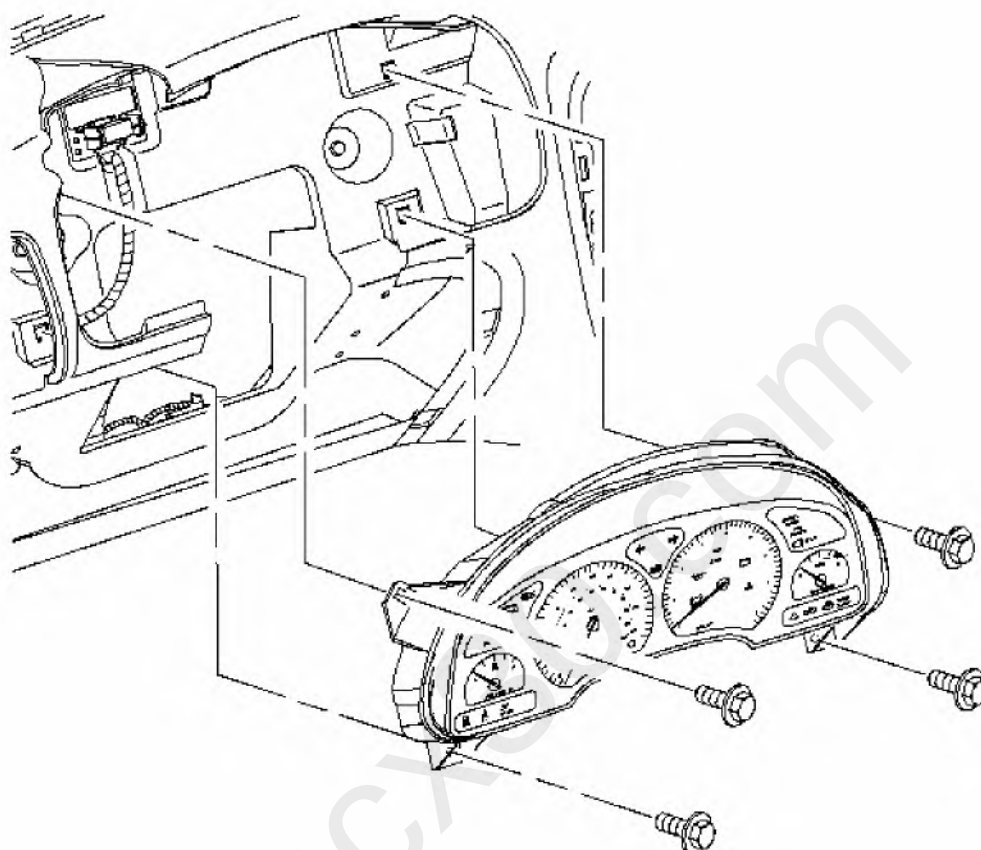


Fig. 43: Removing & Installing Instrument Panel Cluster
Courtesy of GENERAL MOTORS CORP.

4. Remove the fasteners from the upper and the lower cluster. Pull rearward to remove the I/P cluster.
5. Disconnect the I/P cluster harness.

Installation Procedure

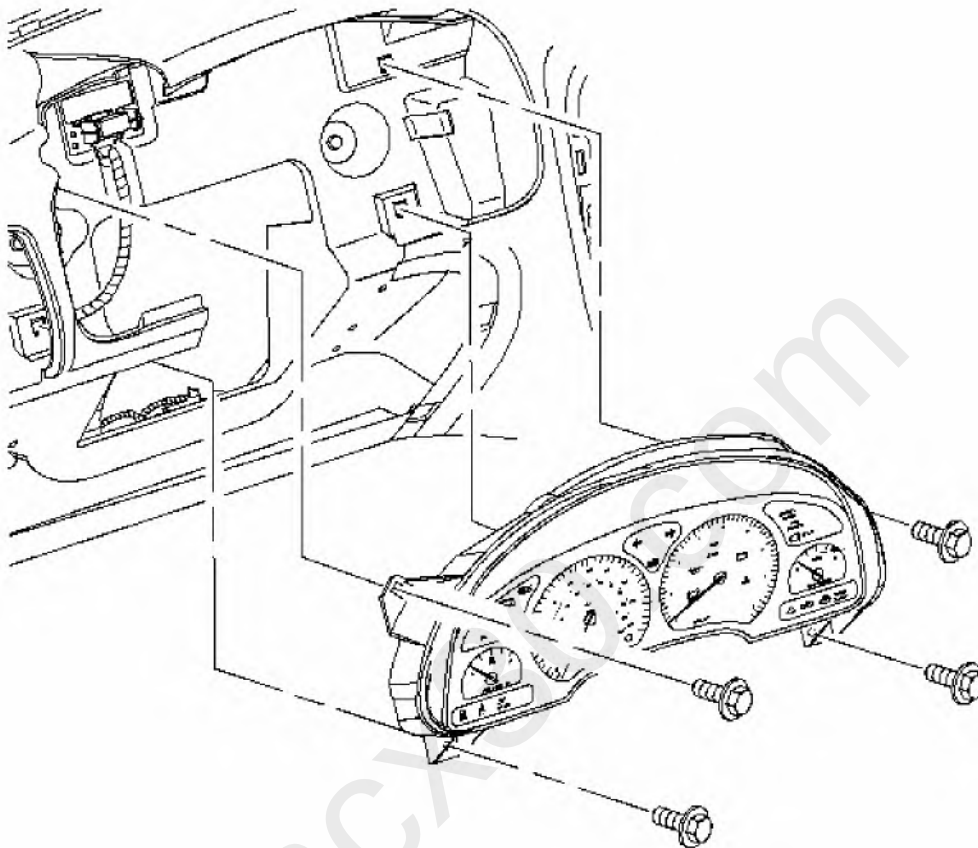


Fig. 44: Removing & Installing Instrument Panel Cluster
Courtesy of GENERAL MOTORS CORP.

1. Connect the I/P cluster harness.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the I/P cluster in the I/P housing. Install and tighten the fasteners.

Tighten: Tighten the fasteners to 2 N.m (18 lb in).

3. Install the I/P cluster trim plate. Refer to Trim Panel Replacement - Instrument Panel (I/P) Cluster.
4. Enable the SIR system. Refer to SIR Disabling and Enabling Zone 3.

INSTRUMENT PANEL (I/P) TRIM PANEL REPLACEMENT - LOWER LEFT

Removal Procedure

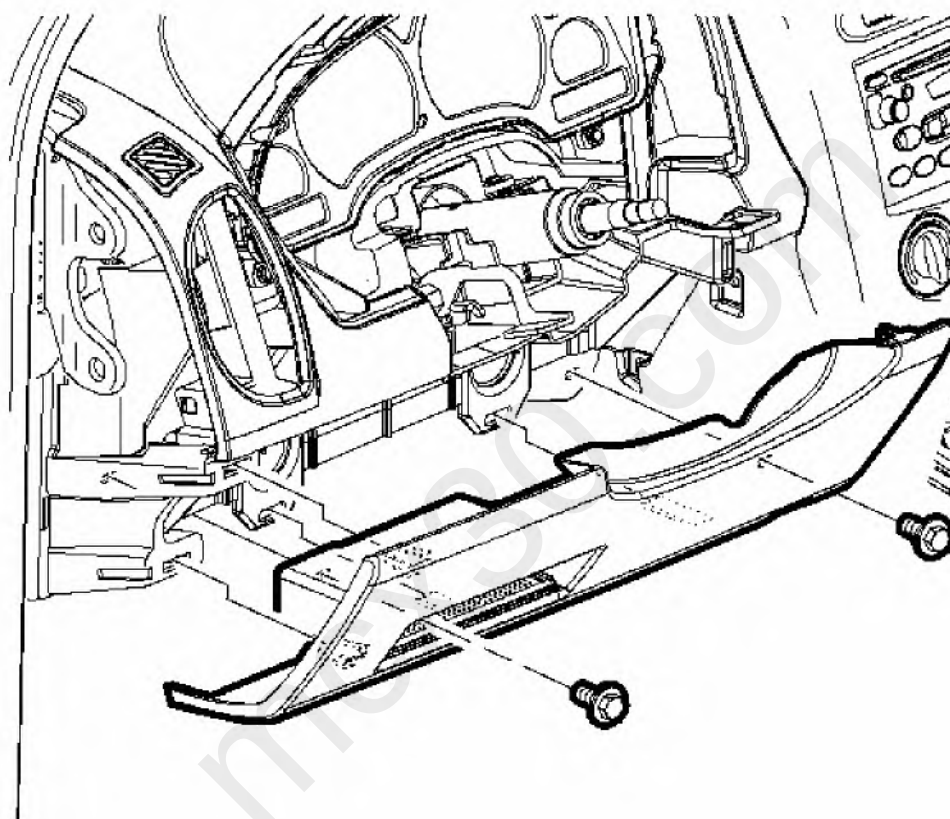


Fig. 45: View Of Knee Bolster (Filler Panel) & Screws
Courtesy of GENERAL MOTORS CORP.

1. Remove the left side knee bolster.

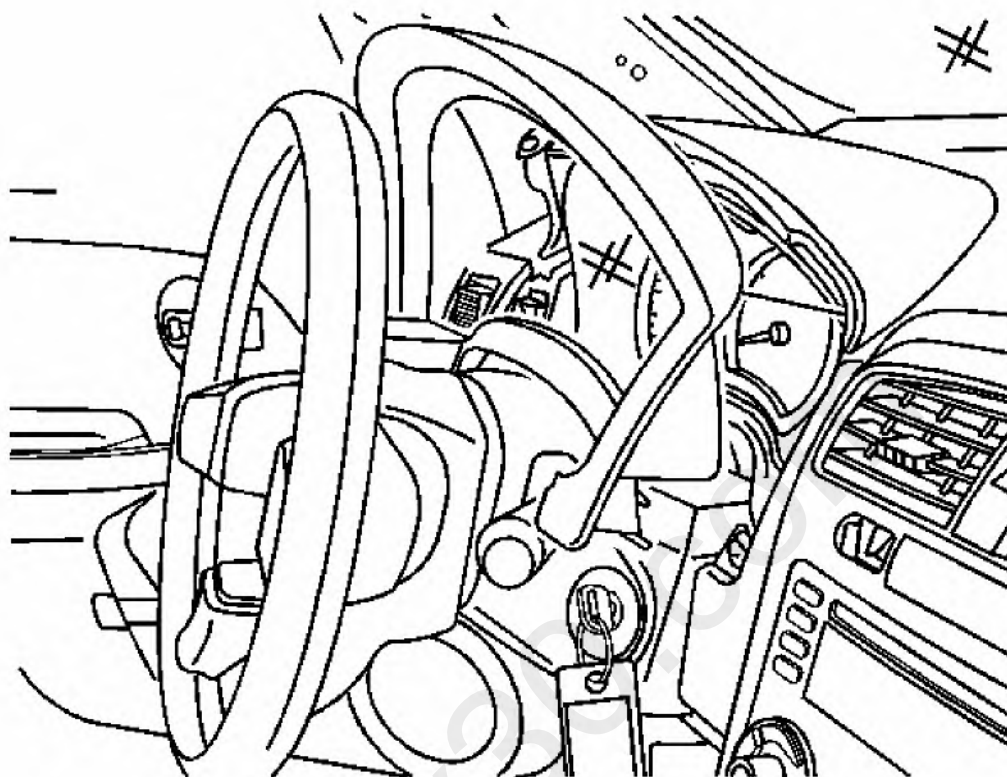


Fig. 46: View Of I/P Cluster Trim Panel
Courtesy of GENERAL MOTORS CORP.

2. Remove the cluster trim bezel.

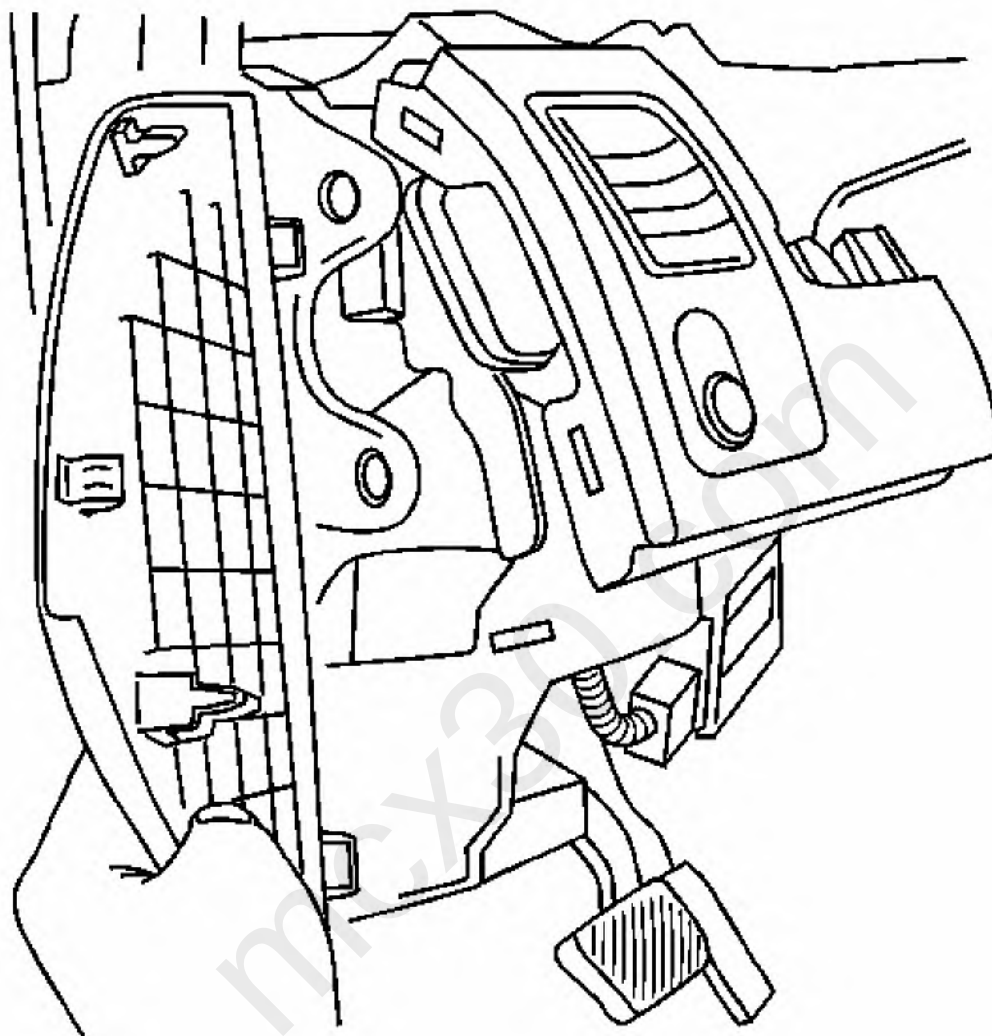


Fig. 47: View Of Left Side End Cap
Courtesy of GENERAL MOTORS CORP.

3. Remove the left side end cap.

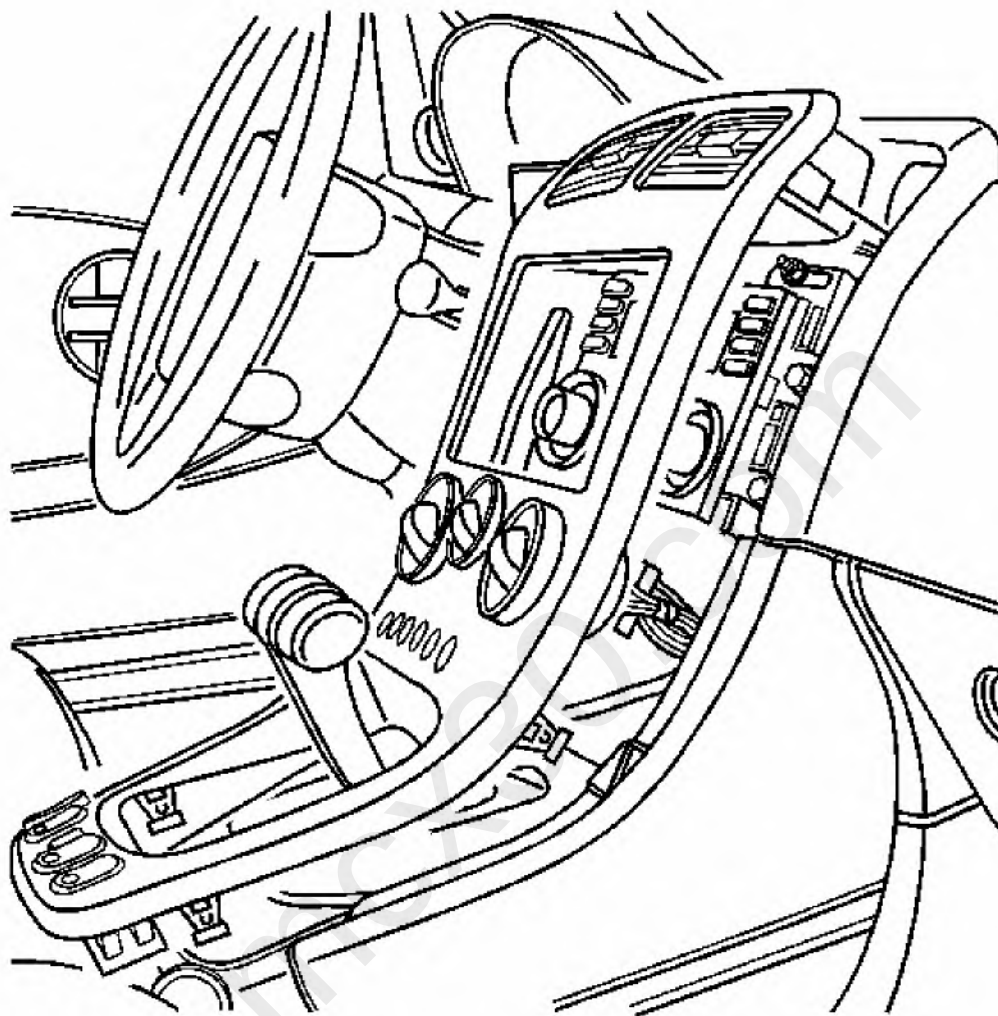


Fig. 48: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

4. Pull the center console trim bezel away from the upper trim panel.
5. Remove the upper trim pad. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper**.

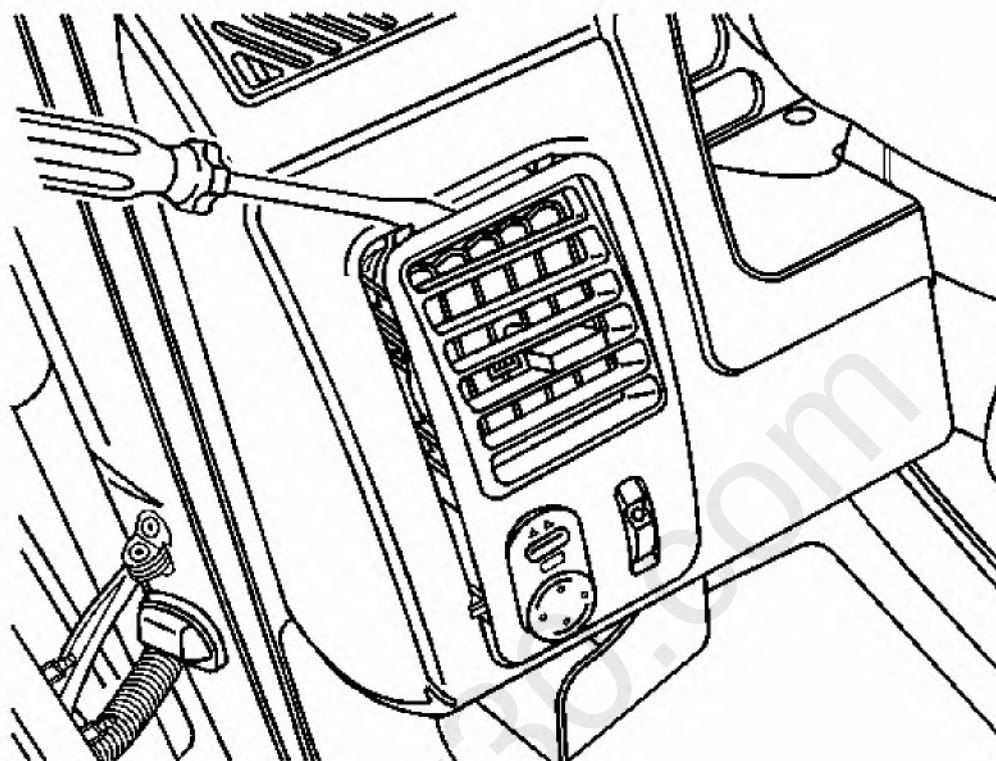


Fig. 49: Removing/Installing Left Front Air Deflector
Courtesy of GENERAL MOTORS CORP.

6. Remove the left front air deflector.

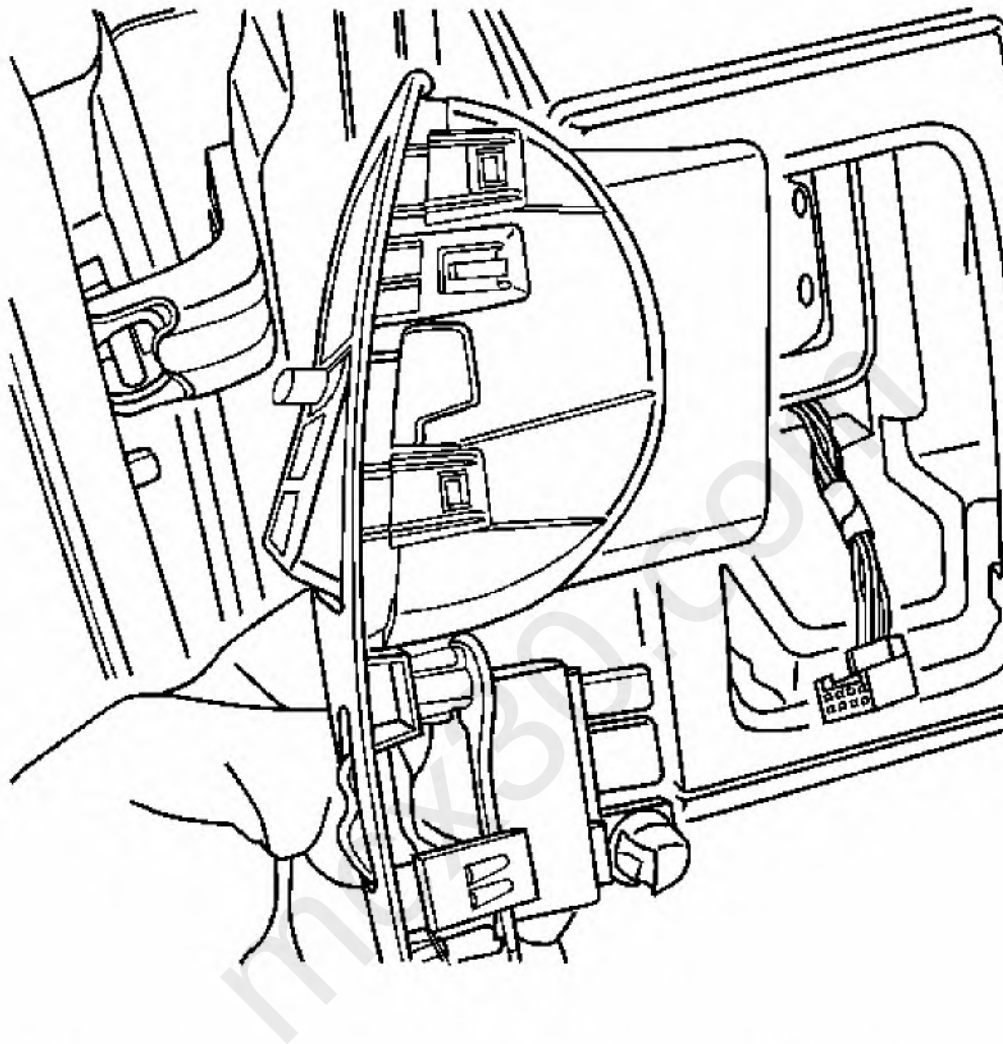


Fig. 50: View Of Power Mirror Switch & Dimmer Switch Panel
Courtesy of GENERAL MOTORS CORP.

7. Disconnect the electrical connectors from the dimmer and power switch.

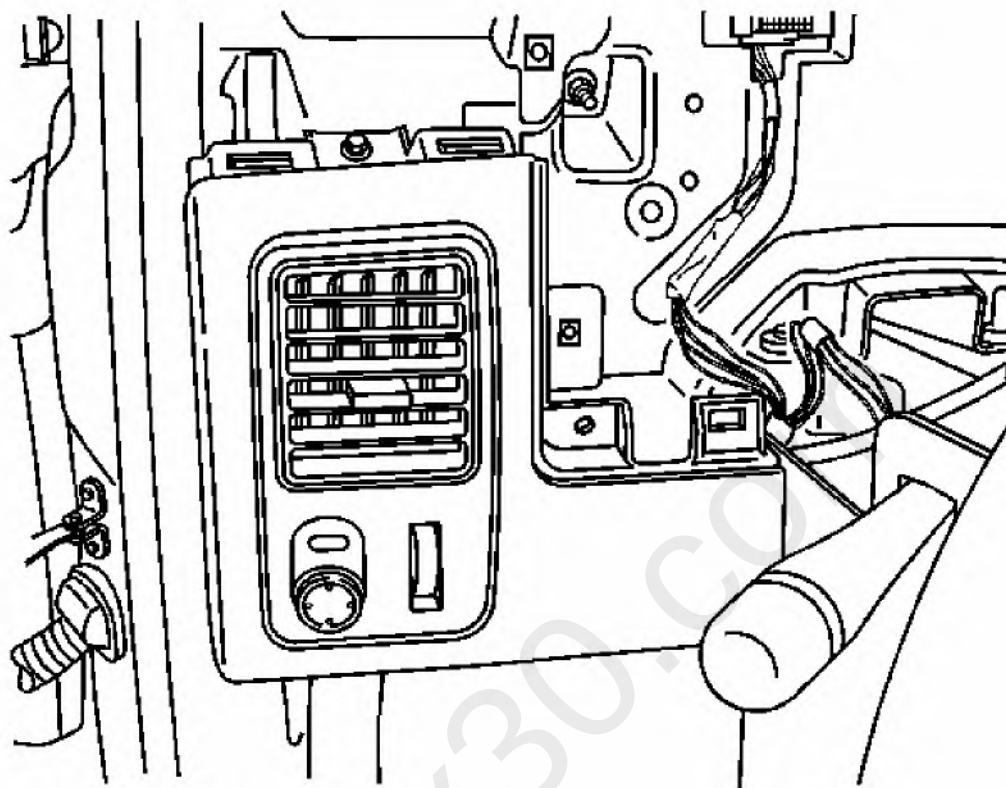


Fig. 51: View Of Lower Left I/P Trim Panel
Courtesy of GENERAL MOTORS CORP.

8. Remove the fasteners holding the trim plate.
9. Remove the trim plate from the vehicle.

Installation Procedure

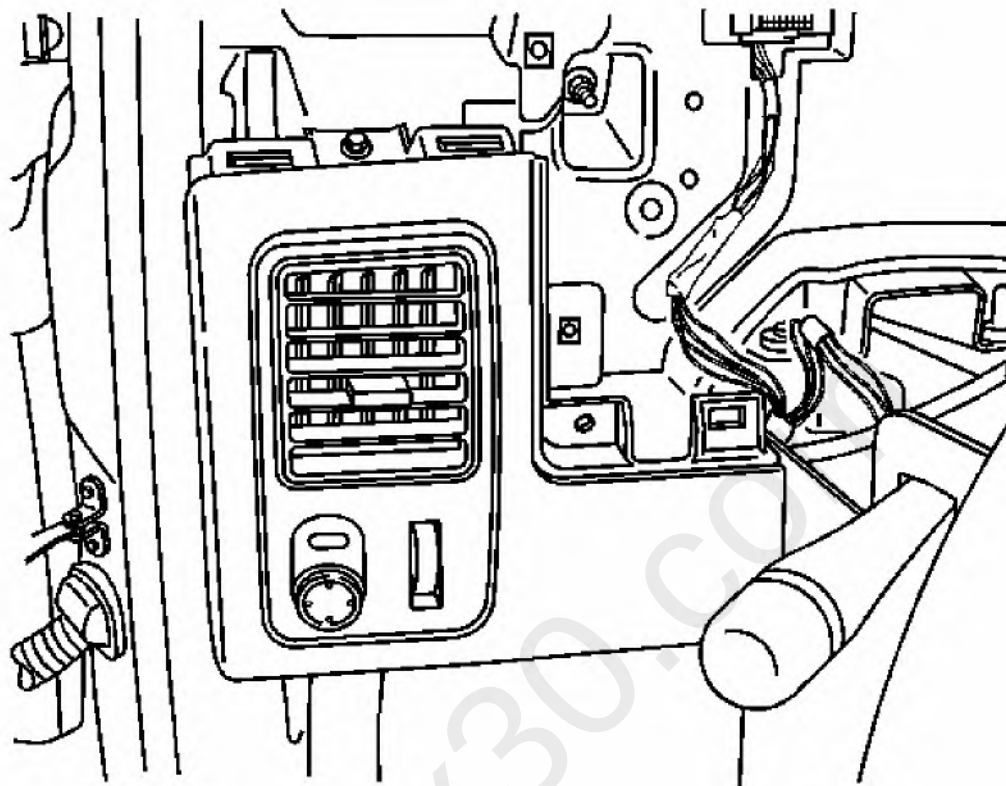


Fig. 52: View Of Lower Left I/P Trim Panel
Courtesy of GENERAL MOTORS CORP.

1. Align the trim plate to the vehicle.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the trim plate fasteners to the I/P.

Tighten: Tighten the fasteners to 2.5 N.m (22 lb in).

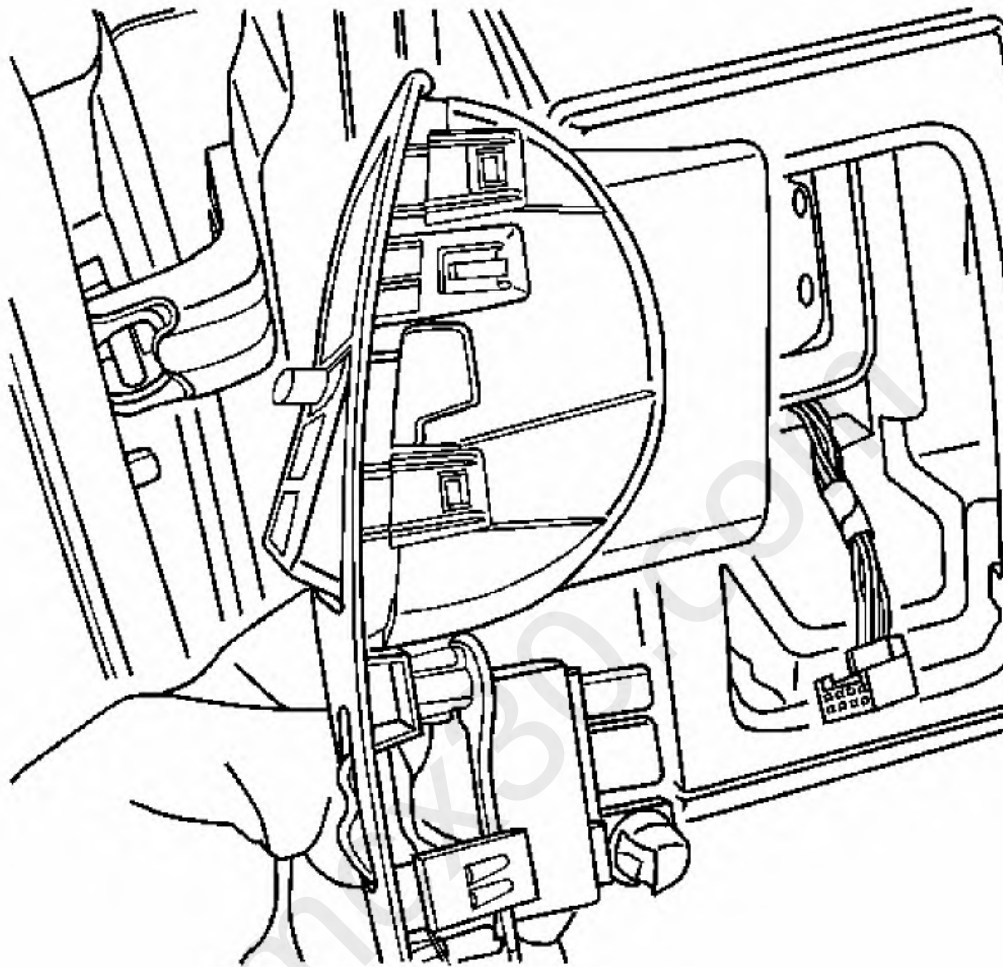


Fig. 53: View Of Power Mirror Switch & Dimmer Switch Panel
Courtesy of GENERAL MOTORS CORP.

3. Connect the electrical connectors to the dimmer switch and the power mirror.

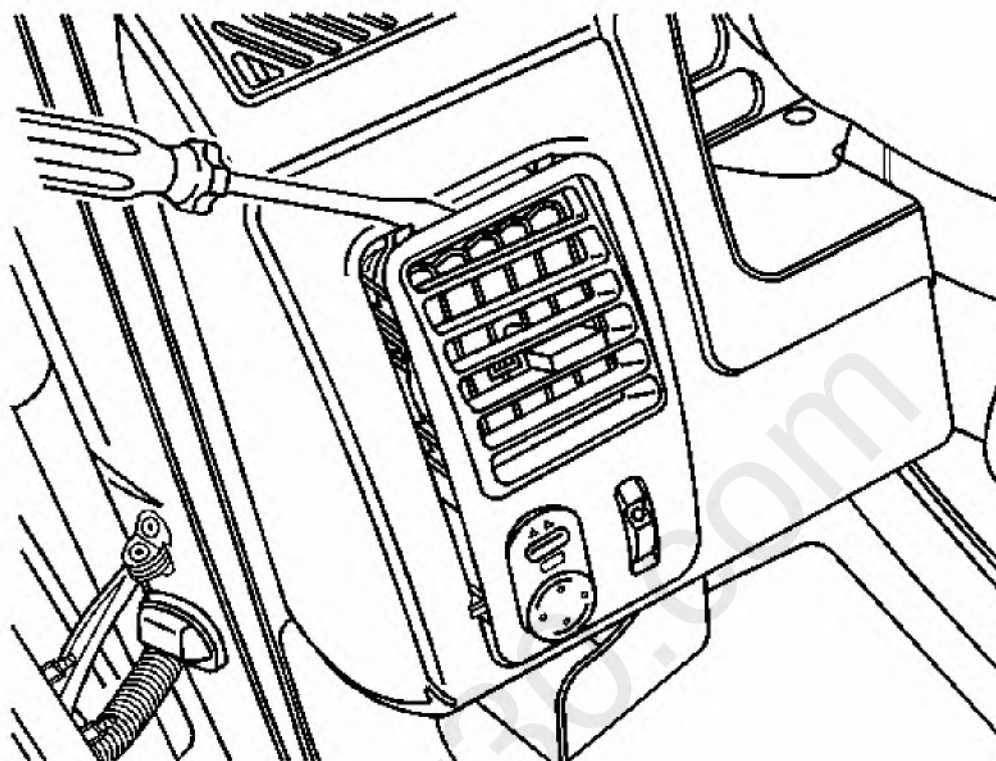


Fig. 54: Removing/Installing Left Front Air Deflector
Courtesy of GENERAL MOTORS CORP.

4. Install the left front air deflector.
5. Install the upper trim panel. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper**.

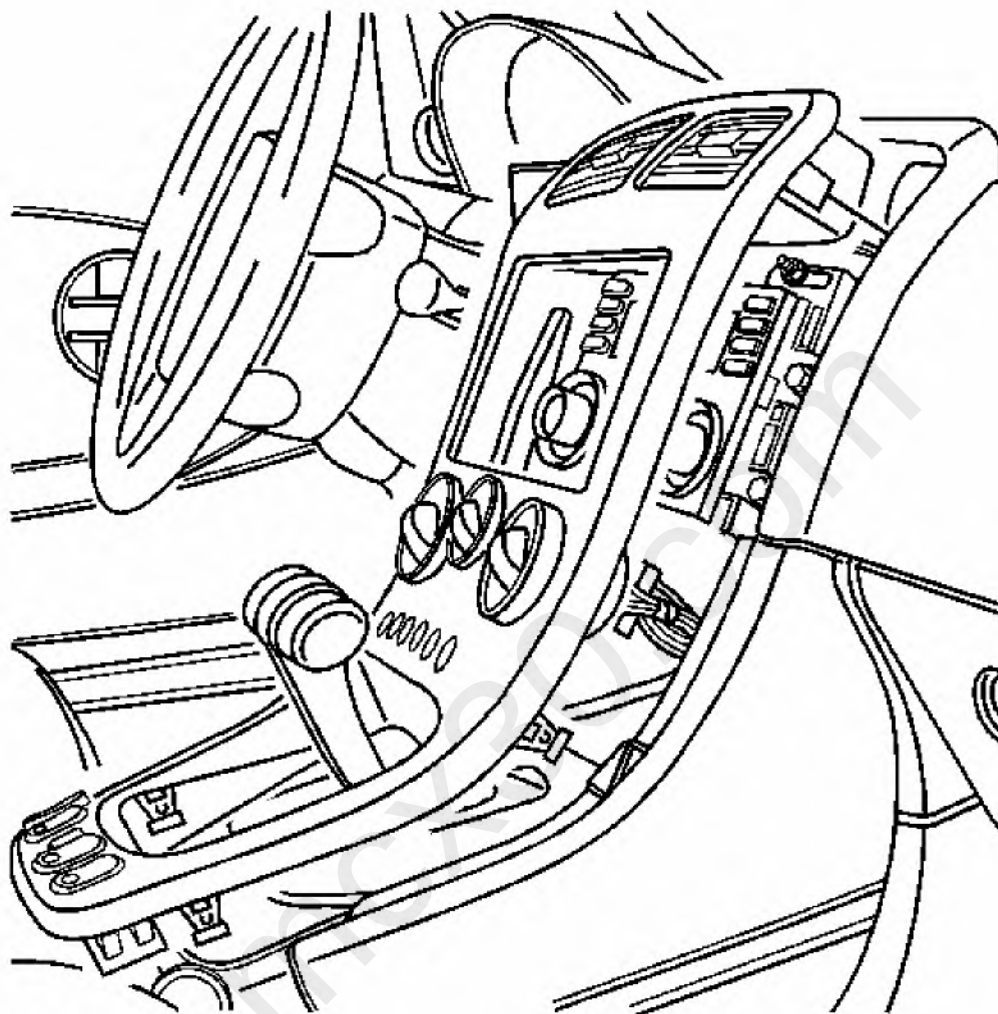


Fig. 55: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

6. Align the center console trim bezel. Snap the bezel into place.

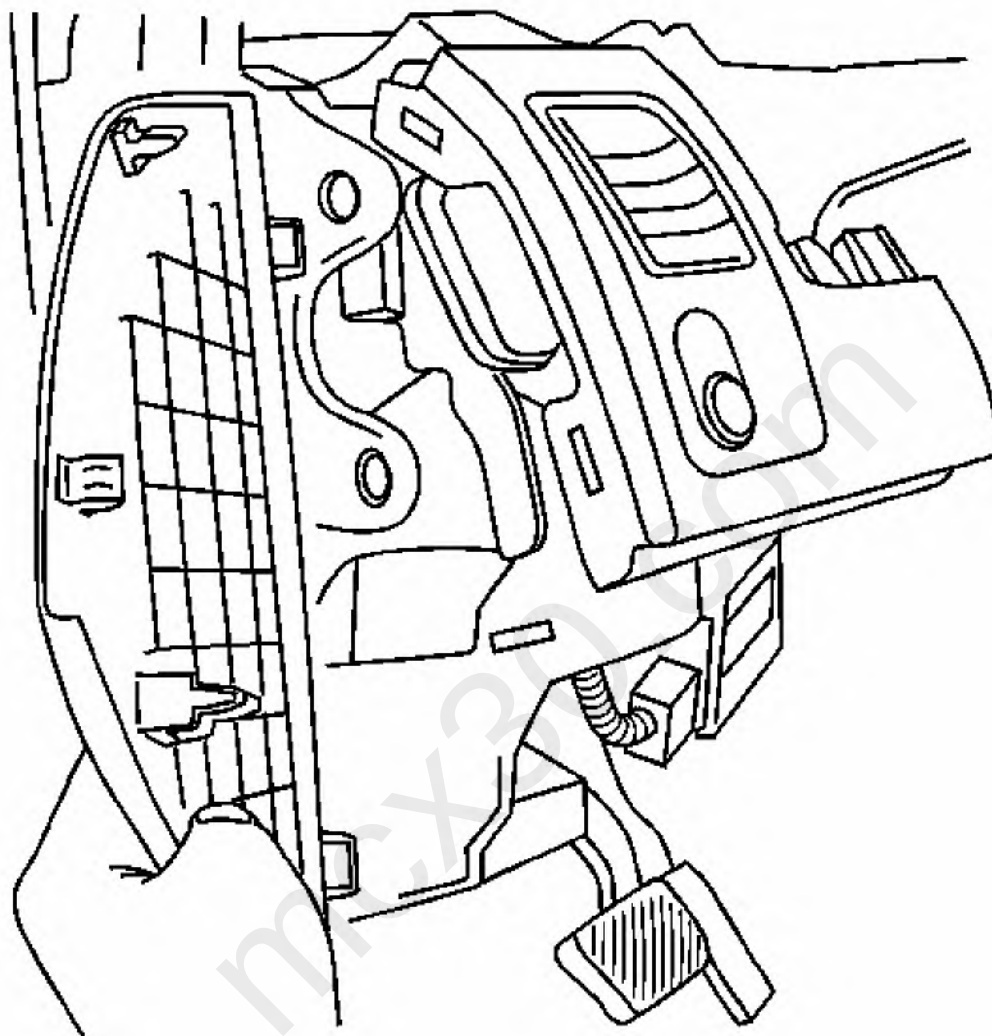


Fig. 56: View Of Left Side End Cap
Courtesy of GENERAL MOTORS CORP.

7. Install the left side end cap.

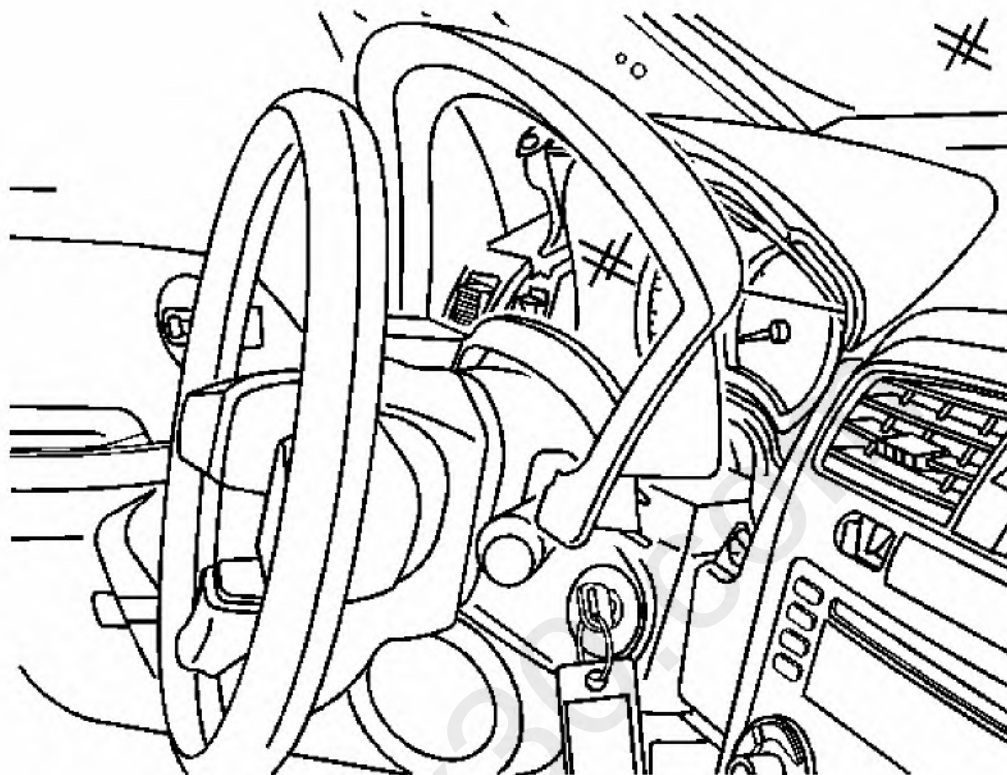


Fig. 57: View Of I/P Cluster Trim Panel
Courtesy of GENERAL MOTORS CORP.

8. Install the cluster trim bezel. Fasten the bezel into place.

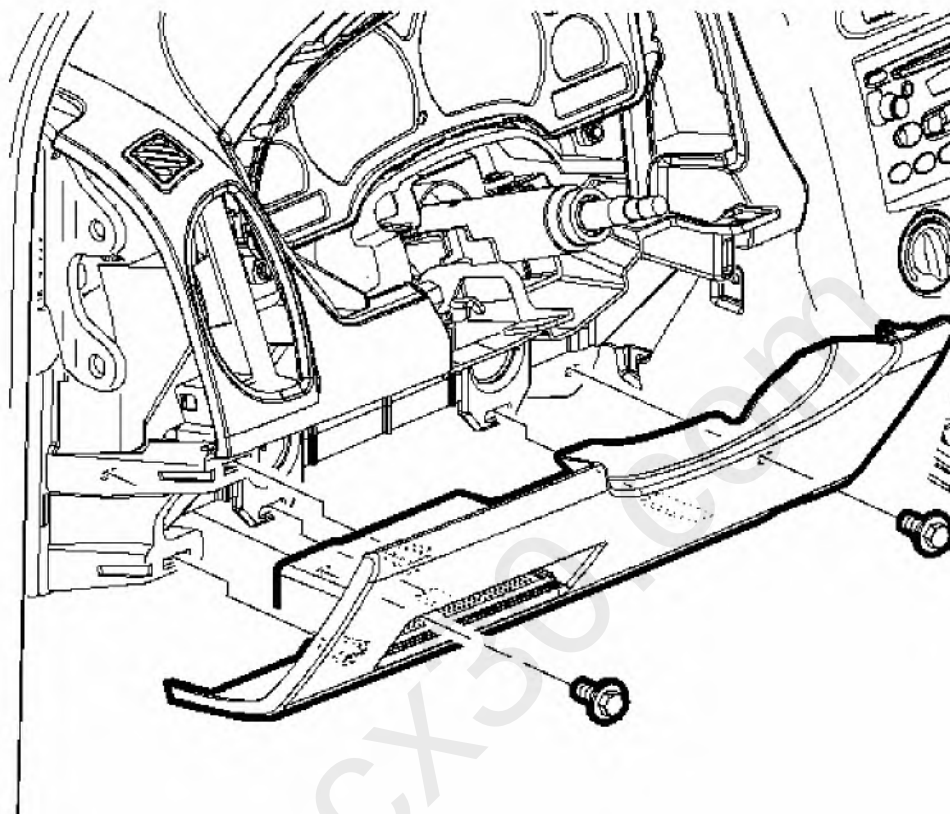


Fig. 58: View Of Knee Bolster (Filler Panel) & Screws
Courtesy of GENERAL MOTORS CORP.

9. Install the left side knee bolster.

Tighten: Tighten the fasteners to 2.5 N.m (22 lb in).

10. Inspect the I/P for proper operation.

INSTRUMENT PANEL (I/P) TRIM PANEL REPLACEMENT - LOWER RIGHT

Removal Procedure

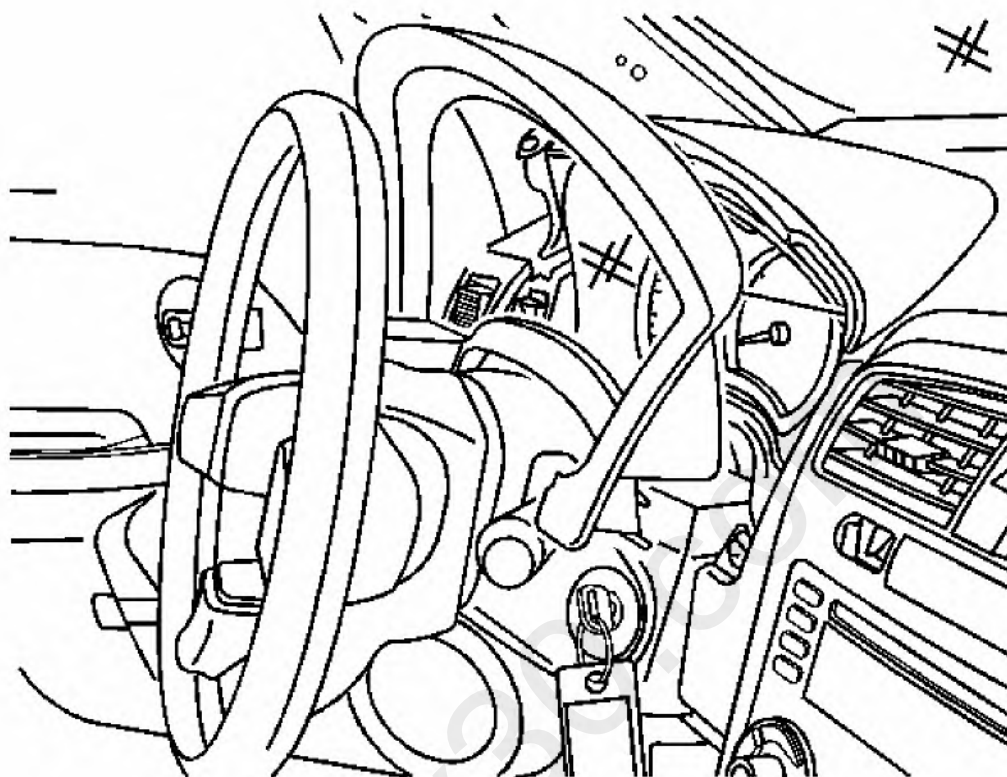


Fig. 59: View Of I/P Cluster Trim Panel
Courtesy of GENERAL MOTORS CORP.

1. Remove the cluster trim bezel.

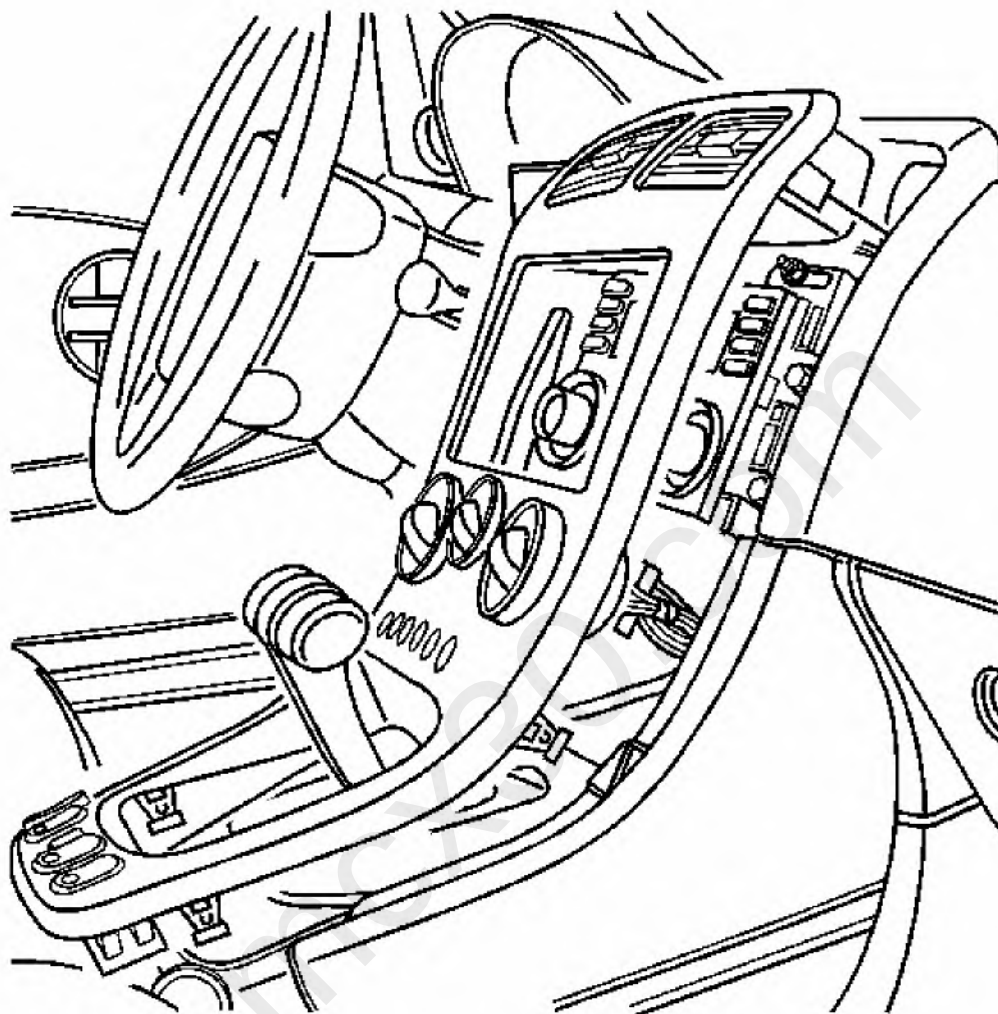


Fig. 60: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

2. Remove the center console trim bezel from the instrument panel (I/P).

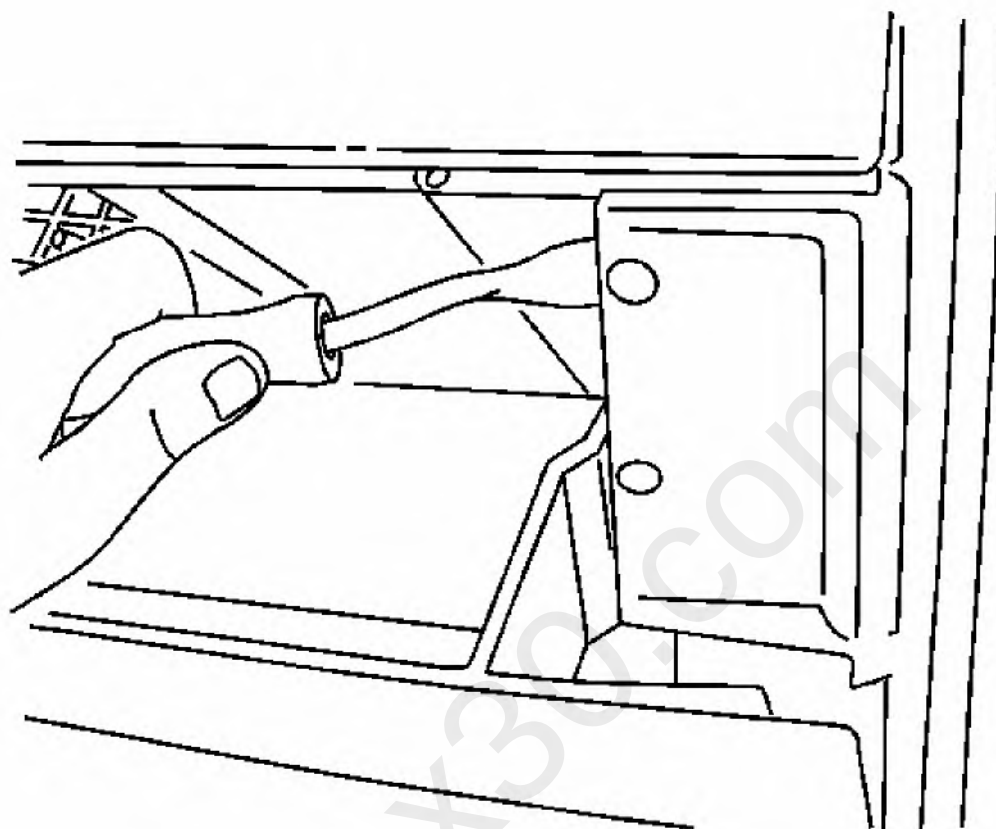


Fig. 61: Opening Compartment Door
Courtesy of GENERAL MOTORS CORP.

3. Open the compartment door to expose the trim panel fasteners and the end cap bolt.

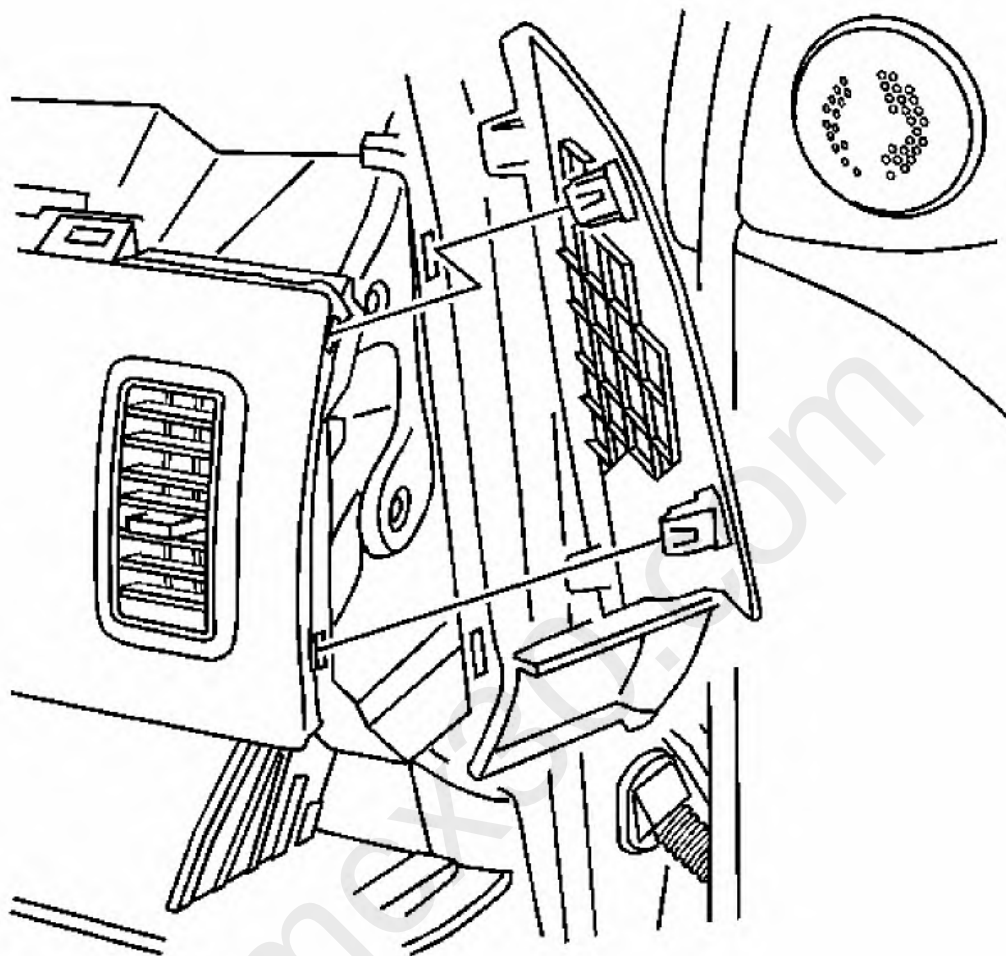


Fig. 62: Removing/Installing Right I/P Outer Trim Cover
Courtesy of GENERAL MOTORS CORP.

4. Remove the right side end cap.

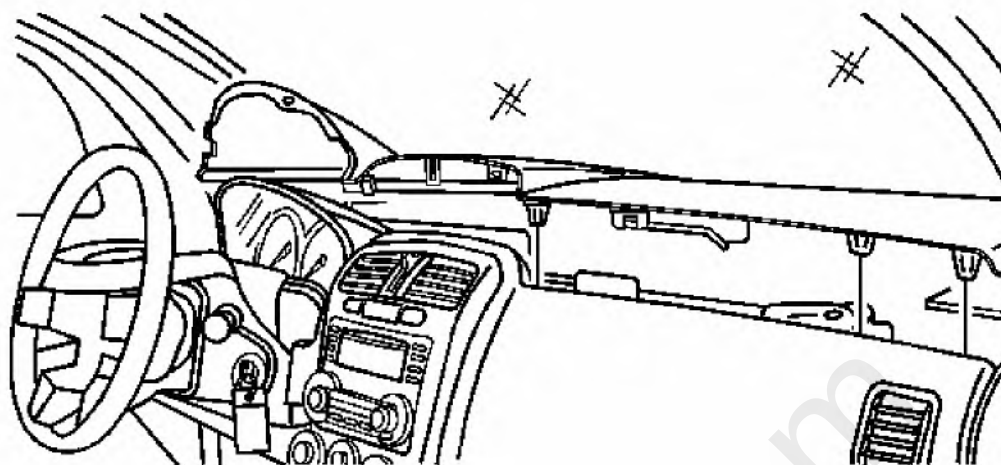


Fig. 63: Removing/Installing Upper Trim Pad
Courtesy of GENERAL MOTORS CORP.

5. Remove the upper I/P trim pad. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper**.

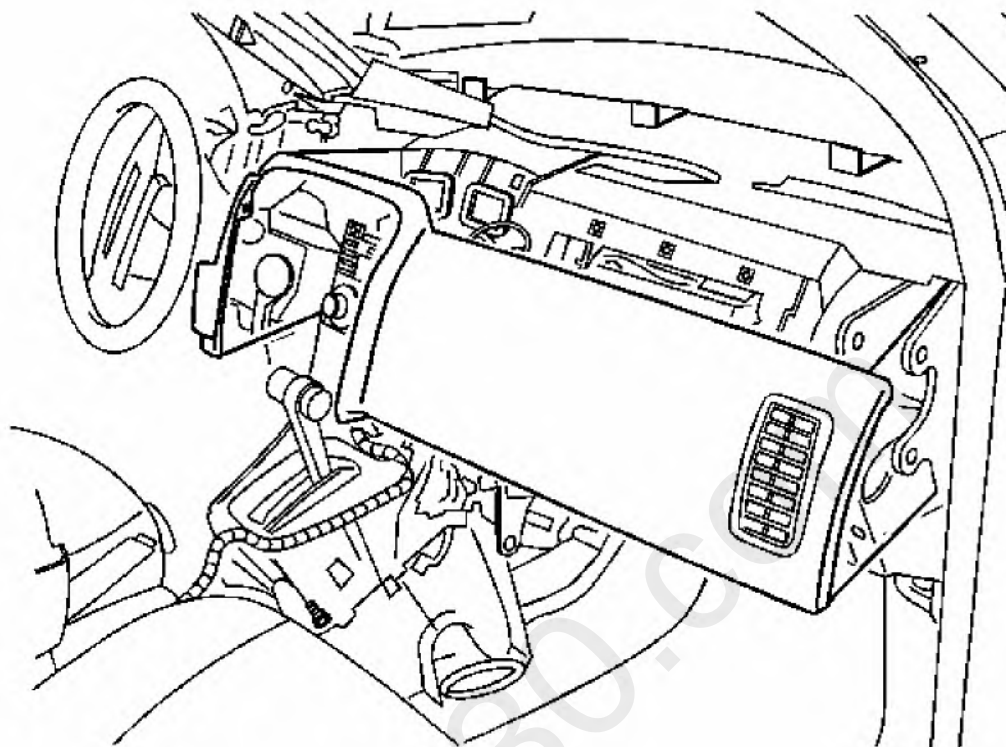


Fig. 64: View Of Lower Right I/P Trim Panel
Courtesy of GENERAL MOTORS CORP.

6. Remove the fasteners holding the trim pad - right. Remove the trim panel from the vehicle.

Installation Procedure

NOTE: Refer to Fastener Notice in Cautions and Notices.

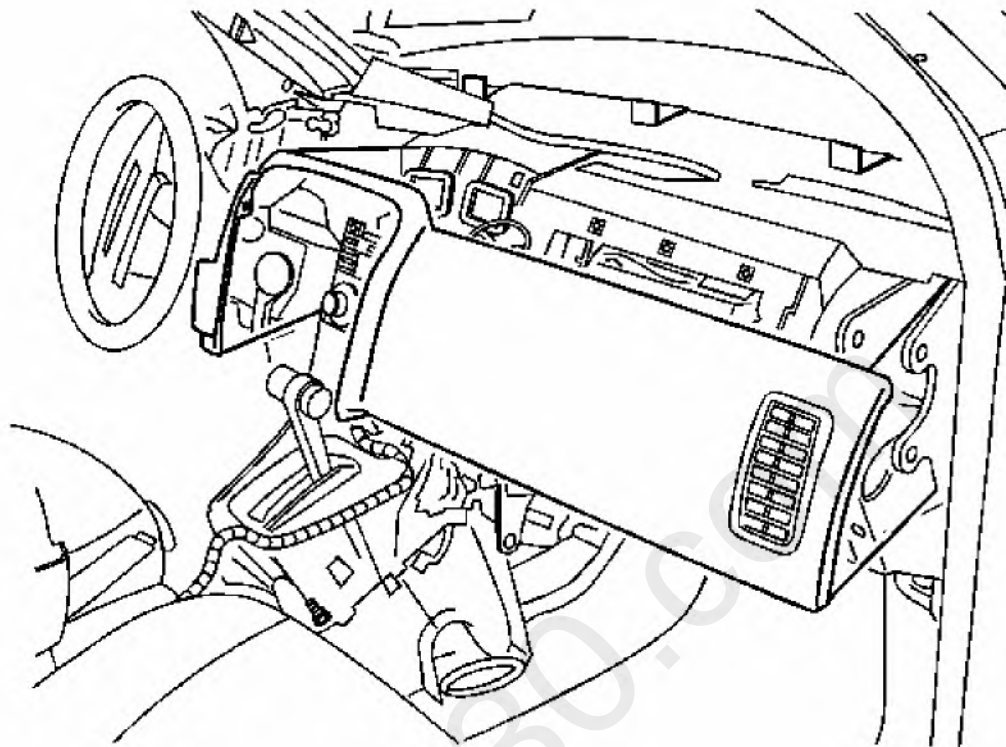


Fig. 65: View Of Lower Right I/P Trim Panel
Courtesy of GENERAL MOTORS CORP.

1. Align the trim panel with the I/P. Fasten in place.

Tighten: Tighten the fasteners to 2.5 N.m (22 lb in).

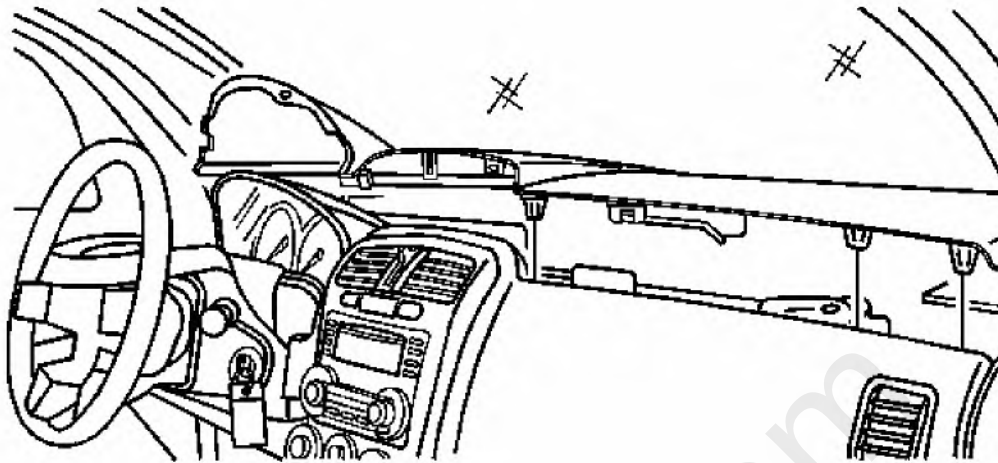


Fig. 66: Removing/Installing Upper Trim Pad
Courtesy of GENERAL MOTORS CORP.

2. Install the upper trim pad. Refer to **Trim Panel Replacement - Instrument Panel (I/P) Upper**.

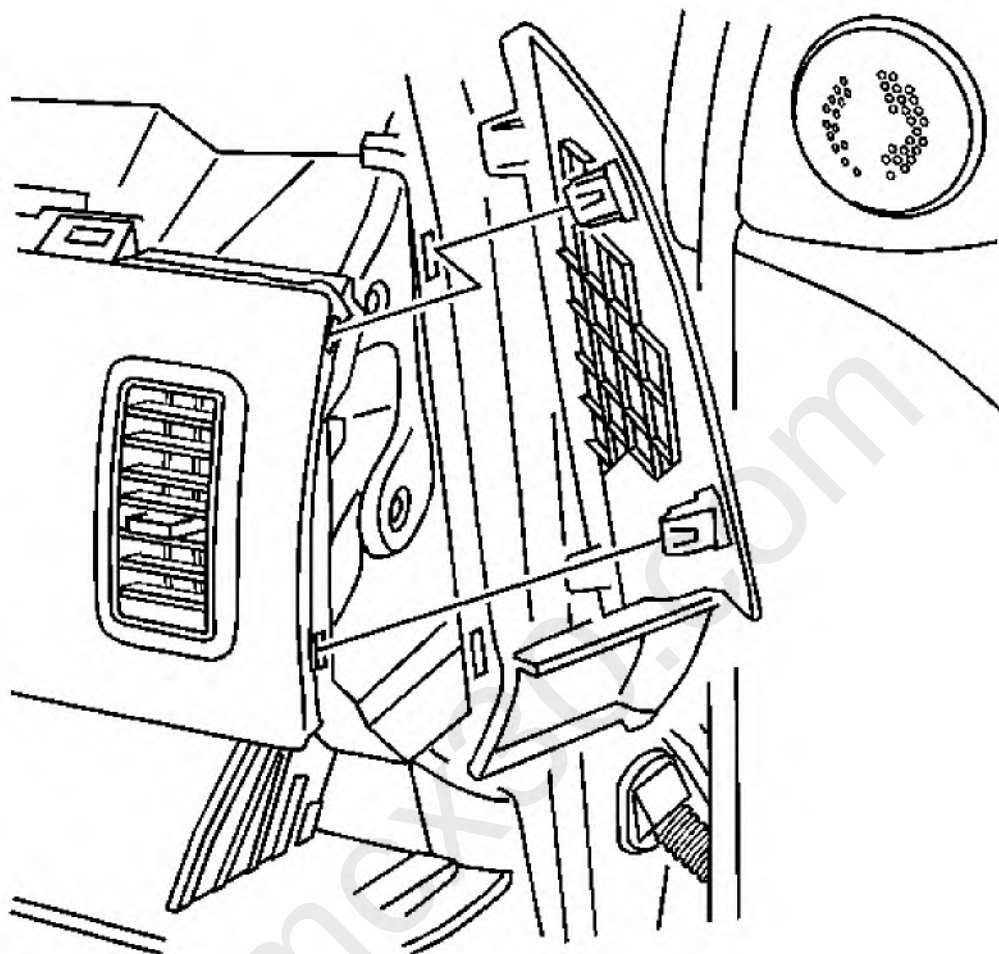


Fig. 67: Removing/Installing Right I/P Outer Trim Cover
Courtesy of GENERAL MOTORS CORP.

3. Install the right side end cap. Fasten in place.

Tighten: Tighten the fasteners to 2.5 N.m (22 lb in).

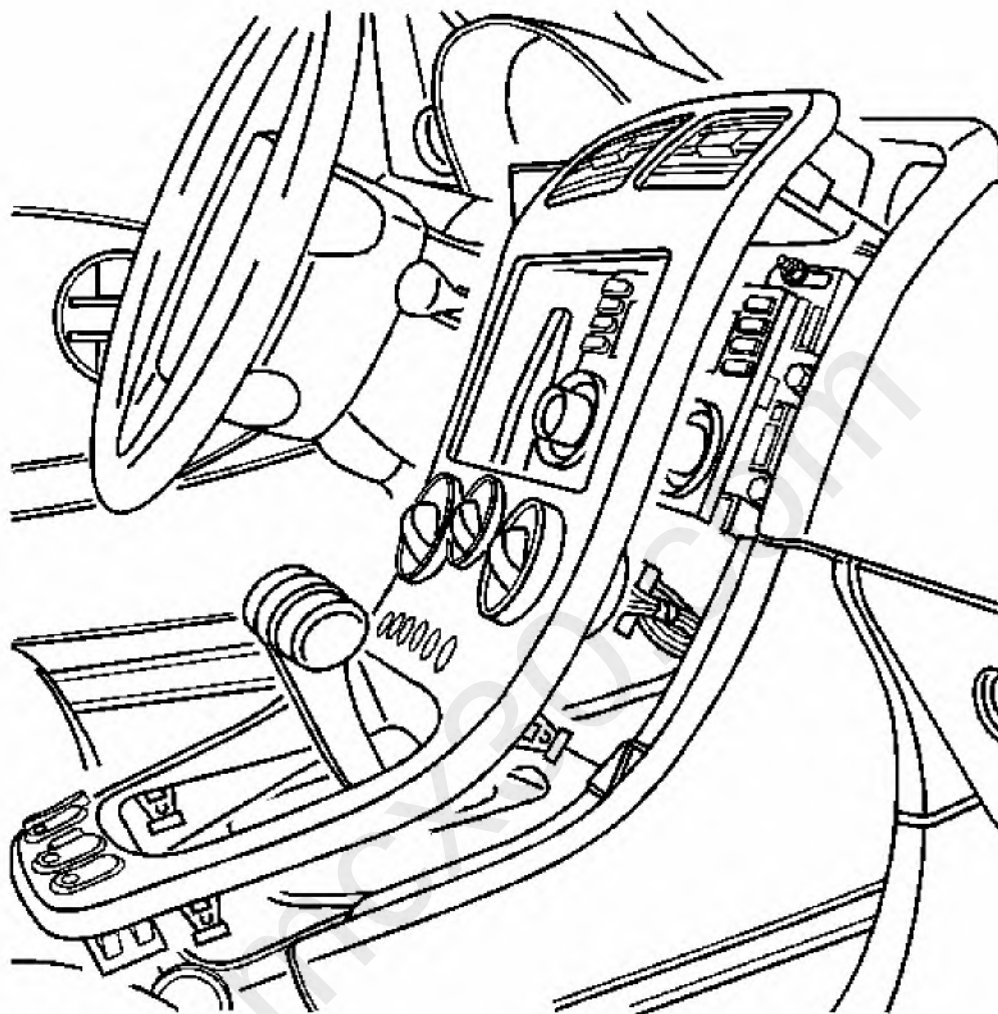


Fig. 68: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

4. Align the center console trim bezel. Snap the bezel into place.

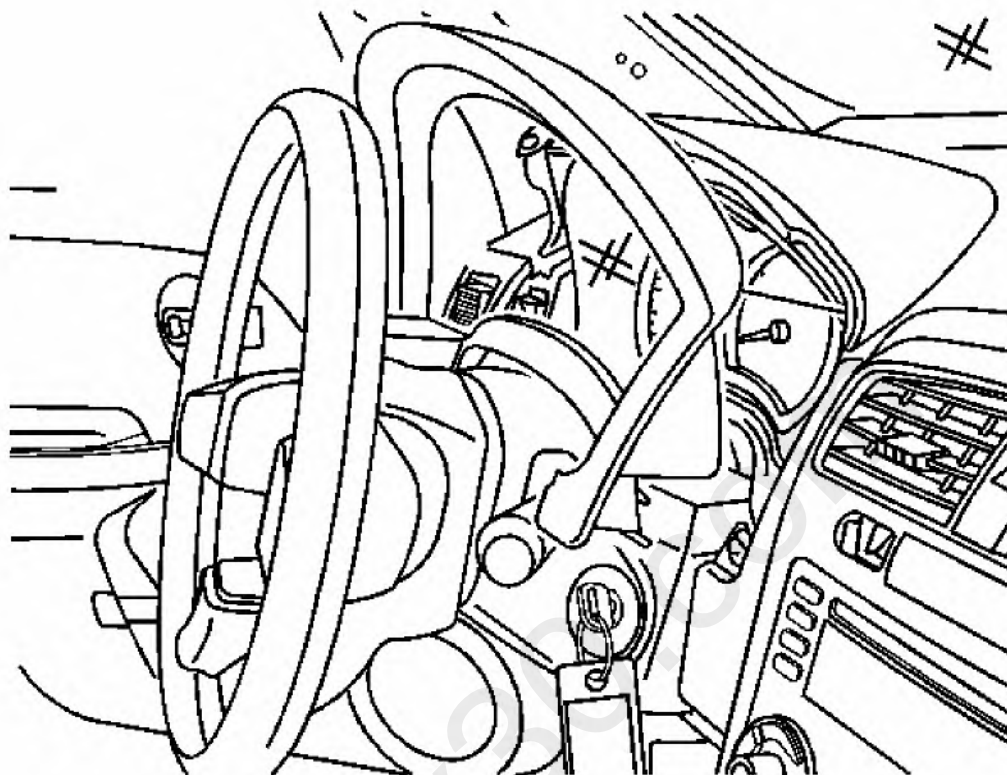


Fig. 69: View Of I/P Cluster Trim Panel
Courtesy of GENERAL MOTORS CORP.

5. Align the I/P cluster trim bezel. Fasten the bezel into place.

Tighten: Tighten the fasteners to 2.5 N.m (22 lb in).

6. Close the compartment door.
7. Inspect the I/P for proper operation.

INSTRUMENT PANEL TIE BAR REPLACEMENT

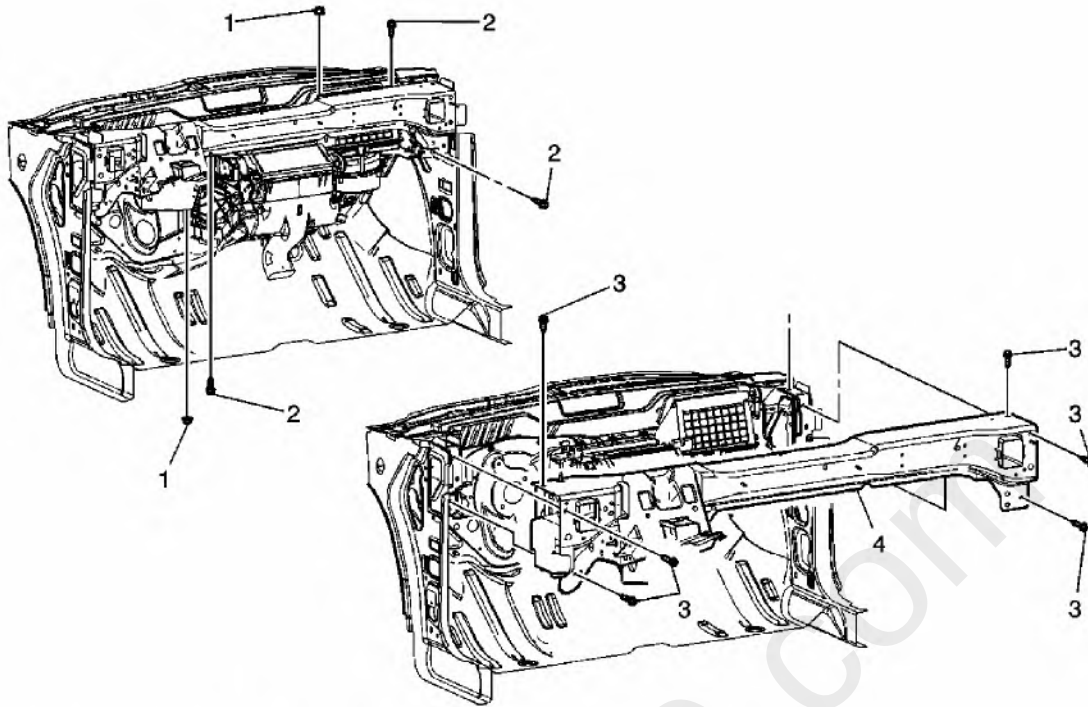


Fig. 70: View Of Instrument Panel Tie Bar
 Courtesy of GENERAL MOTORS CORP.

Instrument Panel Tie Bar Replacement

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> . Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u>. Preliminary Procedures 1. Remove the steering column. Refer to <u>Steering Column Replacement</u> . 2. Remove the brake pedal assembly. Refer to <u>Brake Pedal Assembly Replacement</u> . 3. Remove the instrument panel retainer. Refer to <u>Instrument Panel (I/P) Retainer Replacement</u>.	
1	Instrument Panel Tie Bar to HVAC Module Assembly Nuts (Qty: 2) Tighten: 4 N.m (36 lb in)
2	Instrument Panel Tie Bar to HVAC Module Assembly Bolts (Qty: 3) Tighten: 4 N.m (36 lb in)
	Instrument Panel Tie Bar to Body Bolts (Qty: 6)

3	Tighten: 25 N.m (18 lb ft)
4	Instrument Panel Tie Bar Assembly Tip: 1. Note routing of the instrument panel wiring harness prior to removal to aid in the reinstallation. 2. Disconnect the instrument panel wiring harness from the tie bar assembly. 3. With the aid of an assistant, remove the tie bar assembly from the vehicle.

LATCH REPLACEMENT - CONSOLE COMPARTMENT DOOR

Removal Procedure

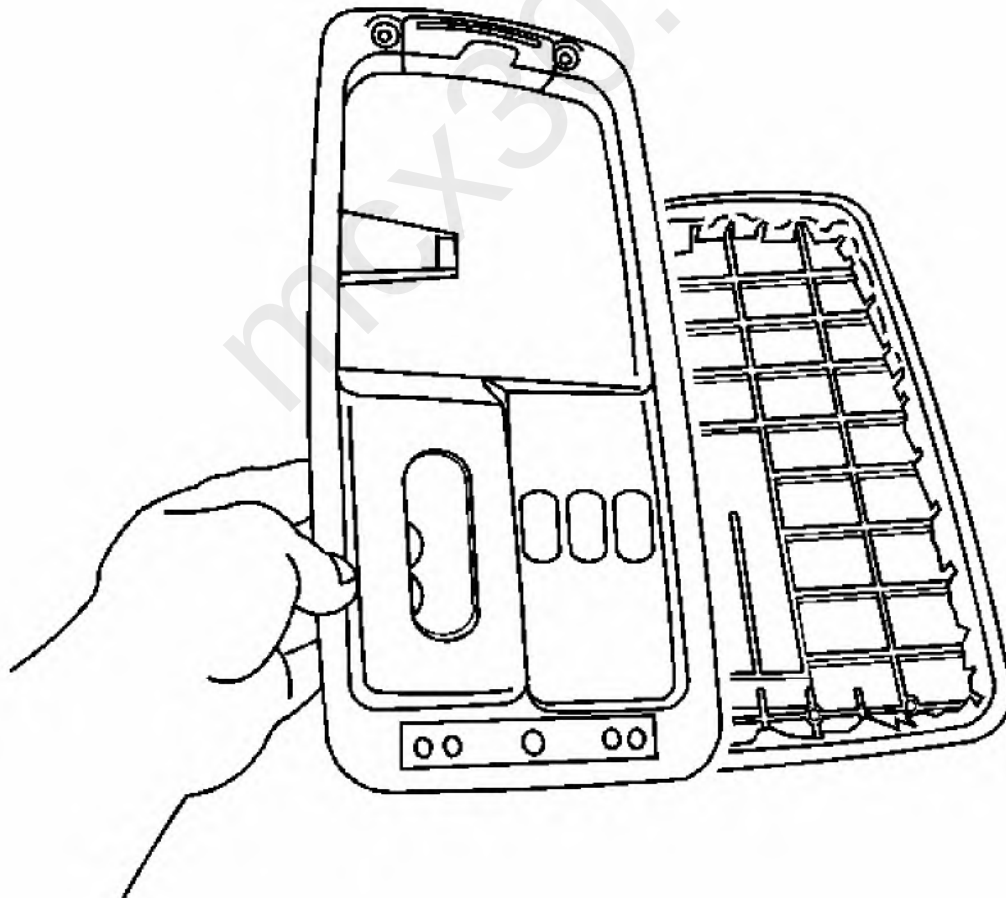


Fig. 71: View Of Armrest Cover, Hinge & Insert

Courtesy of GENERAL MOTORS CORP.

1. Lift the armrest cover to expose the armrest hinge and insert.

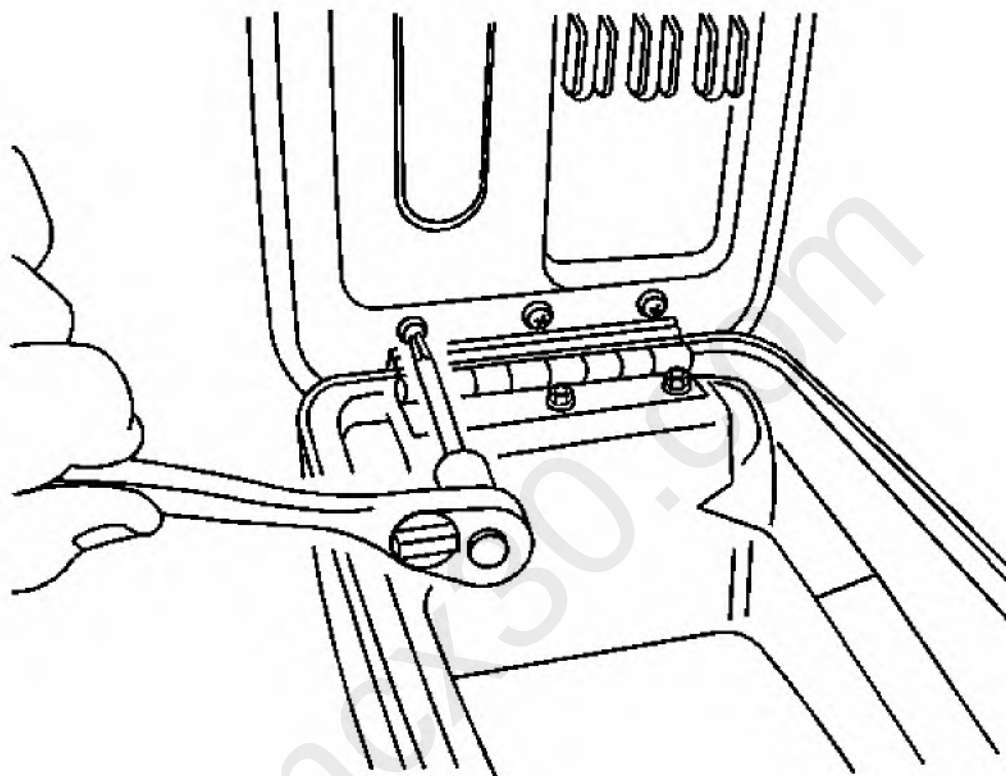


Fig. 72: Removing/Installing Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the screws from the armrest cover.

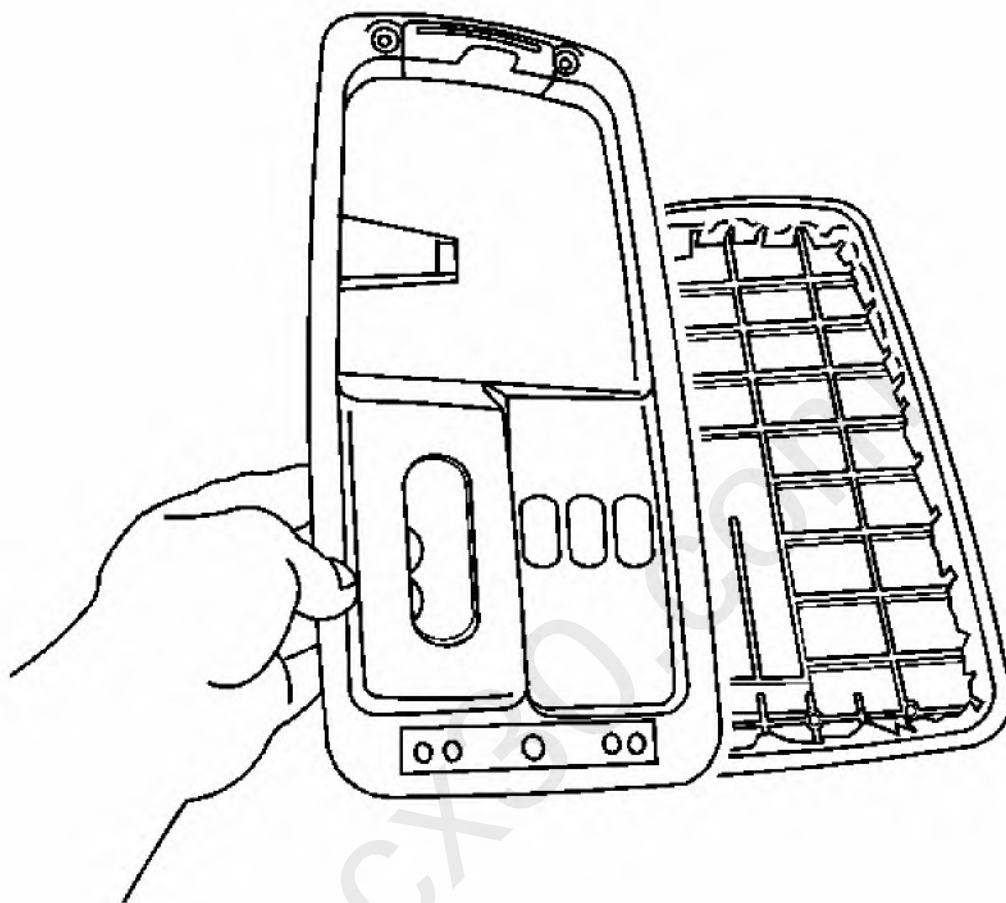


Fig. 73: View Of Armrest Cover, Hinge & Insert
Courtesy of GENERAL MOTORS CORP.

3. Remove the console latch cover to expose the latch screws.

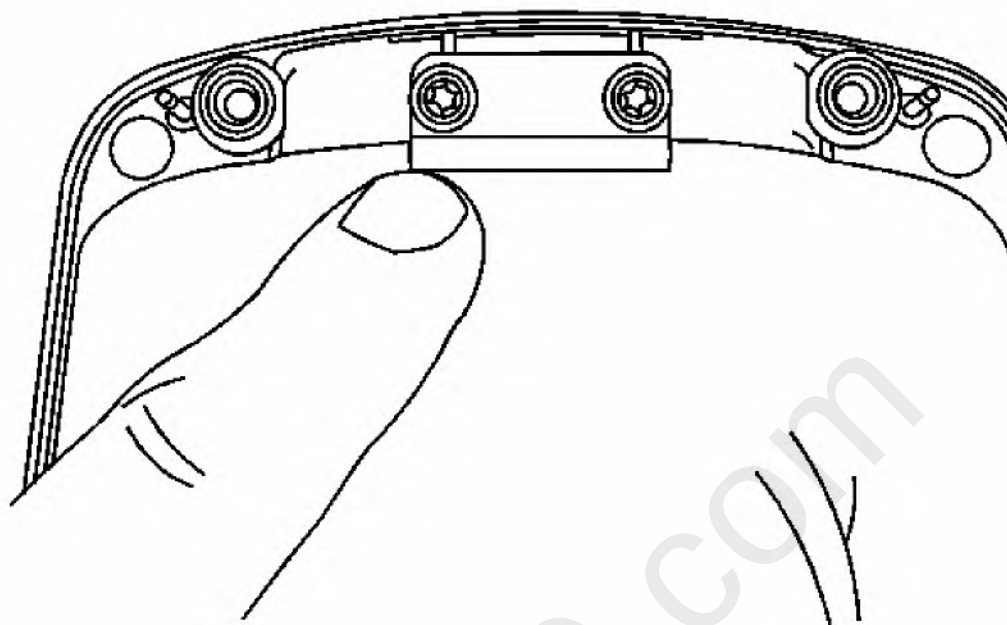


Fig. 74: View Of Latch To Center Console Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

4. Remove the latch screws from the center console armrest cover.

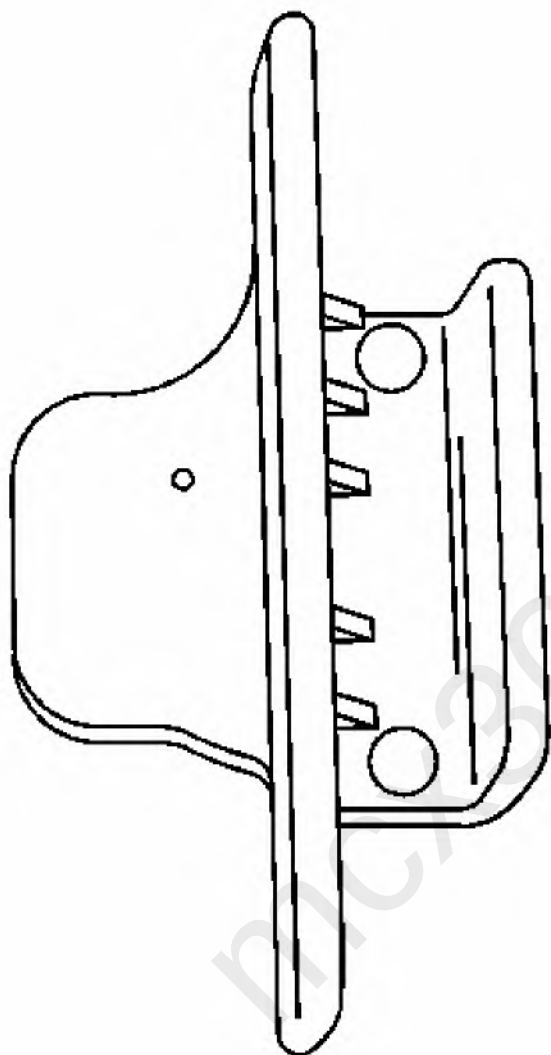


Fig. 75: View Of Armrest Cover Latch
Courtesy of GENERAL MOTORS CORP.

5. Remove the latch from the armrest cover.

Installation Procedure

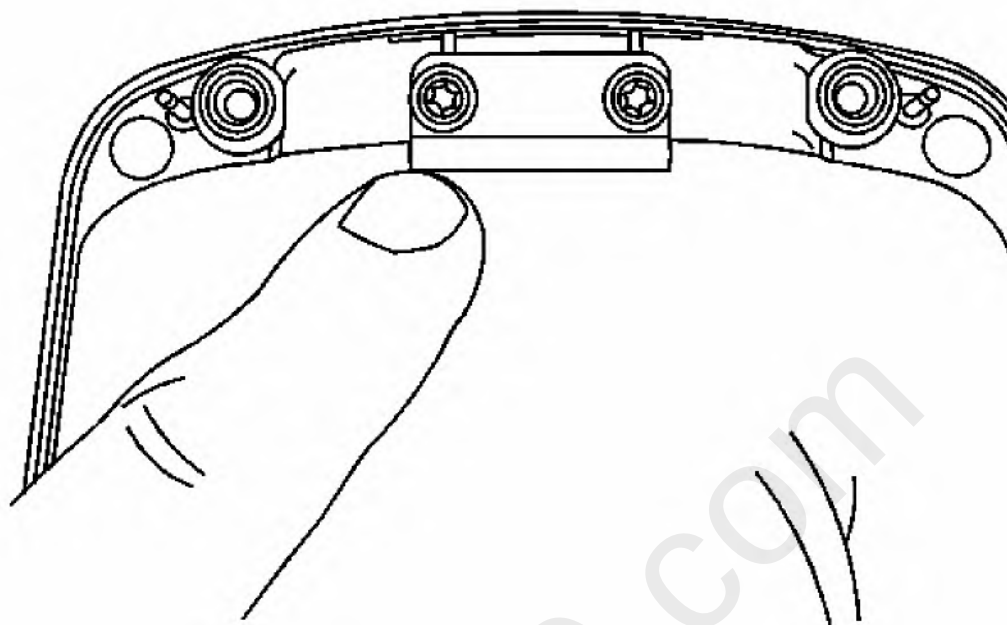


Fig. 76: View Of Latch To Center Console Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

1. Align the new latch to the armrest cover.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the latch screws to the armrest cover.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

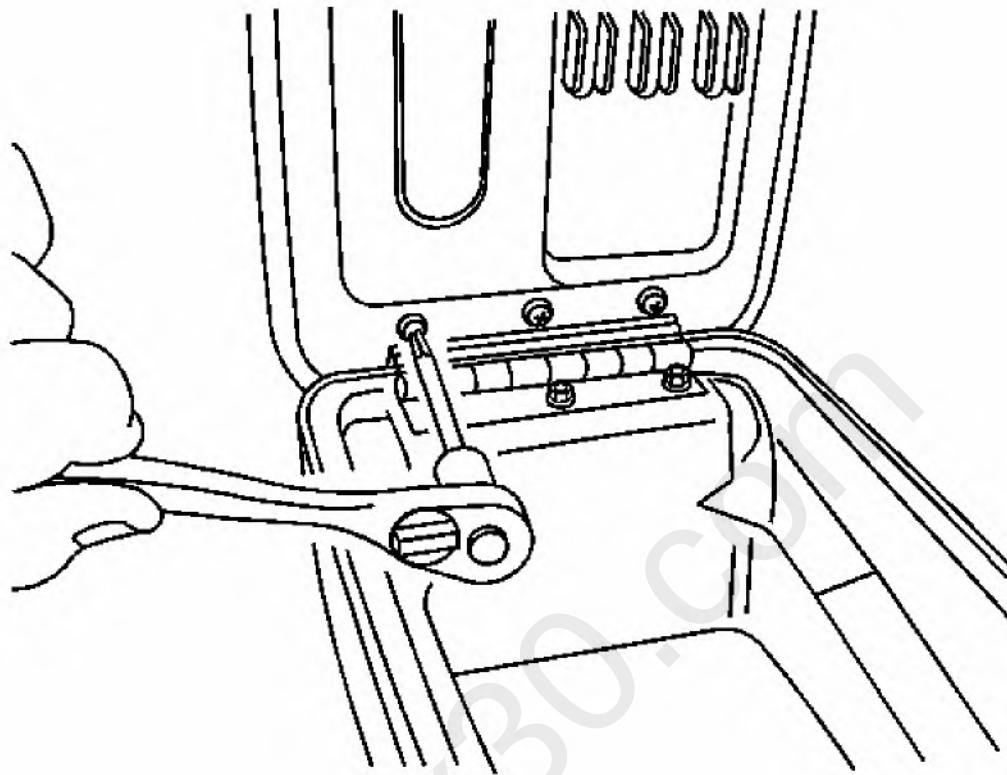


Fig. 77: Removing/Installing Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

3. Install the screws that secure the armrest cover to the center console.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

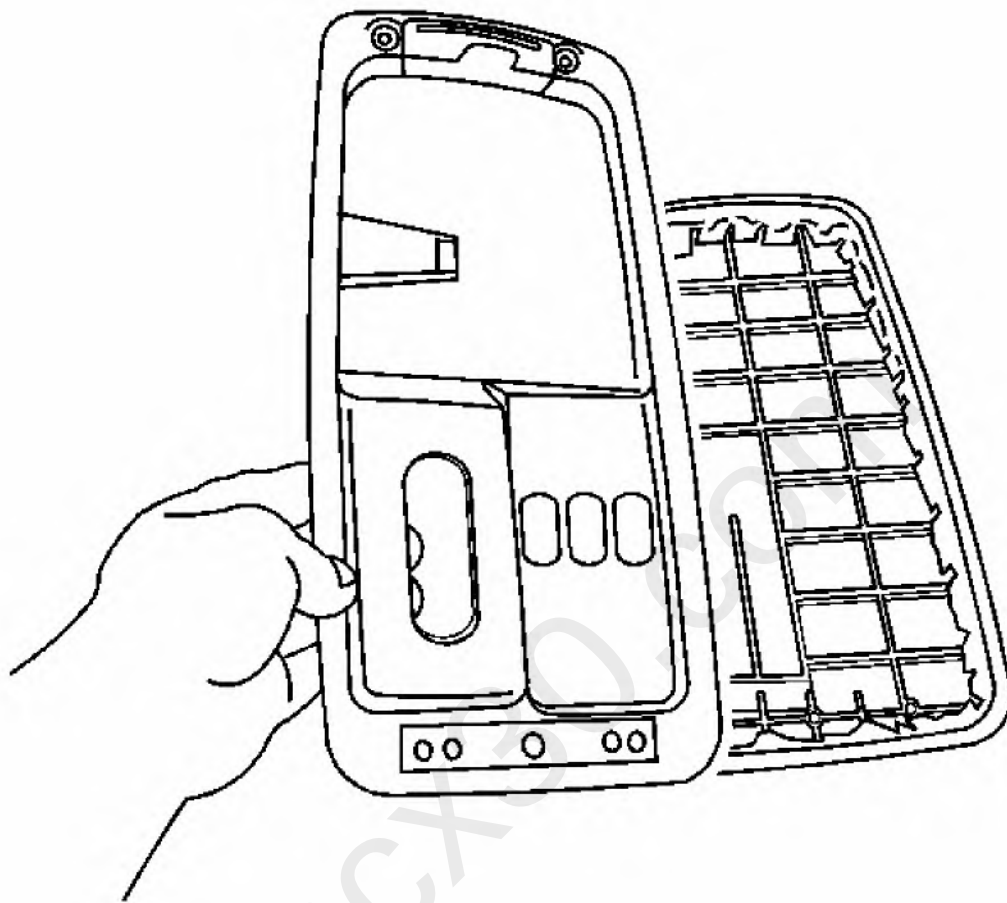


Fig. 78: View Of Armrest Cover, Hinge & Insert
Courtesy of GENERAL MOTORS CORP.

4. Snap the console insert to the armrest cover.
5. Close the armrest cover. Inspect the cover for alignment and operation.

CONSOLE STORAGE BIN REPLACEMENT

Removal Procedure

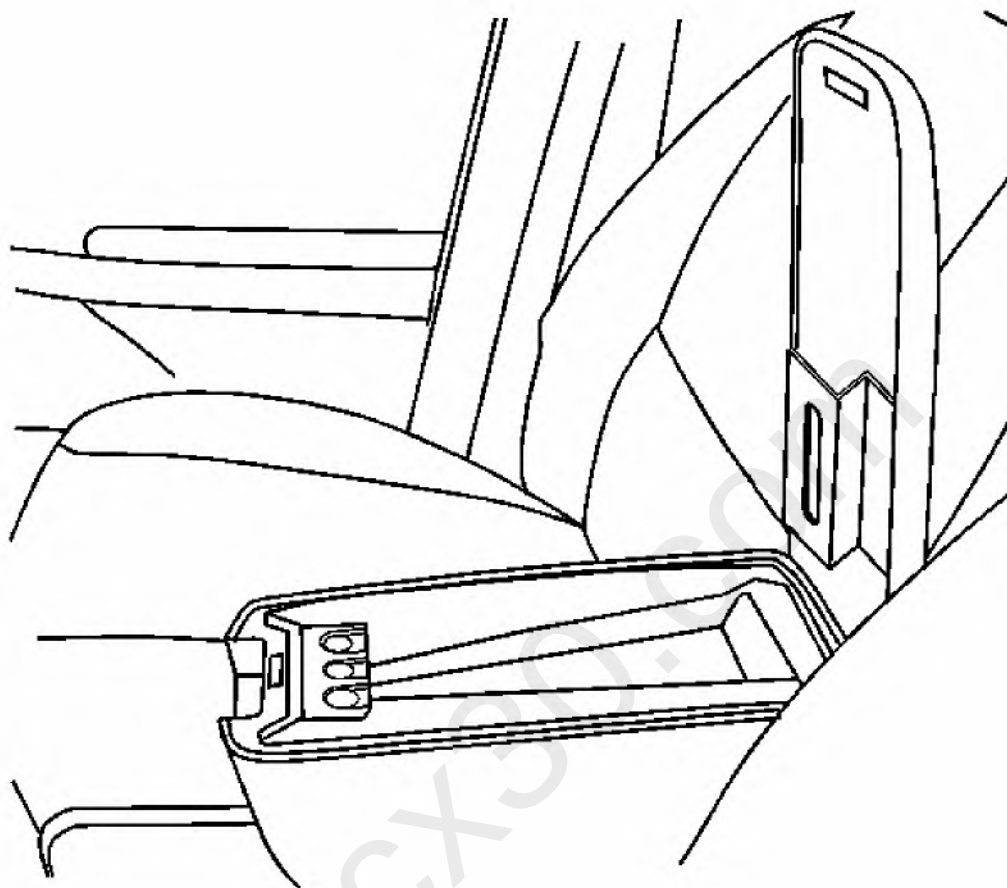


Fig. 79: View Of Opened Console Storage Bin Lid
Courtesy of GENERAL MOTORS CORP.

1. Raise the console lid to expose the hinge.

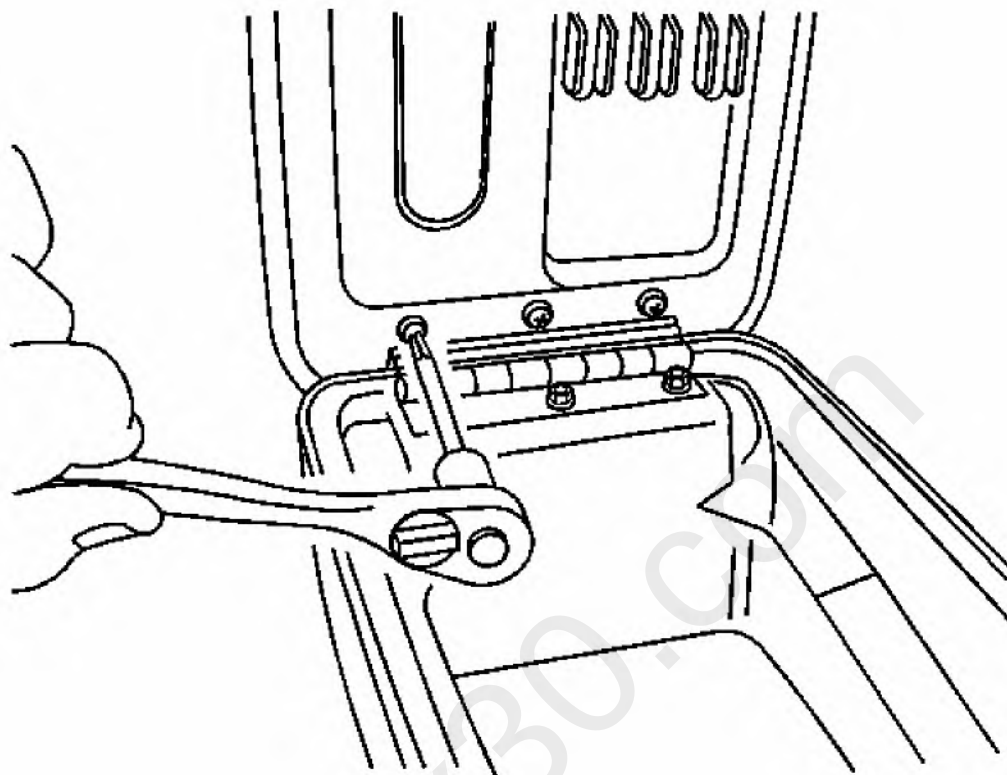


Fig. 80: Removing/Installing Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the screws that retain the console hinge to the base. Remove the console hinge.
3. Remove the console storage bin.

Installation Procedure

1. Insert the new storage bin.

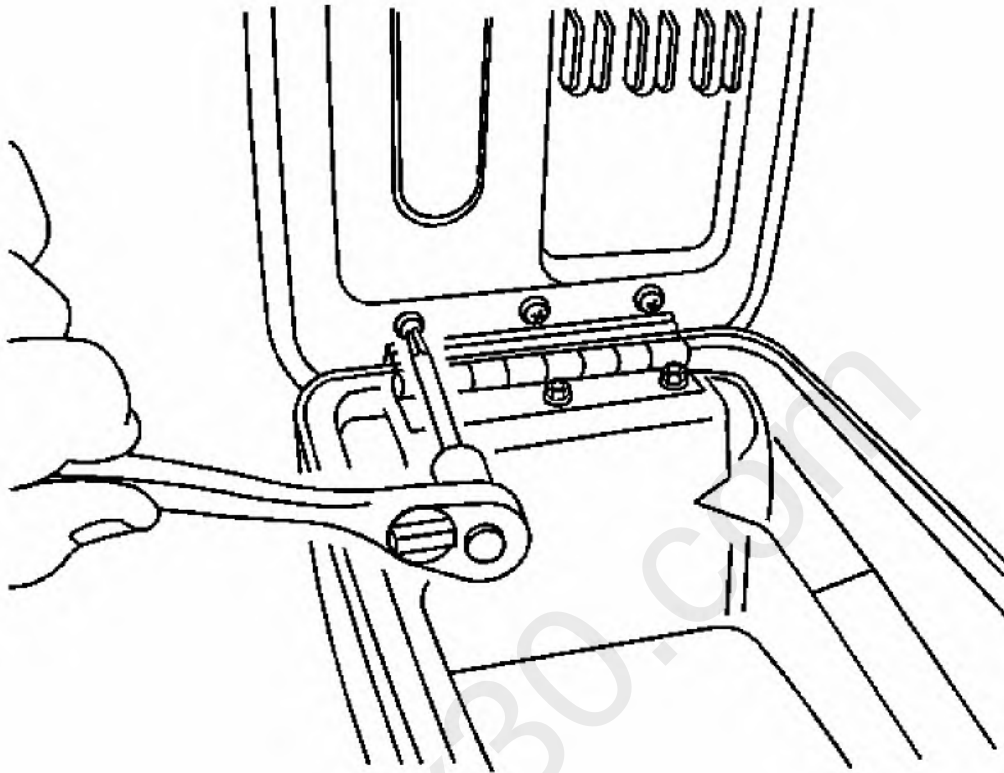


Fig. 81: Removing/Installing Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Fasten the storage bin cover with the hinge screws.

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

3. Inspect the lid for alignment and operation.

TRIM PLATE REPLACEMENT - CONSOLE

Removal Procedure

1. Position the front seats rearward.

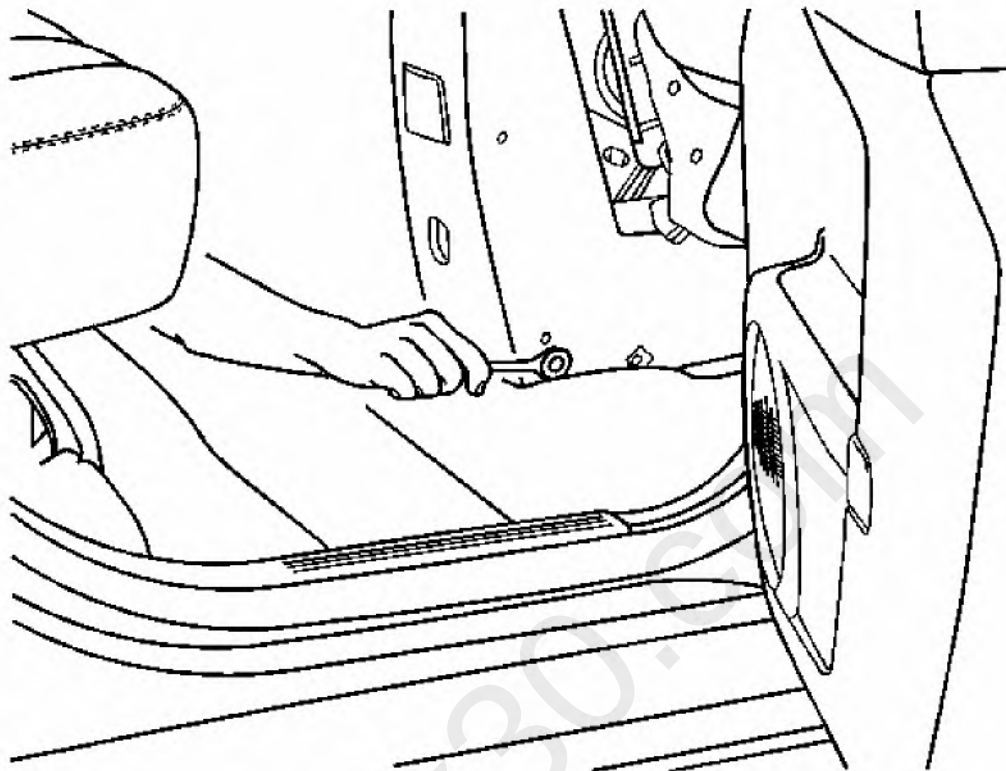


Fig. 82: Removing/Installing Lower Console Screws
Courtesy of GENERAL MOTORS CORP.

2. Reach under the front seats to access the lower console screws.
3. Remove the console screws.

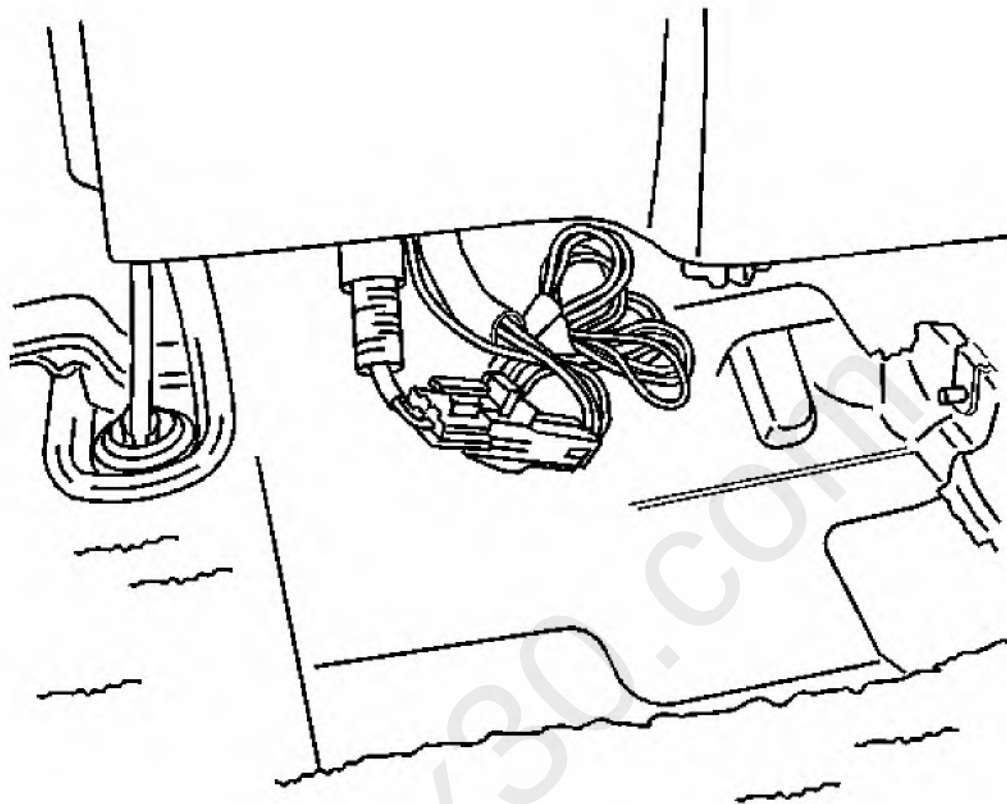


Fig. 83: View Of Auxiliary Power Outlet Electrical Connector
Courtesy of GENERAL MOTORS CORP.

4. Lift the rear of the center floor console.
5. Disconnect the electrical connector to the auxiliary power outlet.

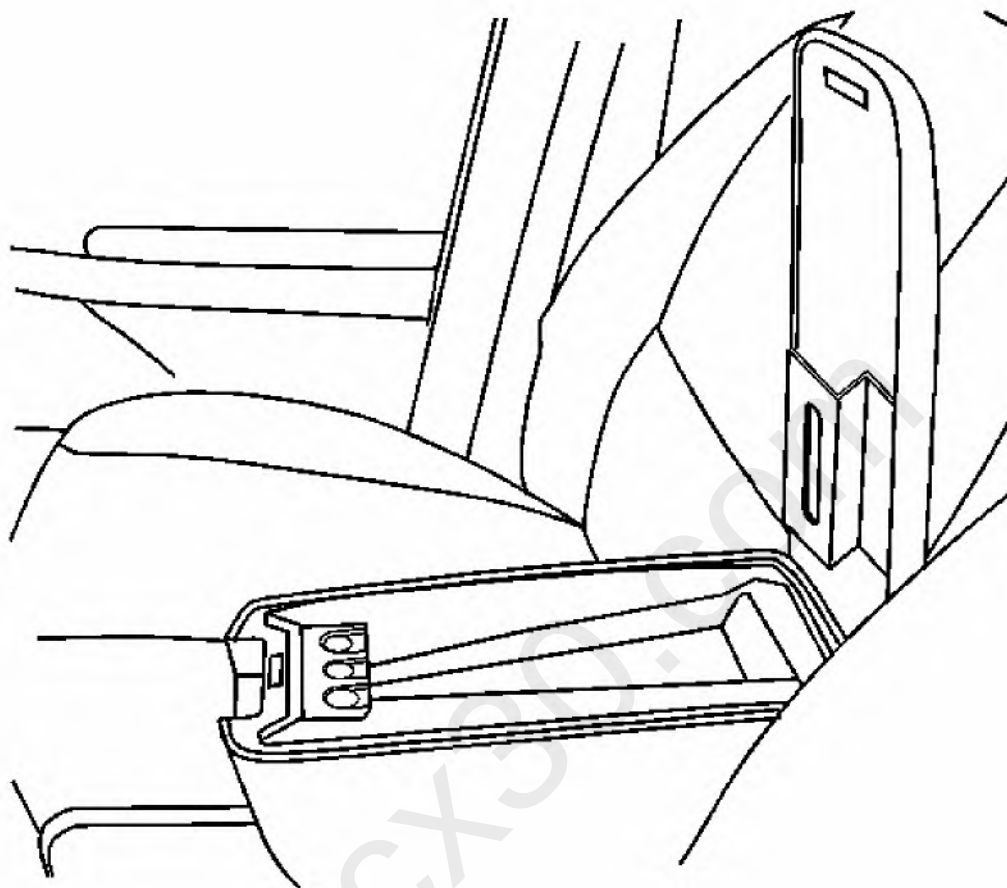


Fig. 84: View Of Opened Console Storage Bin Lid
Courtesy of GENERAL MOTORS CORP.

6. Slide the center floor console rearward.

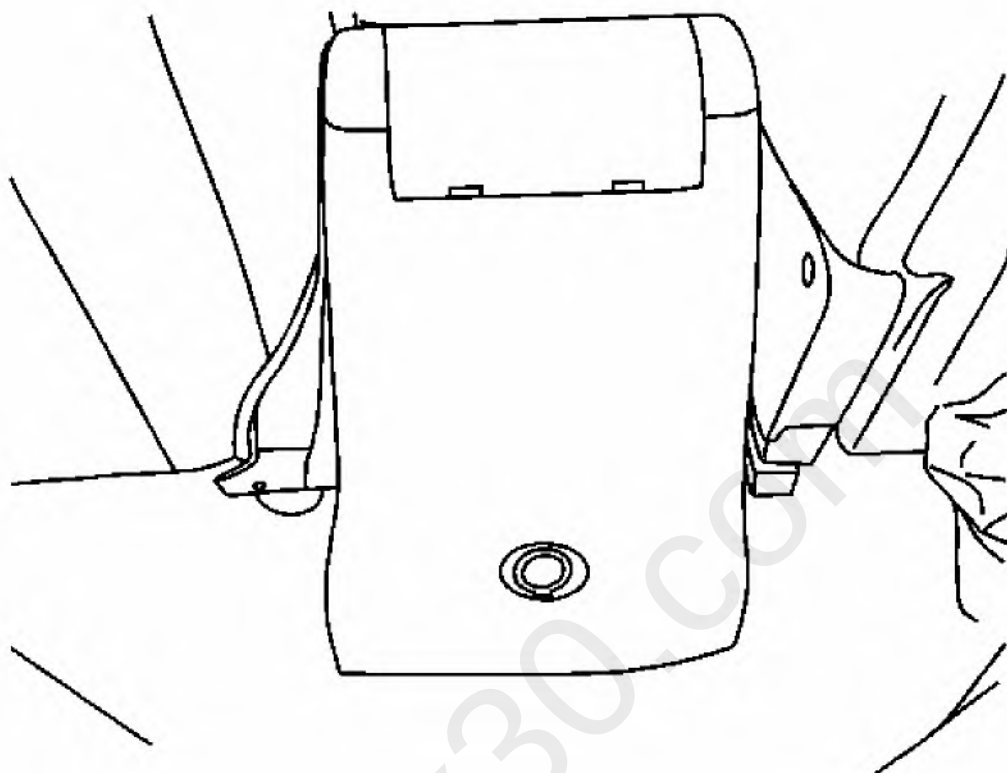


Fig. 85: Removing Center Trim Panel
Courtesy of GENERAL MOTORS CORP.

7. Remove the center trim panel by pulling outward.

Installation Procedure

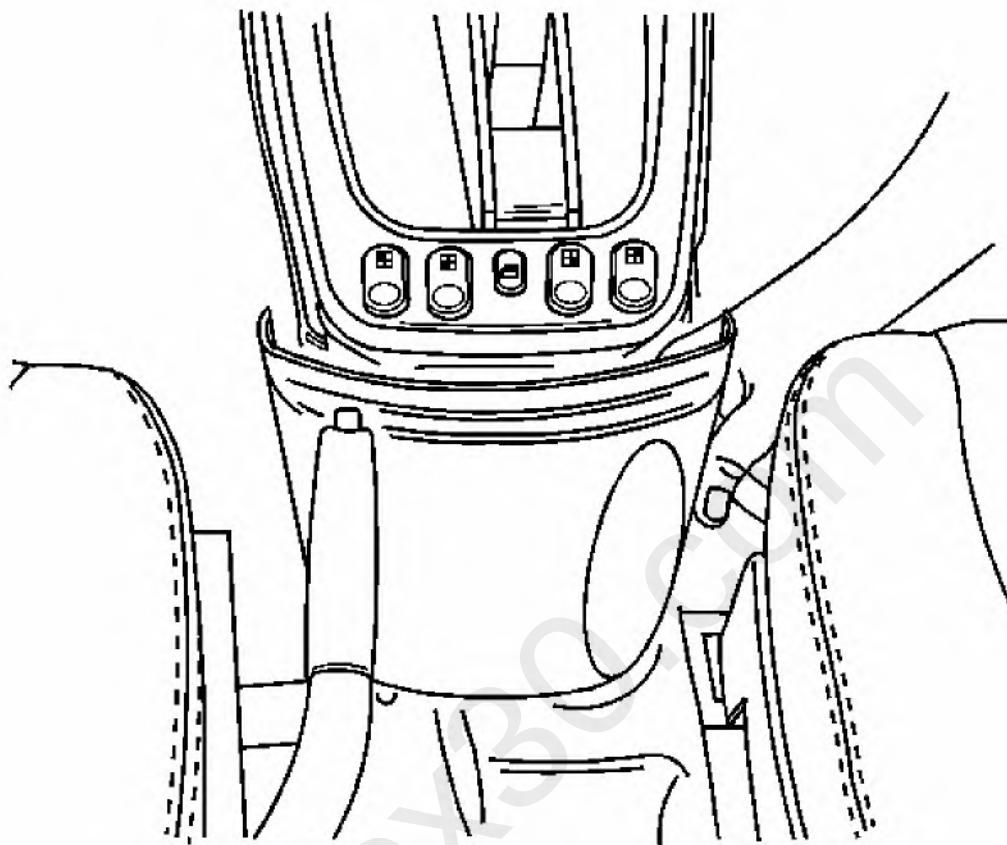


Fig. 86: View Of Center Trim Plate
Courtesy of GENERAL MOTORS CORP.

1. Position the center trim plate to the front console.
2. Push until the trim clips engage.

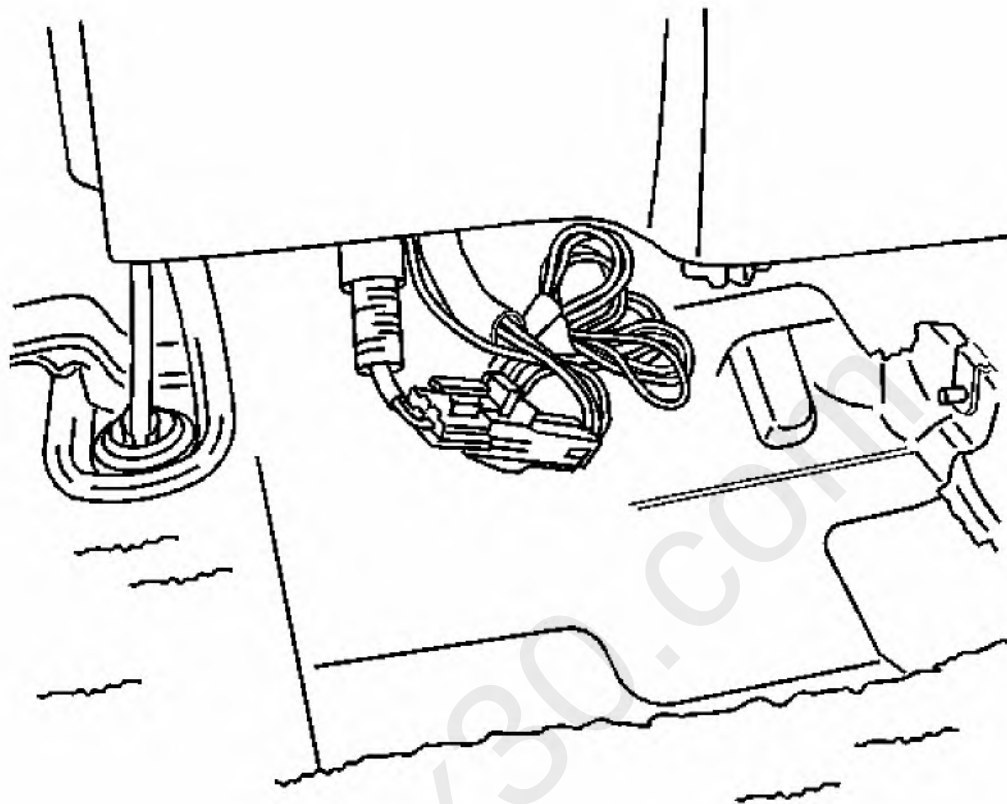


Fig. 87: View Of Auxiliary Power Outlet Electrical Connector
Courtesy of GENERAL MOTORS CORP.

3. Lift the rear of the center floor console.
4. Connect the electrical connector to the auxiliary power outlet.

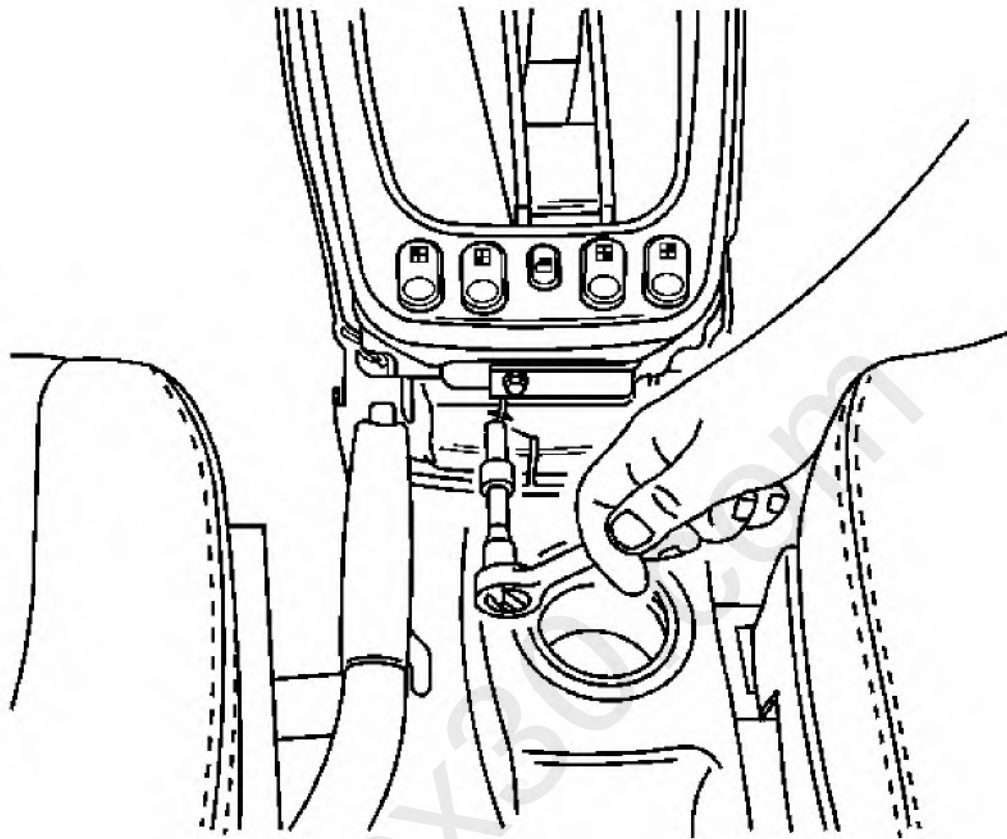


Fig. 88: View Of Center Console
Courtesy of GENERAL MOTORS CORP.

5. Reposition the center console.

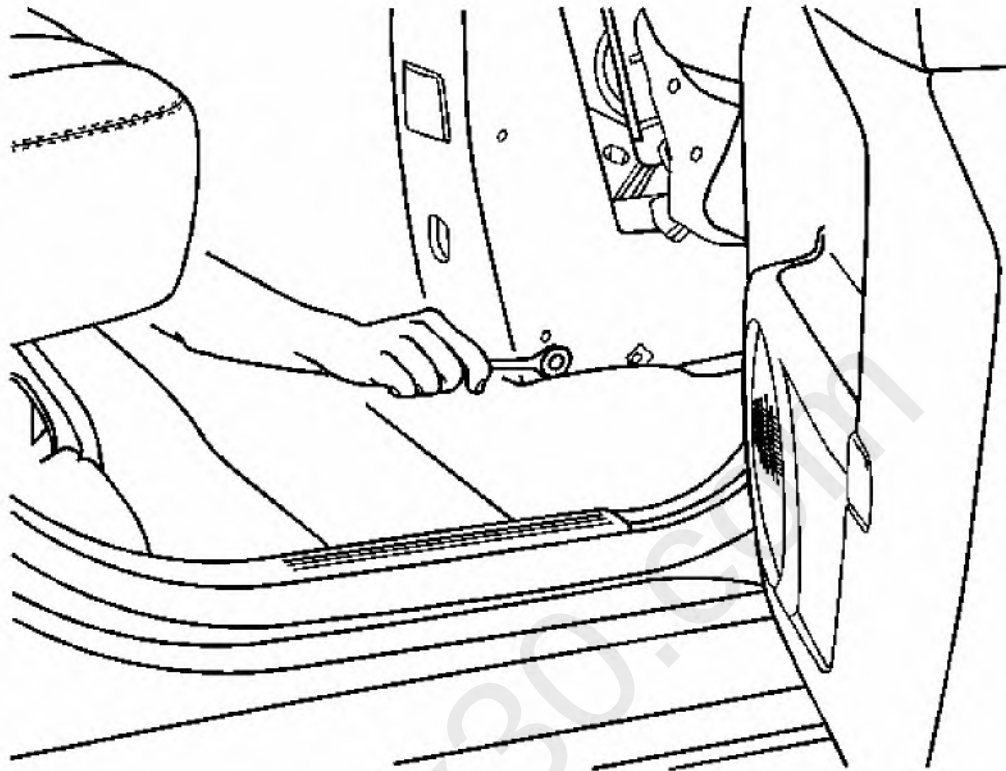


Fig. 89: Removing/Installing Lower Console Screws
Courtesy of GENERAL MOTORS CORP.

6. Reach under the front seats to access the lower console screws.
7. Install the center console screws.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

8. Position the front seat forward to the original position.

CONSOLE TRIM PANEL REPLACEMENT - RIGHT

Removal Procedure

1. Position the front seats rearward.

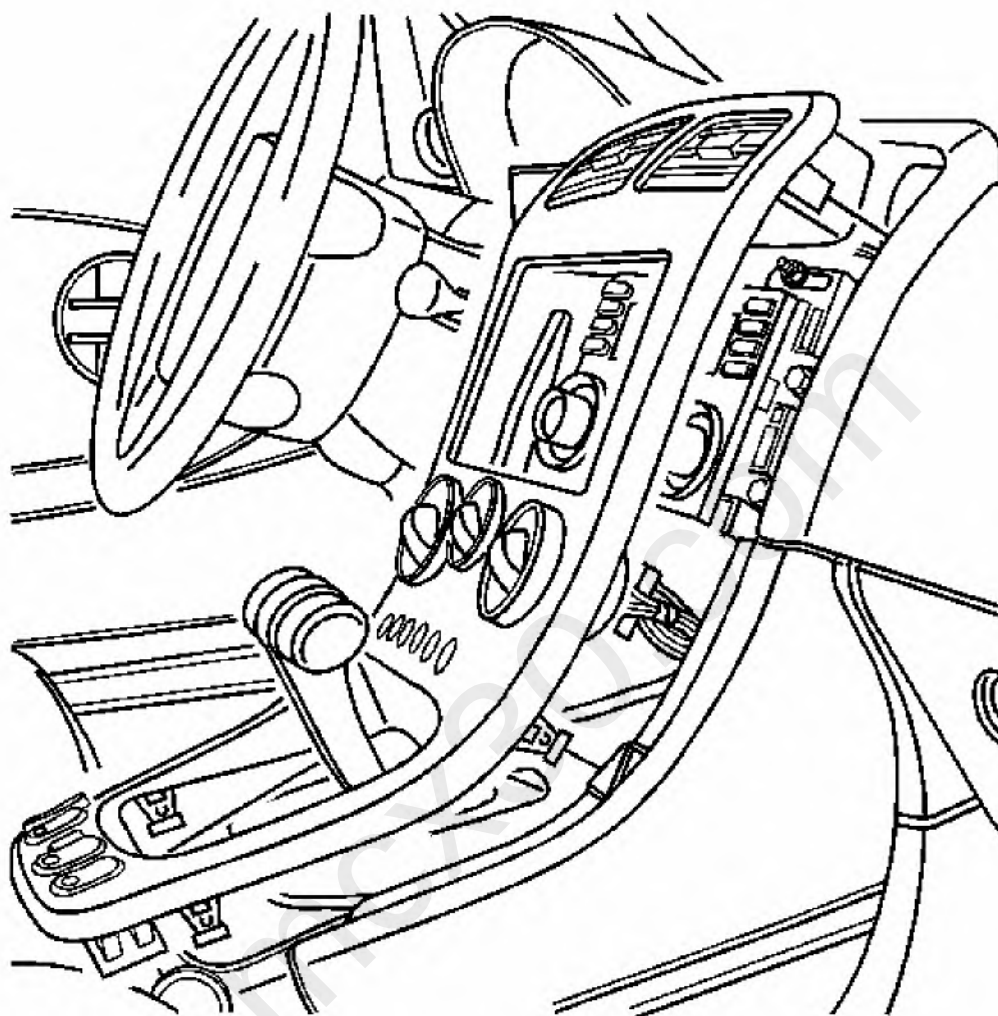


Fig. 90: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

2. Remove the center trim panel by pulling outward.

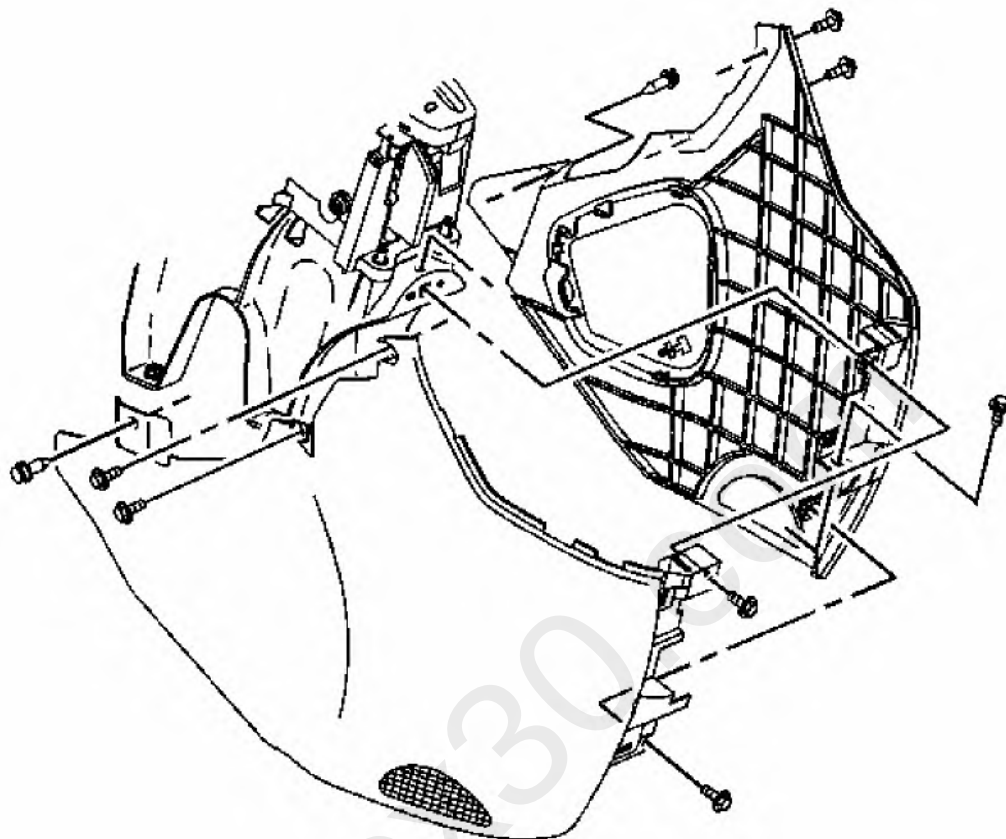


Fig. 91: Removing/Installing Front Console Trim Panels
Courtesy of GENERAL MOTORS CORP.

3. Remove the screws from the right console trim panel.

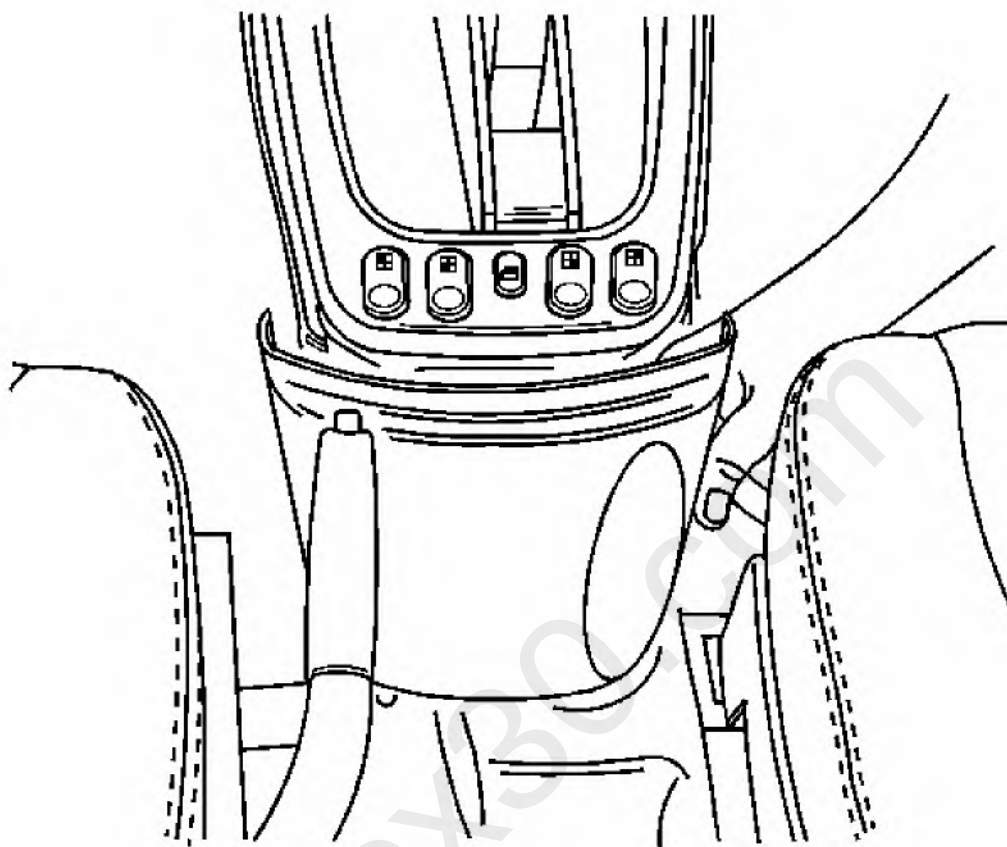


Fig. 92: View Of Center Trim Plate
Courtesy of GENERAL MOTORS CORP.

4. Remove the push-in fastener from the trim panel.

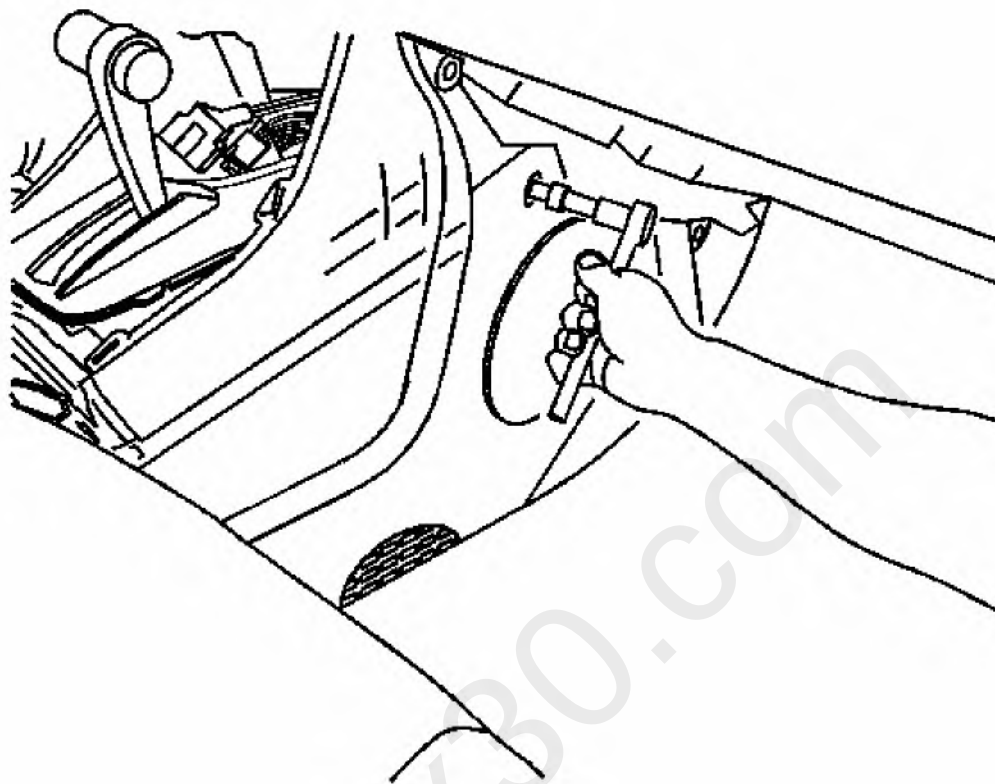


Fig. 93: Removing Console Trim Panel
Courtesy of GENERAL MOTORS CORP.

5. Remove the trim panel from the vehicle.

Installation Procedure

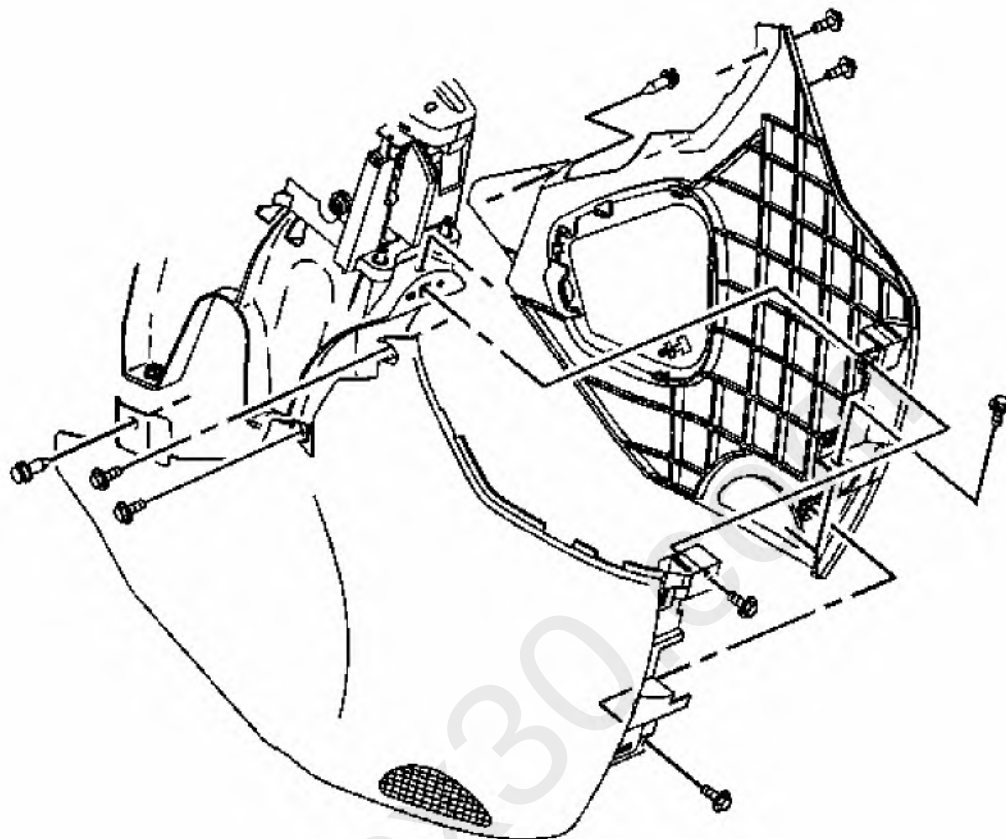


Fig. 94: Removing/Installing Front Console Trim Panels
Courtesy of GENERAL MOTORS CORP.

1. Position the right console trim panel.
2. Install the push-in fastener.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the screws to the right console trim panel.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

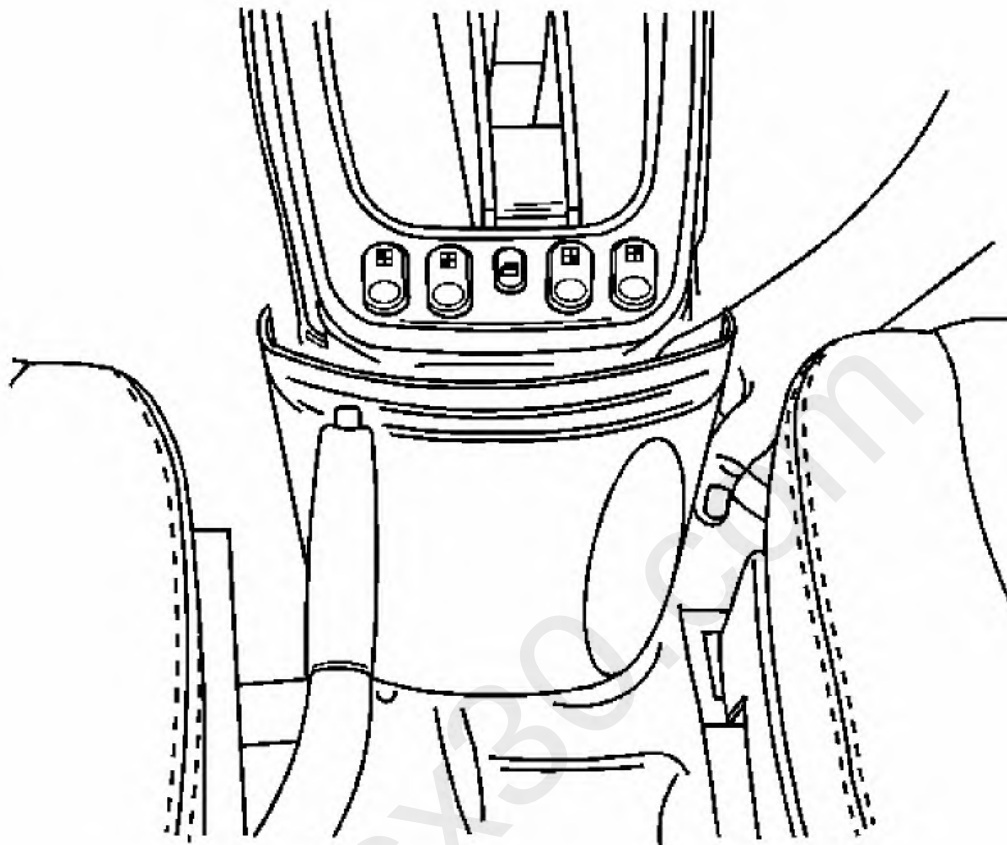


Fig. 95: View Of Center Trim Plate
Courtesy of GENERAL MOTORS CORP.

4. Position the center trim plate to the front console.
5. Push until the trim clips engage.

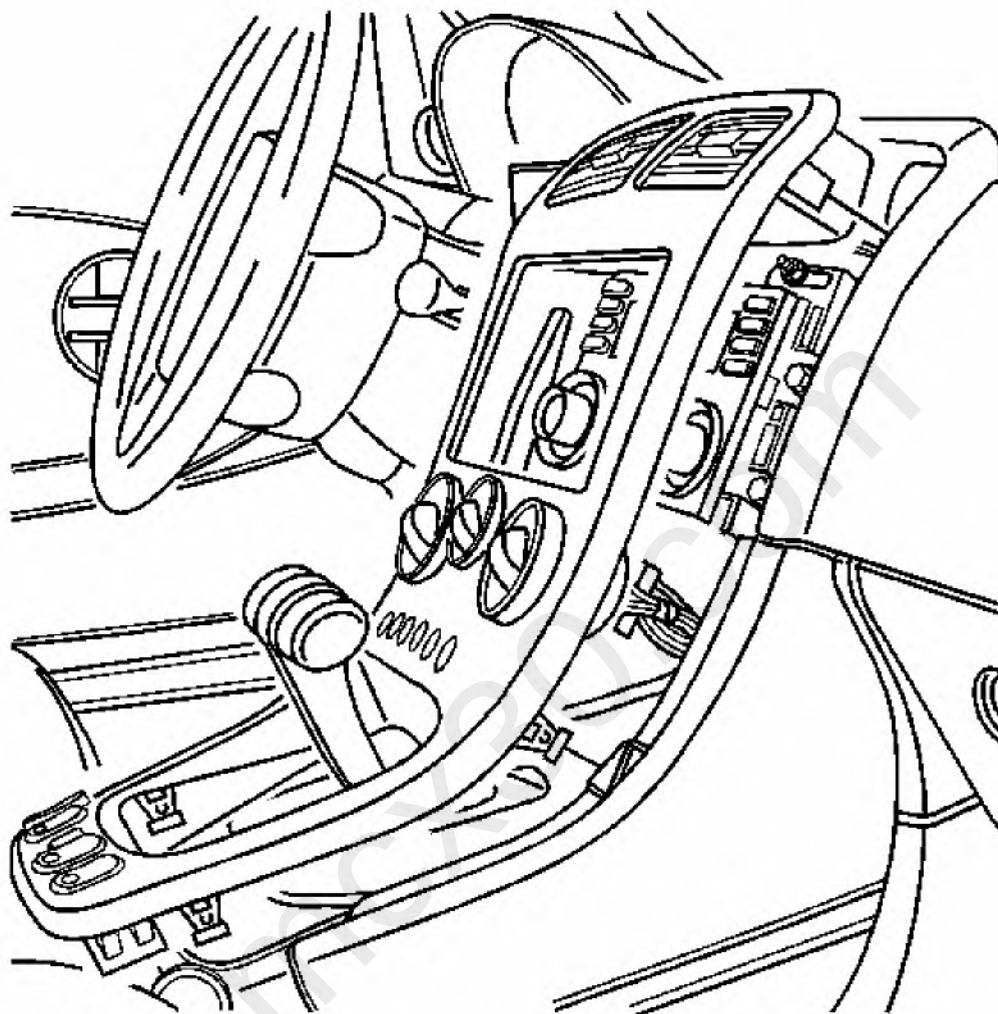


Fig. 96: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

6. Connect the electrical connectors to the center trim panel.
7. Snap the center trim panel into place.
8. Position the front seat forward to the original position.

CONSOLE TRIM PANEL REPLACEMENT - LEFT

Removal Procedure

1. Position the front seats rearward.

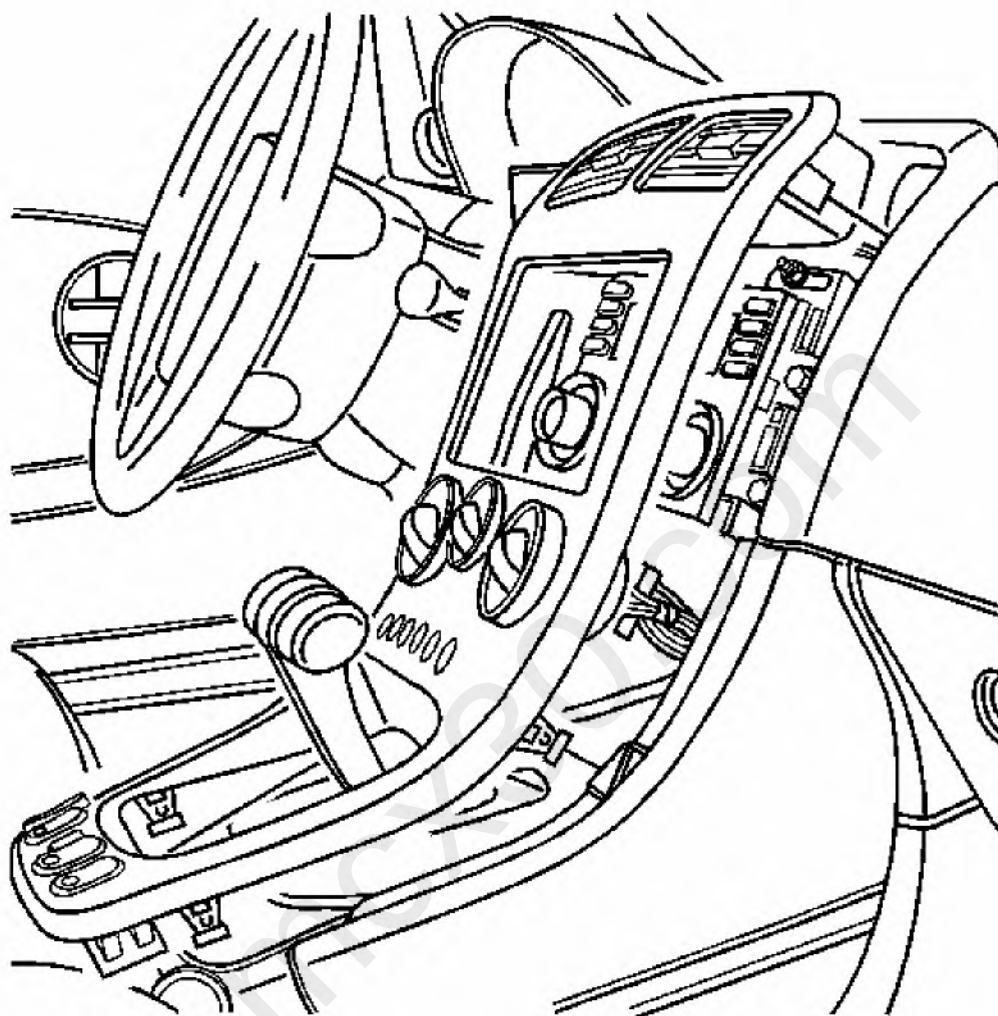


Fig. 97: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

2. Remove the center trim panel by pulling outward.

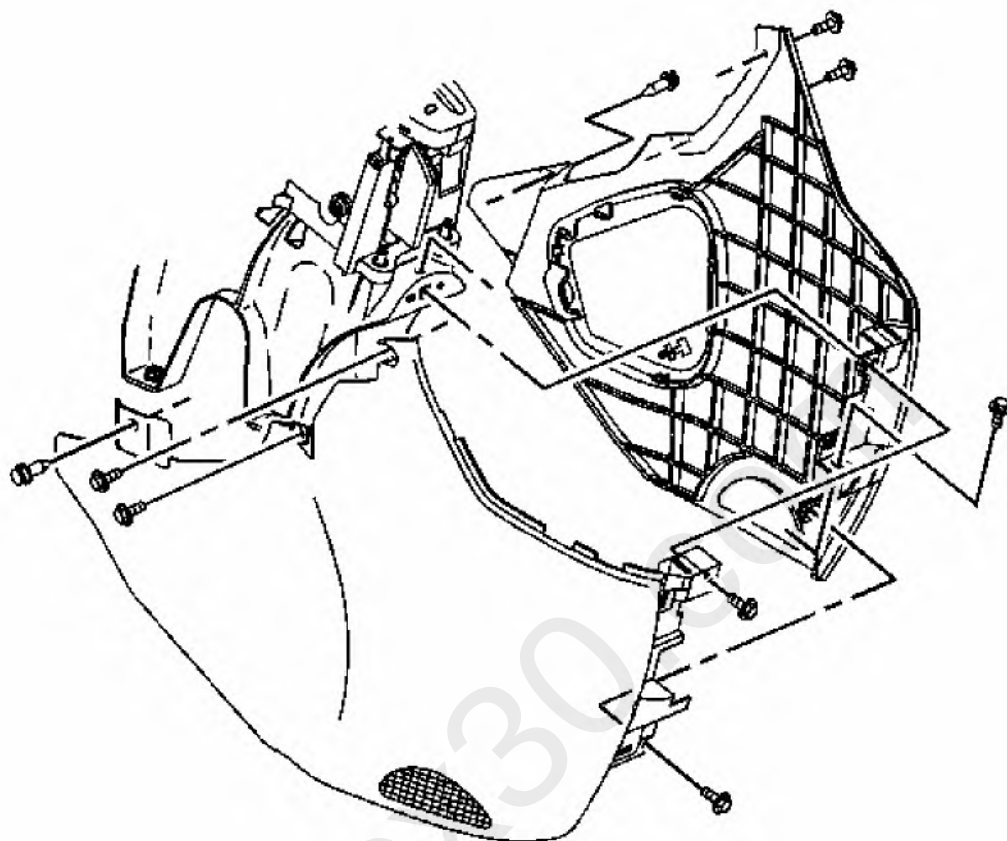


Fig. 98: Removing/Installing Front Console Trim Panels
Courtesy of GENERAL MOTORS CORP.

3. Remove the screws from the left console trim panel.

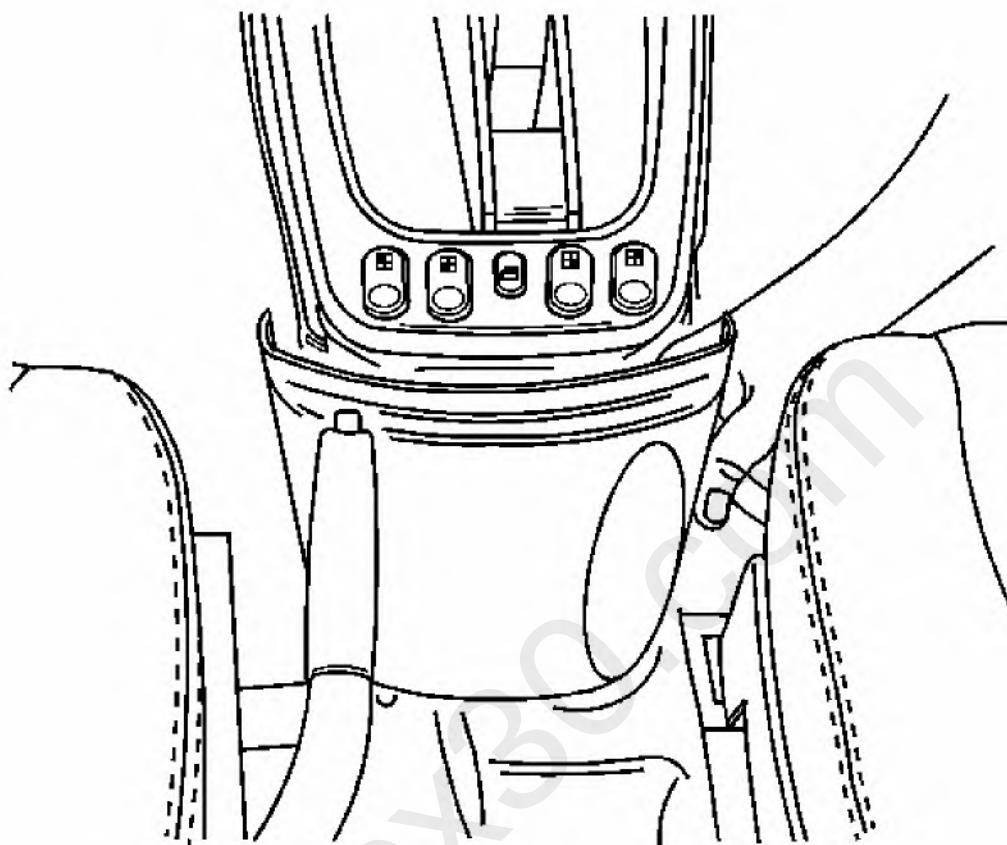


Fig. 99: View Of Center Trim Plate
Courtesy of GENERAL MOTORS CORP.

4. Remove the push-in fastener from the trim panel.

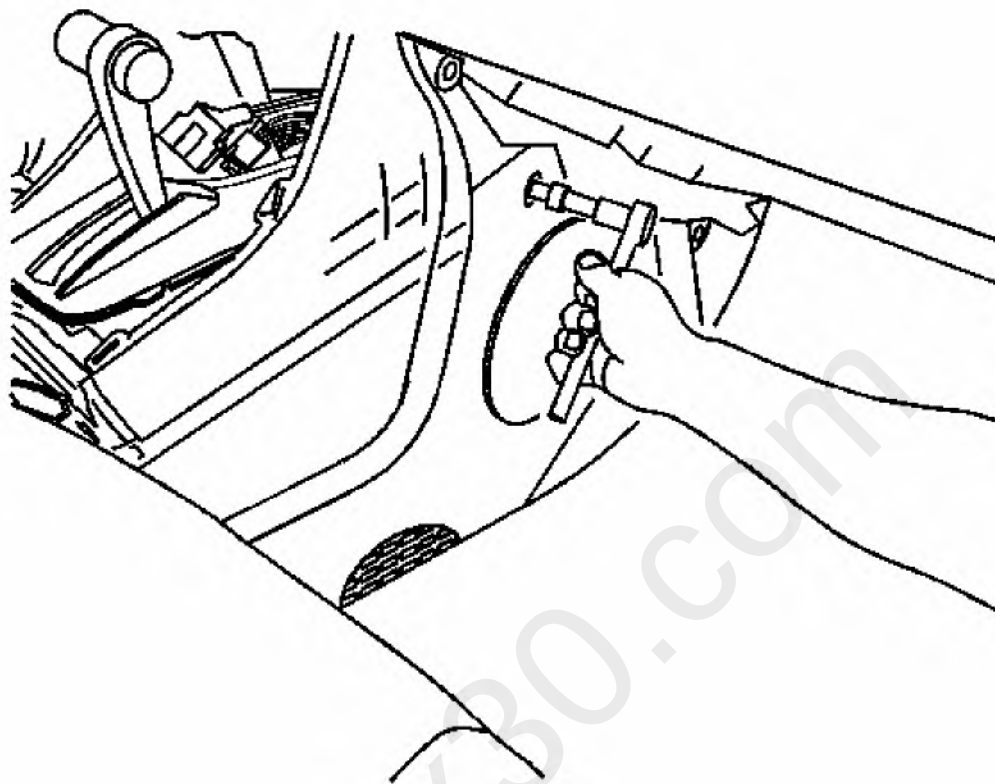


Fig. 100: Removing Console Trim Panel
Courtesy of GENERAL MOTORS CORP.

5. Remove the trim panel from the vehicle.

Installation Procedure

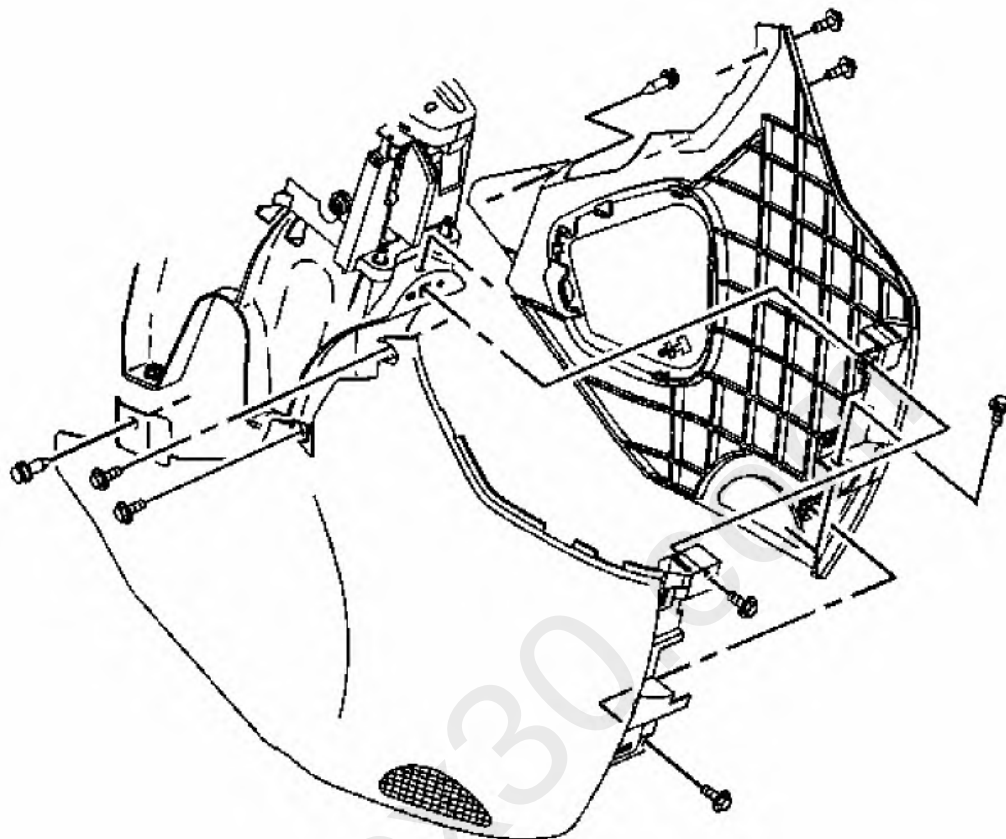


Fig. 101: Removing/Installing Front Console Trim Panels
Courtesy of GENERAL MOTORS CORP.

1. Position the left console trim panel.
2. Install the push-in fastener.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the screws to the left console trim panel.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

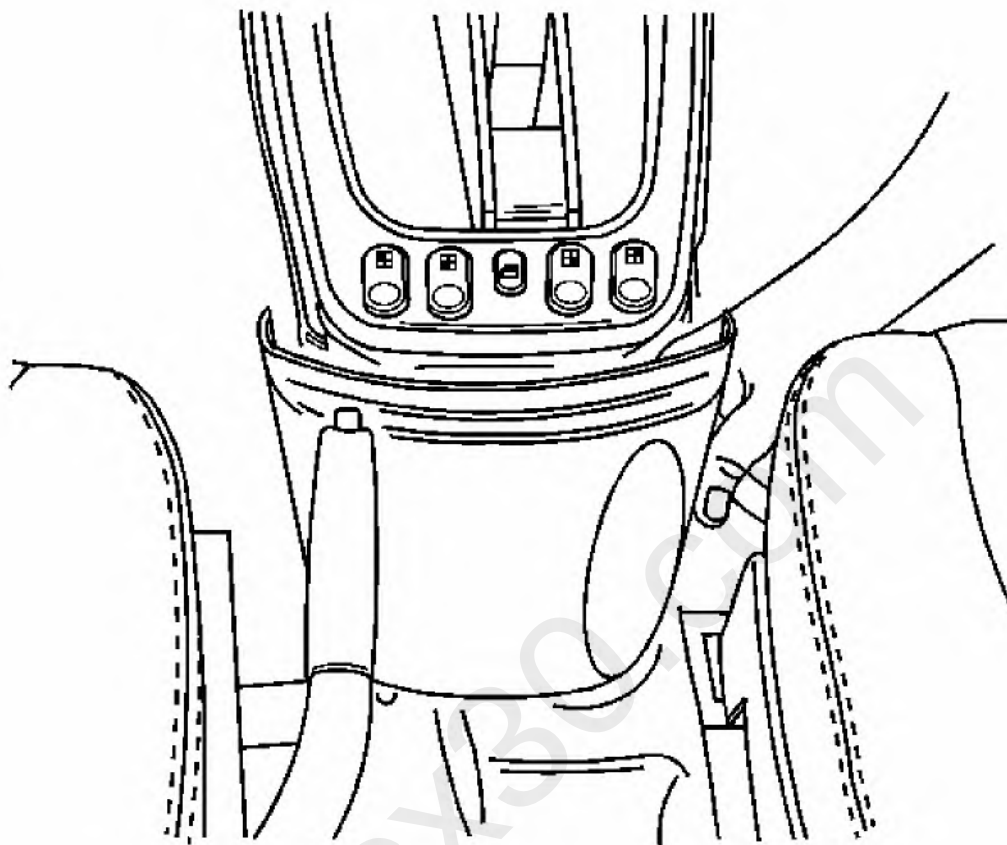


Fig. 102: View Of Center Trim Plate
Courtesy of GENERAL MOTORS CORP.

4. Position the center trim plate to the front console.
5. Push until the trim clips engage.

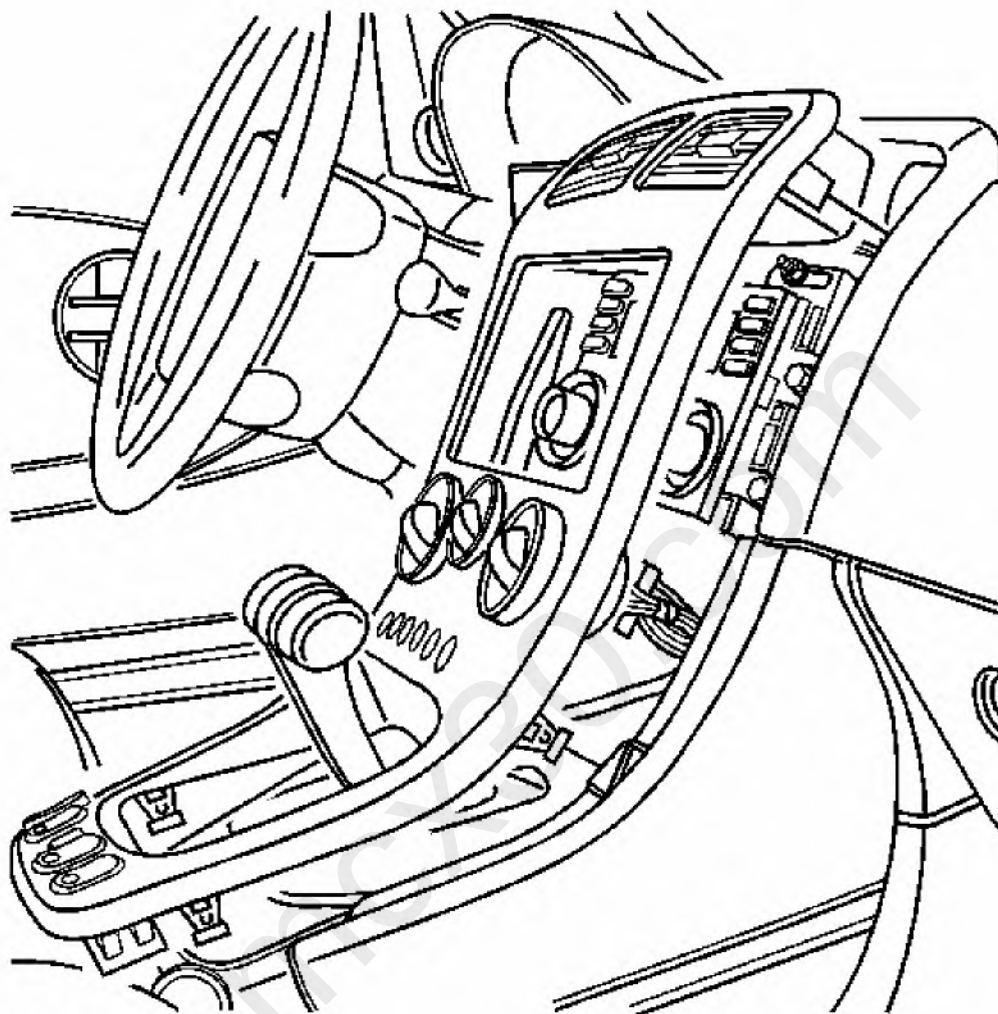


Fig. 103: View Of Center Console Trim Bezel
Courtesy of GENERAL MOTORS CORP.

6. Install the center trim panel.
7. Position the front seat forward to the original position.

CONSOLE REPLACEMENT

Removal Procedure

1. Position the front seats rearward.

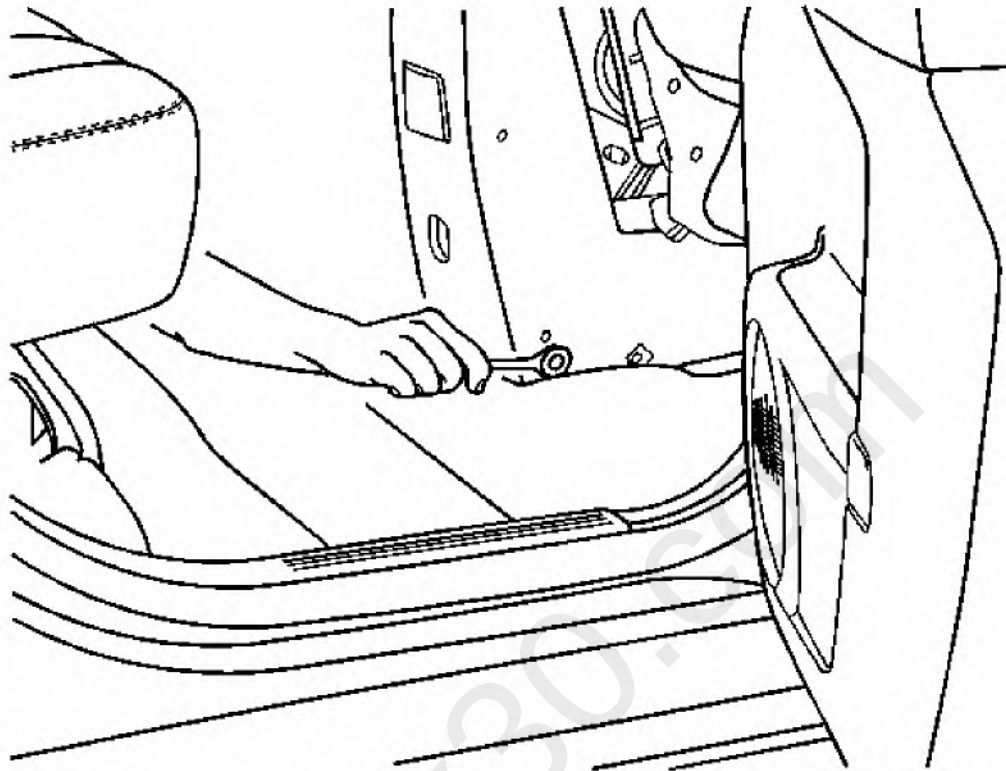


Fig. 104: Removing/Installing Lower Console Screws
Courtesy of GENERAL MOTORS CORP.

2. Reach under the front seats to access the lower console screws.
3. Remove the console screws.
4. Lift the rear of the center floor console.

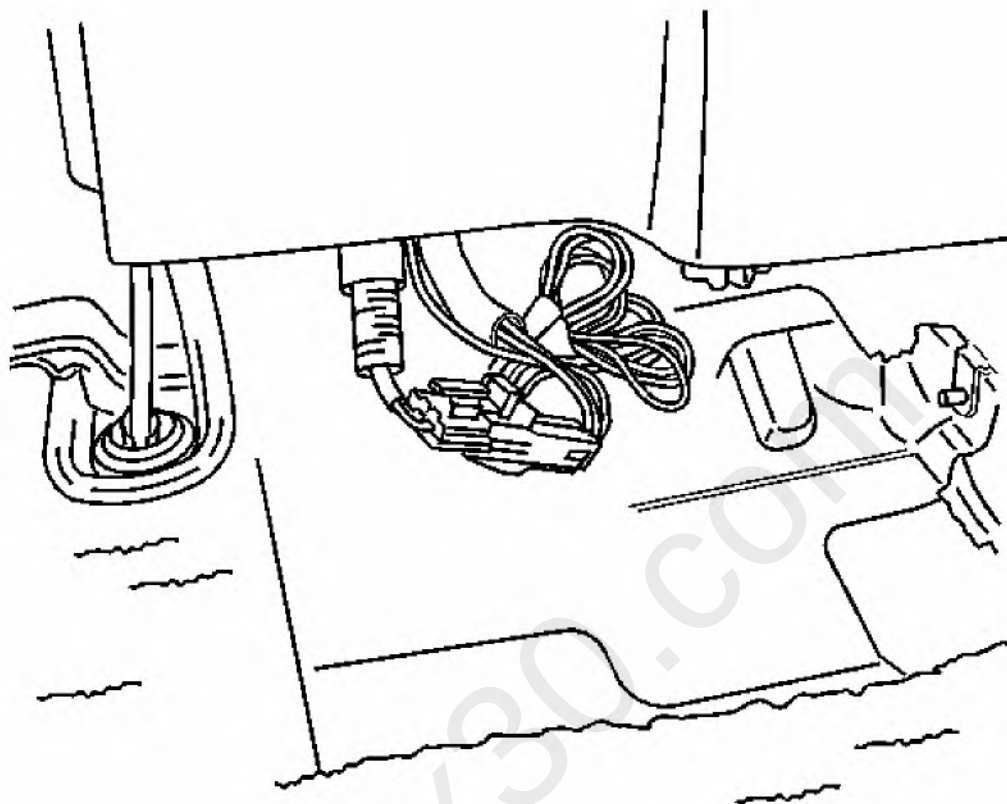


Fig. 105: View Of Auxiliary Power Outlet Electrical Connector
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the electrical connector to the auxiliary power outlet.
6. Slide the center floor console rearward to access the upper console screws.

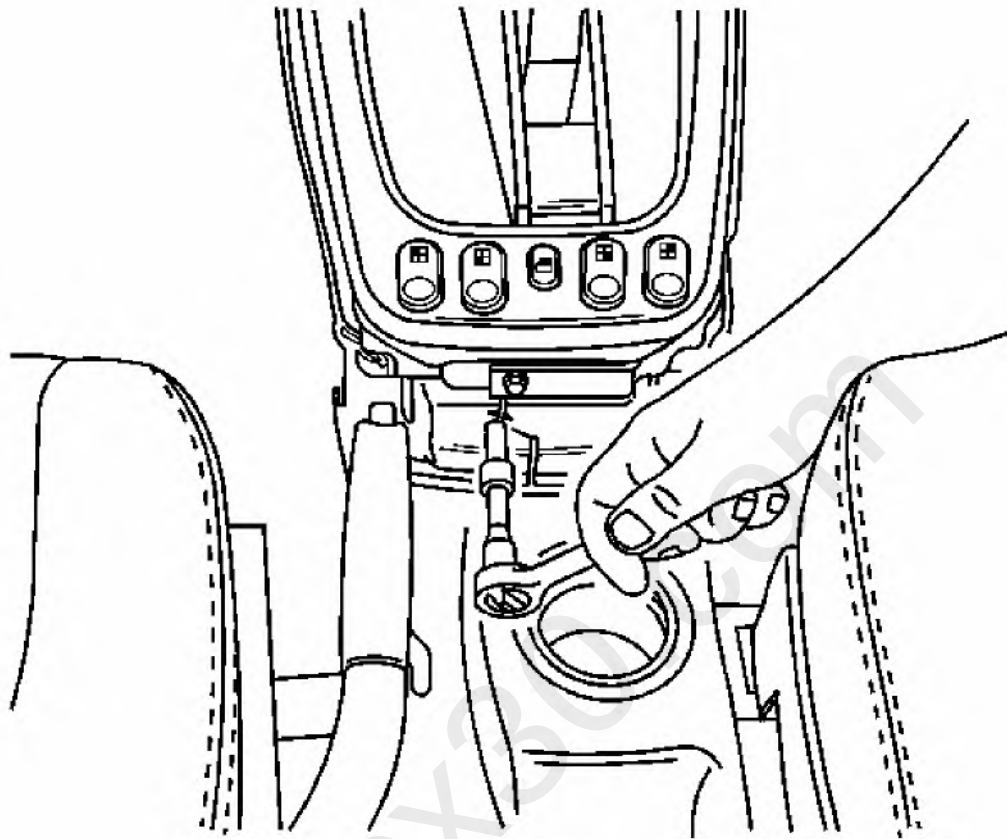


Fig. 106: View Of Center Console
Courtesy of GENERAL MOTORS CORP.

7. Remove the bolts which hold the console to the center stack.
8. Remove the floor console.

Installation Procedure

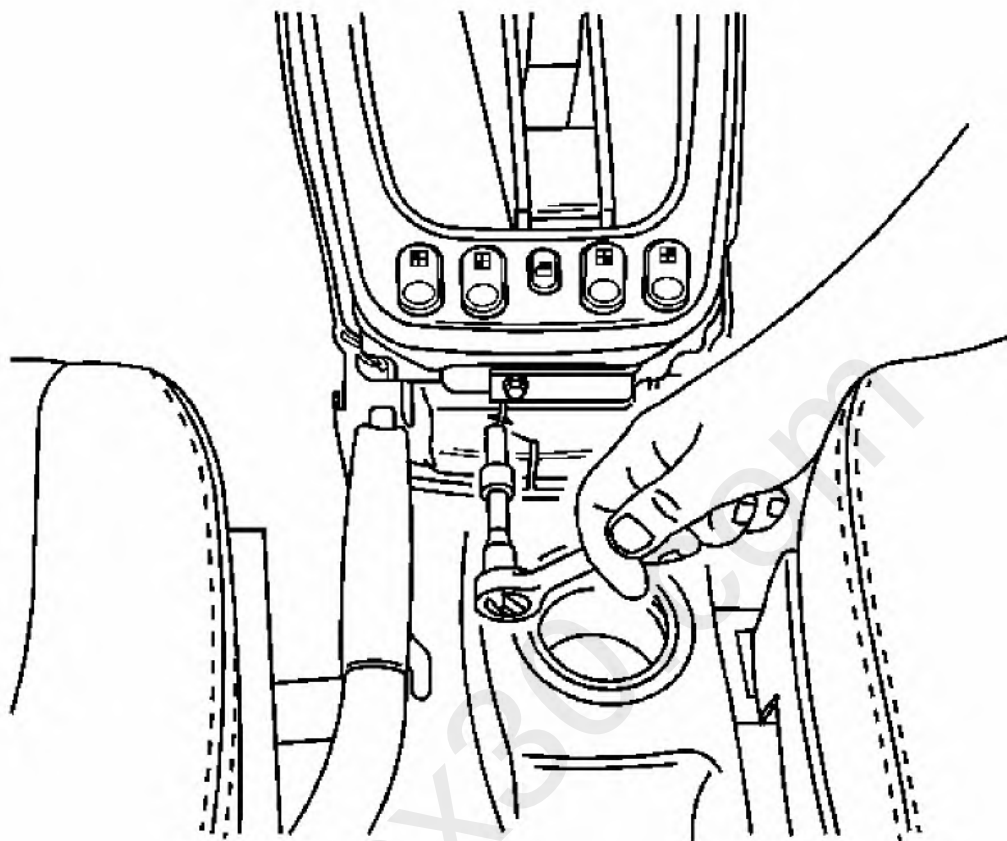


Fig. 107: View Of Center Console
Courtesy of GENERAL MOTORS CORP.

1. Position the console with the mounting bracket.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the console screws.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

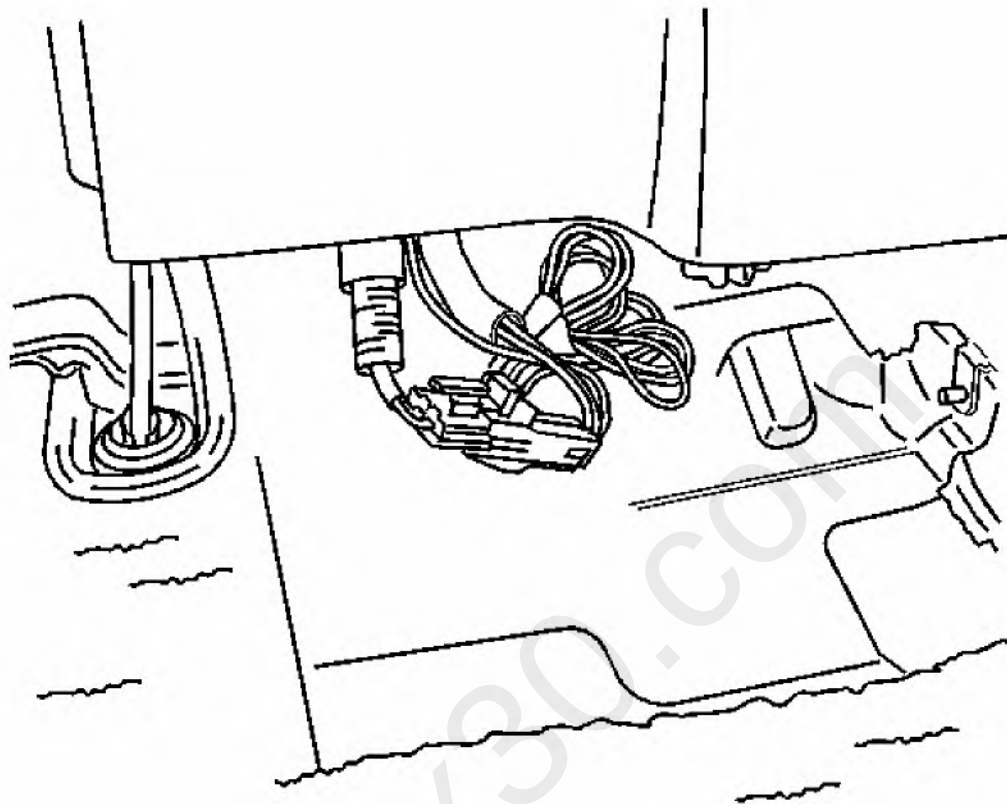


Fig. 108: View Of Auxiliary Power Outlet Electrical Connector
Courtesy of GENERAL MOTORS CORP.

3. Connect the electrical connector to the auxiliary power outlet.
4. Reposition the center console.

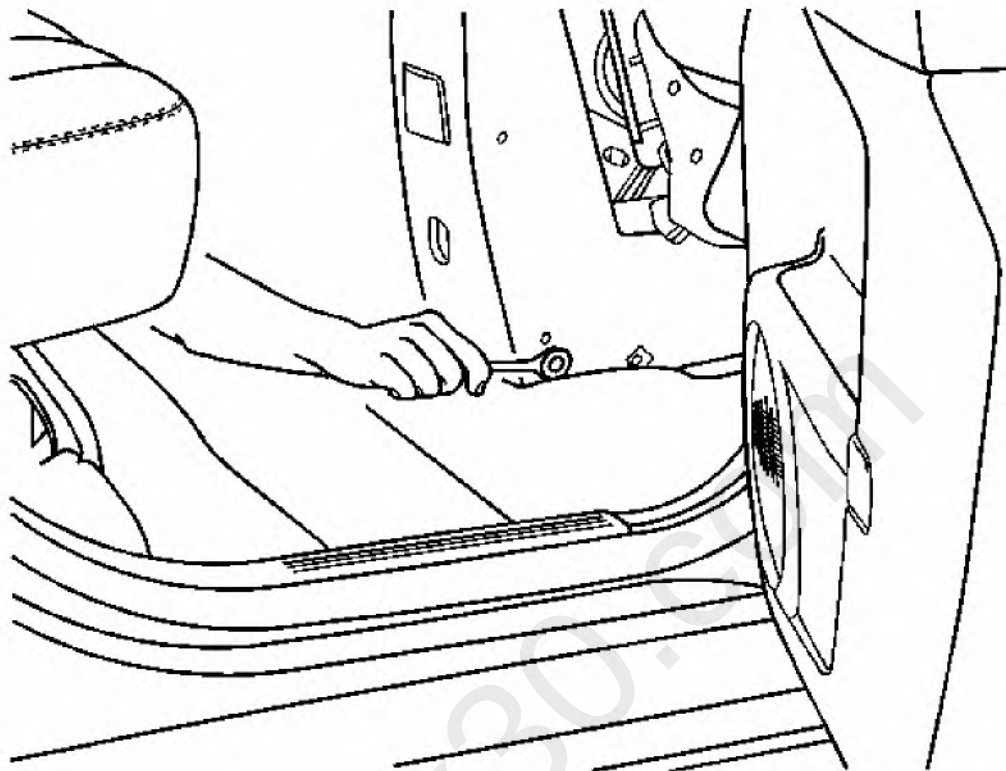


Fig. 109: Removing/Installing Lower Console Screws
Courtesy of GENERAL MOTORS CORP.

5. Reach under the front seats to access the lower console screws.
6. Install the center console screws.

Tighten: Tighten the screws to 2.5 N.m (22 lb in).

7. Position the front seat forward to the original position.

CONSOLE ARMREST REPLACEMENT - FRONT FLOOR

Removal Procedure

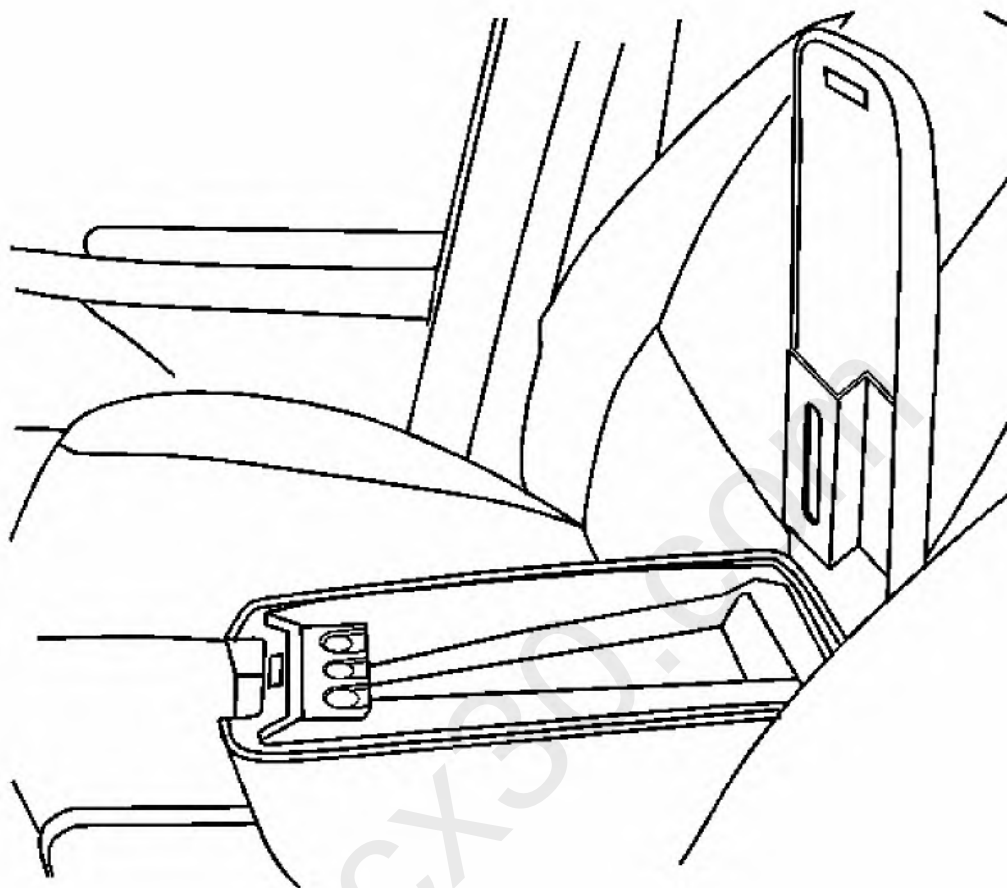


Fig. 110: View Of Opened Console Storage Bin Lid
Courtesy of GENERAL MOTORS CORP.

1. Move the front seats rearward and open the center armrest cover.

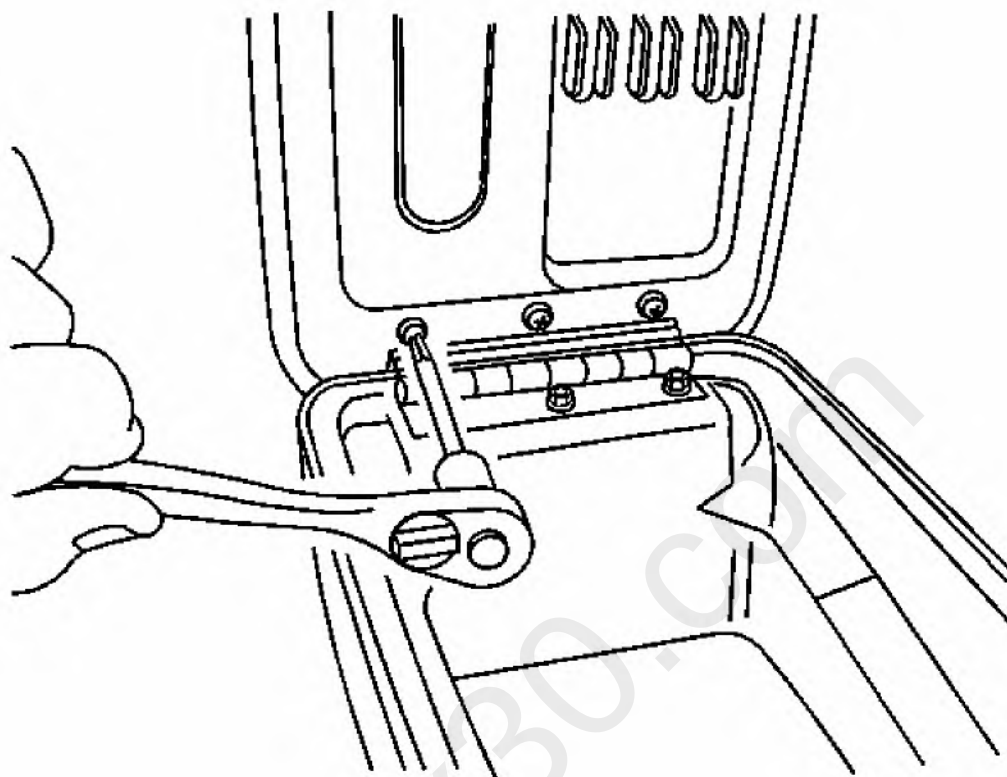


Fig. 111: Removing/Installing Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

2. Remove the screws from the hinge holding the armrest cover to the center console.
3. Remove the armrest cover.

Installation Procedure

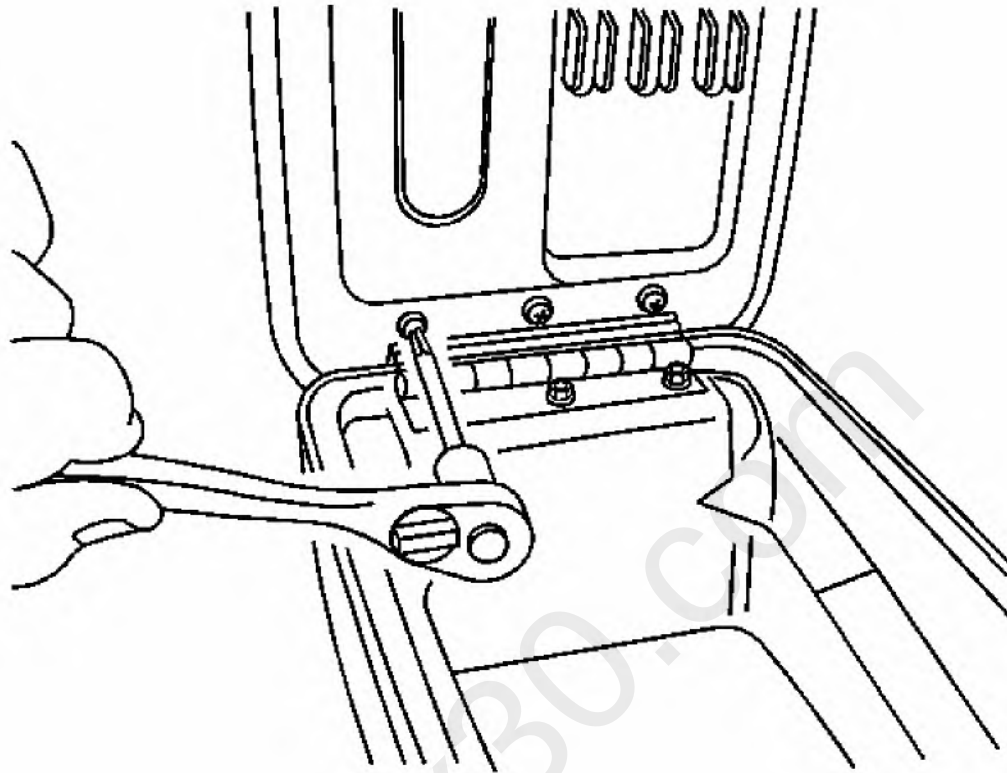


Fig. 112: Removing/Installing Armrest Cover Screws
Courtesy of GENERAL MOTORS CORP.

1. Align the armrest cover with the hinge positioned correctly.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the screws to the hinge holding the armrest cover to the center console.

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

3. Close the armrest cover. Inspect the cover for proper alignment and operation.
4. Return the front seat to the proper position.

CUP HOLDER REPLACEMENT - FRONT FLOOR CONSOLE - FRONT

Removal Procedure

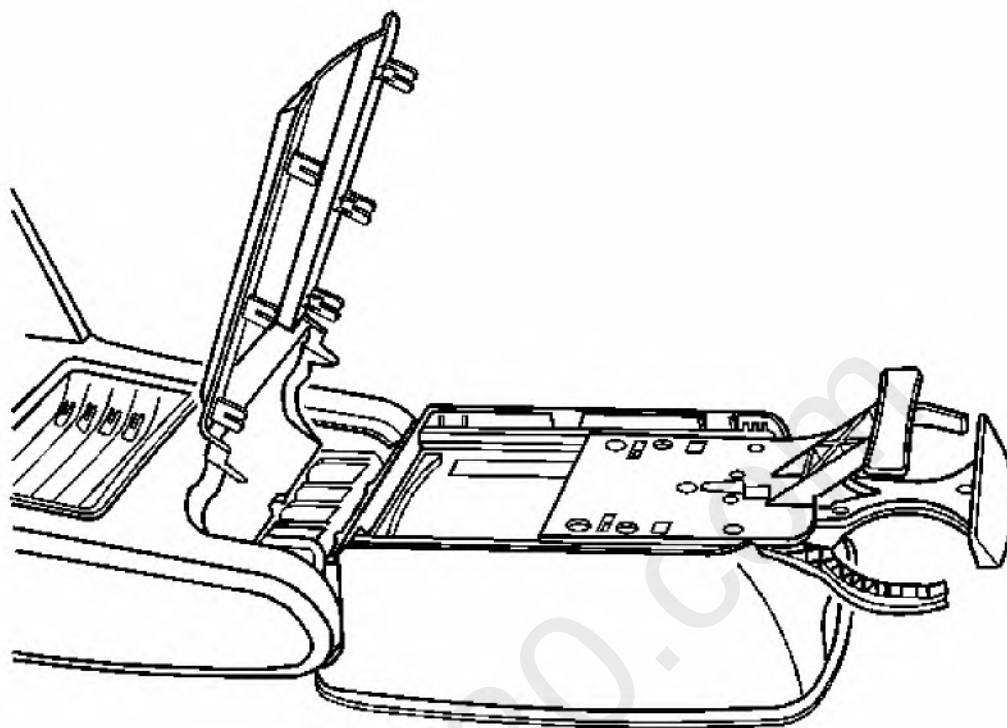


Fig. 113: Removing Cupholder Cover, Track & Holder
Courtesy of GENERAL MOTORS CORP.

1. Open the arm rest on the console.
2. Remove the cupholder cover.
3. Remove the screws from the cup holder track.
4. Remove the cup holder and the track from the console.

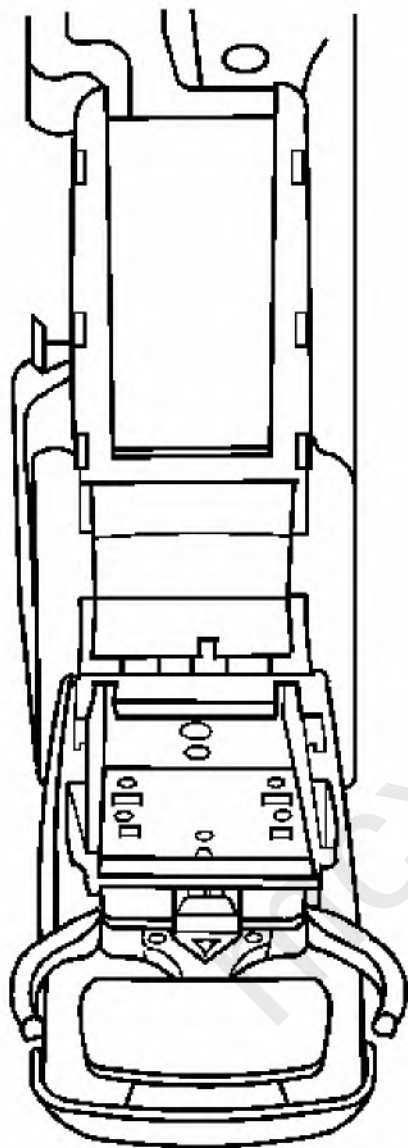


Fig. 114: View Of Front Floor Console Cup Holder
Courtesy of GENERAL MOTORS CORP.

5. Pull to separate the cup holder from the track.

Installation Procedure

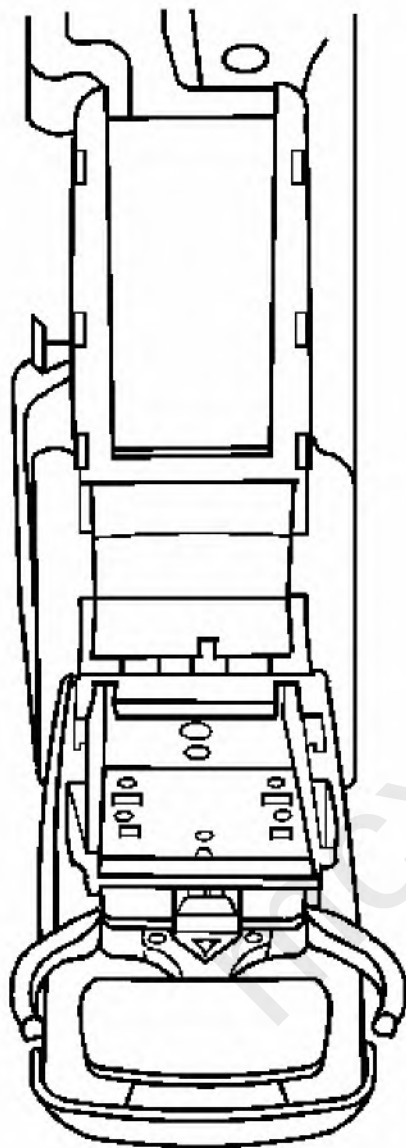


Fig. 115: View Of Front Floor Console Cup Holder
Courtesy of GENERAL MOTORS CORP.

1. Install the cup holder to the track.
2. Position the track in the console assembly.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the console track screws.

Tighten: Tighten the screw to 2.5 N.m (22 lb in).

4. Snap the cupholder cover in place.
5. Inspect the cupholder for correct operation.

CUP HOLDER REPLACEMENT - FRONT FLOOR CONSOLE - REAR

Removal Procedure

1. Pull all the way out on the cup holder.
2. Remove the screws from the cup holder track.

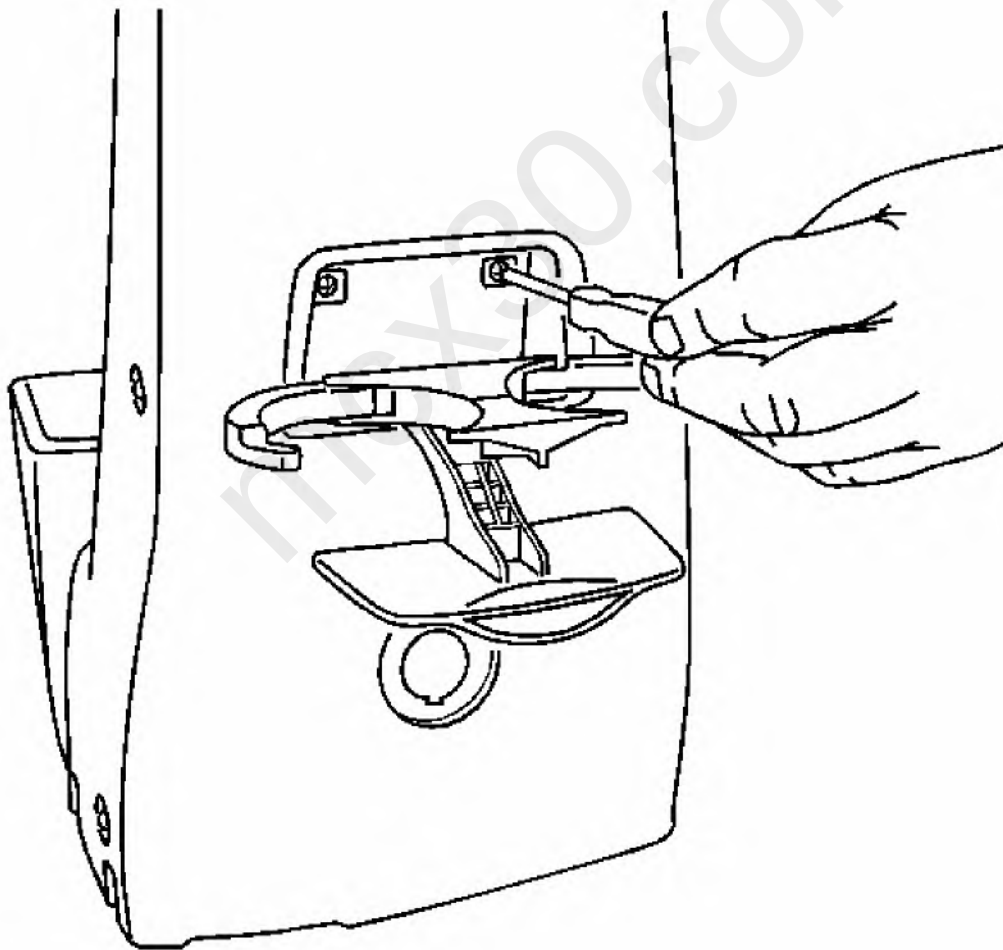


Fig. 116: Removing/Installing Rear Front Floor Console Cup Holder
Courtesy of GENERAL MOTORS CORP.

3. Remove the cup holder and the track from the console.

Installation Procedure

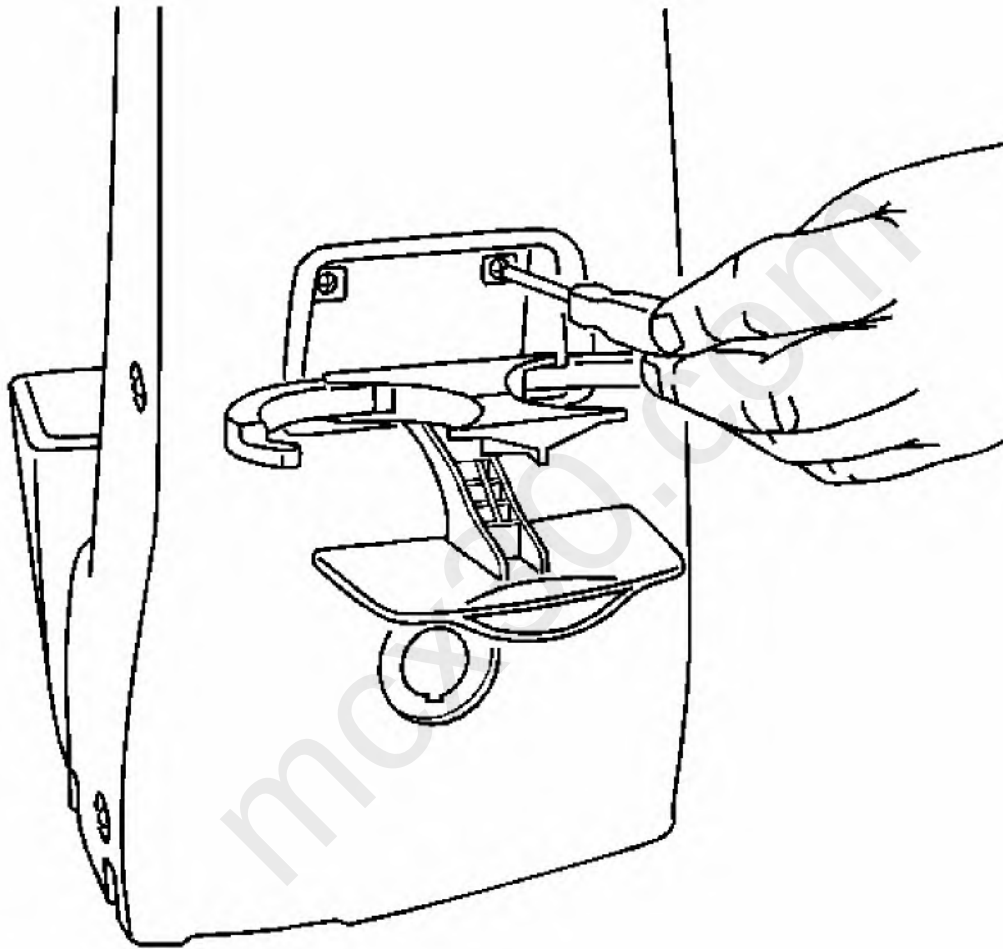


Fig. 117: Removing/Installing Rear Front Floor Console Cup Holder
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

1. Install the console track screws.

Tighten: Tighten the screw to 2.5 N.m (22 lb in).

2. Verify the rear cup holder for correct operation.

DESCRIPTION AND OPERATION

SHIFT INDICATOR DESCRIPTION AND OPERATION

The shift indicator, located in the console, displays the selected gear position. The body control module (BCM) controls the LEDs in the PRNDL display of the shift indicator through 4 control circuits. The parameters of the 4 control circuits to the shift indicator are bits A, B, C, and parity. These outputs are available for display on the scan tool. The BCM has 8 DTCs for these 4 control circuits. These DTCs diagnose a short or an open for each circuit. The BCM receives selected gear position information from the transmission control module (TCM) via serial data. The TCM receives the gear position through four inputs from the park/neutral position switch assembly.

INSTRUMENT PANEL CLUSTER (IPC) DESCRIPTION AND OPERATION

Displays Test

Certain instrument panel cluster (IPC) features are tested when the ignition is turned on in order to verify that the features are working properly. The following indicators illuminate briefly at key up:

- ABS
- Air bag-flashes 7 times
- Brake system
- Charging system
- Change Engine Oil
- DRL
- Engine Coolant Temperature
- High beam indicator
- Liftgate Ajar
- Low Fuel
- Low oil pressure indicator
- Low Traction indicator
- Malfunction indicator lamp (MIL)-Check engine
- Reduced Engine Power indicator
- Security indicator
- Service Vehicle Soon indicator
- Stability System Disabled
- Tire Pressure Monitor
- Traction Off

Indicators and Warning Messages

Refer to **Indicator/Warning Message Description and Operation**.

Engine Coolant Temperature Gage

The powertrain control module (PCM) sends coolant temperature as determined by the coolant temperature sensor to the body control module (BCM) via controller area network (CAN) serial data. The instrument panel cluster (IPC) displays the engine coolant temperature with the gage when the BCM sends a class 2 message to the IPC indicating coolant temperature percentage. The engine coolant temperature gage defaults to cold (0°) or below if:

- The PCM detects a malfunction in the engine coolant temperature sensor circuit.
- The IPC detects a loss of class 2 communications with the BCM.
- The BCM detects a loss of CAN communications with the PCM.

Fuel Gage

The PCM sends fuel level percent to the BCM via CAN serial data. The IPC displays the fuel level as determined by the BCM. The fuel gage defaults to E (empty) if:

- The PCM detects a malfunction in the fuel level sensor circuit.
- The IPC detects a loss of class 2 communications with the BCM.
- The BCM detects a loss of CAN communications with the PCM.

When the fuel level is less than a pre-determined value, the Low Fuel indicator message illuminates.

Odometer

The odometer shows how far the vehicle has been driven, in either miles (domestic) or kilometers (export). The odometer is shown on display when any of the following occur:

- Ignition is in ACC
- Ignition is in RUN, with no messages on
- The trip reset stem is pressed with the ignition OFF

Odometer readings are displayed in the IPC based on a class 2 message from the BCM. The PCM calculates the distance traveled from the vehicle speed sensor (VSS) input. The BCM receives a CAN serial data message from the PCM and stores the current mileage.

The IPC stores the last valid odometer reading from the BCM in non-volatile memory. When a new valid odometer reading is received from the BCM, the IPC will update the display and store the new reading.

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The IPC also receives class 2 messages from the BCM regarding VIN and Vehicle content information. Valid information is stored in non-volatile memory at the first key-up with a new IPC. If the VIN or option content do not match the stored information, the odometer will display ERROR.

Speedometer

The IPC displays the vehicle speed based on the information from the BCM. The PCM calculates the vehicle speed based on the CAN serial data message indicating the wheel reference speed from the electronic brake control module (EBCM). The PCM sends a CAN serial data message to the BCM indicating the vehicle speed. The BCM sends a class 2 message to the IPC indicating the vehicle speed.

The speedometer defaults to 0 km/h (0 mph) when any of the following occur:

- The EBCM detects a malfunction in the vehicle speed sensor circuit.
- The PCM detects a loss of CAN communications with the EBCM.
- The BCM detects a loss of CAN communications with the PCM.
- The IPC detects a loss of class 2 communications with the BCM.

Tachometer

The IPC displays the engine speed as determined by the BCM via a class 2 message. The PCM determines the engine speed and sends a CAN serial data message to the BCM indicating the engine speed. The tachometer will default to 0 RPM if:

- The PCM detects a malfunction in the engine speed sensor circuit.
- The BCM detects a loss of CAN communications with the PCM.
- The IPC detects a loss of class 2 communications with the BCM.

Trip Odometer

Trip odometer readings are calculated by the IPC based on the odometer reading received through a class 2 message from the BCM. The trip odometer is shown when selected with the odometer trip reset stem. To reset the trip odometer, press and hold the trip reset stem for about two seconds, until the trip odometer shows zero.

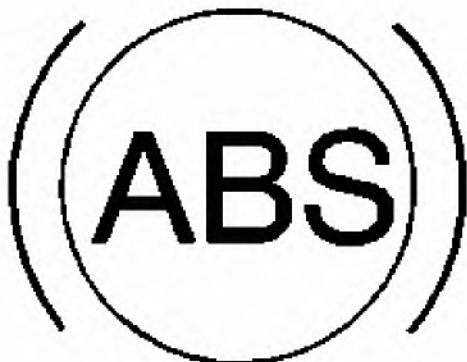
INDICATOR/WARNING MESSAGE DESCRIPTION AND OPERATION

Indicators

Symbol	Description

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ABS: Refer to **ABS Description and Operation** in Antilock Brake System



Air Bag: Refer to **SIR System Description and Operation** in SIR

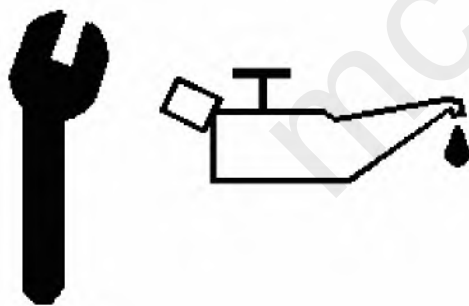
BRAKE: Refer to **Brake Warning System Description and Operation** in Hydraulic Brakes

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(Export)
BRAKE

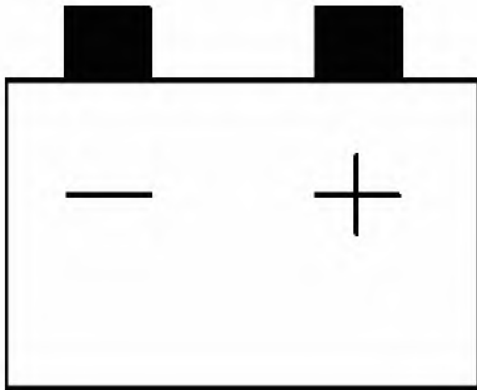


Change Engine Oil: Refer to
Indicator/Warning Message Description
and Operation

Charge: Refer to **Charging System
Description and Operation** in Engine
Electrical

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DRL: Refer to **Exterior Lighting Systems Description and Operation** in Lighting Systems

Engine Coolant Temperature: Refer to the following:

- **Cooling System Description and Operation** in Engine Cooling
- **Transmission Indicators and Messages** in Automatic Transaxle - AF33-5

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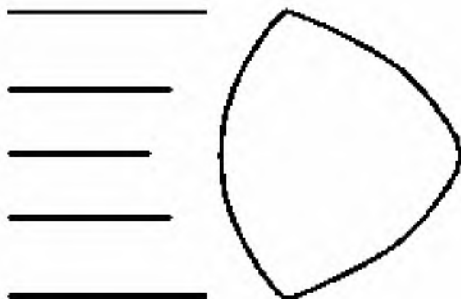
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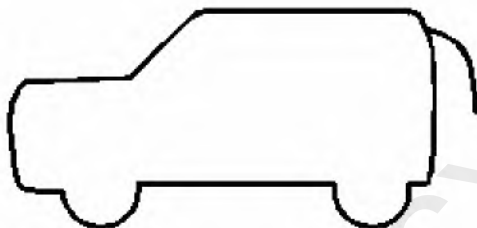
Fasten Seat Belt: Refer to **Seat Belt System Description and Operation** in Seat Belts

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High Beam: Refer to **Exterior Lighting Systems Description and Operation** in Lighting Systems

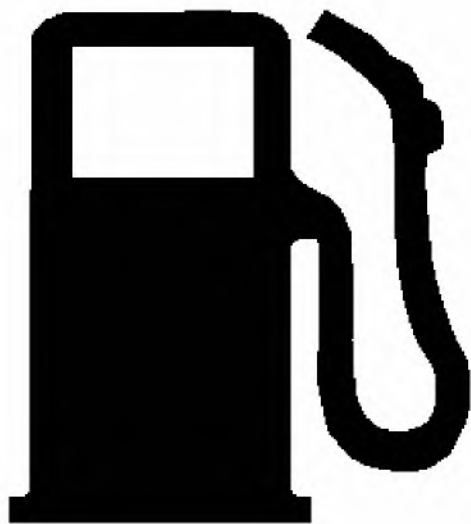


Liftgate Ajar: Refer to **Rear Hatch/Gate Description and Operation** in Body Rear End

Low Fuel: Refer to Indicator/Warning Message Description and Operation

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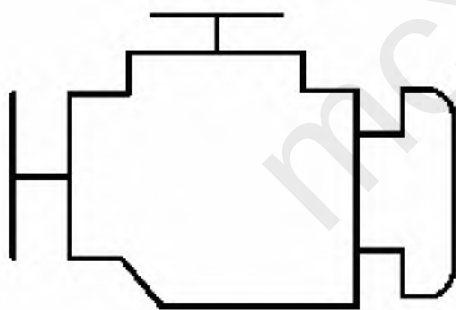


Low Oil Pressure: Refer to
Indicator/Warning Message Description
and Operation

Low Traction: Refer to **ABS Description
and Operation** in Antilock Brake System

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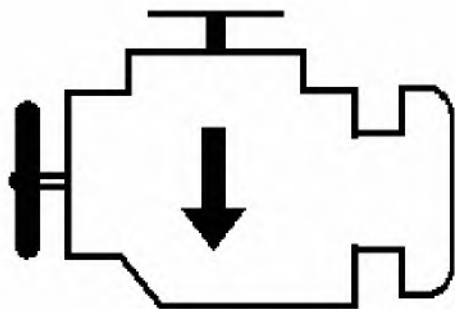


MIL: Refer to **Powertrain Control Module (PCM) Description** in Engine Controls - 3.4L

Reduced Engine Power: Refer to Indicator/Warning Message Description and Operation

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Security: Refer to **Theft Systems**
Description and Operation in Theft
Deterrent



Service Vehicle Soon: Refer to
Indicator/Warning Message Description
and Operation

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Traction Off: Refer to **ABS Description and Operation** in Antilock Brake System



Turn Signals: Refer to **Exterior Lighting Systems Description and Operation** in Lighting Systems

CHANGE ENGINE OIL

The instrument panel cluster (IPC) illuminates the CHANGE ENGINE OIL indicator when a class 2 message from the body control module (BCM) requests illumination. The BCM receives a controller area network (CAN) serial data message from the powertrain control module (PCM) when the PCM determines that the engine oil should be changed. After the oil is changed, reset the engine oil monitor. Refer to **GM Oil Life System - Resetting** in Maintenance and Lubrication.

LOW FUEL

The instrument panel cluster (IPC) illuminates the Low Fuel indicator when the IPC detects that the fuel level is less than a pre-determined value. The IPC receives a class 2 message indicating the fuel level percent from the body control module (BCM).

LOW OIL PRESSURE

The instrument panel cluster (IPC) illuminates the engine oil pressure indicator when the powertrain control module (PCM) detects low engine oil pressure, and the signal circuit is low. The PCM sends a controller area network (CAN) serial data message to the body control module (BCM) indicating low engine oil pressure. The BCM sends a class 2 message to the IPC requesting illumination when the engine oil pressure is low.

REDUCED ENGINE POWER

The instrument panel cluster (IPC) illuminates the REDUCED POWER indicator when a class 2 message from the body control module (BCM) requests illumination. The BCM receives a controller area network (CAN) serial data message from the powertrain control module (PCM) when the PCM determines that a certain amount of engine power has been lost.

SERVICE VEHICLE SOON

The instrument panel cluster (IPC) illuminates the service vehicle soon indicator during any of the following conditions:

- The body control module (BCM) detects a security failure. The BCM sends a class 2 message to the IPC requesting illumination.
- The BCM detects a malfunction in the passive trunk release system. The BCM sends a class 2 message to the IPC requesting illumination.
- The BCM detects a failure in the traction control system. The BCM sends a class 2 message to the IPC requesting illumination.
- The IPC detects a mismatch between its part number and the vehicle platform configuration sent by the BCM via a class 2 message.
- The IPC receives a class 2 message from the BCM when certain malfunctions that are not related to the emissions system are detected.

AUDIBLE WARNINGS DESCRIPTION AND OPERATION

The audible warnings alert the driver of a system concern or a critical vehicle condition. The body control module (BCM) generates the audible warnings. The BCM receives audible warning requests via the class 2 serial data line or the controller area network (CAN) data line. If the BCM receives multiple audible warning requests, the warning with the highest priority sounds first. The following lists the audible warning priority and the pulse rate:

1. Fast rate chime-200 pulses per minute

2. Medium rate chime-150 pulses per minute
3. Slow rate chime-50 pulses per minute
4. Single chime

Fasten Safety Belt Warning

The BCM activates the fasten safety belt audible warning as requested by the sensing and diagnostic module (SDM). The SDM sends a class 2 message to the BCM. The fasten safety belt warning sounds and the fasten safety belt indicator illuminates when the following occurs:

- The ignition switch transitions to ON.
- The inflatable restraint SDM detects that the driver seat belt is not buckled and or the signal is low. The BCM receives a class 2 message from the SDM indicating the driver seat belt status.

If the seat belt is buckled when the ignition is turned ON, the chime does not sound. If the seat belt is buckled while the chime is sounding, the chime stops. If the seat belt is unbuckled after the initial transition to ON, the chime does not sound.

Key in Ignition Warning

The BCM monitors the signal circuit of the ignition switch. The BCM activates the key-in-ignition audible warning. The key-in-ignition warning sounds when the following occurs:

- The ignition switch is OFF.
- The BCM determines that the driver door is open and the signal circuit is low.
- The BCM determines that the key-in-ignition switch is closed and the signal circuit is low.

Lights On Warning

The BCM activates the lights on warning. The BCM chimes a frequency of a fast rate and a continuous duration. The lights on warning sounds when the following occurs:

- The ignition is OFF.
- The BCM determines that the driver door is open and the signal circuit is low.
- The BCM determines that the headlamp switch is in the park or head position.

Park Brake Warning

The BCM activates the park brake audible warning. The park brake warning sounds and the BRAKE indicator illuminates when the following occurs:

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- The ignition is ON.
- The vehicle speed is greater than 5 km/h (3.1 mph). The BCM receives a CAN serial message from the ECM indicating the vehicle speed.
- The BCM determines that the park brake is engaged and the signal circuit is low.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/ Description
	J 33431-C Signal Generator and Instrument Panel Tester