

## 2004 ACCESSORIES & EQUIPMENT

### Wipers/Washer Systems - Vue

## SPECIFICATIONS

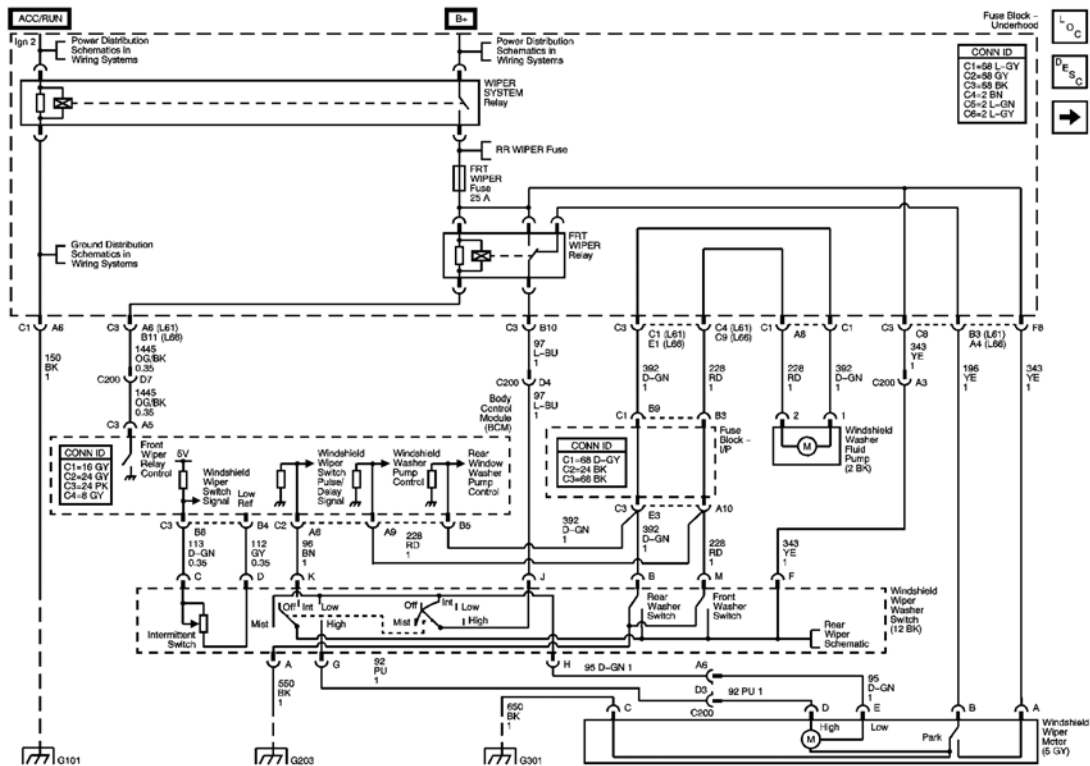
### FASTENER TIGHTENING SPECIFICATIONS

#### Fastener Tightening Specifications

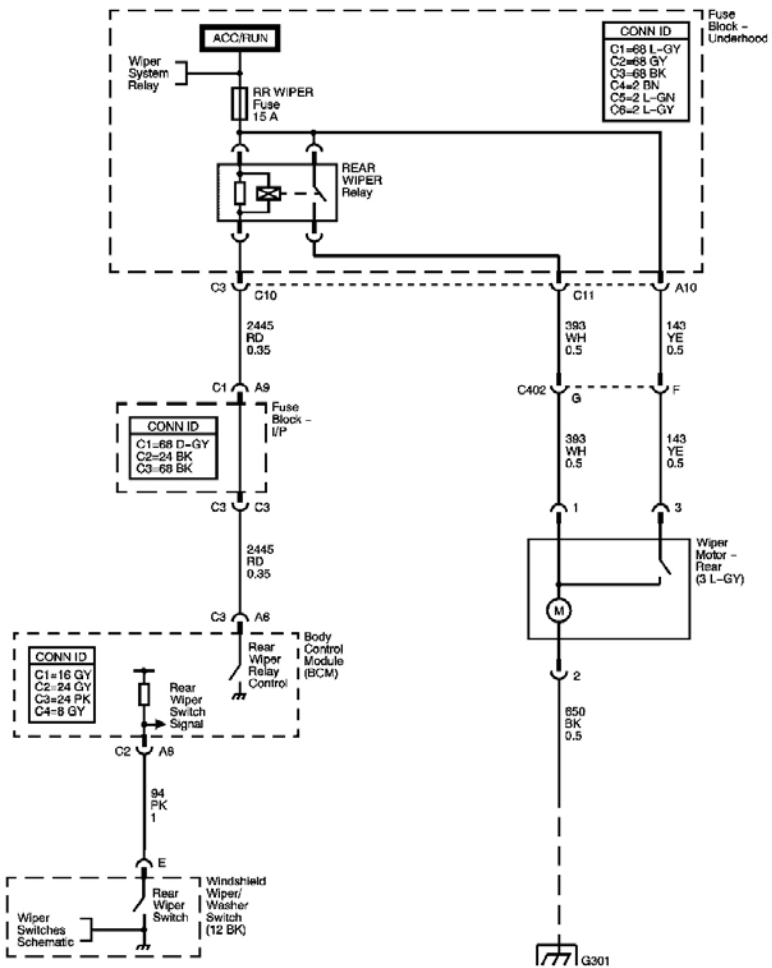
Application	Specification	
	Metric	English
Coolant Surge Tank Bolts	6 N.m	53 lb in
Washer Solvent Container Screws	2.5 N.m	22 lb in
Wiper Arm Retaining Nut - Front	27 N.m	20 lb in
Wiper Arm Retaining Nut - Rear	27 N.m	20 lb ft
Wiper Module Bolts - Front	12 N.m	9 lb ft
Wiper Module Bolts - Rear	7 N.m	62 lb in
Wiper Motor to Crank Nut	14 N.m	10 lb ft
Wiper Motor to Module Bolts	8 N.m	71 lb in

## SCHEMATIC AND ROUTING DIAGRAMS

### WIPER/WASHER SYSTEM SCHEMATICS



**Fig. 1: View Of Wiper/Washer Schematics**  
 Courtesy of GENERAL MOTORS CORP.



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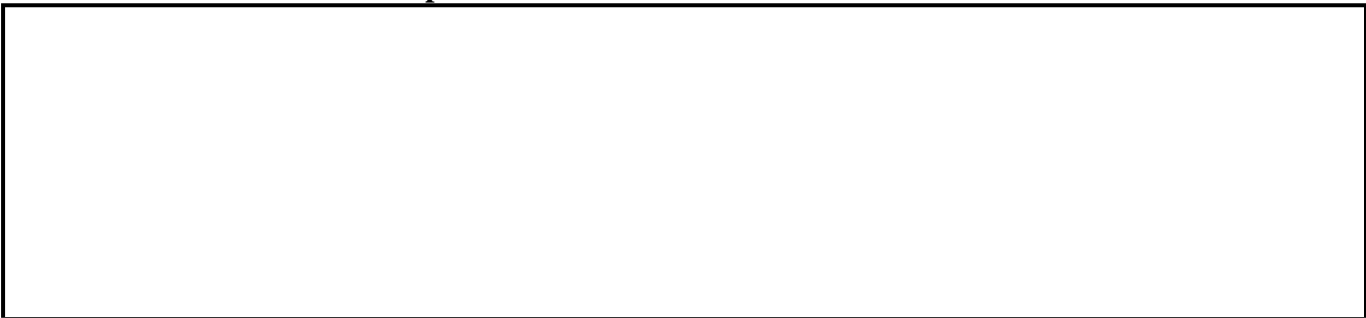
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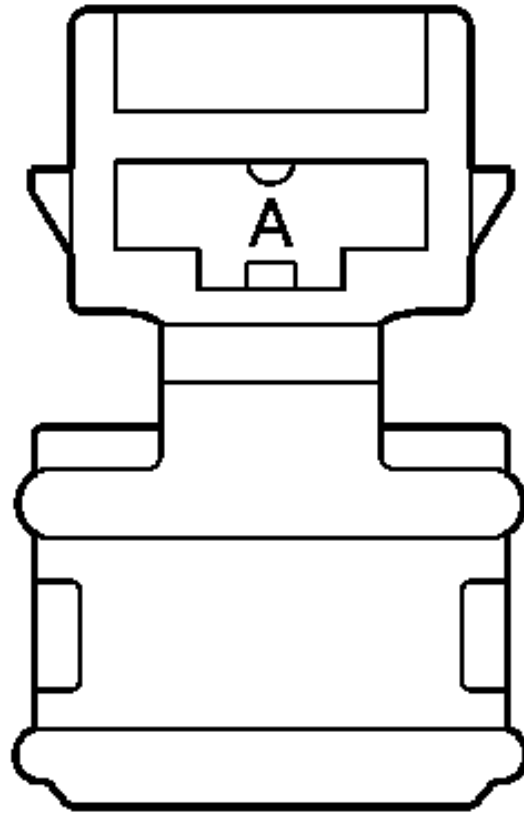
**Fig. 2: View Of Rear Wiper Motor and Switch**  
 Courtesy of GENERAL MOTORS CORP.

## COMPONENT LOCATOR

### WIPER/WASHER SYSTEM CONNECTOR END VIEWS

#### Windshield Washer Fluid Pump Connector End View





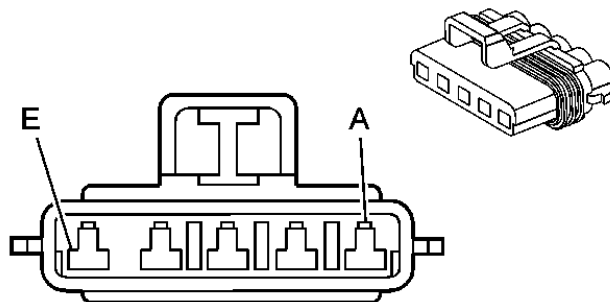
**Connector Part Information**

- 15305325
- 2-Way F Mini Timer (BK)

Pin	Wire Color	Circuit Number	Function
1	D-GN	392	Rear Window Washer Pump Control
2	RD	228	Windshield Washer Pump Control

**Windshield Wiper Motor Connector End View**



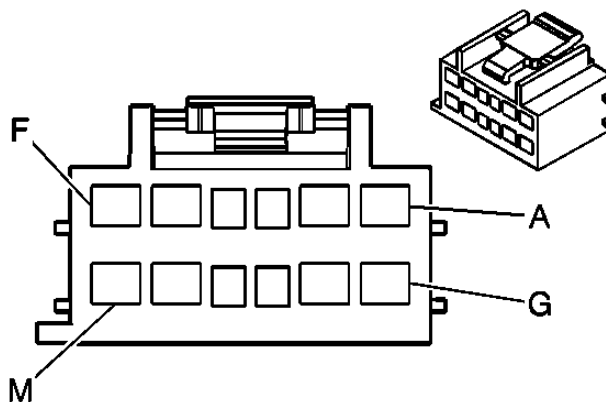


**Connector Part Information**

- 12084891
- 5-Way F Metri-Pack 280 Series Sealed (GY)

Pin	Wire Color	Circuit Number	Function
A	YE	343	Accessory Voltage
B	YE	196	Windshield Wiper Motor Park Switch Signal
C	BK	650	Ground
D	PU	92	Windshield Wiper Motor High Speed
E	D-GN	95	Windshield Wiper Motor Low Speed

**Windshield Wiper/Washer Switch Connector End View**



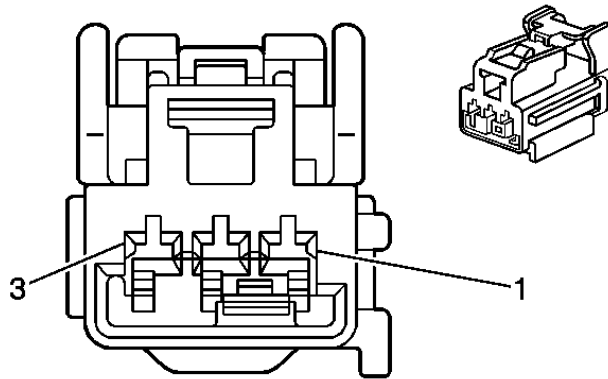
**Connector Part Information**

- 15336888
- 12-Way F GT 150 280 (BK)

Pin	Wire Color	Circuit Number	Function
A	BK	550	Ground
B	D-GN	392	Rear Window Washer Pump Control

C	D-GN	113	Windshield Wiper Switch Signal
D	GY	112	Low Reference
E	PK	94	Rear Wiper Switch Signal
F	YE	343	Accessory Voltage
G	PU	92	Windshield Wiper Motor High Speed
H	D-GN	95	Windshield Wiper Motor Low Speed
J	L-BU	97	Windshield Wiper Switch Mist/Off/Low Signal
K	BN	96	Windshield Wiper Switch Pulse Delay Signal
L	-	-	Not Used
M	RD	228	Windshield Washer Pump Control

### Wiper Motor - Rear Connector End View



<b>Connector Part Information</b>		<ul style="list-style-type: none"> <li>• 7283-5539-40</li> <li>• 3-Way F (L-GY)</li> </ul>	
<b>Pin</b>	<b>Wire Color</b>	<b>Circuit Number</b>	<b>Function</b>
1	WH	393	Rear Window Wiper Motor Control
2	BK	650	Ground
3	YE	143	Accessory Voltage

## DIAGNOSTIC INFORMATION AND PROCEDURES

### DIAGNOSTIC STARTING POINT - WIPER/WASHER SYSTEMS

Begin wiper/washer system diagnosis with the **Diagnostic System Check - Wiper/Washer** . 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 diagnostic trouble codes (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.

## DIAGNOSTIC SYSTEM CHECK - WIPER/WASHER

### Test Description

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

**2:** Lack of communication may be due to a partial malfunction of the class 2 serial data circuit or due to a total malfunction of the class function of the class 2 serial data circuit. The specified procedure will determine the particular condition.

**4:** The presence of DTCs which began with U indicate some other module is not communicating. The specified procedure will compile all the available information before tests are performed.

### Diagnostic System Check - Wiper/Washer

Step	Action	Yes	No
1	Install a scan tool. Does the scan tool power up?	Go to <b>Step 2</b>	Go to <b>Scan Tool Does Not Power Up</b> in Data Link Communications
2	1. Turn ON the ignition, with the engine OFF. 2. Attempt to establish communication with the body control module (BCM).  Does the scan tool communicate with the body control module?	Go to <b>Step 3</b>	Go to <b>Scan Tool Does Not Communicate with Class 2 Device</b> in Data Link Communications
3	Select the display DTCs function on the scan tool for the BCM. Does the scan tool display any DTCs?	Go to <b>Step 4</b>	Go to <b>Symptoms - Wiper/Washer Systems</b>
4	Does the scan tool display any DTCs which begin with a "U"?	Go to <b>Scan Tool Does Not Communicate with Class 2 Device</b> in Data Link Communications	Go to <b>Step 5</b>
5	Does the scan tool display DTC B1000, B1001, B1372, or B1382?	Go to <b>Diagnostic Trouble Code (DTC) List</b> in Body Control System	Go to <b>Step 6</b>
6	Does the scan tool display DTC B1327 or B1328?	Go to <b>Diagnostic Trouble Code (DTC) List</b> in Engine Electrical	Go to <b>Diagnostic Trouble Code (DTC) List</b>

## SCAN TOOL OUTPUT CONTROLS

### Body Control Module (BCM) Scan Tool Output Controls

Scan Tool Output Control	Additional Menu Selection (s)	Description
Wiper Test	Front Wiper Relay	The wiper switch has to be in the Low position for this output control to function. The BCM actuates the Wiper relay when ON is selected. The front wiper should operate at low speed.
Wiper Test	Rear Wiper Relay	The wiper switch has to be in the Low position for this output control to function. The BCM actuates the Wiper relay when ON is selected. The rear wiper should operate at low speed.

## SCAN TOOL DATA LIST

### Wiper/Washer Scan Tool Data List

Scan Tool Parameter	Units Displayed	Typical Data Value
<b>Operating Conditions: Ignition in Run, Engine OFF, All Doors Closed, Park Brake Applied (DRLs OFF)</b>		
Battery 1	Volts	Varies
Front Washer Motor Input	On/Off	Off
Front Wiper Delay Switch	On/Off	Off
Front Wiper Delay Relay Cmd.	On/Off	Off
Front Wiper Delay Relay Fdbk.	High/Low	High
Rear Washer Motor Input	On/Off	Off
Rear Wiper Switch	On/Off	Off
Rear Wiper Relay Cmd.	On/Off	Off
Rear Wiper Relay Fdbk.	High/Low	High
Wiper Delay 1	Yes/No	Varies
Wiper Delay 2	Yes/No	Varies
Wiper Delay 3	Yes/No	Varies
Wiper Delay Input	Volts	Varies

## SCAN TOOL DATA DEFINITIONS

### Front Washer Motor Input

The scan tool displays On/Off. This input displays On when the front washer spray is on.

### Front Wiper Relay Cmd.

The scan tool displays On/Off. The body control module will indicate if it is commanding the front wiper relay On or Off.



### **Front Wiper Relay Fdbk.**

The scan tool displays High/Low. This input to the BCM displays the state of the front wiper relay feedback circuit. Low is displayed when the BCM is providing a ground to the front wiper relay control circuit.

### **Front Wiper Switch**

The scan tool displays On/Off. This input displays On when the front wipers are on.

### **Rear Washer Motor Input**

The scan tool displays On/Off. This input displays On when the rear washer spray is on.

### **Rear Wiper Relay Cmd.**

The scan tool displays On/Off. The body control module will indicate if it is commanding the rear wiper relay On or Off.

### **Rear Wiper Relay Fdbk.**

The scan tool displays High/Low. This input to the BCM displays the state of the rear wiper relay feedback circuit. Low is displayed when the BCM is providing a ground to the rear wiper relay control circuit.

### **Rear Wiper Switch**

The scan tool displays On/Off. This input displays On when the rear wipers are on.

### **Wiper Delay 1**

The scan tool displays Yes/No. This input to the body control module displays the state of the wiper delay switch.

### **Wiper Delay 2**

The scan tool displays Yes/No. This input to the body control module displays the state of the wiper delay switch.

### **Wiper Delay 3**

The scan tool displays Yes/No. This input to the body control module displays the state of the wiper delay switch.

### **Wiper Delay Input**

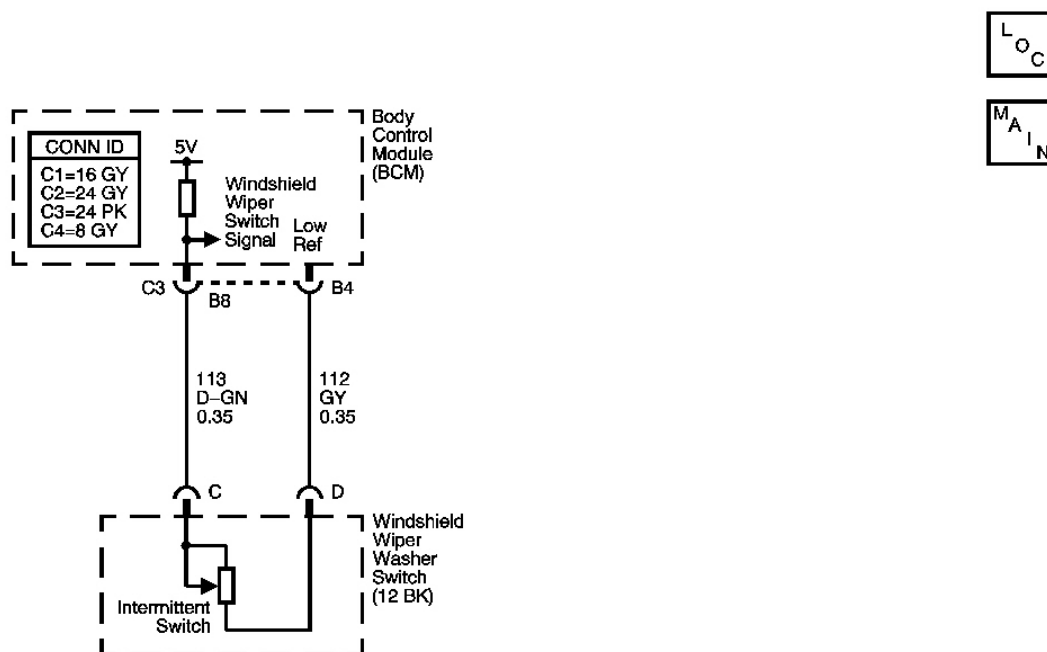
The scan tool displays volts. This input displays the voltage supplied to the body control module.

## DIAGNOSTIC TROUBLE CODE (DTC) LIST

### Diagnostic Trouble Code (DTC) List

DTC	Diagnostic Procedure	Module(s)
B3702	<b><u>DTC B3702</u></b>	BCM
B3703	<b><u>DTC B3703</u></b>	BCM
B3708	<b><u>DTC B3708</u></b>	BCM
B3713	<b><u>DTC B3713</u></b>	BCM
B3717	<b><u>DTC B3715, B3716, B3717, B3718, or B3719</u></b>	BCM
B3718	<b><u>DTC B3715, B3716, B3717, B3718, or B3719</u></b>	BCM
B3722	<b><u>DTC B3722</u></b>	BCM
B3723	<b><u>DTC B3723</u></b>	BCM

### DTC B3702



**Fig. 3: DTC B3702 Circuit**

Courtesy of GENERAL MOTORS CORP.

### Circuit Description

The intermittent switch in the windshield wiper washer switch is a voltage divider connected across the body

control module (BCM) inputs circuit 113 and circuit 112. The wiper relay is energized by the BCM switching circuit 1445 to ground depending on delay switch position.

The intermittent wiper delay switch has three switch positions.

- Delay 1 (500 ohms resistance)
- Delay 2 (1000 ohms resistance)
- Delay 3 (2000 ohms resistance)

Refer to **Wiper/Washer System Description and Operation** for the timing of each delay position.

#### **Conditions for Running the DTC**

Ignition is in RUN or ACC position.

#### **Conditions for Setting the DTC**

Circuit 113 shorted to ground or less than 0.20 volts.

#### **Actions Taken When the DTC Sets**

- No light will illuminate in I/P.
- Cannot vary wiper speed.
- B3702 is set in BCM.

#### **Conditions for Clearing the DTC**

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

#### **Diagnostic Aids**

- Inspect wiring harness for damage. Check for broken or chaffed insulation.
- If fault is suspected to be intermittent, wiggling harness wiring may help in locating fault.
- Check for poor connection at the BCM. Inspect harness connectors for backed out terminals, improper terminal mating, broken connector locks, improperly formed or damaged terminals and poor terminal-to-wire connection (terminal crimped over wire insulation and not conductors).

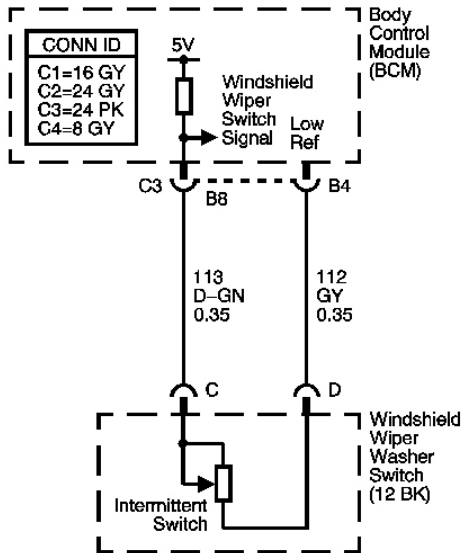
#### **DTC B3702 Circuit**

<b>Step</b>	<b>Action</b>	<b>Yes</b>	<b>No</b>
<b>Connector End View Reference: Master Electrical Component List in Wiring Systems</b>			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b><u>Diagnostic System Check - Wiper/Washer</u></b>

2	<ol style="list-style-type: none"> <li>1. Turn ON the ignition, with the engine OFF.</li> <li>2. With a scan tool, observe the wiper delay input in the body control module (BCM) wiper/washer data list.</li> </ol> <p>Is the voltage less than 0.4 volts?</p>	Go to <b>Step 3</b>	Go to Diagnostic Aids
3	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the windshield wiper washer switch.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. With a scan tool, observe the wiper delay input in the body control module (BCM) wiper/washer data list.</li> </ol> <p>Is the voltage greater than 4.5 volts?</p>	Go to <b>Step 6</b>	Go to <b>Step 4</b>
4	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the BCM connector C3.</li> <li>3. Check continuity between the windshield wiper switch signal circuit and ground, then between the windshield wiper switch signal circuit, and the windshield wiper switch low reference circuit.</li> </ol> <p>Is there continuity?</p>	Go to <b>Step 5</b>	Go to <b>Step 7</b>
5	<p>Repair a short to ground in the windshield wiper switch signal circuit or windshield wiper switch low reference circuit. Refer to <b>Wiring Repairs</b> or <b>Connector Repairs</b> in Wiring Systems.</p> <p>Did you complete the repair?</p>	Go to <b>Step 8</b>	-
6	<p>Replace the windshield wiper washer switch. Refer to <b>Multifunction, Turn Signal Switch Replacement</b> in Steering Wheel and Column.</p> <p>Did you complete the replacement?</p>	Go to <b>Step 8</b>	-
7	<p><b>IMPORTANT:</b> <b>Perform the programming or set up procedure for the replaced control module if required.</b></p> <p>Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure. Did you complete the replacement?</p>	Go to <b>Step 8</b>	-
8	<ol style="list-style-type: none"> <li>1. Use the scan tool to clear the DTCs.</li> <li>2. Operate the vehicle within the conditions for running the DTC as specified in the supporting text.</li> </ol> <p>Does the DTC reset?</p>	Go to <b>Step 2</b>	System OK

LOC

MAIN



**Fig. 4: DTC B3703 Circuit**  
 Courtesy of GENERAL MOTORS CORP.

### Circuit Description

The intermittent switch in the windshield wiper washer switch is a voltage divider connected across the body control module (BCM) inputs circuit 113 and circuit 112. The wiper relay is energized by the BCM switching circuit 1445 to ground depending on delay switch position.

The intermittent wiper delay switch has three switch positions.

- Delay 1 (500 ohms resistance)
- Delay 2 (1000 ohms resistance)
- Delay 3 (2000 ohms resistance)

Refer to **Wiper/Washer System Description and Operation** for the timing of each delay position.

### Conditions for Running the DTC

Ignition is in RUN or ACC position.

### Conditions for Setting the DTC

- Circuit 113 greater than 4.71 volts (open or shorted to voltage).

- Circuit 112 is open.

### Actions Taken When the DTC Sets

- No light will illuminate in I/P.
- Cannot vary wiper speed.

### Conditions for Clearing the DTC

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

### Diagnostic Aids

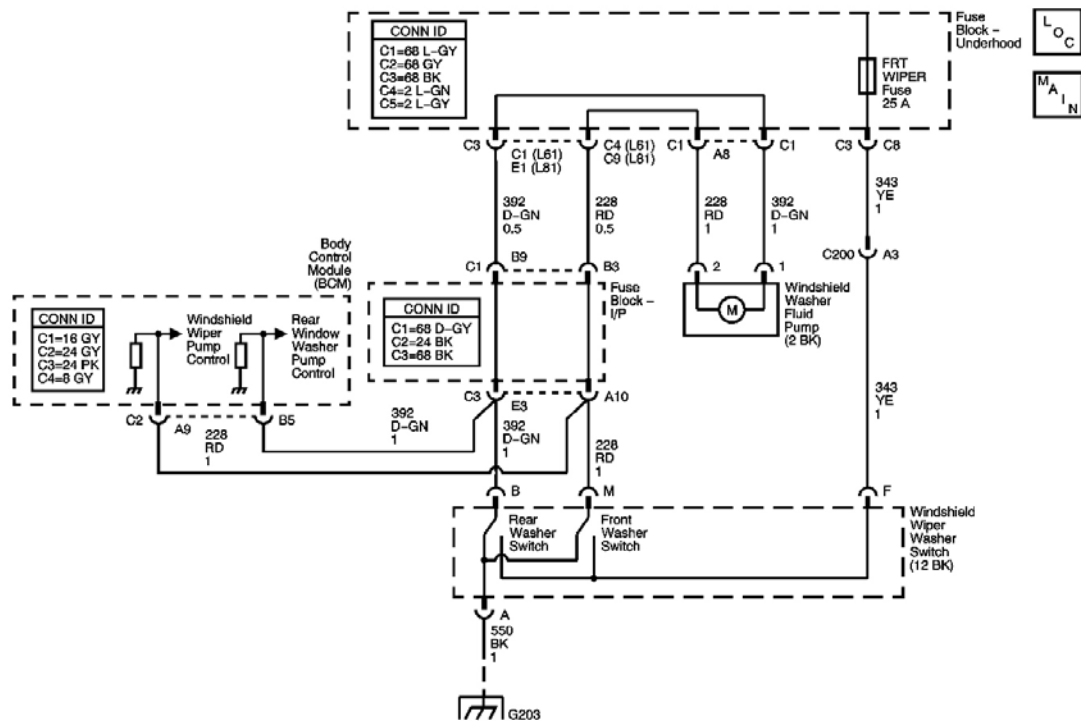
- Inspect wiring harness for damage. Check for broken or chaffed insulation.
- If fault is suspected to be intermittent, wiggling harness wiring may help in locating fault.
- Check for poor connection at the BCM. Inspect harness connectors for backed out terminals, improper terminal mating, broken connector locks, improperly formed or damaged terminals and poor terminal-to-wire connection (terminal crimped over wire insulation and not conductors).

### DTC B3703 Circuit

Step	Action	Yes	No
<b>Connector End View Reference: Master Electrical Component List in Wiring Systems</b>			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b>Diagnostic System Check - Wiper/Washer</b>
2	1. Turn ON the ignition, with the engine OFF. 2. With a scan tool, observe the wiper delay input in the body control module (BCM) wiper/washer data list.  Is the voltage greater than 4.71 volts?	Go to <b>Step 3</b>	Go to Diagnostic Aids
3	1. Turn OFF the ignition. 2. Disconnect the windshield wiper washer switch. 3. Turn ON the ignition, with the engine OFF. 4. Measure voltage between the windshield wiper switch signal circuit and the windshield wiper switch low reference circuit at the harness connector.  Is the voltage less than 4 volts?	Go to <b>Step 4</b>	Go to <b>Step 5</b>
4	Measure voltage on the windshield wiper switch signal circuit to ground. Is the voltage between 4-6 volts?	Go to <b>Step 7</b>	Go to <b>Step 8</b>
	Is voltage between 4-6 volts?	Go to	

5		<b>Step 6</b>	Go to <b>Step 9</b>
6	Using a fused jumper, jumper the windshield wiper switch signal circuit to the windshield wiper switch low reference circuit at harness connector. Is the voltage less than 0.4 volts?	Go to <b>Step 11</b>	Go to <b>Step 10</b>
7	Test the windshield wiper switch low reference circuit for an open. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 12</b>	Go to <b>Step 10</b>
8	Test the windshield wiper switch signal circuit for an open. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 12</b>	Go to <b>Step 10</b>
9	Test the windshield wiper switch signal circuit for a short to voltage. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 12</b>	Go to <b>Step 10</b>
10	<b>IMPORTANT:</b> <b>Perform the programming or set up procedure for the replaced control module if required.</b>  Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure. Did you complete the replacement?	Go to <b>Step 12</b>	-
11	Replace the windshield wiper washer switch. Refer to <b>Multifunction, Turn Signal Switch Replacement</b> in Steering Wheel and Column. Did you complete the replacement?	Go to <b>Step 12</b>	-
12	1. Use the scan tool 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 <b>Step 2</b>	System OK

## DTC B3708



**Fig. 5: DTC B3708 Circuit**  
**Courtesy of GENERAL MOTORS CORP.**

### Circuit Description

The body control module (BCM) monitors the windshield washer pump control circuit 228. When a front windshield wash is requested for more than two minutes, circuit 228 at battery voltage, the BCM will turn OFF the windshield washer pump if the front wiper is NOT requested by the wiper switch.

Battery voltage for the windshield washer pump is supplied through the front wiper fuse and windshield wiper washer switch. Grounding for the windshield washer pump is through circuit 550 or through the OFF position of the rear washer switch, when equipped.

### Conditions for Running the DTC

Ignition is in RUN or ACC position.

### Conditions for Setting the DTC

Front windshield washer pump control circuit 228 shorted to battery voltage for two minutes.

### Actions Taken When the DTC Sets

- No light will illuminate in I/P.



- Default turn OFF washer motor after failing DTC if wiper input is not active.

### Conditions for Clearing the DTC

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

### Diagnostic Aids

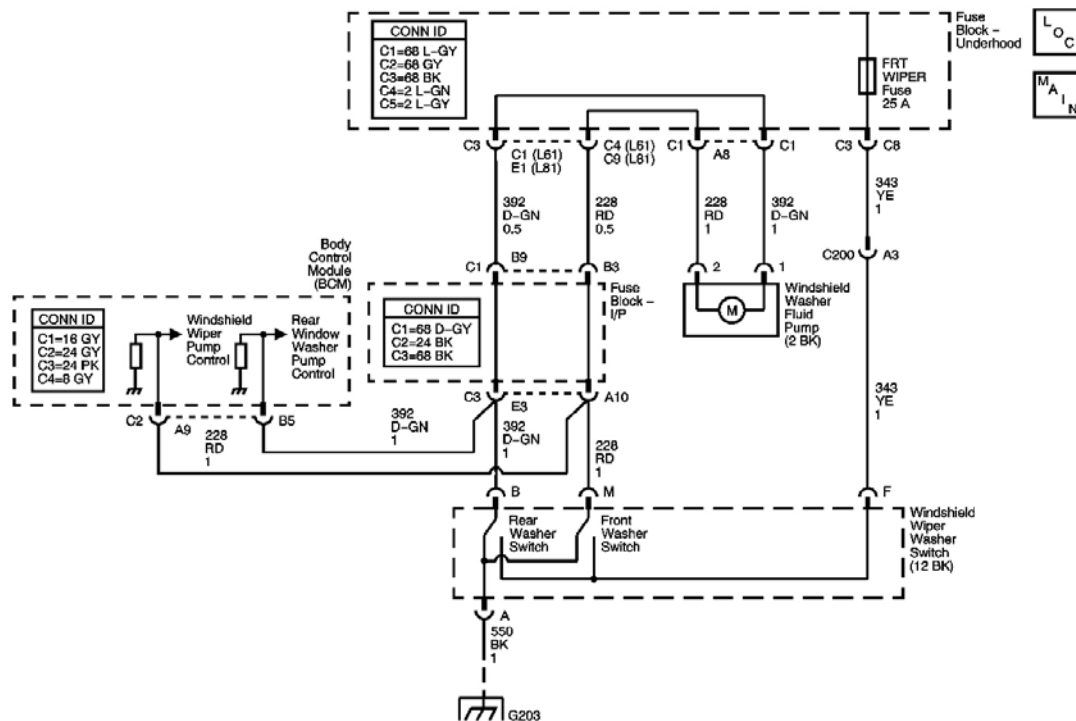
- Check for poor connection at the BCM. Inspect harness connectors for backed out terminals, improper terminal mating, broken connector locks, improperly formed or damaged terminals and poor terminal-to-wire connection, terminal crimped over wire insulation and not conductors.
- Inspect wiring harness for damage. Check for broken or chaffed insulation.
- If fault is suspected to be intermittent, wiggling harness wiring may help in locating fault.

### DTC B3708 Circuit

Step	Action	Yes	No
<b>Connector End View Reference: Master Electrical Component List</b> in Wiring Systems			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b>Diagnostic System Check - Wiper/Washer</b>
2	<ol style="list-style-type: none"> <li>1. Turn ON the ignition, with the engine OFF.</li> <li>2. With a scan tool, observe the front washer motor input in the body control module (BCM) wiper/washer data list, while cycling the front washer switch.</li> </ol> Does the scan tool indicate correct washer pump status, ON/OFF?	Go to Diagnostic Aids	Go to <b>Step 3</b>
3	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the windshield wiper washer switch.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. With a scan tool, observe the front washer motor input.</li> </ol> Does the scan tool indicate switch is OFF?	Go to <b>Step 5</b>	Go to <b>Step 4</b>
4	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the BCM connector C2.</li> <li>3. Test the windshield washer pump control circuit for a short to voltage. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems.</li> </ol>		

	Did you find and correct the condition?	Go to <b>Step 7</b>	Go to <b>Step 6</b>
5	Replace the windshield wiper washer switch. Refer to <b>Multifunction, Turn Signal Switch Replacement</b> in Steering Wheel and Column. Did you complete the replacement?	Go to <b>Step 7</b>	-
6	<b>IMPORTANT:</b> Perform the programming or set up procedure for the replaced control module if required.  Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure. Did you complete the replacement?	Go to <b>Step 7</b>	-
7	1. Use the scan tool 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 <b>Step 2</b>	System OK

### DTC B3713



**Fig. 6: DTC B3713 Circuit**  
Courtesy of GENERAL MOTORS CORP.

## Circuit Description

The body control module (BCM) monitors the rear window washer pump control circuit 392. When a rear windshield wash is requested for more than two minutes, circuit 392 at battery voltage, the BCM will turn OFF the windshield washer fluid pump motor if the rear wiper is NOT requested by the windshield wiper washer switch.

Power for the windshield washer fluid pump is supplied through the front wiper fuse and windshield wiper washer switch. Grounding for the windshield washer fluid pump is through the OFF position of the windshield washer fluid pump.

## Conditions for Running the DTC

Ignition is in RUN or ACC position.

## Conditions for Setting the DTC

Rear window washer pump control circuit 392 at battery voltage for two minutes.

## Actions Taken When the DTC Sets

No light will illuminate in I/P.

## Conditions for Clearing the DTC

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

## Diagnostic Aids

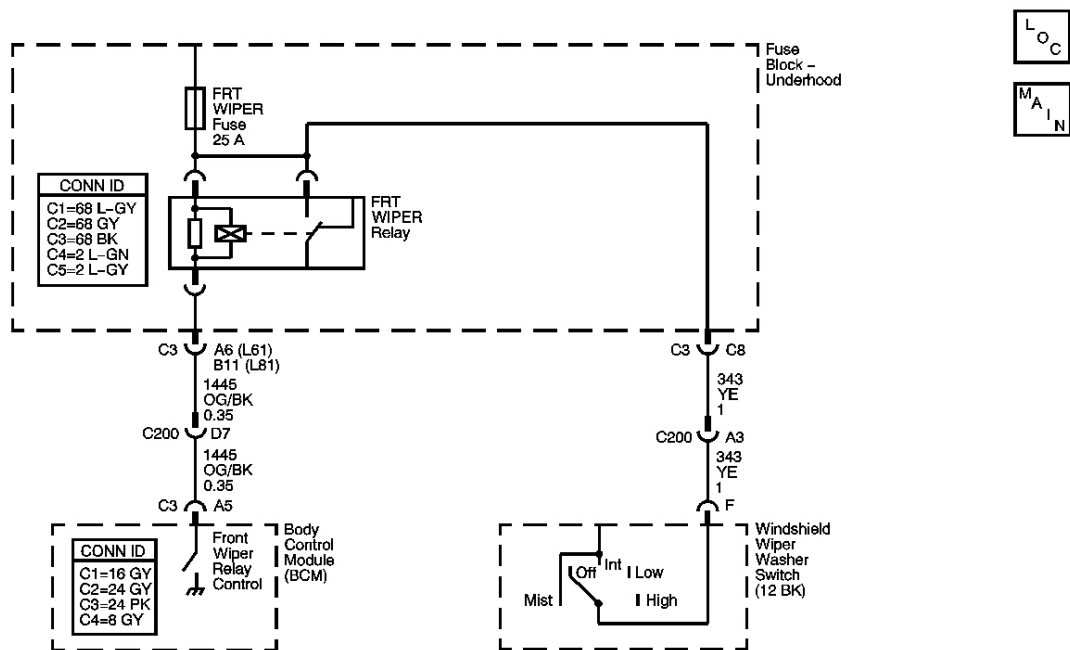
- Inspect wiring harness for damage. Check for broken or chaffed insulation.
- If fault is suspected to be intermittent, wiggling harness wiring may help in locating fault.

## DTC B3713 Circuit

Step	Action	Yes	No
<b>Connector End View Reference: Master Electrical Component List</b> in Wiring Systems			
1	Did you perform the Wiper/Washer Diagnostic System Check for the system exhibiting the symptom?	Go to <b>Step 2</b>	Go to <b>Diagnostic System Check - Wiper/Washer</b>
2	<ol style="list-style-type: none"><li>1. Turn ON the ignition, with the engine OFF.</li><li>2. With a scan tool, observe the rear washer motor input in the body control module (BCM) wiper/washer data list, while cycling the rear washer switch.</li></ol>	Go to	

	Does the scan tool indicate correct washer pump status, ON/OFF?	Diagnostic Aids	Go to <b>Step 3</b>
3	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the windshield wiper washer switch.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. With a scan tool, observe the rear washer motor input.</li> </ol>		
	Does the scan tool indicate switch is OFF?	Go to <b>Step 4</b>	Go to <b>Step 5</b>
4	<p>Using a fused jumper, jumper the windshield wiper washer switch power circuit to the front washer switch circuit and jumper the rear window washer switch circuit to the windshield wiper washer switch ground circuit at the wiper switch harness connector.</p>		
	Does the washer pump motor run?	Go to <b>Step 7</b>	Go to <b>Step 6</b>
5	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the BCM connector C2.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. Test the front washer switch circuit and the rear washer switch circuit for a short to voltage. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems.</li> </ol>		
	Did you find and correct the condition?	Go to <b>Step 9</b>	Go to <b>Step 8</b>
6	<p>Repair an open in the rear window washer switch circuit or the windshield wiper washer switch ground circuit. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems.</p>		
	Did you complete the repair?	Go to <b>Step 9</b>	-
7	<p>Replace the windshield wiper washer switch. Refer to <b>Multifunction, Turn Signal Switch Replacement</b> in Steering Wheel and Column.</p>		
	Did you complete the replacement?	Go to <b>Step 9</b>	-
8	<p><b>IMPORTANT:</b> Perform the programming or set up procedure for the replaced control module if required.</p> <p>Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure. Did you complete the replacement?</p>		
		Go to <b>Step 9</b>	-
9	<ol style="list-style-type: none"> <li>1. Use the scan tool to clear the DTCs.</li> <li>2. Operate the vehicle within the conditions for running the DTC as specified in the supporting text.</li> </ol>		
	Does the DTC reset?	Go to <b>Step 2</b>	System OK

# DTC B3715, B3716, B3717, B3718, OR B3719



**Fig. 7: DTC B3715, B3716, B3717, B3718, or B3719 Circuit**  
 Courtesy of GENERAL MOTORS CORP.

## Circuit Description

The body control module (BCM) monitors the front wiper relay control circuit 1445 of the front wiper relay. The voltage level should be high while the front wiper relay is de-energized. The voltage will be near system voltage while the relay is de-energized. When the front wiper switch is in intermittent or mist, voltage from the windshield wiper washer switch is applied to the front wiper input of the BCM. The BCM responds by switching circuit 1445 to ground. This action energizes the front wiper relay, providing low speed operation of the windshield washer fluid pump during single swipes. Control of the wiper during LO or HIGH speed switch settings is direct wired from the windshield wiper washer switch to the windshield washer fluid pump and is not under the control of the BCM.

## Conditions for Running the DTC

The ignition is in the RUN or ACC position.

## Conditions for Setting the DTCs

The following conditions will cause these DTCs to set:

- B3717, the BCM detects short to ground or open.

- For B3717 the wiper switch does not need to be On.
- B3718, the BCM detects a short to battery voltage.
- For B3718 to set the wiper switch must be in mist or intermittent.

#### Action Taken When the DTC Sets

- The windshield wipers will be disabled until the conditions mentioned above are no longer present for an open or short to battery.
- The wipers will always be on if the circuit 1445 is shorted to ground.
- No indicator will illuminate on I/P.
- If circuit 1445 is shorted to battery, the BCM output will go into a protective state. The BCM output will not allow itself to be activated, switch closed, for as much as three minutes.

#### Conditions for Clearing the DTC

- This DTC will change from current to 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.

#### Test Description

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

**10:** Listen for an audible click when the front wiper relay operates. Command both the ON and OFF states. Repeat the commands as necessary.

**11:** Verifies that the BCM is providing voltage to the front wiper relay.

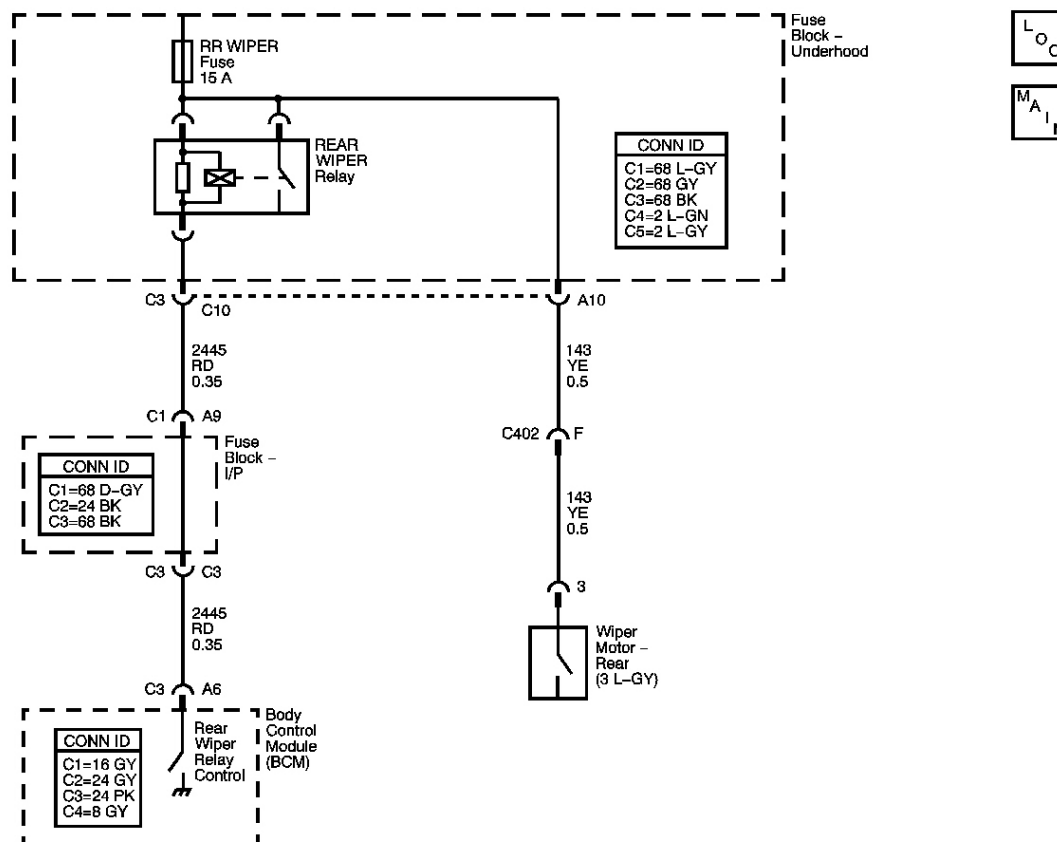
#### DTC B3715, B3716, B3717, B3718, or B3719 Circuit

Step	Action	Yes	No
<b>Connector End View Reference: Master Electrical Component List</b> in Wiring Systems			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b>Diagnostic System Check - Wiper/Washer</b>
2	1. Turn ON the ignition, with the engine OFF. 2. Operate the windshield wiper washer switch through all the switch positions. Refer to <b><u>Wiper/Washer System Description and Operation</u></b> .  Does the windshield wiper/washer system operate normally?	Go to <b>Testing for Intermittent Conditions and Poor Connections</b> in Wiring Systems	Go to <b>Step 3</b>
3	Are the wipers always on?	Go to <b>Step 9</b>	Go to <b>Step 4</b>
	1. Turn OFF the ignition.		

4	<ol style="list-style-type: none"> <li>2. Disconnect the front wiper relay in the underhood fuse block (UHFB).</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. Connect a test lamp from the windshield wiper washer switch power circuit of the front wiper relay and a good ground.</li> </ol> <p>Does the test lamp illuminate?</p>	Go to <b>Step 5</b>	Go to <b>Step 8</b>
5	<ol style="list-style-type: none"> <li>1. Connect a test lamp from the windshield wiper washer switch power circuit and the front wiper relay control circuit of the front wiper relay.</li> <li>2. With a scan tool command the front wiper relay On and Off under body control module special functions.</li> </ol> <p>Does the test lamp follow the scan tool commands?</p>	Go to <b>Step 10</b>	Go to <b>Step 6</b>
6	<p>Test the front wiper relay control circuit for an open or a short to voltage. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 12</b>	Go to <b>Step 7</b>
7	<p>Inspect for poor connections at the harness connector of the BCM. Refer to <b>Testing for Intermittent Conditions and Poor Connections</b> and <b>Connector Repairs</b> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 12</b>	Go to <b>Step 11</b>
8	<p>Repair an open, high resistance, or the short to ground in the windshield wiper washer switch power circuit of the front wiper relay. Refer to <b>Wiring Repairs</b> or <b>Connector Repairs</b> in Wiring Systems. Did you complete the repair?</p>	Go to <b>Step 12</b>	-
9	<p>Repair a short to ground on the front wiper relay control circuit. Refer to <b>Wiring Repairs</b> or <b>Connector Repairs</b> in Wiring Systems. Did you complete the repair?</p>	Go to <b>Step 12</b>	-
10	<p>Replace the front wiper relay. Refer to <b>Relay Replacement (Within an Electrical Center)</b> <b>Relay Replacement (Attached to Wire Harness)</b> in Wiring Systems. Did you complete the replacement?</p>	Go to <b>Step 12</b>	-
	<p><b>IMPORTANT:</b> Perform the programming or setup procedure</p>		

	for the replaced control module if required.		
11	Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure. Did you complete the replacement?	Go to <b>Step 12</b>	-
12	<ol style="list-style-type: none"> <li>1. Use the scan tool to clear the DTCs.</li> <li>2. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text.</li> </ol>		
	Does the DTC reset?	Go to <b>Step 2</b>	System OK

## DTC B3722



**Fig. 8: DTC B3722 Circuit**

Courtesy of GENERAL MOTORS CORP.



## Circuit Description

When operation of the rear wiper is selected, battery voltage from the rear wiper switch is applied to the rear wiper switch signal input of the body control module (BCM) circuit 94. The BCM responds by switching the rear wiper relay control circuit 2445 to ground. This action energizes the rear wiper relay, providing power to the rear wiper motor.

## Conditions for Running the DTC

Ignition is in RUN or ACC position.

## Conditions for Setting the DTC

- Circuit 2445 is shorted to ground or open.
- Rear wiper relay output if OFF.

## Actions Taken When the DTC Sets

Service (wrench) light will illuminate.

## Conditions for Clearing the DTC

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

## Diagnostic Aids

- Check for poor connection at the BCM. Inspect harness connectors for backed out terminals, improper terminal mating, broken connectors locks, improperly formed or damaged terminals and poor terminal-to-wire connection, terminal crimped over wire insulation and not conductors.
- If circuit 2445 is open, the rear wipers will be inoperative.
- If circuit 2445 is shorted to ground, the rear wipers will always be ON.
- Inspect wiring harness for damage. Check for broken or chaffed insulation.
- If fault is suspected to be intermittent, wiggling harness wiring may help in locating fault.

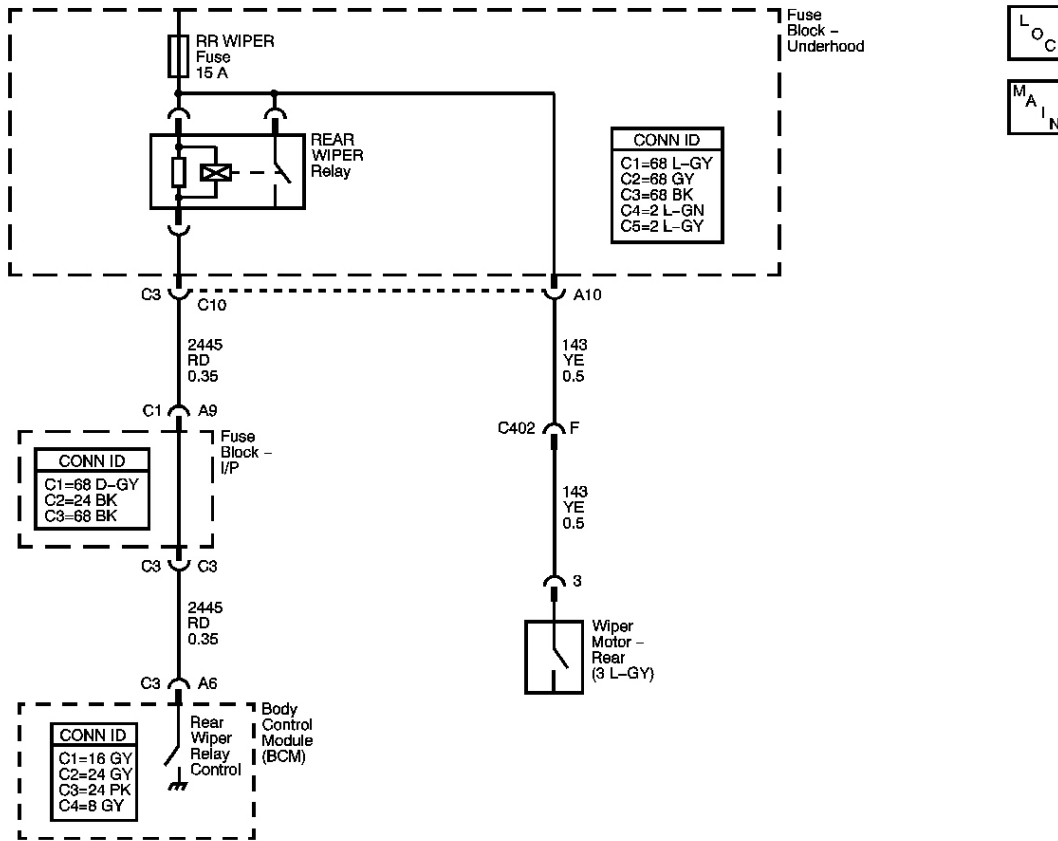
## DTC B3722 Circuit

Step	Action	Yes	No
<b>Connector End View Reference: Master Electrical Component List in Wiring Systems</b>			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b><u>Diagnostic System Check - Wiper/Washer</u></b>
	<ol style="list-style-type: none"><li>1. Turn ON the ignition, with the engine OFF.</li><li>2. With a scan tool, command the rear wiper relay ON</li></ol>		

2	and OFF under body control module special functions. Does relay follow command?	Go to Diagnostic Aids	Go to <b>Step 3</b>
3	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Remove the rear wiper relay in underhood fuse block (UHFB).</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. Connect the test lamp between rear wiper relay control circuit and the rear wiper motor switch at the rear wiper relay.</li> <li>5. Using a scan tool, command rear wiper relay ON and OFF.</li> </ol> Does the test lamp illuminate?	Go to <b>Step 4</b>	Go to <b>Step 5</b>
4	Does the test lamp follow the scan tool command?	Go to <b>Step 13</b>	Go to <b>Step 8</b>
5	Connect the test lamp between the rear wiper motor switch and ground at the rear wiper relay location. Does the test lamp illuminate?	Go to <b>Step 6</b>	Go to <b>Step 7</b>
6	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the BCM connector C3.</li> <li>3. Check the continuity on the rear wiper relay control circuit.</li> </ol> Is there continuity in circuit 2445?	Go to <b>Step 12</b>	Go to <b>Step 11</b>
7	Check for open RR wiper 15 A fuse. Is the fuse open?	Go to <b>Step 10</b>	Go to <b>Step 9</b>
8	Test the rear wiper relay control circuit for a short to ground. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 14</b>	Go to <b>Step 12</b>
9	Repair an open in the rear wiper motor switch circuit. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you complete the repair?	Go to <b>Step 14</b>	-
10	Repair a short to ground in the rear wiper motor switch circuit. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you complete the repair?	Go to <b>Step 14</b>	-
11	Repair an open in the rear wiper relay control circuit. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems.	Go to <b>Step</b>	

	Did you complete the repair?	<b>14</b>	-
12	<p><b>IMPORTANT:</b>  <b>Perform the programming or set up procedure for the replaced control module if required.</b></p> <p>Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure. Did you complete the replacement?</p>	Go to <b>Step 14</b>	-
13	<p>Replace the rear wiper relay. Refer to <b>Relay Replacement (Within an Electrical Center) Relay Replacement (Attached to Wire Harness)</b> in Wiring Systems.  Did you complete the replacement?</p>	Go to <b>Step 14</b>	-
14	<ol style="list-style-type: none"> <li>1. Use the scan tool to clear the DTCs.</li> <li>2. Operate the vehicle within the conditions for running the DTC as specified in the supporting text.</li> </ol> <p>Does the DTC reset?</p>	Go to <b>Step 2</b>	System OK

### DTC B3723



**Fig. 9: DTC B3723 Circuit**  
**Courtesy of GENERAL MOTORS CORP.**

### Circuit Description

When operation of the rear wiper is selected, battery voltage from the rear wiper switch is applied to the rear wiper switch signal input of the body control module (BCM) circuit 94. The BCM responds by switching the rear wiper relay control circuit 2445 to ground. This action energizes the rear wiper relay, providing power to the rear wiper motor.

### Conditions for Running the DTC

Ignition is in RUN or ACC position.

### Conditions for Setting the DTC

- Circuit 2445 is shorted to battery.
- Rear wiper relay output is ON.

### Actions Taken When the DTC Sets

- Service (wrench) light will illuminate.
- The rear wipers are inoperative.

### Conditions for Clearing the DTC

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

### Diagnostic Aids

- When a shorted to battery voltage condition exists in circuit 2445 and the BCM has been requested to activate the rear wiper relay, the BCM will attempt to switch circuit 2445 to ground. High current flow will result and the BCM output will go into a protective state. The BCM output will not allow itself to be activated for as much as 3 minutes.
- Check for poor connection at the BCM. Inspect harness connectors for backed out terminals, improper terminal mating, broken connectors locks, improperly formed or damaged terminals and poor terminal-to-wire connection, terminal crimped over wire insulation and not conductors.
- Inspect wiring harness for damage. Check for broken or chaffed insulation.
- Review all fail information as this may assist in determining the conditions when the fault occurs.
- If fault is suspected to be intermittent, wiggling harness wiring may help in locating fault.

### DTC B3723 Circuit

Step	Action	Yes	No
<b>Connector End View Reference: Master Electrical Component List in Wiring Systems</b>			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b>Diagnostic System Check - Wiper/Washer</b>
2	<ol style="list-style-type: none"> <li>1. Turn ON the ignition, with the engine OFF.</li> <li>2. With a scan tool, command the rear wiper relay ON and OFF under body control module special functions.</li> </ol> Does relay follow command?	Go to Diagnostic Aids	Go to <b>Step 3</b>
3	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Remove the rear wiper relay in underhood fuse block (UHFB).</li> <li>3. Connect the test lamp between rear wiper relay control circuit and the rear wiper motor switch at the rear wiper relay.</li> <li>4. Using a scan tool, command rear wiper relay ON and OFF.</li> </ol>		

	Does the test lamp follow command?	Go to <b>Step 6</b>	Go to <b>Step 4</b>
4	1. Turn OFF the ignition. 2. Disconnect the BCM connector C3. 3. Check for battery voltage on the rear wiper relay control circuit.  Does the voltage exist on the rear wiper relay control circuit?	Go to <b>Step 5</b>	Go to <b>Step 7</b>
5	Repair short to battery in the rear wiper relay control circuit. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you complete the repair?	Go to <b>Step 8</b>	-
6	Replace the rear wiper relay. Refer to <b>Relay Replacement (Within an Electrical Center)</b> and <b>Relay Replacement (Attached to Wire Harness)</b> in Wiring Systems. Did you complete the replacement?	Go to <b>Step 8</b>	-
7	<b>IMPORTANT:</b> <b>Perform the programming or set up procedure for the replaced control module if required.</b>  Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure. Did you complete the replacement?	Go to <b>Step 8</b>	-
8	1. Use the scan tool 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 <b>Step 2</b>	System OK

## SYMPTOMS - WIPER/WASHER SYSTEMS

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

- Perform the **Diagnostic System Check - Wiper/Washer** 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.
- Review the system operation in order to familiarize yourself with the system functions. Refer to **Wiper/Washer System Description and Operation**.

### Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the wiper/washer system. Refer to **Checking Aftermarket Accessories** in Wiring Systems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Ensure that all mechanical components are operative before diagnosing the electrical portion of the system.

### Intermittent

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

### Symptom List

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

- **Washers Inoperative**
- **Wipers Always On**
- **Wipers Inoperative - One or More Modes**

## WASHERS INOPERATIVE

### Washers Inoperative

Step	Action	Yes	No
<b>Schematic Reference:</b> <u>Wiper/Washer System Schematics</u>			
<b>Connector End View Reference:</b> <u>Master Electrical Component List</u> in Wiring Systems			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b><u>Diagnostic System Check - Wiper/Washer</u></b>
2	<ol style="list-style-type: none"> <li>1. Turn the ignition ON.</li> <li>2. Press the front washer switch and then the rear washer switch.</li> </ol> Do the windshield washers operate normally?	Go to <b><u>Testing for Intermittent Conditions and Poor Connections</u></b> in Wiring Systems	Go to <b>Step 3</b>
3	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the harness connector of the windshield washer fluid pump.</li> <li>3. Turn the ignition ON, with the engine OFF.</li> <li>4. Connect a test lamp from the front washer switch control circuit to the rear washer switch circuit at the windshield washer fluid pump.</li> </ol>		

	<p>5. Press the front washer switch.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 9</b>	Go to <b>Step 4</b>
4	<p>1. Connect a test lamp from the front washer switch control circuit to a good ground.</p> <p>2. Press the front washer switch.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 5</b>	Go to <b>Step 7</b>
5	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect the harness connector C2 of the BCM.</p> <p>3. Turn the ignition ON, with the engine OFF.</p> <p>4. Connect a test lamp from the control circuit of the rear washer switch control circuit to a good ground.</p> <p>5. Press the rear washer switch.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 11</b>	Go to <b>Step 6</b>
6	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect the harness connector of the windshield wiper washer switch.</p> <p>3. Test the control circuit of the rear washer switch for an open or a short to ground. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	Go to <b>Step 15</b>	Go to <b>Step 10</b>
7	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect the harness connector C2 of the BCM.</p> <p>3. Turn the ignition ON, with the engine OFF.</p> <p>4. Connect a test lamp from the control circuit of the front washer switch to a good ground.</p> <p>5. Press the front washer switch.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 11</b>	Go to <b>Step 8</b>
	<p>1. Turn OFF the ignition</p> <p>2. Disconnect the harness connector of the</p>		



8	windshield wiper washer switch. 3. Test the control circuit of the front washer switch for an open or a short to ground. Refer to <b><u>Circuit Testing</u></b> and <b><u>Wiring Repairs</u></b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 15</b>	Go to <b>Step 10</b>
9	Inspect for poor connections at the windshield washer fluid pump. Refer to <b><u>Testing for Intermittent Conditions and Poor Connections</u></b> and <b><u>Connector Repairs</u></b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 15</b>	Go to <b>Step 12</b>
10	Inspect for poor connections at the windshield wiper washer switch. Refer to <b><u>Testing for Intermittent Conditions and Poor Connections</u></b> and <b><u>Connector Repairs</u></b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 15</b>	Go to <b>Step 13</b>
11	Inspect for poor connections at the BCM. Refer to <b><u>Testing for Intermittent Conditions and Poor Connections</u></b> and <b><u>Connector Repairs</u></b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 15</b>	Go to <b>Step 14</b>
12	Replace the windshield washer fluid pump. Refer to <b><u>Washer Pump/Reservoir Replacement</u></b> . Did you complete the replacement?	Go to <b>Step 15</b>	-
13	Replace the windshield wiper washer switch. Refer to <b><u>Multifunction, Turn Signal Switch Replacement</u></b> in Steering Wheel and Column. Did you complete the replacement?	Go to <b>Step 15</b>	-
14	<b>IMPORTANT:</b> <b>Perform the programming or set up procedure for the replaced control module if required.</b> Replace the BCM. Refer to <b><u>Body Control Module Replacement</u></b> in Body Control System for applicable replacement procedure. Did you complete the replacement?	Go to <b>Step 15</b>	-
15	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 2</b>

**WIPERS ALWAYS ON**

## Wipers Always On

Step	Action	Yes	No
<b>Schematic Reference:</b> <u>Wiper/Washer System Schematics</u> <b>Connector End View Reference:</b> <u>Master Electrical Component List</u> in Wiring Systems			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b>Diagnostic System Check - Wiper/Washer</b>
2	1. Turn the ignition ON. 2. Turn the front and rear windshield wiper washer switch OFF.  Do the windshield wipers remain in the park position?	Go to <b>Testing for Intermittent Conditions and Poor Connections</b> in Wiring Systems	Go to <b>Step 3</b>
3	Are the rear wipers always on?	Go to <b>Step 4</b>	Go to <b>Step 7</b>
4	1. Turn OFF the ignition. 2. Disconnect the rear wiper relay. 3. Turn the ignition ON.  Do the rear wipers remain in the park position?	Go to <b>Step 5</b>	Go to <b>Step 6</b>
5	1. Turn OFF the ignition. 2. Connect a test lamp from the rear wiper relay control circuit and the battery side of the relay at the rear wiper relay. 3. Turn the ignition ON.  Does the test lamp illuminate?	Go to <b>Step 8</b>	Go to <b>Step 15</b>
6	Test the rear wiper motor control circuit for a short to voltage. Did you find and correct the condition?	Go to <b>Step 19</b>	Go to <b>Step 16</b>
7	1. Turn OFF the ignition. 2. Disconnect the harness connector of the windshield wiper washer switch. 3. Turn the ignition ON.  Do the wipers stop?	Go to <b>Step 11</b>	Go to <b>Step 10</b>
8	1. Turn OFF the ignition. 2. Disconnect the harness connector C2 of the BCM. 3. Turn the ignition ON. 4. Connect a test lamp from the rear window wiper switch signal circuit and a good		

	ground at the BCM. Does the test lamp illuminate?	Go to <b>Step 9</b>	Go to <b>Step 13</b>
9	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the harness connector of the windshield wiper washer switch.</li> <li>3. Test the rear wiper switch control circuit for a short to voltage.</li> </ol> Did you find and correct the condition?	Go to <b>Step 19</b>	Go to <b>Step 14</b>
10	Test the high front wiper control circuit and the LOW/MIST front wiper control circuit for a short to voltage. Did you find and correct the condition?	Go to <b>Step 19</b>	Go to <b>Step 16</b>
11	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Reconnect the windshield wiper washer switch connector.</li> <li>3. Disconnect the BCM connector C2.</li> <li>4. Turn the ignition ON.</li> </ol> Do the wipers stop?	Go to <b>Step 13</b>	Go to <b>Step 12</b>
12	Test the front wiper input control circuit for a short to voltage. Did you find and correct the condition?	Go to <b>Step 19</b>	Go to <b>Step 14</b>
13	Inspect for poor connections at the BCM. Refer to <b>Testing for Intermittent Conditions and Poor Connections</b> and <b>Connector Repairs</b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 19</b>	Go to <b>Step 18</b>
14	Inspect for poor connections at the windshield wiper washer switch. Refer to <b>Testing for Intermittent Conditions and Poor Connections</b> and <b>Connector Repairs</b> in Wiring Systems. Did you find and correct the condition?	Go to <b>Step 19</b>	Go to <b>Step 17</b>
15	Replace the rear wiper relay. Refer to <b>Relay Replacement (Within an Electrical Center)</b> <b>Relay Replacement (Attached to Wire Harness)</b> in Wiring Systems. Did you complete the replacement?	Go to <b>Step 19</b>	-
16	Replace the wiper motor. Refer to <b>Wiper Motor Replacement</b> . Did you complete the replacement?	Go to <b>Step 19</b>	-
	Replace the windshield wiper washer switch.		

17	Refer to <b><u>Multifunction, Turn Signal Switch Replacement</u></b> in Steering Wheel and Column. Did you complete the replacement?	Go to <b>Step 19</b>	-
18	<b>IMPORTANT:</b> <b>Perform the programming or set up procedure for the replaced control module if required.</b>  Replace the BCM. Refer to <b><u>Body Control Module Replacement</u></b> in Body Control System for applicable replacement procedure. Did you complete the replacement?	Go to <b>Step 19</b>	-
19	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 2</b>

## WIPERS INOPERATIVE - ONE OR MORE MODES

### Wipers Inoperative - One or More Modes

Step	Action	Yes	No
<b>Schematic Reference: <u>Wiper/Washer System Schematics</u></b>			
<b>Connector End View Reference: <u>Master Electrical Component List</u> in Wiring Systems</b>			
1	Did you perform the Wiper/Washer Diagnostic System Check?	Go to <b>Step 2</b>	Go to <b><u>Diagnostic System Check - Wiper/Washer</u></b>
2	1. Turn the ignition ON, with the engine OFF. 2. Operate the front and rear wiper switch through all switch positions.  Do the wiper system operate normally?	Go to <b><u>Testing for Intermittent Conditions and Poor Connections</u></b> in Wiring Systems	Go to <b>Step 3</b>
3	Are the wipers inoperative in the front and rear?	Go to <b>Step 21</b>	Go to <b>Step 4</b>
4	Are the wipers only inoperative in the front?	Go to <b>Step 5</b>	Go to <b>Step 9</b>
5	Is there only one mode inoperative in the front wipers?	Go to <b>Step 6</b>	Go to <b>Step 8</b>
6	Is the mode intermittent?	Go to <b>Step 15</b>	Go to <b>Step 7</b>
7	Is the mode LOW or MIST?	Go to <b>Step 16</b>	Go to <b>Step 18</b>
8	1. Connect a test lamp between the HIGH front wiper motor control circuit and the front wiper motor ground circuit. 2. Turn the front wipers to HIGH.  Does the test lamp illuminate?	Go to <b>Step 23</b>	Go to <b>Step 20</b>
	1. The rear wipers are inoperative. 2. Connect a test lamp between the rear wiper		

9	<p>relay voltage control circuit and a good ground.</p> <p>3. Turn the rear wipers to intermittent.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 10</b>	Go to <b>Step 11</b>
10	<p>Connect a test lamp between the rear wiper motor voltage control circuit and the rear wiper motor ground.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 23</b>	Go to <b>Step 12</b>
11	<p>Connect a test lamp between the rear wiper relay voltage circuit and the rear wiper relay control circuit.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 29</b>	Go to <b>Step 13</b>
12	<p>Connect a test lamp between the rear wiper motor voltage control circuit and a good ground.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 25</b>	Go to <b>Step 26</b>
13	<p>Connect a test lamp between the rear wiper input control circuit and a good ground.</p> <p>Does the test lamp illuminate?</p>	Go to <b>Step 24</b>	Go to <b>Step 14</b>
14	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the windshield wiper washer switch.</li> <li>3. Test the wiper input control circuit for an open or short to ground.</li> </ol> <p>Did you find and correct the condition?</p>	Go to <b>Step 31</b>	Go to <b>Step 22</b>
15	<ol style="list-style-type: none"> <li>1. Connect a test lamp between the front wiper input control circuit and a good ground.</li> <li>2. Turn the front wipers to intermittent.</li> </ol> <p>Does the test lamp illuminate?</p>	Go to <b>Step 24</b>	Go to <b>Step 22</b>
16	<ol style="list-style-type: none"> <li>1. Connect a test lamp at the LOW/MIST control circuit at the front wiper motor and a good ground.</li> <li>2. Turn the front wiper switch to LOW or MIST.</li> </ol> <p>Does the test lamp illuminate?</p>	Go to <b>Step 23</b>	Go to <b>Step 17</b>
17	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the windshield wiper washer switch connector.</li> <li>3. Test the LOW/MIST control circuit for an open or a short to ground.</li> </ol>		

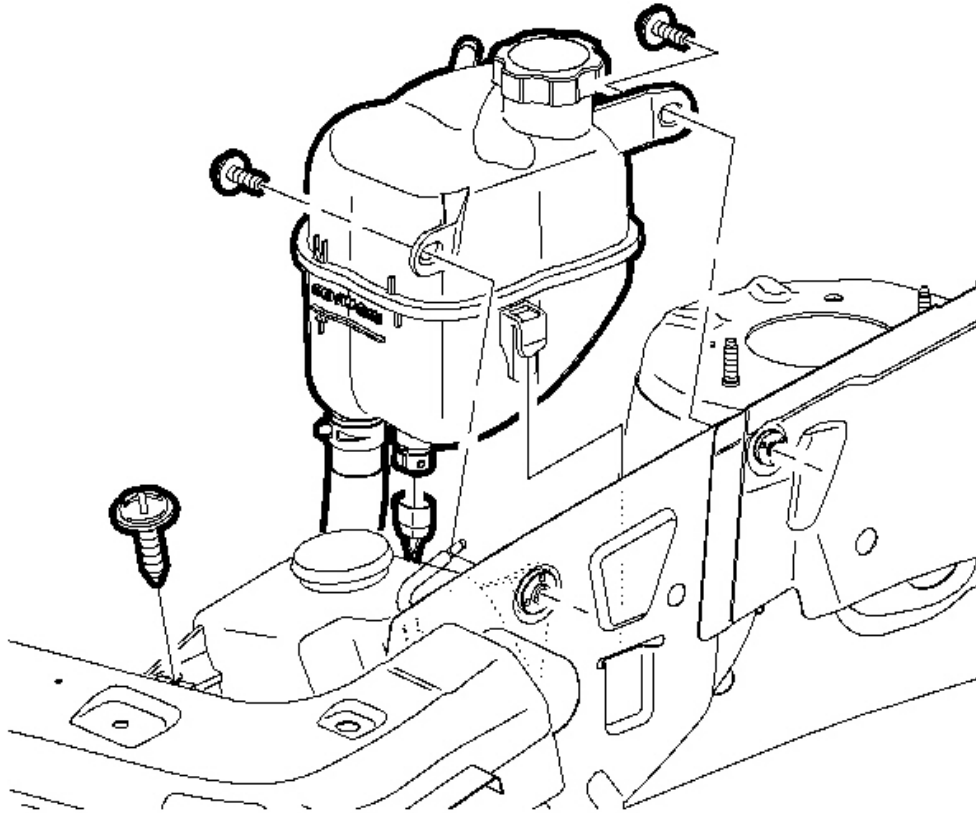
	Did you find and correct the condition?	Go to <b>Step 31</b>	Go to <b>Step 22</b>
18	<ol style="list-style-type: none"> <li>1. The inoperative mode is HIGH.</li> <li>2. Connect a test lamp at the HIGH control circuit at the front wiper motor and a good ground.</li> <li>3. Turn the front wiper switch to HIGH.</li> </ol> <p>Does the test lamp illuminate?</p>	Go to <b>Step 23</b>	Go to <b>Step 19</b>
19	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the windshield wiper washer switch connector.</li> <li>3. Test the high control circuit for an open or a short to ground.</li> </ol> <p>Did you find and correct the condition?</p>	Go to <b>Step 31</b>	Go to <b>Step 22</b>
20	<p>Connect a test lamp between the HIGH front wiper motor control circuit and a good ground. Does the test lamp illuminate?</p>	Go to <b>Step 25</b>	Go to <b>Step 22</b>
21	<p>Test the ground circuit for the wiper motors for an open at the splice pack G301. Refer to <b>Circuit Testing</b> and <b>Wiring Repairs</b> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 31</b>	Go to <b>Step 22</b>
22	<p>Inspect for poor connections at the harness connector of the windshield wiper washer switch. Refer to <b>Testing for Intermittent Conditions and Poor Connections</b> and <b>Connector Repairs</b> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 31</b>	Go to <b>Step 27</b>
23	<p>Inspect for poor connections at the harness connector of the wiper motor. Refer to <b>Testing for Intermittent Conditions and Poor Connections</b> and <b>Connector Repairs</b> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 31</b>	Go to <b>Step 28</b>
24	<p>Inspect for poor connections at the harness connector of the BCM. Refer to <b>Testing for Intermittent Conditions and Poor Connections</b> and <b>Connector Repairs</b> in Wiring Systems. Did you find and correct the condition?</p>	Go to <b>Step 31</b>	Go to <b>Step 30</b>
25	<p>Repair an open in the wiper motor ground circuit. Refer to <b>Wiring Repairs</b> and <b>Connector Repairs</b> in Wiring Systems. Did you complete the repair?</p>	Go to <b>Step 31</b>	-

26	Repair an open or short to ground in the rear wiper motor voltage control circuit. Refer to <b>Wiring Repairs</b> and <b>Connector Repairs</b> in Wiring Systems. Did you complete the repair?	Go to <b>Step 31</b>	-
27	Replace the windshield wiper washer switch. Refer to <b>Multifunction, Turn Signal Switch Replacement</b> in Steering Wheel and Column. Did you complete the replacement?	Go to <b>Step 31</b>	-
28	Replace the wiper motor. Refer to <b>Wiper Motor Replacement</b> . Did you complete the replacement?	Go to <b>Step 31</b>	-
29	Replace the rear wiper relay. Refer to <b>Relay Replacement (Within an Electrical Center)</b> <b>Relay Replacement (Attached to Wire Harness)</b> in Wiring Systems. Did you complete the replacement?	Go to <b>Step 31</b>	-
30	<b>IMPORTANT:</b> <b>Perform the programming or set up procedure for the replaced control module if required.</b>  Replace the BCM. Refer to <b>Body Control Module Replacement</b> in Body Control System for applicable replacement procedure.Did you complete the replacement?	Go to <b>Step 31</b>	-
31	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to <b>Step 2</b>

## REPAIR INSTRUCTIONS

### WASHER PUMP/RESERVOIR REPLACEMENT

#### Removal Procedure



**Fig. 10: View Of Washer Pump/Reservoir**  
Courtesy of GENERAL MOTORS CORP.

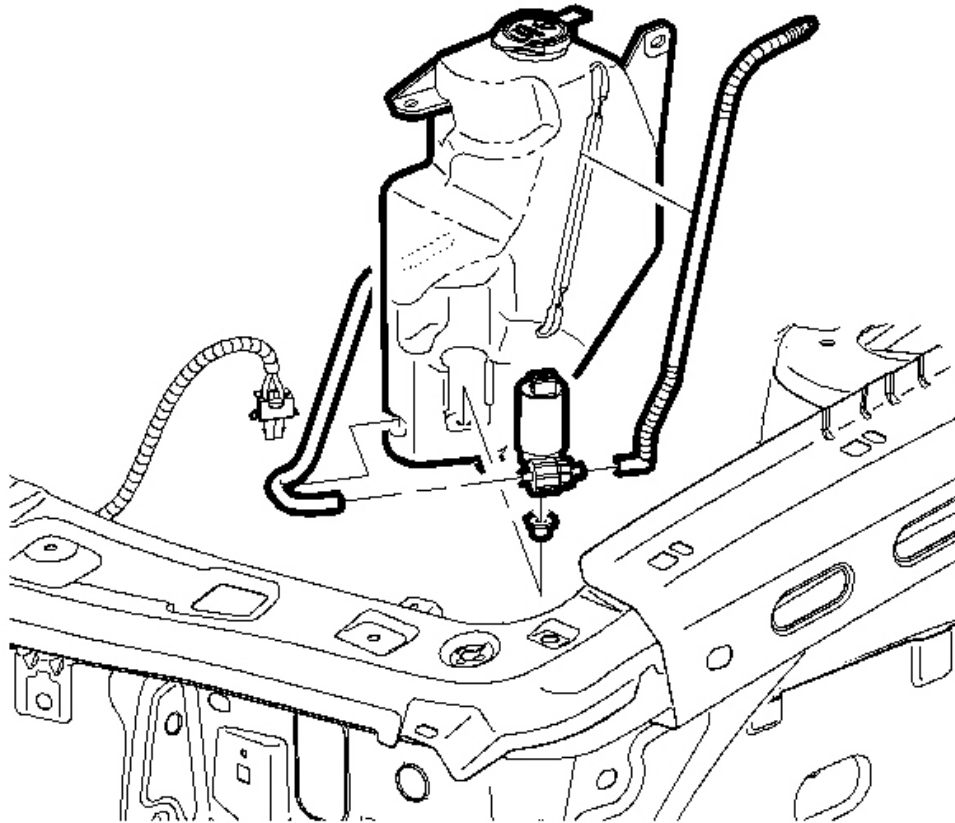
**IMPORTANT: Allow the coolant surge tank sufficient cooling time before handling.**

1. Remove the coolant surge tank bolts.

**IMPORTANT: Do not disconnect the coolant hoses from the coolant surge tank.**

2. Disconnect the surge tank level sensor and set surge tank aside in engine compartment.
3. Remove the front washer solvent container bolts.





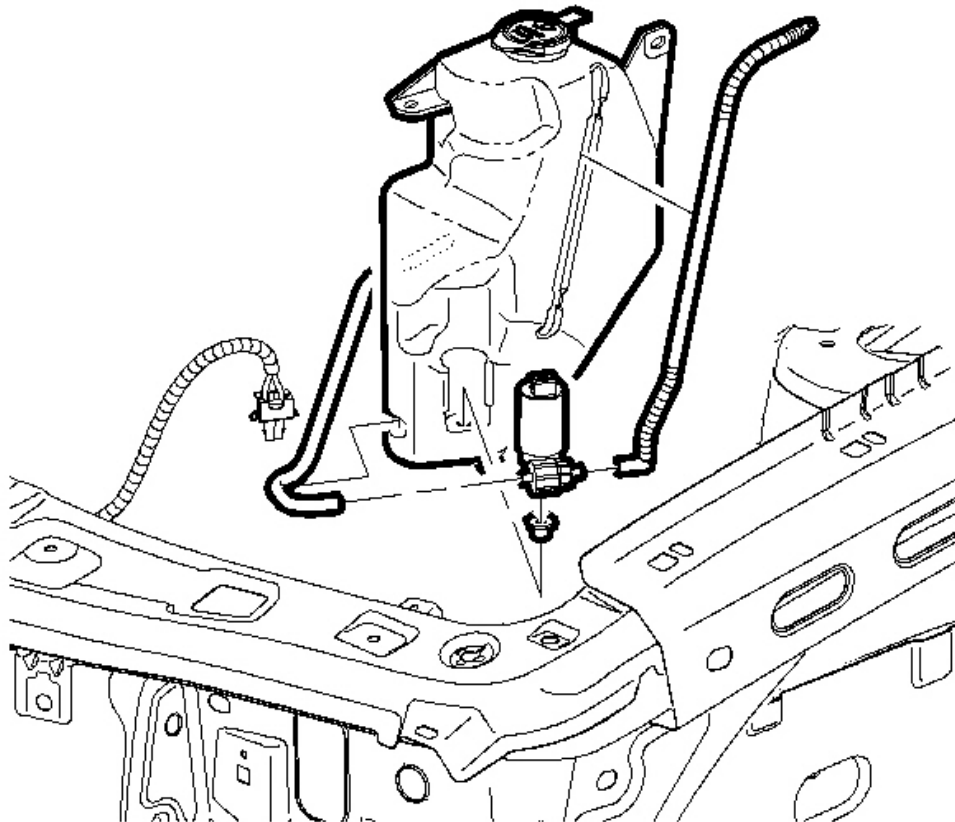
**Fig. 11: Removing/Installing Washer Solvent Filter Grommet**  
Courtesy of GENERAL MOTORS CORP.

4. Disconnect the front washer solvent container hose from the front washer nozzle hose that runs along the upper motor compartment rail.
5. Angle the washer solvent container to the rear of the vehicle and pull out of the mounting hole.
6. Disconnect the washer pump electrical connector.

**IMPORTANT: Contain any solvent that may spill while removing pump and hoses.**

7. Pull the washer solvent pump from the solvent container.
8. Disconnect the front and rear washer solvent hoses from the washer pump.

**IMPORTANT: Do not reuse washer solvent as debris may clog the system.**

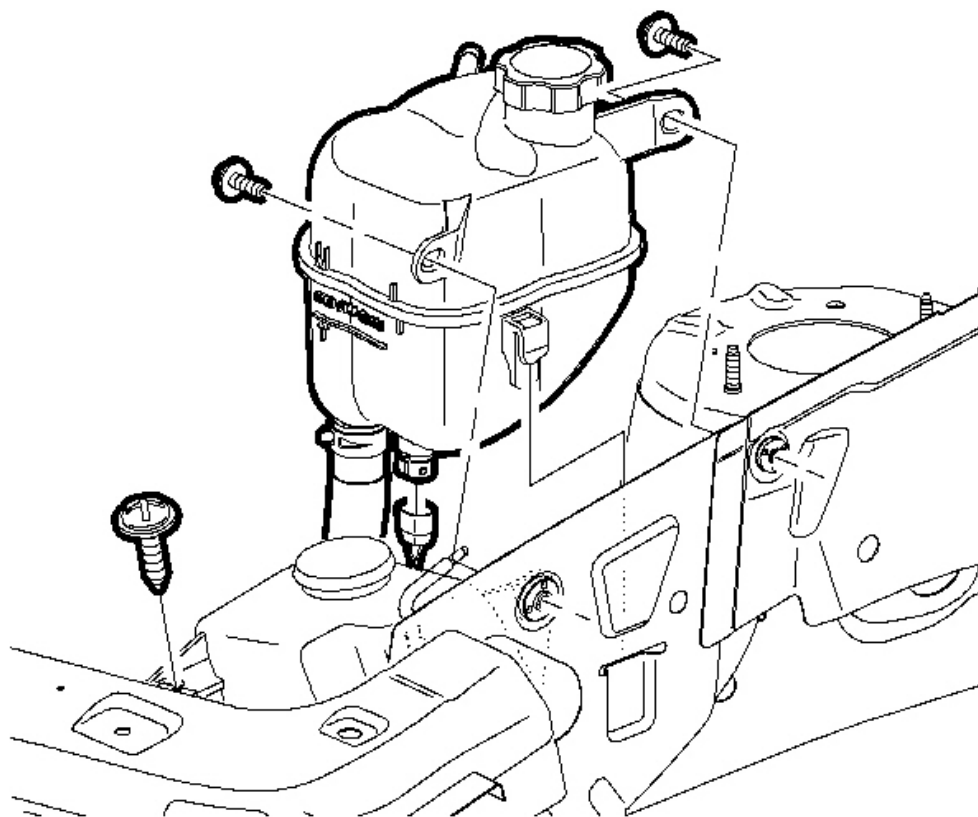


**Fig. 12: Removing/Installing Washer Solvent Filter Grommet**  
Courtesy of GENERAL MOTORS CORP.

1. Connect the front and rear washer solvent hoses to the washer pump.
2. Install the washer pump into the washer solvent container. Ensure the washer pump filter is installed, if removed.
3. Connect the washer pump electrical connector.
4. Insert the front and rear washer solvent container hoses into the grooves in the solvent container.

**IMPORTANT: Washer solvent container grommet must be installed between container and body structure to prevent squeaks and rattles.**

5. Install the washer solvent container into the motor compartment. Ensure that the washer solvent container's mounting peg, with grommet installed, is seated into the mounting hole in the body structure. A lubricant may be used to ease installation.
6. Connect the front washer solvent container hose to front nozzle hose that runs along the upper motor compartment rail.



**Fig. 13: View Of Washer Pump/Reservoir**  
Courtesy of GENERAL MOTORS CORP.

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

7. Install the washer solvent container screws.

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

8. Position coolant surge tank back into correct location.

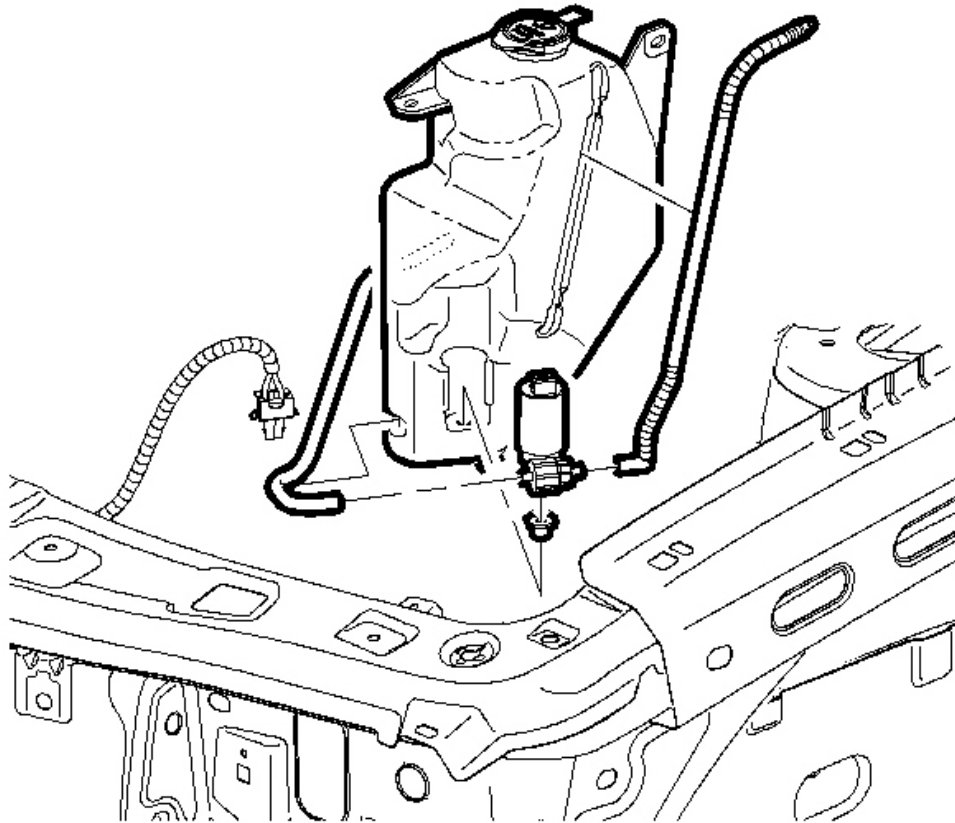
9. Install the coolant surge tank bolts.

**Tighten:** Tighten the bolts to 6 N.m (53 lb in).

10. Fill the washer solvent container with washer solvent.

## **WASHER PUMP FILTER GROMMET REPLACEMENT**

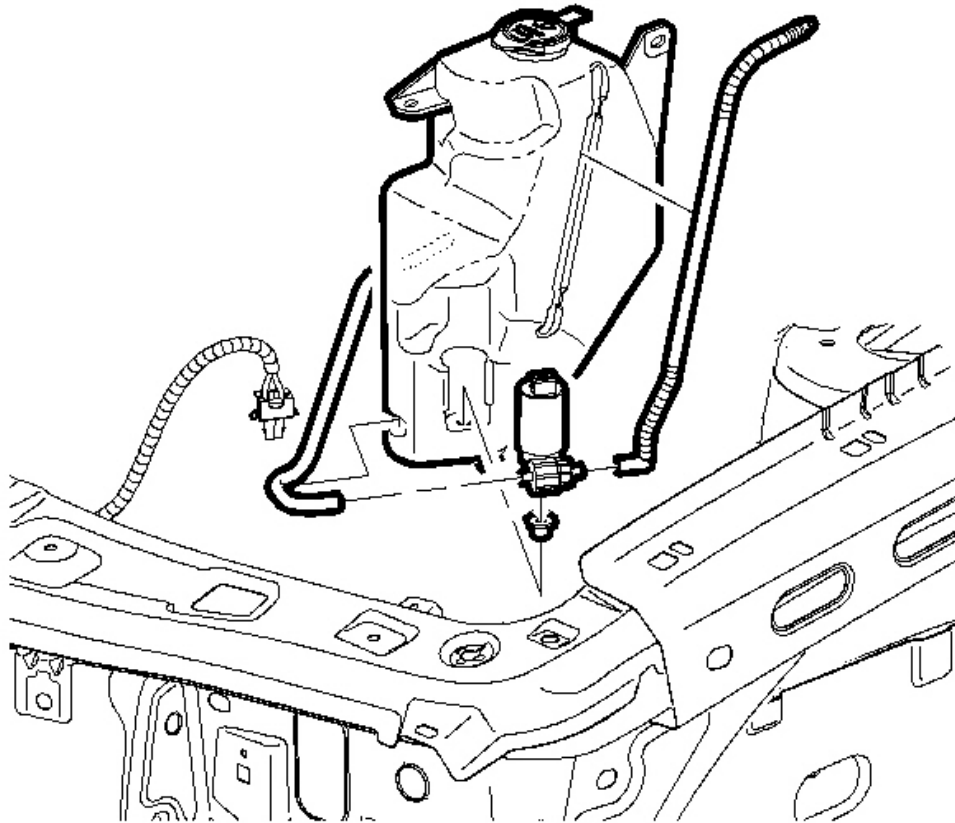
### **Removal Procedure**



**Fig. 14: Removing/Installing Washer Solvent Filter Grommet**  
Courtesy of GENERAL MOTORS CORP.

1. Remove the washer solvent pump. Refer to **Washer Pump/Reservoir Replacement** .
2. Remove the washer solvent filter grommet from the pump.

**Installation Procedure**

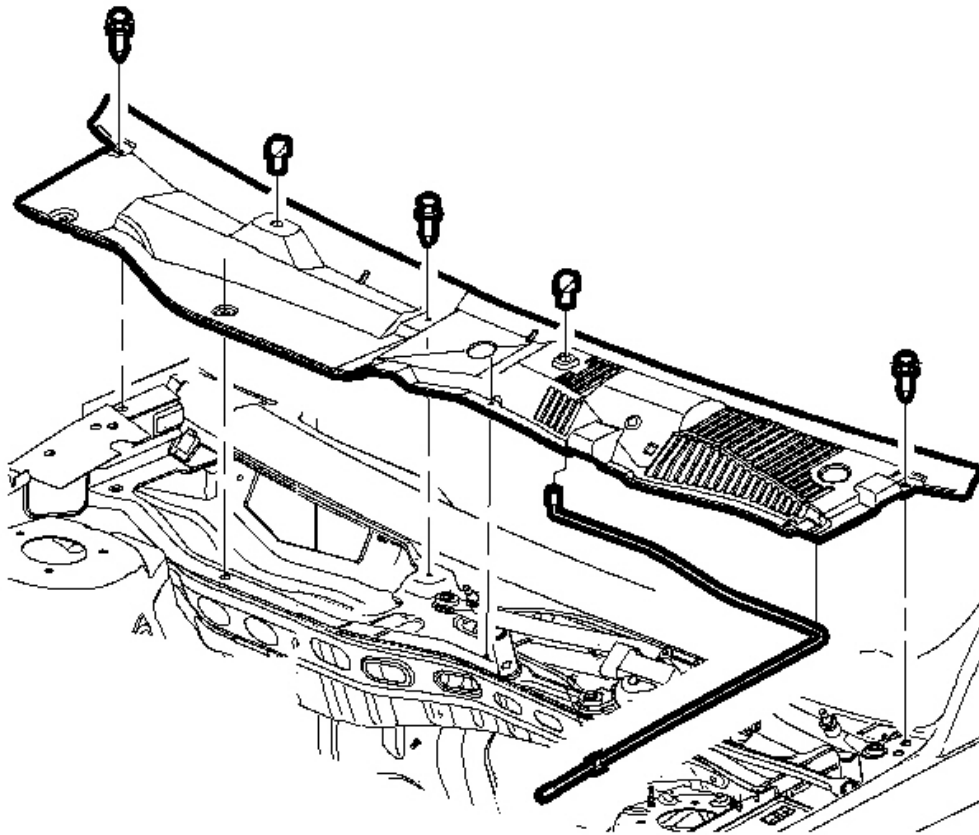


**Fig. 15: Removing/Installing Washer Solvent Filter Grommet**  
Courtesy of GENERAL MOTORS CORP.

1. Install the washer solvent filter grommet to the pump.
2. Install the washer solvent pump. Refer to **Washer Pump/Reservoir Replacement** .

## **WASHER NOZZLE REPLACEMENT - FRONT**

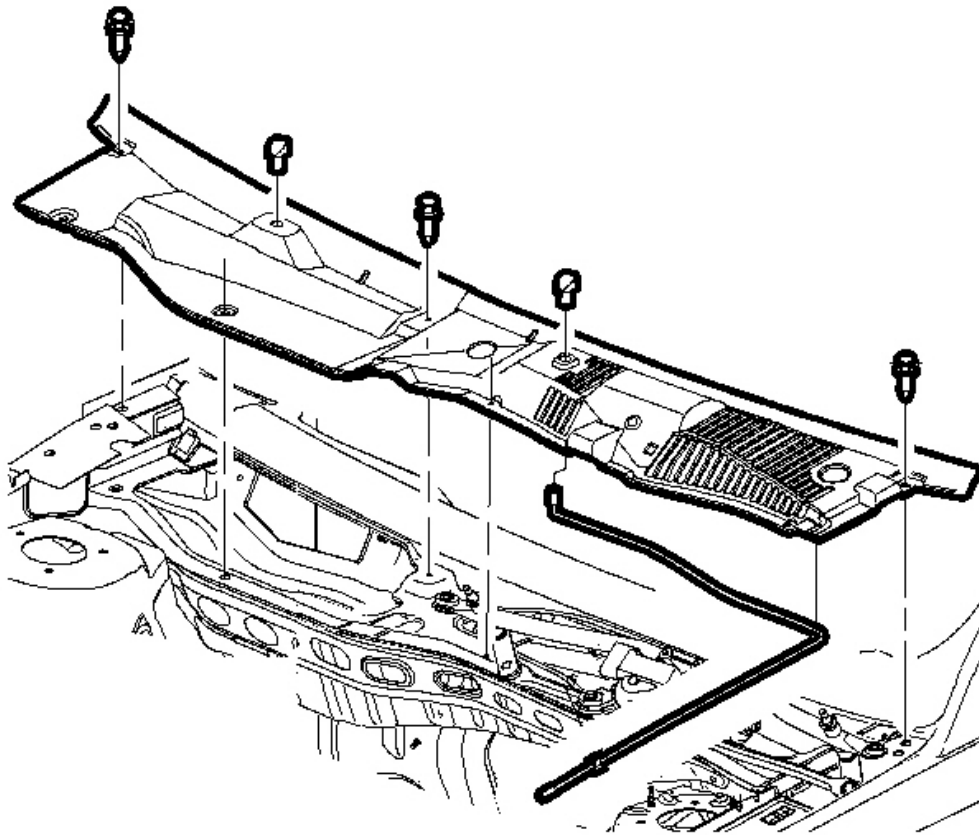
### **Removal Procedure**



**Fig. 16: Removing/Installing Air Inlet Grille Panel**  
Courtesy of GENERAL MOTORS CORP.

1. Remove the air inlet grille panel. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.
2. Depress the washer nozzle tabs to disengage the nozzle from the air inlet grille.
3. Remove the nozzle.

#### **Installation Procedure**



**Fig. 17: Removing/Installing Air Inlet Grille Panel**  
Courtesy of GENERAL MOTORS CORP.

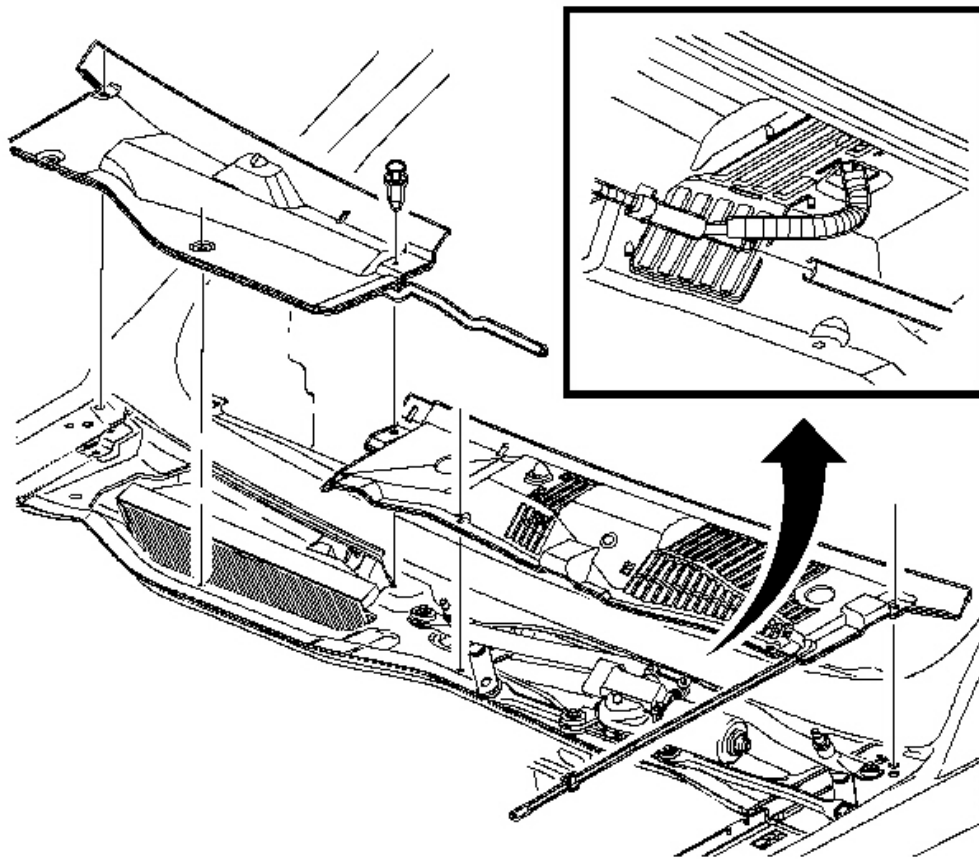
1. Push the washer nozzles into the air inlet grille panel until the tabs engage with the panel.
2. Install the air inlet grille panel. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.

## **HOSE REPLACEMENT - WINDSHIELD WASHER**

### **Removal Procedure**

1. Remove the air inlet grille. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.

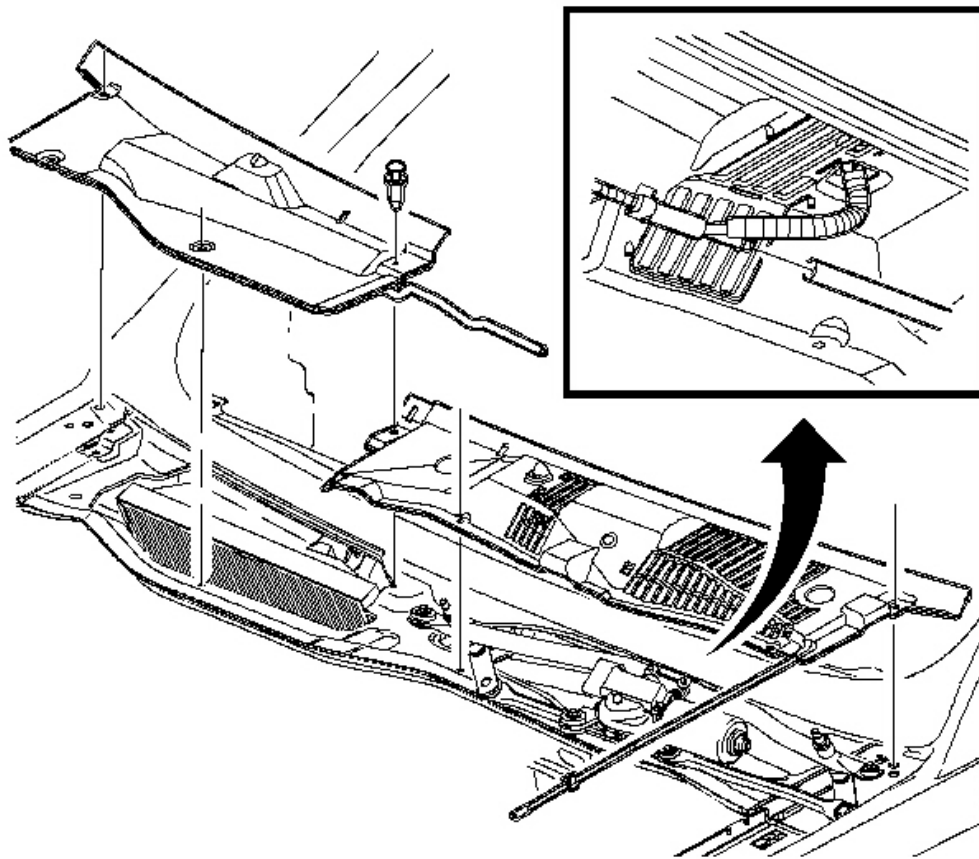




**Fig. 18: Removing/Installing Front Washer Nozzle Hose**  
Courtesy of GENERAL MOTORS CORP.

2. Separate front washer nozzle hose from the front washer solvent container hose that runs along the upper motor compartment rail.
3. Remove the front washer nozzle hose.

#### **Installation Procedure**

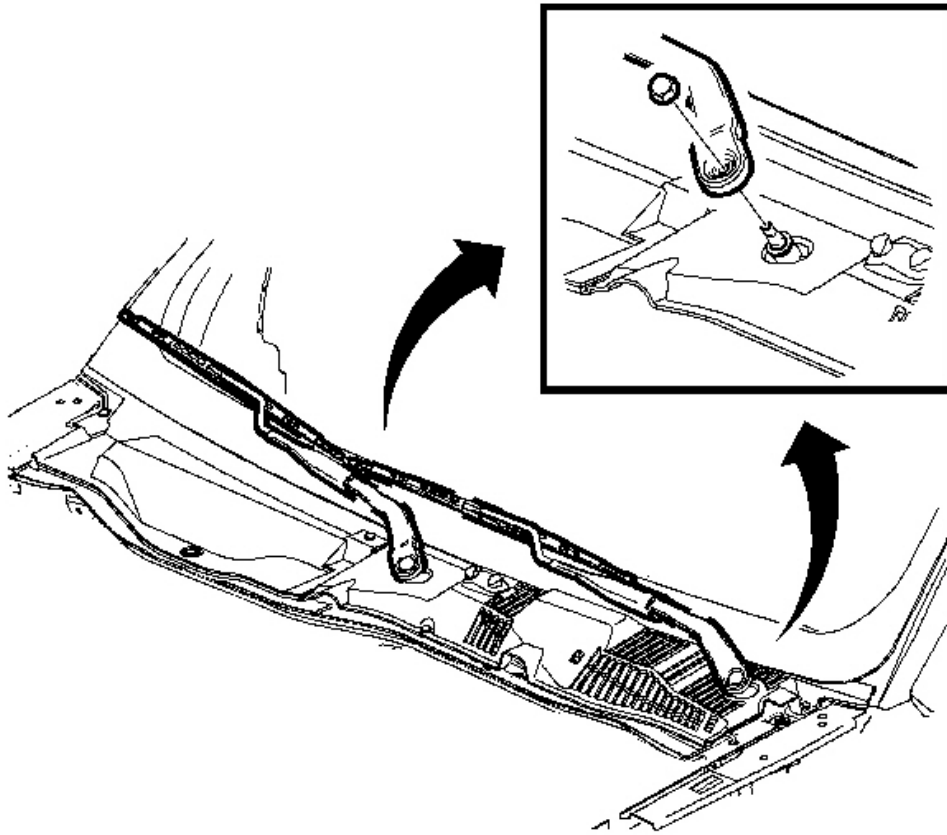


**Fig. 19: Removing/Installing Front Washer Nozzle Hose**  
Courtesy of GENERAL MOTORS CORP.

1. Connect the front nozzle hose to the front washer solvent container hose that runs along the upper motor compartment rail.
2. Position the washer hoses into the vehicle.
3. Install the air inlet grille. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.

## **WIPER ARM REPLACEMENT**

### **Removal Procedure**



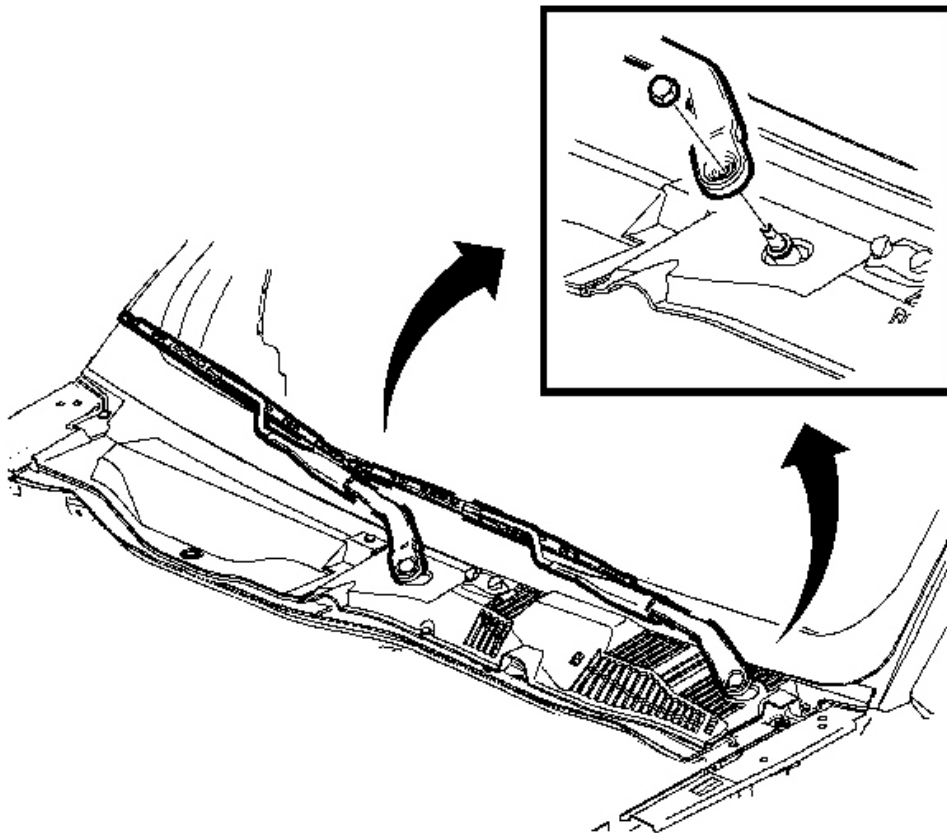
**Fig. 20: Removing/Installing Wiper Arm**  
Courtesy of GENERAL MOTORS CORP.

1. Open hood to access wiper arm nut.
2. Remove wiper arm nut.
3. Lift wiper arm assembly away from windshield and remove wiper arm from pivot shaft.

#### **Installation Procedure**

1. Position wiper blade assembly at tick mark in lower portion of windshield blackout strip on driver side of vehicle.
2. Position wiper blade assembly at tick mark in windshield pillar portion of windshield blackout strip on

passenger side of vehicle.



**Fig. 21: Removing/Installing Wiper Arm**  
Courtesy of GENERAL MOTORS CORP.

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

3. Install the wiper arm nut.

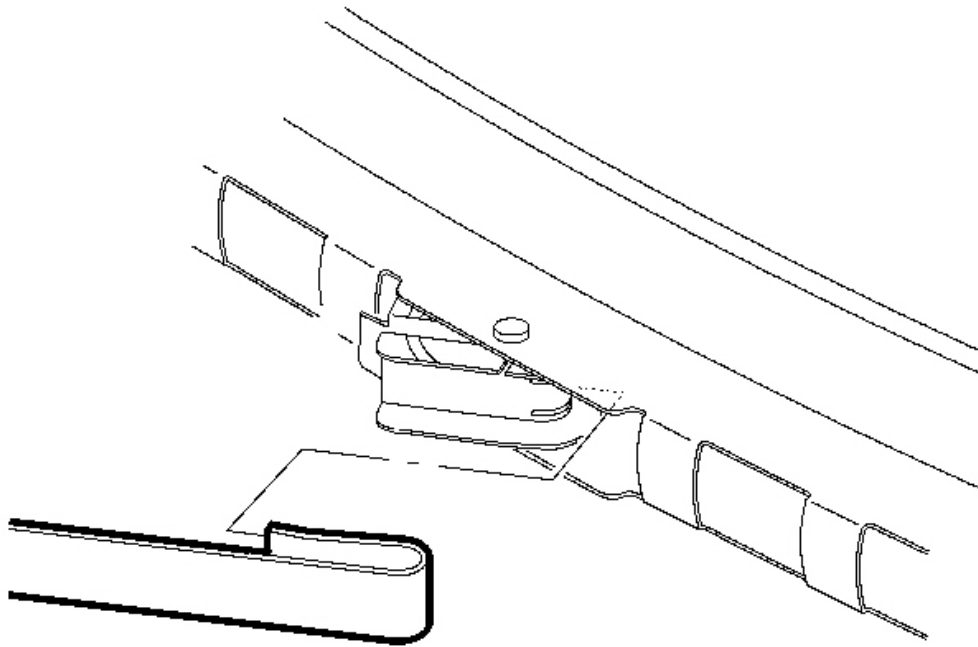
**Tighten:** Tighten the nut to 27 N.m (20 lb ft).

4. Operate the windshield wipers and inspect for proper operation.

# WIPER ARM BLADE REPLACEMENT

## Removal Procedure

1. Move the wiper arm to the service up position

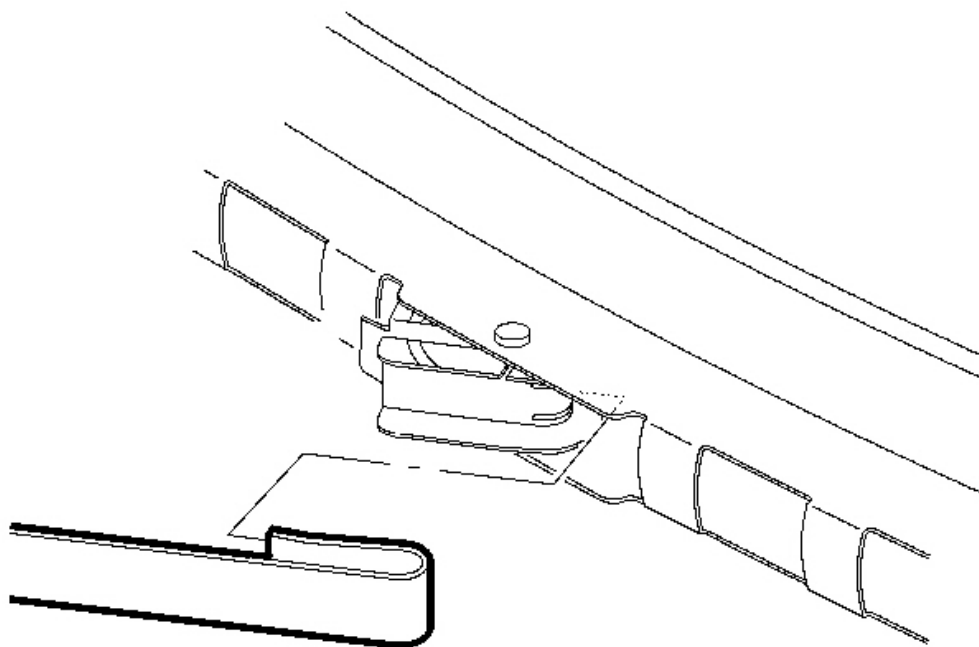


**Fig. 22: View Of Wiper Arm Blade**  
Courtesy of GENERAL MOTORS CORP.

2. Depress the wiper blade attachment clip and slide blade out of wiper arm hook.

## Installation Procedure

**IMPORTANT: Passenger and driver side wiper blades are different lengths. Ensure that the longer blade is installed on the driver side.**

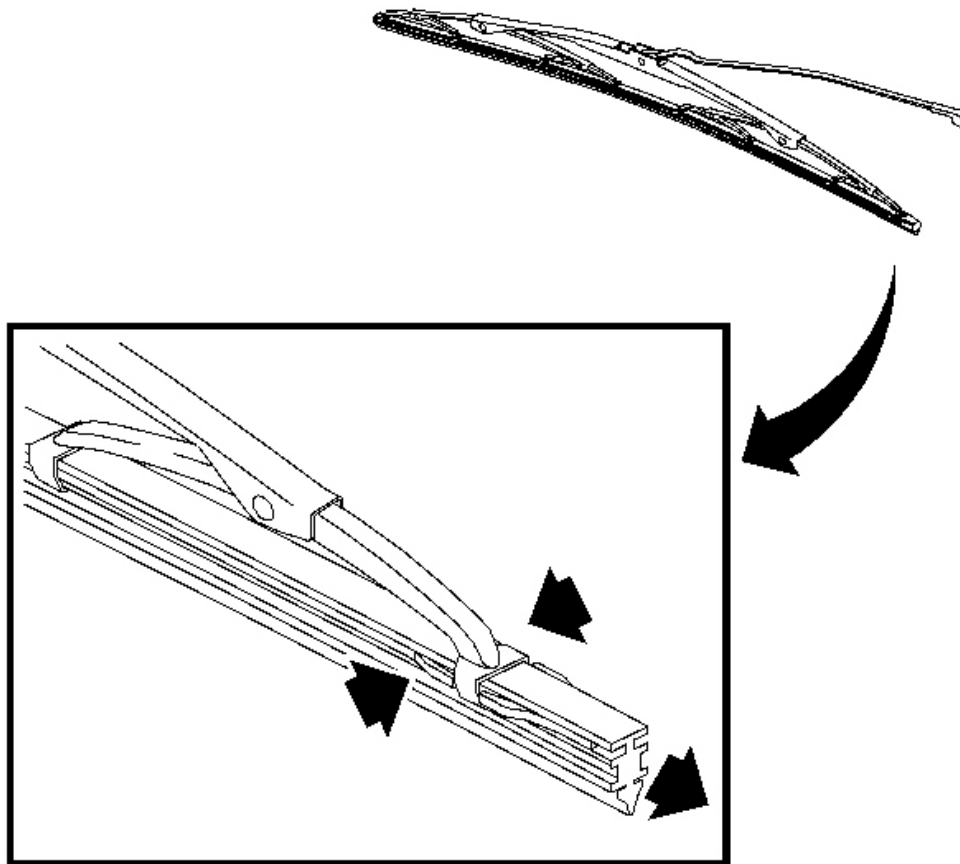


**Fig. 23: View Of Wiper Arm Blade**  
**Courtesy of GENERAL MOTORS CORP.**

1. Install the hook of the wiper arm through the opening in the wiper blade.
2. Press the wiper blade pivot into the wiper arm hook until the pivot locks into the hook.
3. Operate the windshield wipers and inspect for proper operation.

## **WIPER BLADE ELEMENT REPLACEMENT**

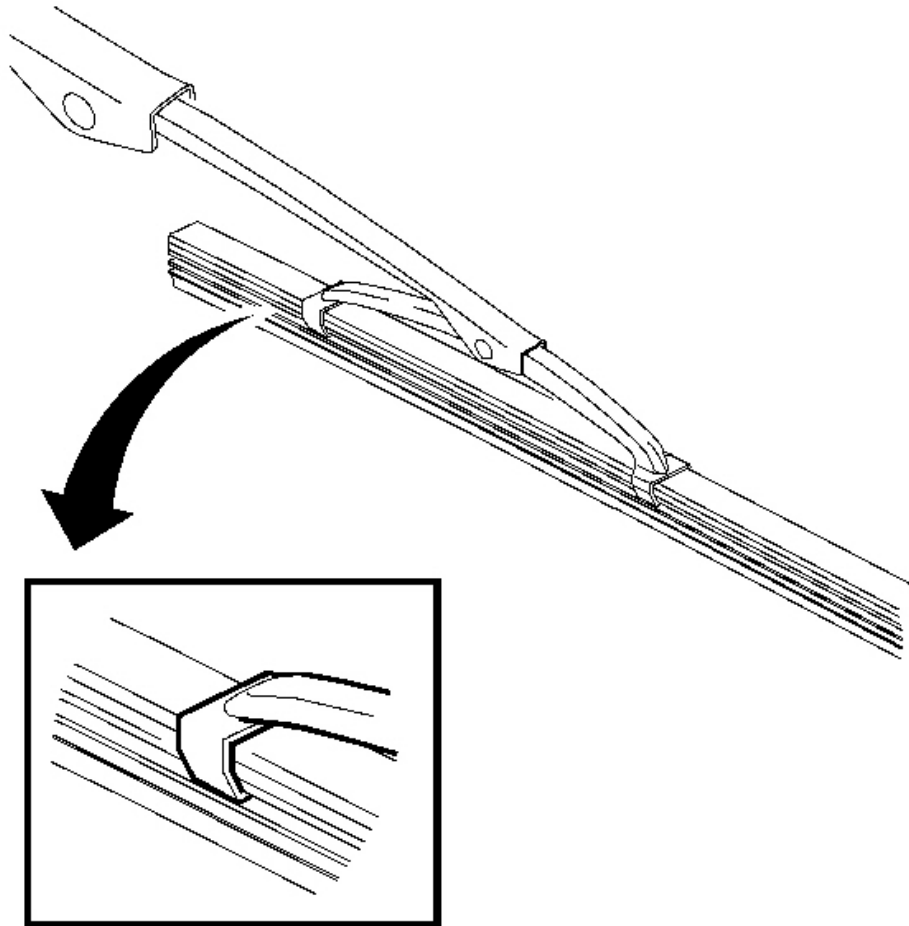
## Removal Procedure



**Fig. 24: View Of Wiper Blade Element**  
Courtesy of GENERAL MOTORS CORP.

1. Lift the wiper arm up to the service position.
2. Remove the wiper blade element by squeezing the metal tabs and pulling on the end of the insert at the heel claw.

## Installation Procedure



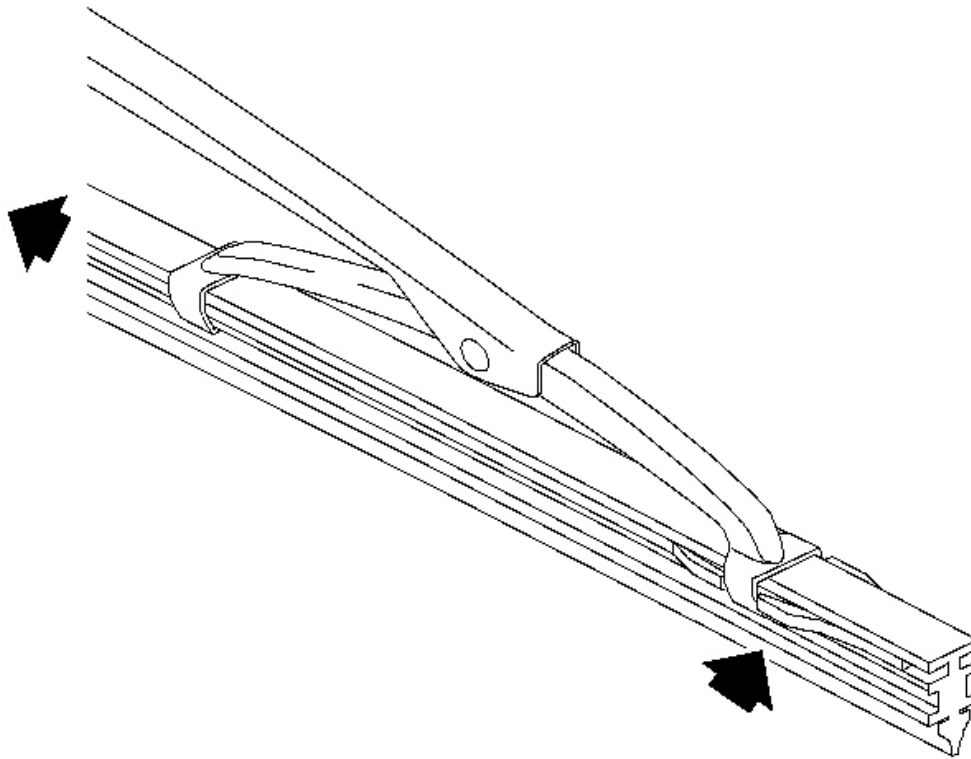
**Fig. 25: Removing/Installing Wiper Blade Element**  
Courtesy of GENERAL MOTORS CORP.

**IMPORTANT:** Passenger and driver side wiper blades are different lengths. Ensure that the longer blade is installed on the driver side.

**IMPORTANT:** Do not remove the retainer clips from the new wiper blade element until installed.

1. Slide the wiper blade element into the wiper blade, starting with the heel claw, so that the claw engages in the groove of the wiper blade element.
2. Guide the wiper blade element through the wiper blade claw sets.





**Fig. 26: View Of Wiper Blade Insert**  
Courtesy of GENERAL MOTORS CORP.

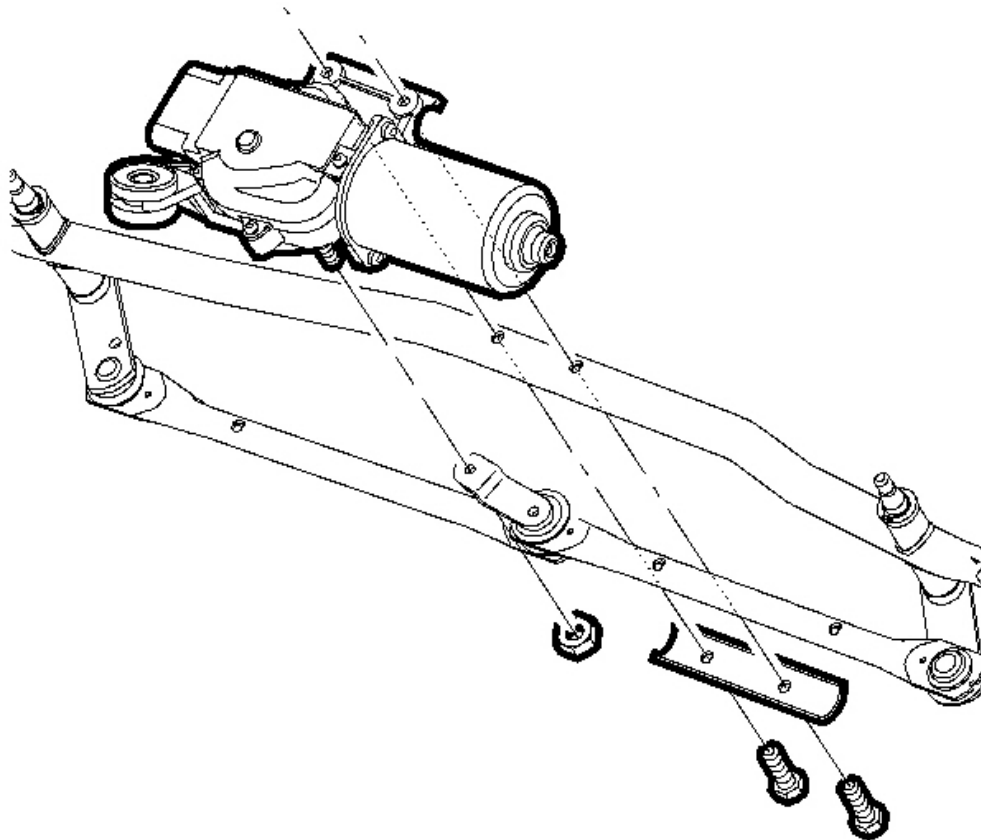
**NOTE:** If the metal clip on the wiper blade insert is not completely engaged to the heel claw, the wiper blade insert will not be sufficiently retained and may result in windshield damage.

3. Push the wiper blade insert so that the metal tabs fully engage into the heel claw.

## **WIPER MOTOR REPLACEMENT**

### **Removal Procedure**

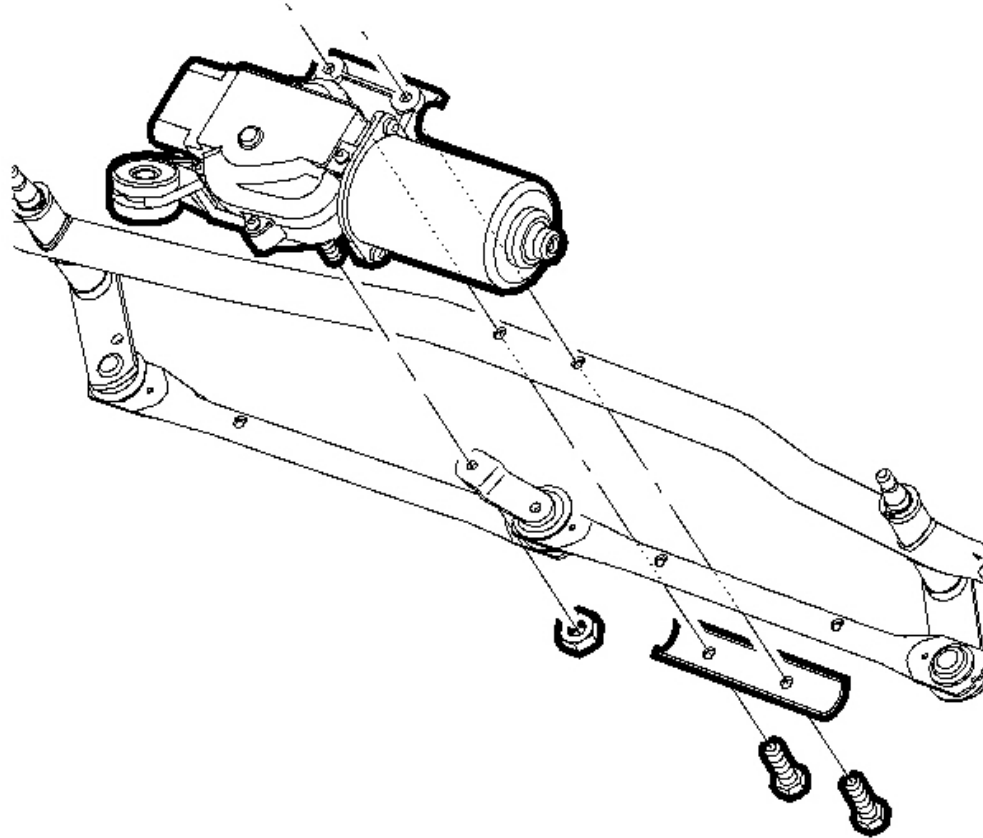
1. Remove the wiper motor module. Refer to **Wiper Motor Module Replacement** .



**Fig. 27: Removing/Installing Wiper Motor**  
Courtesy of GENERAL MOTORS CORP.

2. Remove the wiper motor to crank nut.
3. Remove the two wiper motor to wiper module frame bolts.
4. Remove the wiper motor from the wiper module.

#### **Installation Procedure**



**Fig. 28: Removing/Installing Wiper Motor**  
Courtesy of GENERAL MOTORS CORP.

1. Position the wiper motor to the wiper module.

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

2. Install the two wiper motor to wiper module frame bolts.

**Tighten:** Tighten the bolts to 8 N.m (71 lb in).

3. Install the wiper motor crank arm and crank arm nut.

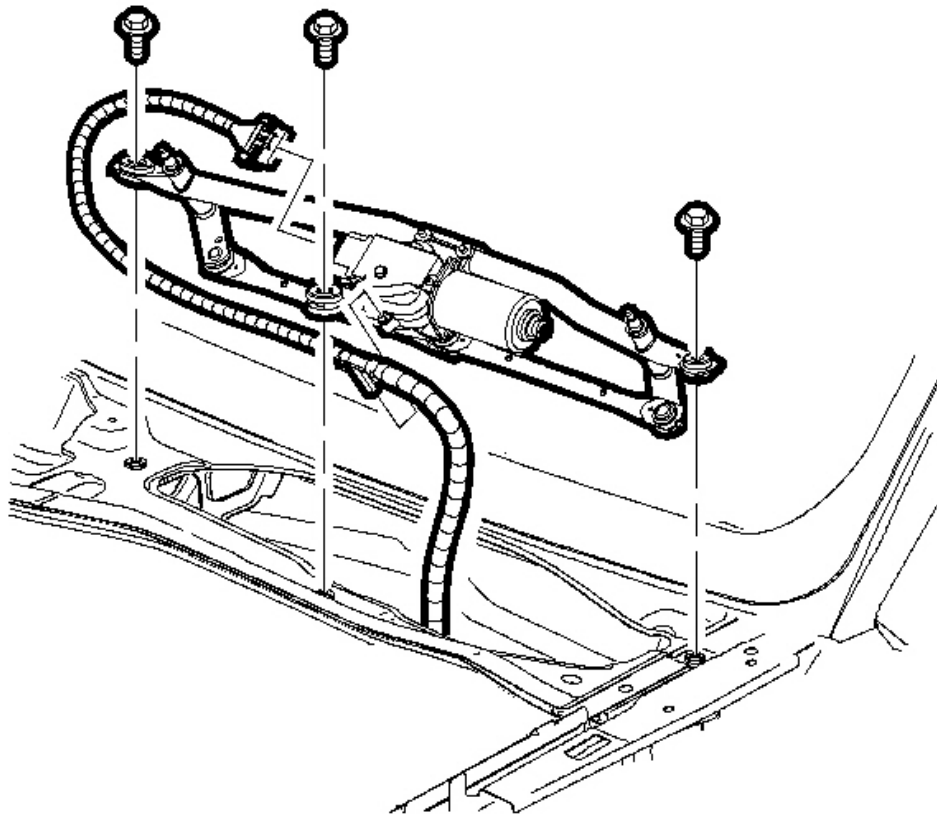
**Tighten:** Tighten the screws to 14 N.m (10 lb ft).

4. Install the wiper motor module. Refer to **Wiper Motor Module Replacement** .

## WIPER MOTOR MODULE REPLACEMENT

### Removal Procedure

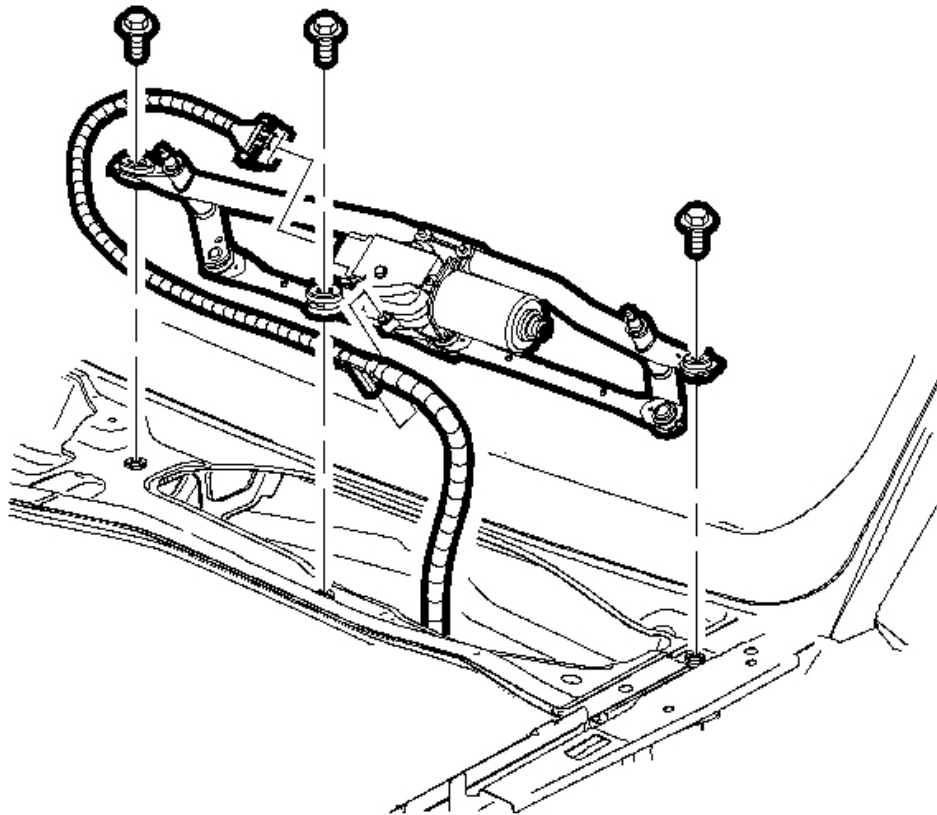
1. Remove the wiper arms. Refer to **Wiper Arm Replacement** .
2. Remove the air inlet grille. Refer to **Air Inlet Grille Panel Replacement** in Body Front End.



**Fig. 29: Removing/Installing Wiper Motor Module Assembly**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the wiper module bolts.
4. Lift the wiper motor module away from the cowl.
5. Disconnect the wire harness rosebud clip from the wiper module frame.
6. Disconnect the wiper module electrical connector at the motor.

### **Installation Procedure**



**Fig. 30: Removing/Installing Wiper Motor Module Assembly**  
Courtesy of GENERAL MOTORS CORP.

1. Connect the wiper module electrical connector to the motor.
2. Connect the wire harness rosebud clip to the wiper module frame.

3. Install the wiper module assembly into the plenum.

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

4. Install the fasteners attaching the wiper module assembly to the plenum.

**Tighten:** Tighten the fasteners to 12 N.m (9 lb ft)

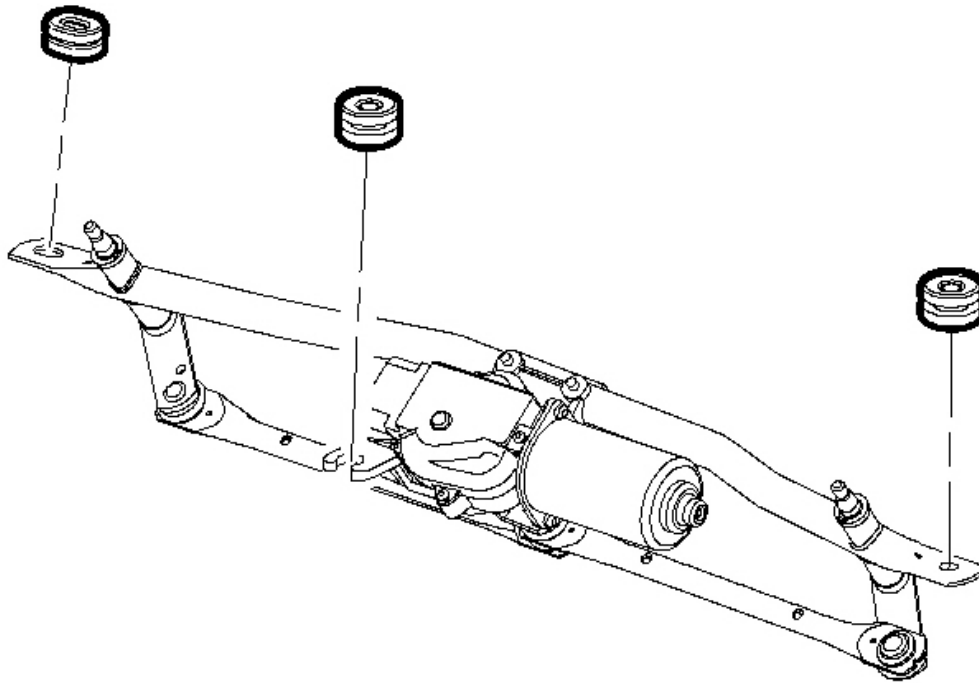
5. Turn the key to RUN position and cycle wiper system to ensure motor is in the park position.

6. Install the air inlet screens. Refer to Air Inlet Grille Panel Replacement in Body Front End.

7. Install the wiper arms. Refer to Wiper Arm Replacement .

## **WIPER MOTOR MODULE GROMMET REPLACEMENT (FRONT)**

### **Removal Procedure**

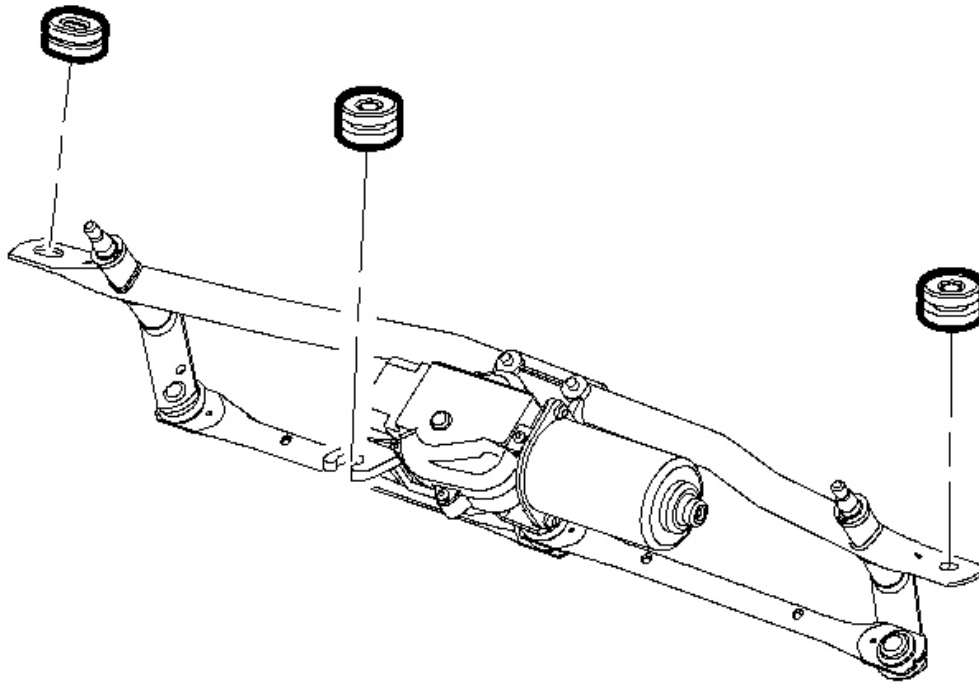


**Fig. 31: Removing/Installing Front Wiper Motor**  
Courtesy of GENERAL MOTORS CORP.

1. Remove the front wiper motor. Refer to **Wiper Motor Module Replacement** .
2. Remove the grommets and the bushings from the module.

#### **Installation Procedure**

**IMPORTANT:** The metal bushing inserts need to be installed with the flat side underneath the module bolts.



**Fig. 32: Removing/Installing Front Wiper Motor**  
Courtesy of GENERAL MOTORS CORP.

1. Install the grommets and the bushings to the module.
2. Install the front wiper motor. Refer to **Wiper Motor Module Replacement** .

## **WINDSHIELD GLASS CLEANING**

Clean the windshield with windshield cleaner, GM P/N 1050011 (Canadian P/N 992727) or equivalent. The cleaner should not harm the paint finish or scratch the glass. The glass is clean when the water no longer beads, but sheets across the entire glass surface.

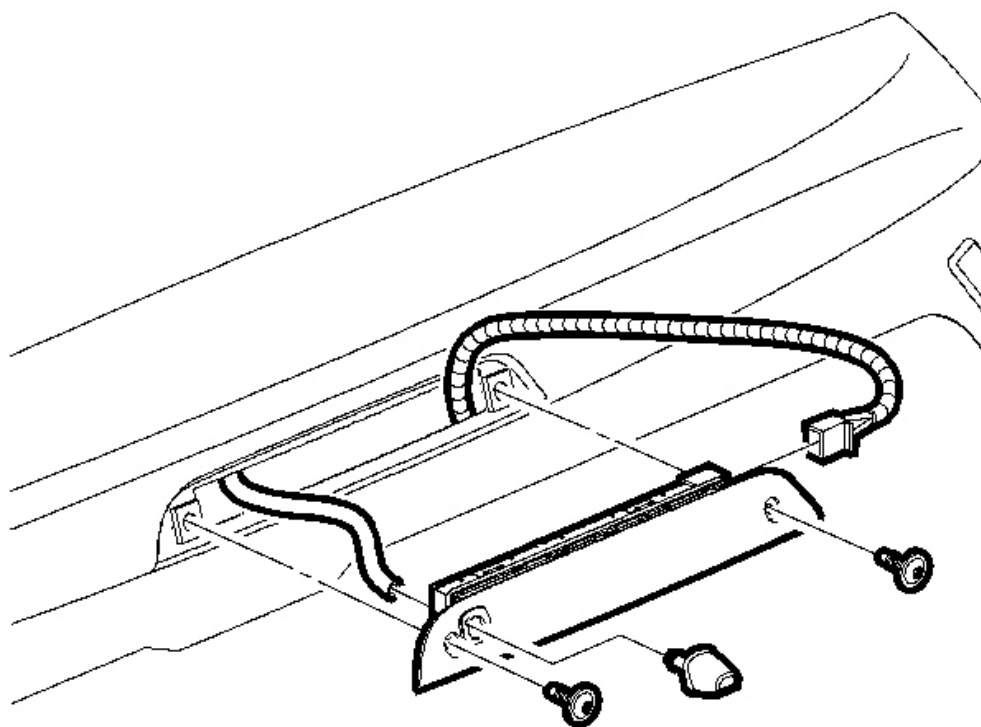
## **BLADE ELEMENT CLEANING**



Lift each blade assembly off of the windshield and clean the element with a cloth saturated with full strength washer solvent. Hold the blade in one hand and wipe the element with the saturated cloth until the black residue disappears. Then rinse the blade assembly elements with clean drinkable water.

## WASHER NOZZLE REPLACEMENT - REAR

### Removal Procedure

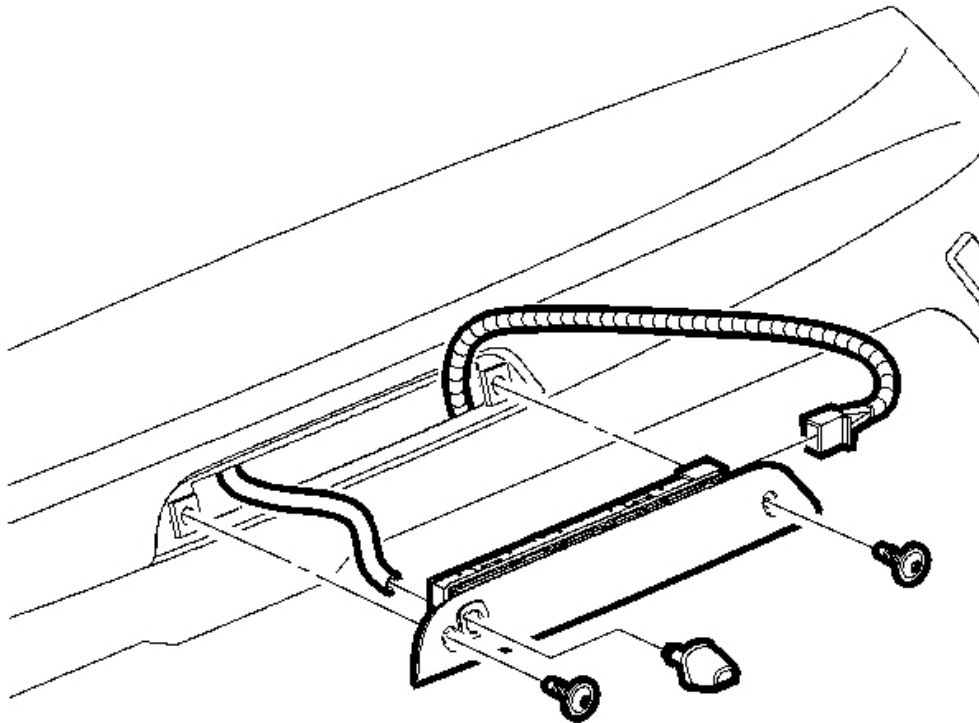


**Fig. 33: Disconnecting/Connecting Rear Washer Nozzle Hose**  
Courtesy of GENERAL MOTORS CORP.

1. Remove the center high mounted stop lamp (CHMSL). Refer to **High Mounted Stop Lamp Replacement** in Lighting Systems.

2. Disconnect the rear washer nozzle hose from the rear washer nozzle.
3. Rotate the rear washer nozzle 45° counterclockwise and remove the nozzle.

### Installation Procedure



**Fig. 34: Disconnecting/Connecting Rear Washer Nozzle Hose**  
Courtesy of GENERAL MOTORS CORP.

1. Insert the rear washer nozzle into the CHMSL and rotate 45° clockwise to lock the nozzle into position.
2. Connect the rear washer nozzle hose to the rear nozzle. Soapy water may be used as a lubricant to aid in assembly.
3. Install the CHMSL. Refer to **High Mounted Stop Lamp Replacement** in Lighting Systems.

## **WASHER HOSE REPLACEMENT - REAR**

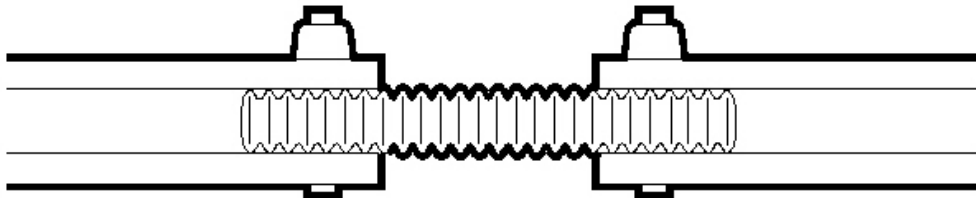
### **Rear Washer Hose Routing**

The rear washer hose is a component of the main body wire harness assembly. The rear washer hose is a hard plastic convoluted tube that is wrapped in the electrical tape along with the main body wiring harness. It starts underhood where it connects to the rear washer solvent container hose, this is rubber tubing. The rear washer hose routes into the main body wire harness underhood and passes through the front of the dash. The rear washer hose runs inside the vehicle interior along the left side rocker and over the left rear wheel housing. The rear washer hose is then routed up the left side pillar where it connects to the rear washer nozzle hose, where it is rubber tubing, at the top of the lift gate opening.

### **Removal Procedure**

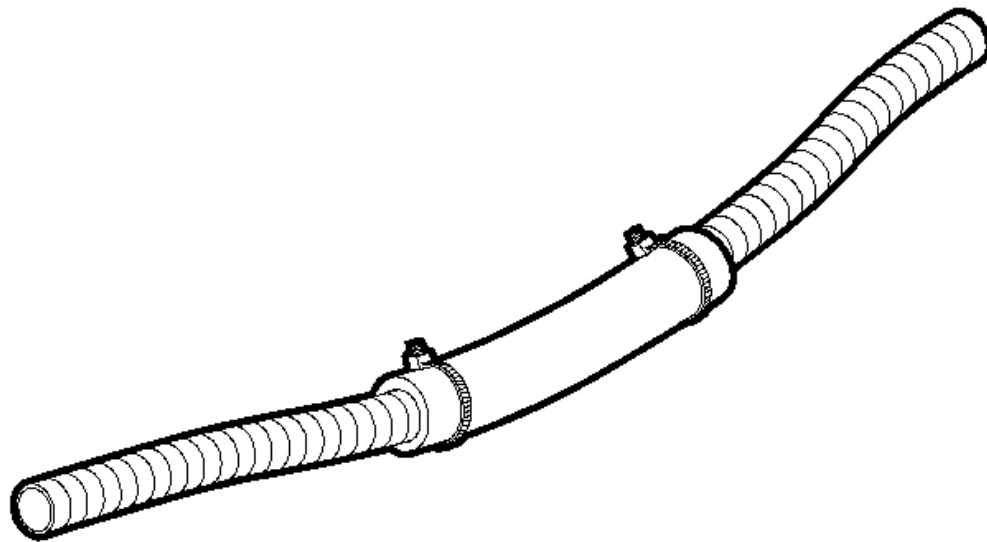
1. Locate the damaged section of the rear washer hose, this will be hard plastic convoluted tubing.
2. If the leak is located inside the main body wire harness, cut back the wire harness electrical tape to expose the damaged section.
3. Cut out the damaged section of the rear washer hose.

### **Installation Procedure**



**Fig. 35: View Of Rear Washer Hose**  
**Courtesy of GENERAL MOTORS CORP.**

1. Replace the damaged section of the rear washer hose.
  - Use a 9.5 mm (3/8 in) vacuum hose to replace damaged section.
  - Overlap the rear washer hose, the plastic tubing, by 10 mm (0.39 in) on each end.
  - Retain each end of the vacuum hose with a 100 mm (4 in) cable tie.
2. Verify the repair by activating the washer system and checking for leaks.
3. If the leak was located inside the main body wire harness, use electrical tape to retain the repaired section to the wire harness.

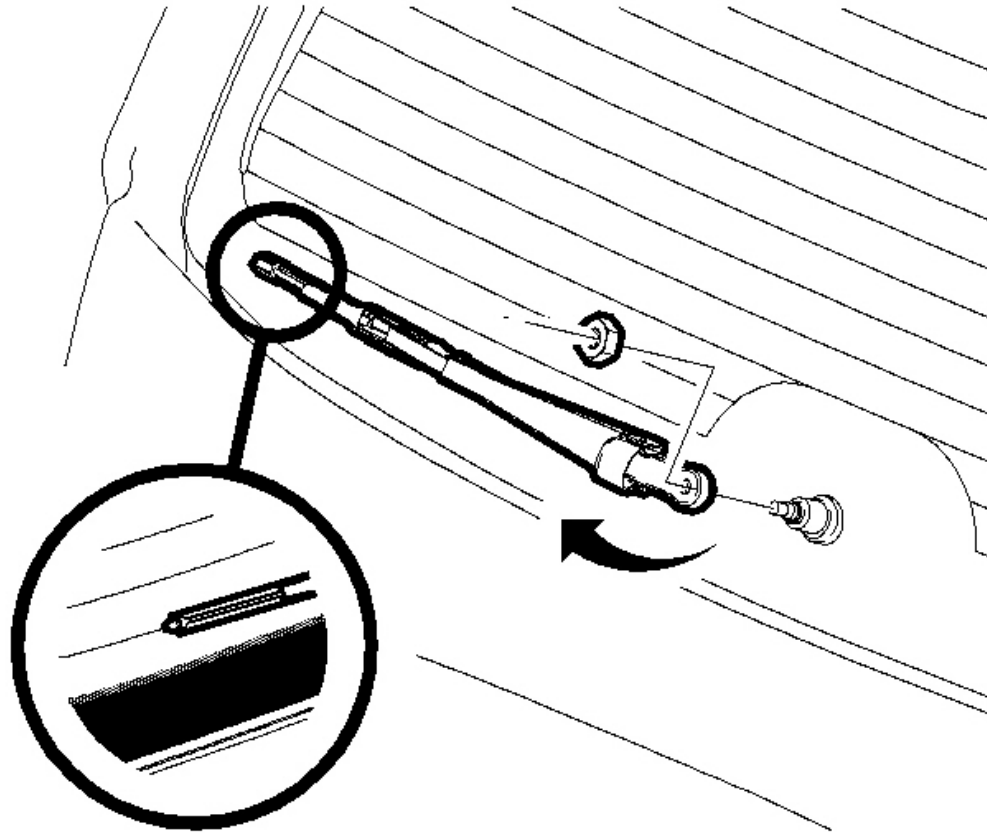


**Fig. 36: Repairing Rear Washer Hose**  
Courtesy of GENERAL MOTORS CORP.

4. If the leak requires the rear washer hose to be removed in the front of dash grommet do the following:
  - Cut out the auxiliary washer hose hole from the grommet.
  - Pass new section of the rear washer hose through the new grommet hose.
  - Repair the hose on either side of the grommet.

## **WIPER ARM REPLACEMENT - REAR**

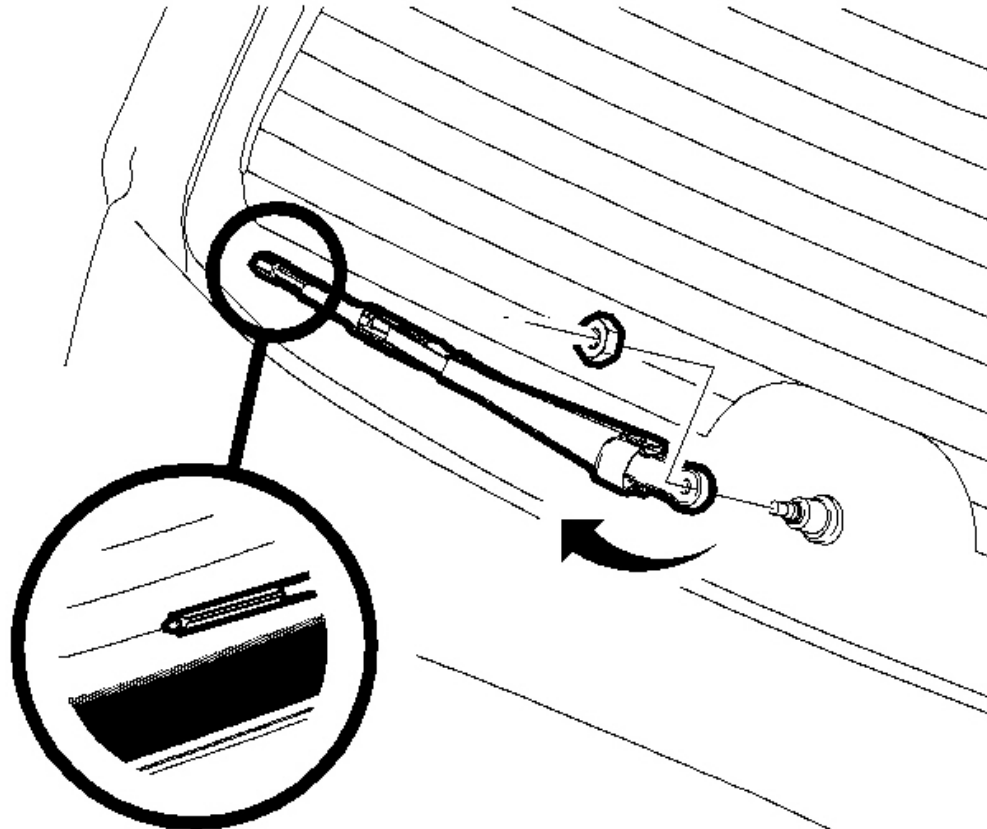
### **Removal Procedure**



**Fig. 37: View Of Rear Wiper Arm Assembly**  
**Courtesy of GENERAL MOTORS CORP.**

1. Remove the rear wiper arm finish cap to expose the wiper arm nut.
2. Remove the rear wiper arm nut.
3. Lift the rear wiper arm assembly away from the rear window and remove the wiper arm from the pivot shaft.

#### **Installation Procedure**



**Fig. 38: View Of Rear Wiper Arm Assembly**  
Courtesy of GENERAL MOTORS CORP.

1. Position wiper blade assembly on the first rear window defogger grid line above the blackout strip as shown in the illustration.

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

2. Install the rear wiper arm nut.

**Tighten:** Tighten the nut to 27 N.m (20 lb ft).

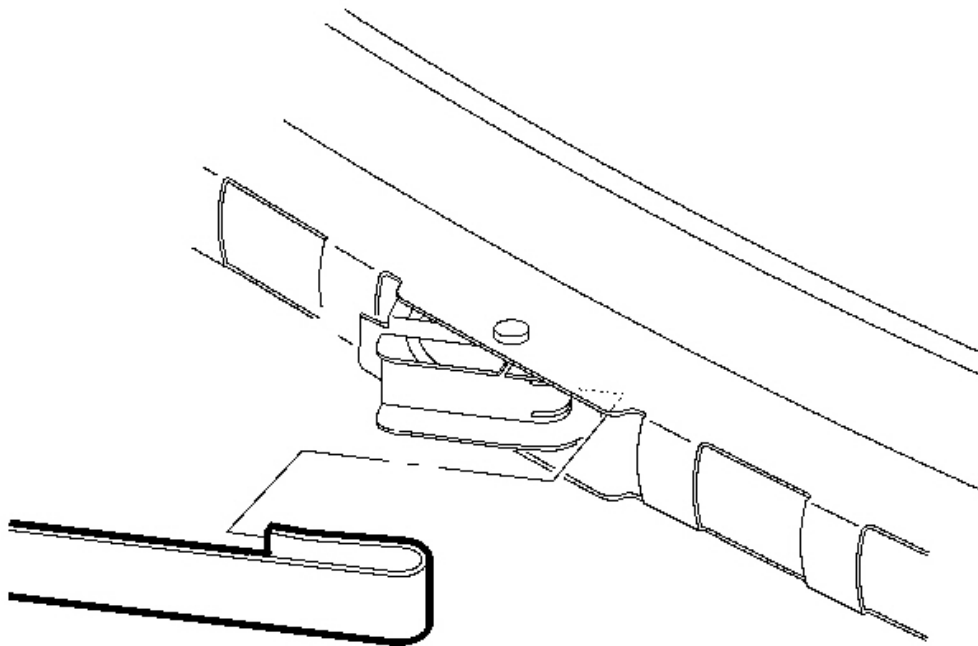
3. Install the rear wiper arm finish cap.

4. Operate the windshield wipers and inspect for proper operation.

## **WIPER ARM BLADE REPLACEMENT - REAR**

### **Removal Procedure**

1. Move the wiper arm to the service up position

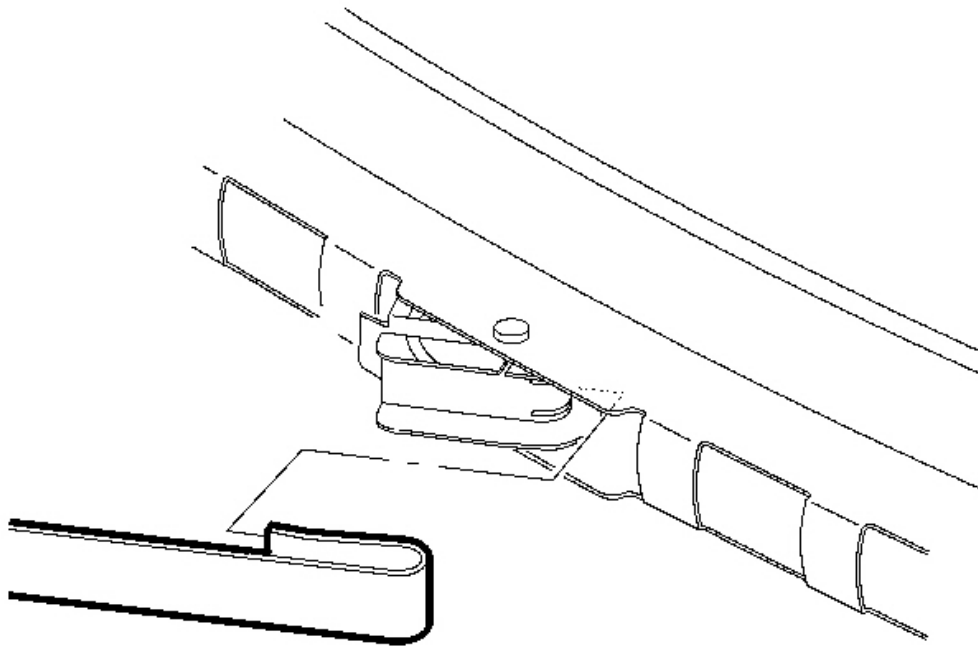


**Fig. 39: View Of Rear Wiper Arm Blade**  
Courtesy of GENERAL MOTORS CORP.

2. Depress the wiper blade attachment clip and slide blade out of wiper arm hook.



## Installation Procedure

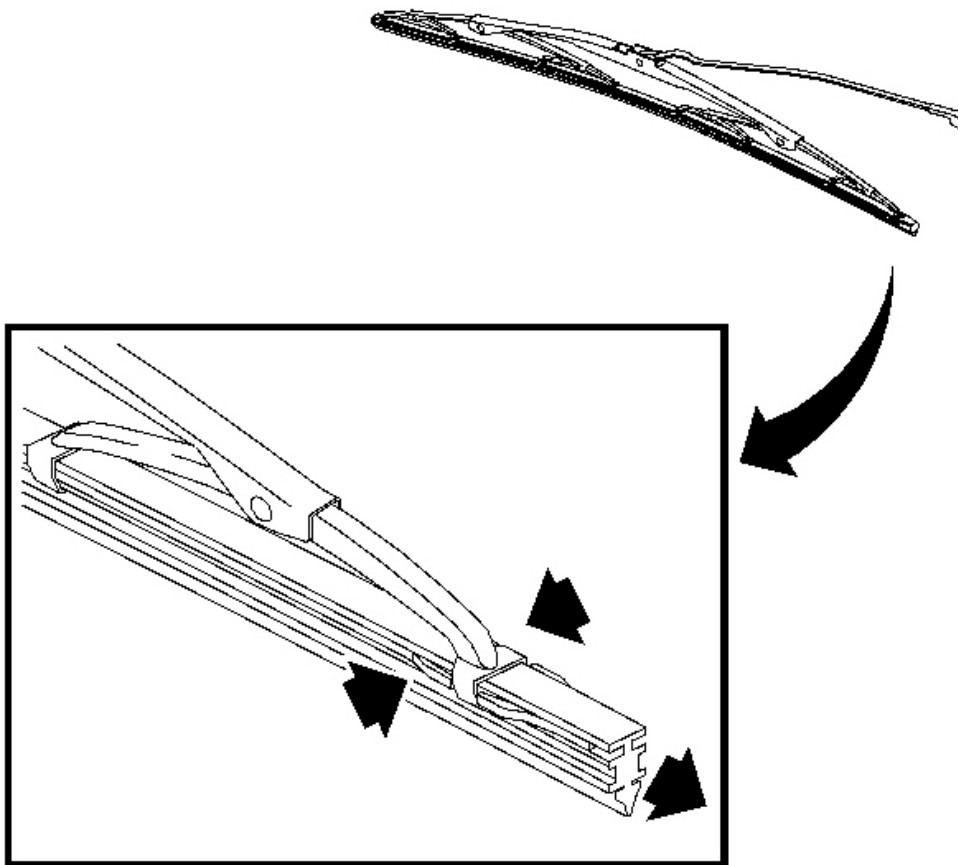


**Fig. 40: View Of Wiper Arm Blade**  
Courtesy of GENERAL MOTORS CORP.

1. Install the hook of the wiper arm through the opening in the wiper blade.
2. Press the wiper blade pivot into the wiper arm hook until the pivot locks into the hook.
3. Operate the windshield wipers and inspect for proper operation.

## BLADE ELEMENT REPLACEMENT - REAR

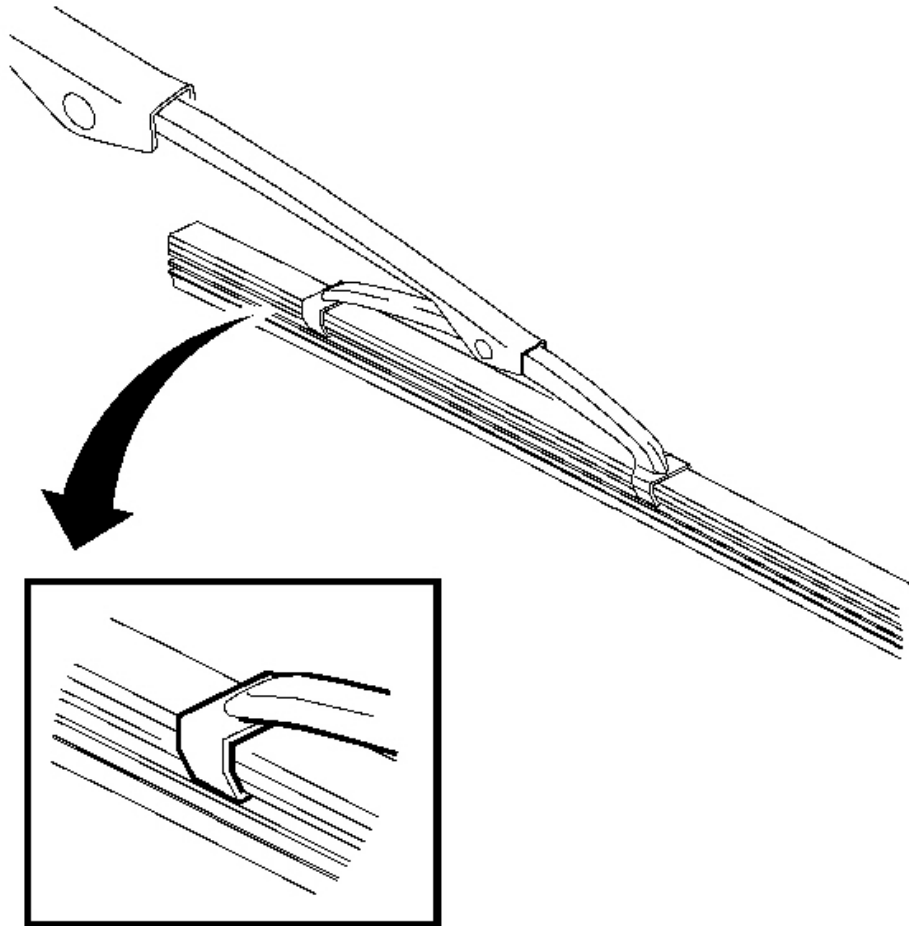
### Removal Procedure



**Fig. 41: View Of Wiper Blade Element**  
**Courtesy of GENERAL MOTORS CORP.**

1. Lift the wiper arm up to the service position.
2. Remove the wiper blade element by squeezing the metal tabs and pulling on the end of the insert at the heel claw.

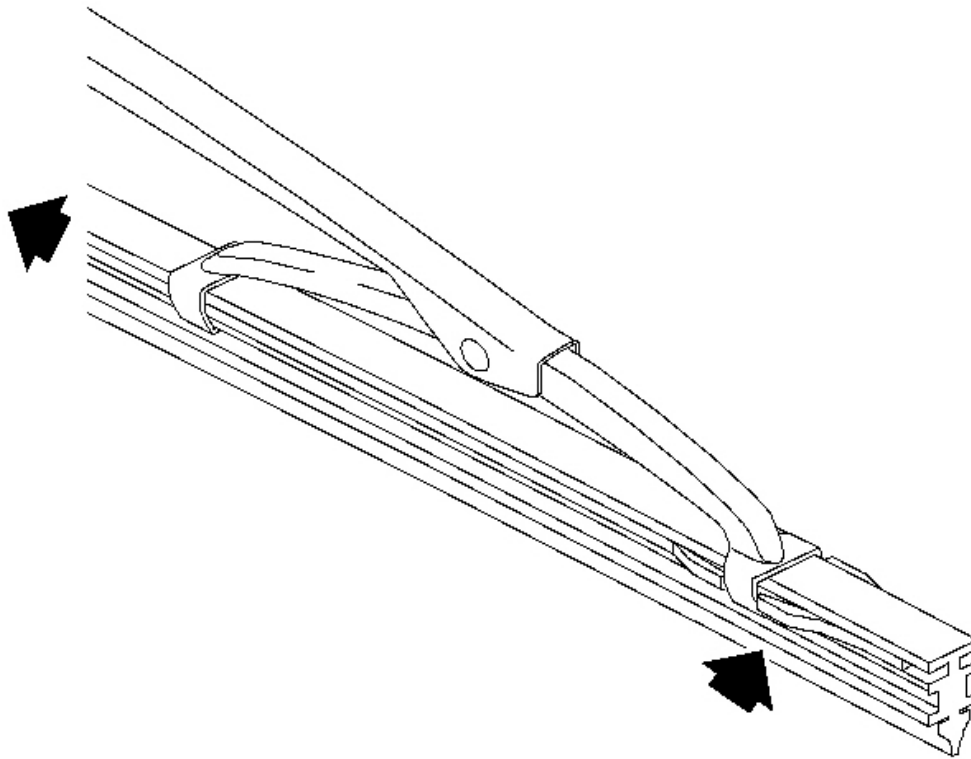
#### **Installation Procedure**



**Fig. 42: Removing/Installing Wiper Blade Element**  
Courtesy of GENERAL MOTORS CORP.

**IMPORTANT: Do not remove the retainer clips from the new wiper blade element until installed.**

1. Slide the wiper blade element into the wiper blade, starting with the heel claw, so that the claw engages in the groove of the wiper blade element.
2. Guide the wiper blade element through the wiper blade claw sets.



**Fig. 43: View Of Wiper Blade Insert**  
Courtesy of GENERAL MOTORS CORP.

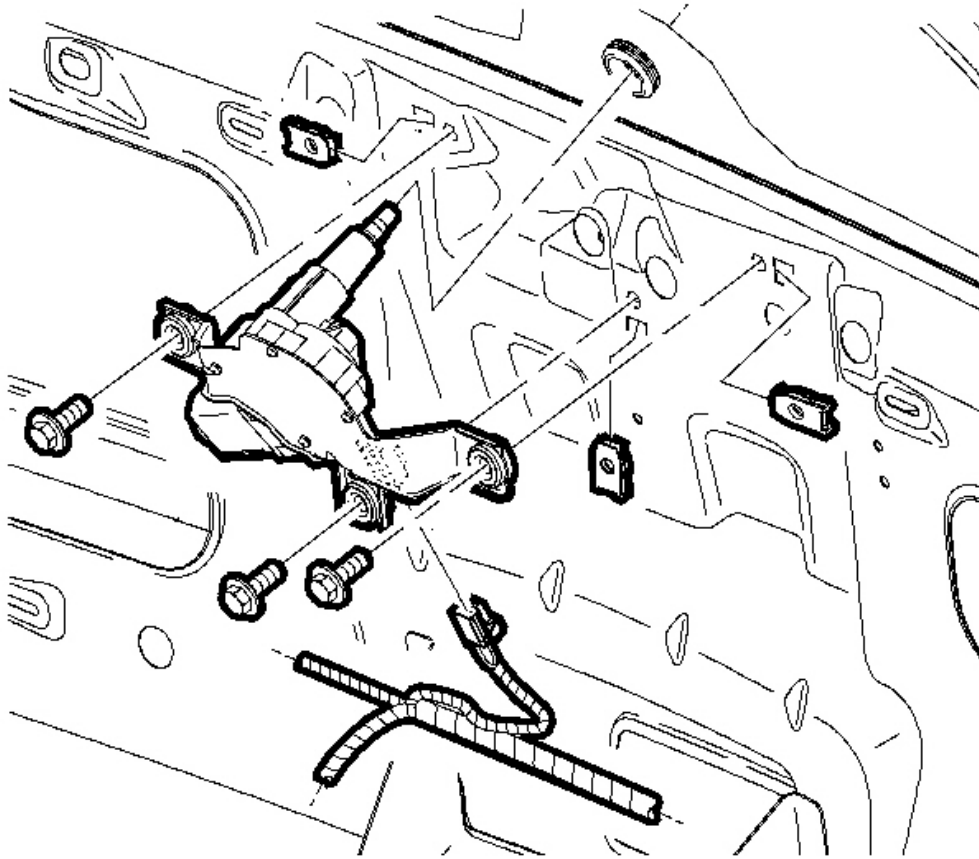
**NOTE:** If the metal clip on the wiper blade insert is not completely engaged to the heel claw, the wiper blade insert will not be sufficiently retained and may result in windshield damage.

3. Push the wiper blade insert so that the metal tabs fully engage into the heel claw.

## **WIPER MOTOR REPLACEMENT - LIFTGATE**

### **Removal Procedure**

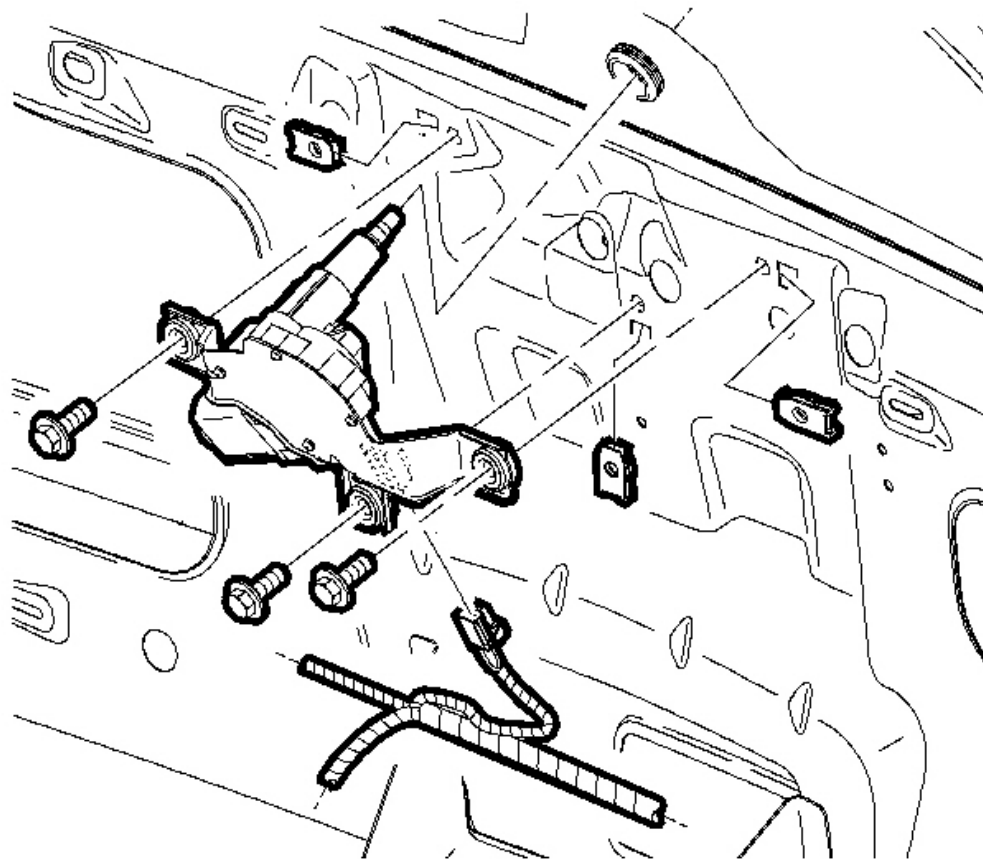
1. Remove the rear wiper arm. Refer to **Wiper Arm Replacement - Rear** .
2. Remove the lift gate trim panel. Refer to **Trim Panel Replacement - Liftgate** in Body Rear End.



**Fig. 44: View Of Liftgate Wiper Motor**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the rear wiper motor bolts.
4. Remove the motor by sliding the pivot shaft out of the rear window grommet.
5. Disconnect the electrical connector.

#### **Installation Procedure**



**Fig. 45: View Of Liftgate Wiper Motor**  
Courtesy of GENERAL MOTORS CORP.

1. Connect the electrical connector.
2. Install the rear wiper motor through the rear window grommet.

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

3. Install the wiper motor bolts.

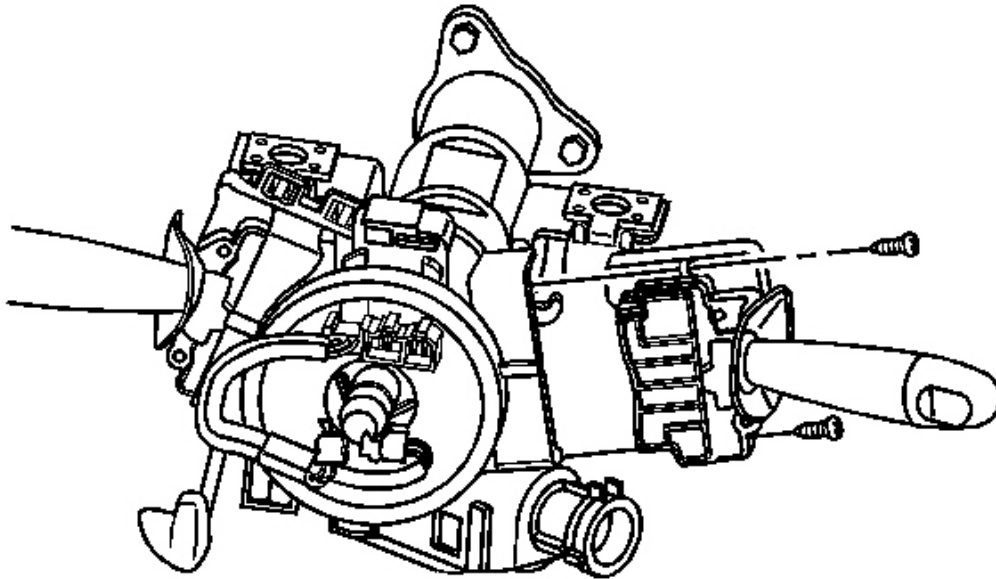
**Tighten:** Tighten the bolts to 7 N.m (62 lb in).

4. Install the lift gate trim panel. Refer to **Trim Panel Replacement - Liftgate** in Body Rear End.
5. Install the wiper motor module. Refer to **Wiper Arm Replacement - Rear** .

## **WIPERS/WASHER SWITCH REPLACEMENT**

### **Removal Procedure**

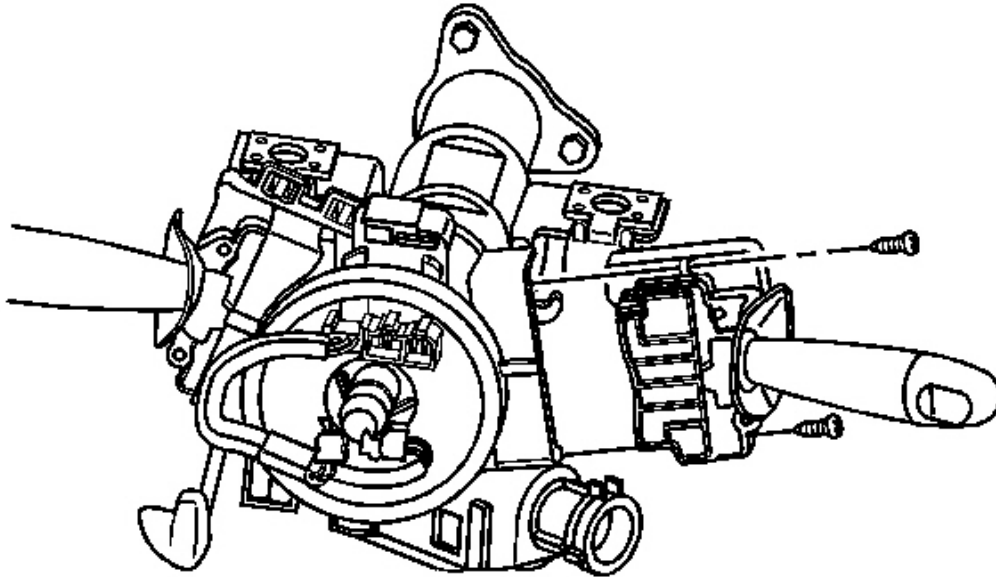
1. Remove the steering column trim covers. Refer to **Steering Column Trim Covers Replacement** in Steering Wheel and Column.
2. Disconnect the wipers/washer switch harness connector.



**Fig. 46: View Of Wipers/Washer Signal Switch**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the wipers/washer signal switch retaining screws.
4. Remove the wipers/washer signal switch from the steering column.

### **Installation Procedure**



**Fig. 47: View Of Wipers/Washer Signal Switch**  
Courtesy of GENERAL MOTORS CORP.

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

1. Install the wipers/washer signal switch to the steering column.

**Tighten:** Tighten the wipers/washer signal switch screws to 2 N.m (17 lb in).

2. Connect the wipers/washer switch harness connector.
3. Install the steering column trim covers. Refer to Steering Column Trim Covers Replacement in Steering Wheel and Column.

## DESCRIPTION AND OPERATION

### WIPER/WASHER SYSTEM DESCRIPTION AND OPERATION

The windshield wiper/washer system consists of front and rear wipers. The front and rear wipers are operative when the vehicle is in accessory or run. The front wipers have 4 different modes. The 4 modes are MIST, Intermittent, Low, and High. When the front wipers are in the intermittent mode, there are 3 delay modes to chose from, commanded by the windshield wiper washer switch through the body control module (BCM). There is one mode for the rear wipers. The rear wipers has an intermittent mode only, and the intermittent mode



has 3 delay modes to chose from. The wipers are powered through the windshield wiper washer switch except for the intermittent mode. The intermittent mode is controlled by the BCM. The front and rear wipers also have a washer function. By putting the wiper switch in the wash mode the front or rear wipers will spray washer fluid on the windshield and the wipers will then clean the windshield, wipers will be controlled by the BCM.

### **High Operation (Front Wipers Only)**

In the High position, the windshield wiper washer switch supplies voltage to the high speed circuit of the windshield wiper motor. The windshield wiper motor will operate at high speed.

### **Intermittent Operation (Front and Rear Wipers)**

The BCM controls the front and rear wipers, when the wipers are in the intermittent mode. When the BCM receives an input from the front or rear wipers switch, the BCM controls the input into the front or rear wiper relay. The BCM will energize the front or rear relay commanding the wipers On. There are 3 intermittent positions for the front or rear wipers. The intermittent switch (located in the wiper switch) sends inputs to the BCM indicating the speed the wipers should be in. Below is a table for the front and rear wipers indicating the time delay for each intermittent mode:

### **Wiper/Washer System Description and Operation**

<b>Front</b>	<b>Rear (with front wipers off)</b>	<b>Rear (with front wipers on)</b>		
		<b>Front (INT)</b>	<b>Front (LOW)</b>	<b>Front (HIGH)</b>
12 seconds	17 seconds	22 seconds	17 seconds	17 seconds
7 seconds	9 seconds	13 seconds	9 seconds	9 seconds
1 second	2 seconds	4 seconds	2 seconds	2 seconds

### **Low Operation (Front Wipers Only)**

In the Low position, the windshield wiper washer switch supplies voltage to the low/mist circuit of the windshield wiper motor. The windshield wiper motor will operate at low speed.

### **Mist Operation (Front Wipers Only)**

In the MIST position, the windshield wiper washer switch supplies voltage to the low/mist circuit of the windshield wiper motor. The windshield wiper motor will operate at low speed.

The windshield wipers make one sweep at low speed and returns to the park position. If the windshield wiper washer switch is held in MIST mode, the windshield wipers will continue to operate until the switch is released.

### **Park Position Operation**

The wiper and rear wiper fuses, supply voltage to signal circuit of the front and rear wiper motor, respectively. The signal will be pulled to voltage by the wiper motor while the windshield wiper motor is operating. When the windshield wiper motor has parked, the signal is at ground, (front wiper motor), or open, (rear wiper motor).

### **Wash Operation (Front and Rear Wipers)**

The front and rear washer systems use the same windshield washer fluid pump. When either the front or rear wiper is in the washer position voltage will be supplied to one side of the windshield washer fluid pump (depending on whether it is front or rear), while the other side of the pump is grounded.

At this point, the windshield washer fluid pump sprays solvent onto the windshield. When the front or rear washer is activated, the BCM receives an input from the switch that is activated. The BCM will control the wipers while in the WASH mode. The BCM will control either the front wiper relay or the rear wiper relay to turn on the wipers. The windshield wipers operate at low speed for 3 swipes and returns to the park position.