

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

2008 ACCESSORIES & EQUIPMENT

Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Air Inlet Grille Panel Screws	1.3 N.m	12 lb in
Plenum Reinforcement Panel Bolts	9 N.m	80 lb in
Windshield Washer Solvent Container Bolts	9 N.m	80 lb in
Windshield Washer Solvent Heater Nuts	9 N.m	80 lb in
Windshield Wiper Arm Pivot Shaft Nuts	30 N.m	22 lb ft
Windshield Wiper System Module Bolts to Plenum	9 N.m	80 lb in

SCHEMATIC AND ROUTING DIAGRAMS

WIPER/WASHER SCHEMATICS

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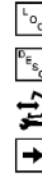


Fig. 1: Wiper Controls
Courtesy of GENERAL MOTORS CORP.

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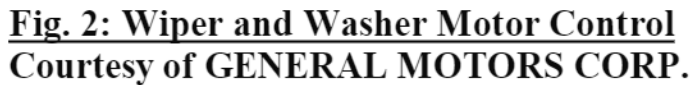


Fig. 2: Wiper and Washer Motor Control
Courtesy of GENERAL MOTORS CORP.

2008 Chevrolet Silverado 1500

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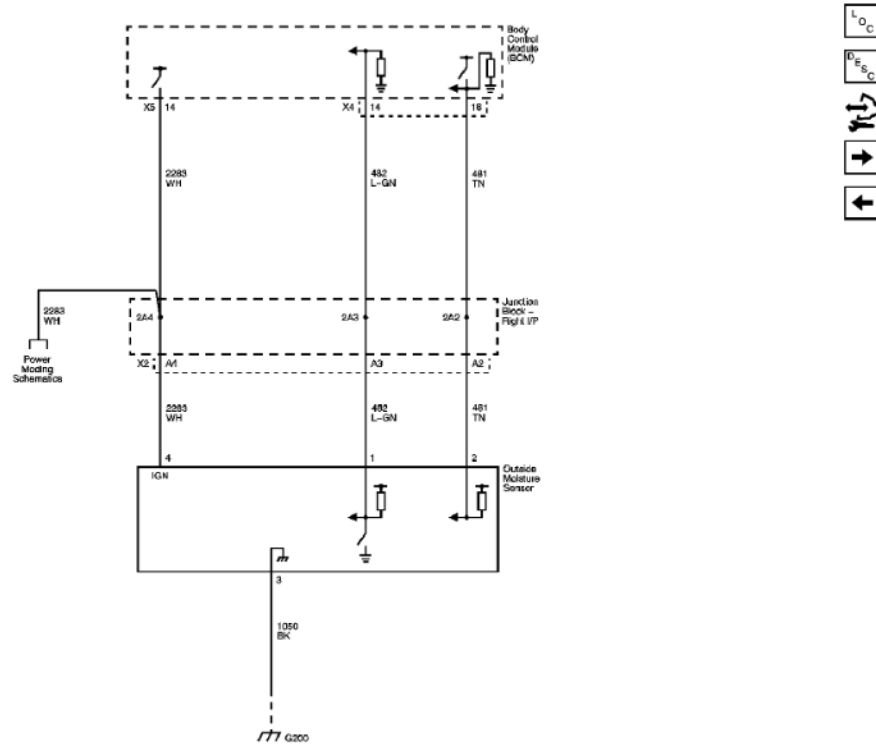


Fig. 3: Outside Moisture Sensor (CE1)
 Courtesy of GENERAL MOTORS CORP.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

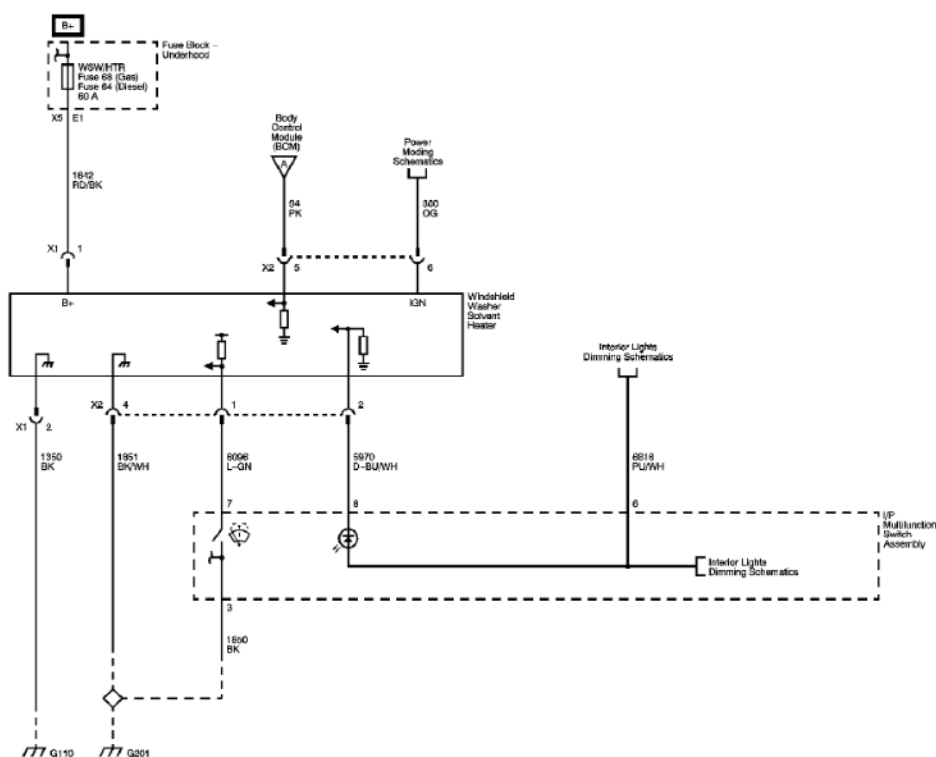


Fig. 4: Heated Washers (XA7)
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B3715	B3715 02: Front Wiper Relay Drive Circuit Short to Ground
DTC B3873	B3873 00: Front Washer Relay Circuit
DTC B3875	B3875 00: Wiper High Speed Relay Circuit
DTC B3922	B3922 00: Front Wiper Function Select Circuit

DIAGNOSTIC STARTING POINT - WIPER/WASHER SYSTEMS

Begin the wiper washer system diagnosis with **Diagnostic System Check - Vehicle**. The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- 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.

DTC B3715

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3715 02

Front Wiper Relay Drive Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
WIPER SPEED Relay B+	1, 2	1, 2	-	-
Windshield Wiper Switch Signal	B3922 00	1	1	-
Windshield Wiper Switch High Signal	4	2	2	-
Windshield Wiper Motor Park Switch Signal	3	3	-	-
WIPER CONTROL Relay Control	B3715 02	1	4	-
WIPER SPEED Relay Control	4	2	B3875 00	-
Windshield Wiper Motor High Speed Control	2	2	4	-
Windshield Wiper Motor Low Speed Control	1	1	4	-
Windshield Wiper Switch Low Reference	-	1, 2	1, 2	-

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Windshield Wiper Motor Ground	-	1, 2, 3	-	-
WIPER CONTROL Relay Ground	-	1	-	-
1. Delay or Low Speed Wipers Inoperative 2. High Speed Wipers Inoperative 3. Wipers Do Not Park 4. Wipers Always ON				

Circuit/System Description

The body control module (BCM) monitors the control circuit of the wiper relay. The voltage level should be low while the wiper relay is de-energized and near system voltage when the relay is energized. After the BCM receives a low, intermittent, or mist signal from the wiper/washer switch, it responds by applying battery voltage through the wiper relay control circuit to the coil side of the relay, energizing the WIPER CONTROL relay.

Conditions for Running the DTC

This DTC can set only when the output is actively being requested by the BCM.

Conditions for Setting the DTC

If the BCM detects a short to ground in the wiper relay control circuit.

Action Taken When the DTC Sets

The BCM will not activate the output.

Conditions for Clearing the DTC

- The current DTC will become history when the request for the output is removed or when the condition for setting the fault is corrected.
- The history DTC will clear after 50 consecutive ignition cycles without a fault present.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, wiper switch in LOW position. Verify the windshield wipers are cycling at the low speed.

Circuit/System Testing

1. Ignition OFF, disconnect the X5 harness connector at the BCM.
2. Ignition ON, verify that the low speed wipers are not on.
 - If the low speed wipers are on, test the WIPER CONTROL relay control circuit terminal 20 for a short to voltage. If the circuit tests normal, replace the underhood fuse block.
3. Install a 10A fused jumper wire between the WIPER CONTROL relay control circuit terminal 20 and B+. Verify the low speed wipers are on.
 - If the low speed wipers are not on, test the relay control circuit for an open/high resistance or short to ground. If the circuit tests normal replace the underhood fuse block.
4. If all circuits test normal, replace the BCM.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B3873

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3873 00

Front Washer Relay Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Windshield Washer Switch Signal	2	1	1	-
Windshield Washer Fluid Pump Control	1	1	2	-
FRT WASH Relay Control	2	1	B3873 00	-
Windshield Washer Switch Low Reference	-	1	-	-
Windshield Washer Fluid Pump Ground	-	1	-	-
1. Washer Inoperative 2. Washers Always ON				

Circuit/System Description

The windshield washer function is controlled by the body control module (BCM). When the washer switch is pressed, ground is applied through the switch contacts and the signal circuit to the BCM indicating the wash request. The BCM then applies ground through the control circuit to the coil side of the FRT WASH relay energizing the relay. With the relay energized, battery voltage from the FRT WPR fuse is applied through the switch contacts of the relay, the FRT

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

WASH fuse, and the control circuit to the windshield washer fluid pump.

Conditions for Running the DTC

This DTC can set only when the output is actively being requested by the BCM.

Conditions for Setting the DTC

This DTC sets if the BCM detects a short to B+ in the windshield washer pump relay control circuit.

Action Taken When the DTC Sets

The BCM will not activate the output.

Conditions for Clearing the DTC

- The current DTC will become history when the request for the output is removed or when the condition for setting the fault is corrected.
- The history DTC will clear after 50 consecutive ignition cycles without a fault present.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Operate the washers using the WASH switch. Verify the washer pump activates.

Circuit/System Testing

1. Ignition OFF, disconnect the X4 harness connector at the BCM.
2. Ignition ON, verify the windshield washer pump is not on.
 - If the windshield washer pump is on, test the windshield washer pump relay control circuit terminal 15 for a short to ground. If the circuit tests normal replace the underhood fuse block.
3. Install a 10A fused jumper wire between the relay control circuit terminal 15 and ground. Verify the windshield washer pump is on.
 - If the windshield washer pump is not on, test the relay control circuit for a short to voltage or an open/high resistance. If the circuit tests normal replace the underhood fuse block.
4. If all circuits test normal, replace the BCM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B3875

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3875 00

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Wiper High Speed Relay Circuit**Diagnostic Fault Information**

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
WIPER SPEED Relay B+	1, 2	1, 2	-	-
Windshield Wiper Switch Signal	B3922 00	1	1	-
Windshield Wiper Switch High Signal	4	2	2	-
Windshield Wiper Motor Park Switch Signal	3	3	-	-
WIPER CONTROL Relay Control	B3715 02	1	4	-
WIPER SPEED Relay Control	4	2	B3875 00	-
Windshield Wiper Motor High Speed Control	2	2	4	-
Windshield Wiper Motor Low Speed Control	1	1	4	-
Windshield Wiper Switch Low Reference	-	1, 2	1, 2	-
Windshield Wiper Motor Ground	-	1, 2, 3	-	-
WIPER CONTROL Relay Ground	-	1	-	-
1. Delay or Low Speed Wipers Inoperative 2. High Speed Wipers Inoperative 3. Wipers Do Not Park 4. Wipers Always ON				

Circuit/System Description

The body control module (BCM) monitors the wiper high speed relay control circuit only when wiper high speed mode is active. When the wiper high speed mode is requested, the BCM responds by applying a ground through the wiper high speed relay control circuit to the coil side of the relay, energizing the WIPER SPEED relay.

Conditions for Running the DTC

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

This DTC can set only when the output is actively being requested by the BCM.

Conditions for Setting the DTC

This DTC sets if the BCM detects a short to voltage on the wiper high speed relay control circuit.

Action Taken When the DTC Sets

The BCM will not activate the output.

Conditions for Clearing the DTC

- The current DTC will become history when the request for the output is removed or when the condition for setting the fault is corrected.
- The history DTC will clear after 50 consecutive ignition cycles without a fault present.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Ignition ON, wiper switch in the HIGH position. Verify the windshield wipers are cycling at the high speed.

Circuit/System Testing

1. Ignition OFF, disconnect the X5 harness connector at the BCM.
2. Install a 10A fused jumper wire between B+ and the WIPER CONTROL relay control circuit terminal 20.
3. Ignition ON, verify that the high speed wipers are not on.
 - If the high speed wipers are on, test the WIPER SPEED relay control circuit terminal 21 for a short to ground. If the circuit tests normal, replace the underhood fuse block.
4. Install a 10A fused jumper wire between the WIPER SPEED relay control circuit terminal 21 and ground. Verify the high speed wipers are on.
 - If the low speed wipers are not on, test the relay control circuit for a short to voltage or an open/high resistance. If the circuit tests normal replace the underhood fuse block.
5. If all circuits test normal, replace the BCM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, setup, and programming

DTC B3922

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3922 00

Front Wiper Function Select Circuit

Diagnostic Fault Information

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2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
WIPER SPEED Relay B+	1, 2	1, 2	-	-
Windshield Wiper Switch Signal	B3922 00	1	1	-
Windshield Wiper Switch High Signal	4	2	2	-
Windshield Wiper Motor Park Switch Signal	3	3	-	-
WIPER CONTROL Relay Control	B3715 02	1	4	-
WIPER SPEED Relay Control	4	2	B3875 00	-
Windshield Wiper Motor High Speed Control	2	2	4	-
Windshield Wiper Motor Low Speed Control	1	1	4	-
Windshield Wiper Switch Low Reference	-	1, 2	1, 2	-
Windshield Wiper Motor Ground	-	1, 2, 3	-	-
WIPER CONTROL Relay Ground	-	1	-	-
1. Delay or Low Speed Wipers Inoperative 2. High Speed Wipers Inoperative 3. Wipers Do Not Park 4. Wipers Always ON				

Circuit/System Description

The body control module (BCM) controls the wiper motor based on input from the windshield wiper washer switch. The BCM monitors the wiper washer switch through three separate signal circuits and a ground circuit. The windshield wiper switch high signal circuit is used to determine high speed wiper operation, the windshield wiper switch low signal is used to determine low speed, intermittent, and mist operation through the use of a resistor ladder, and windshield washer switch signal circuit is used to determine washer operation.

Conditions for Running the DTC

The ignition switch is in the ON position.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Conditions for Setting the DTC

The BCM detects a short to ground on the windshield wiper switch low signal circuit.

Action Taken When the DTC Sets

- The BCM will not activate the low speed output.
- The windshield wipers will only operate in the high speed mode.

Conditions for Clearing the DTC

- The DTC will clear the current status when the condition for setting the fault is corrected.
- A history DTC will clear after 50 consecutive ignition cycles without a fault present.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Windshield Wiper Switch parameter while rotating the wiper

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

switch. The reading should change between Off, Intermittent, and Low.

Circuit/System Testing

1. Ignition OFF, disconnect the X3 harness connector at the turn signal multifunction switch.
2. Ignition ON, verify the scan tool Windshield Wiper Switch parameter is OFF.
 - o If not the specified value, test the signal circuit terminal N for a short to ground. If the circuit tests normal, replace the BCM.
3. If all circuits test normal, test or replace the turn signal multifunction switch.

Component Testing

Turn Signal Multifunction Switch

1. Ignition OFF, disconnect the X1 harness connector at the turn signal multifunction switch.
2. With the wiper switch in the HIGH position, test for less than 2 ohms between the low reference terminal M and the signal terminal K.
 - o If greater than the specified range, replace the windshield wiper washer switch.

IMPORTANT: If the switch tests open in any switch position other than Off, test the signal circuits for a short to voltage before replacing the switch.

3. While cycling the wiper switch through each delay and speed position, test for the specified resistance between the low reference terminal M and the signal terminal N.

Wiper Switch Values

Switch Position	Resistance
Off	Infinite
Mist	300-364 ohms
Delay 1	3.48k-4.25k ohms
Delay 2	2.52k-3.08k ohms
Delay 3	1.78k-2.18k ohms
Delay 4	1.17k-1.44k ohms
Delay 5	697-851 ohms
Low	300-364 ohms
High	300-364 ohms

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- If any switch position is not within the specified range, replace the turn signal multifunction switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

SYMPTOMS - WIPER/WASHER SYSTEMS

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

1. Perform **Diagnostic System Check - Vehicle** , in order to verify that all of the following conditions are true:
 - No DTCs are set.
 - The control modules can communicate via the serial data link.
2. Review the system description and 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 Windshield Wiper/Washer 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 the washer fluid reservoir for the proper fluid level.

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:

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- **Windshield Wiper System Malfunction**
- **Low Washer Fluid Indicator Malfunction**
- **Washer Malfunction**
- **Windshield Washer Solvent Heater Malfunction**
- **Moisture Sensing Feature Inoperative**

WINDSHIELD WIPER SYSTEM MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
WIPER SPEED Relay B+	1, 2	1, 2	-	-
Windshield Wiper Switch Signal	B3922 00	1	1	-
Windshield Wiper Switch High Signal	4	2	2	-
Windshield Wiper Motor Park Switch Signal	3	3	-	-
WIPER CONTROL Relay Control	B3715 02	1	4	-
WIPER SPEED Relay Control	4	2	B3875 00	-
Windshield Wiper Motor High Speed Control	2	2	4	-
Windshield Wiper Motor Low Speed Control	1	1	4	-
Windshield Wiper Switch Low Reference	-	1, 2	1, 2	-
Windshield Wiper Motor Ground	-	1, 2, 3	-	-
WIPER CONTROL Relay	-	1	-	-

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Ground

1. Delay or Low Speed Wipers Inoperative
2. High Speed Wipers Inoperative
3. Wipers Do Not Park
4. Wipers Always ON

Circuit/System Description

The body control module (BCM) controls the wiper motor based on input from the windshield wiper washer switch. The BCM monitors the wiper washer switch through three separate signal circuits and a ground circuit. The windshield wiper switch high signal circuit is used to determine high speed wiper operation, the windshield wiper switch low signal is used to determine low speed, intermittent, and mist operation through the use of a resistor ladder, and windshield washer switch signal circuit is used to determine washer operation.

The BCM controls the windshield wiper motor through two output controls, controlling two relays which determine the desired wiper speed, high or low.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Control Module References for scan tool information

Circuit/System Verification

1. Observe the scan tool Windshield Wiper Switch parameter while rotating the wiper switch. The reading should change between Off, Intermittent, Low, and High.
 - If the Windshield Wiper Switch parameter is incorrect in the Low or High switch positions, refer to the Multifunction Switch Circuit Test and/or the Turn Signal Multifunction Switch Component Test below.
2. Observe the scan tool BCM Wiper Park Switch parameter. The reading should display Active when the wipers are parked and Inactive with the wipers ON or out of the park position.
 - If the Wiper Park Switch parameter is always Active or Inactive, refer to Wipers do not Park Circuit Test below.
3. Connect a test lamp between the TP 1 terminal in the underhood fuse block and ground.
4. Verify the test lamp turns on and off while turning the windshield wiper switch between LOW and OFF.
 - If the test lamp does not turn on and off while changing between the commanded states, refer to Wiper Control Relay Control Circuit Test below.
5. Ignition ON, operate the windshield wiper switch through the Delay, Low, and High positions.
 - If the windshield wipers are inoperative in 1 or more of the delay settings only, test or replace the turn signal multifunction switch.
 - If the windshield wipers operate at high speed while the switch is in the Low position, refer to Wiper Speed Relay Control Circuit Test below.
 - If the windshield wipers operate at low speed while the switch is in the High position, refer to Wiper Speed Relay Control Circuit Test below.
 - If the windshield wipers are inoperative in the Low or High switch positions, refer to Wiper Motor Circuit Test and/or the Wiper Motor Component Test below.

Circuit/System Testing

Multifunction Switch Circuit Test

1. Ignition OFF, disconnect the X3 harness connector at the turn signal multifunction switch.
2. Ignition OFF, test for less than 20 ohms between the low reference circuit terminal M and ground.
 - If greater than the specified range, test the low reference circuit for an open/high

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

resistance. If the circuit tests normal, replace the BCM.

3. Verify the scan tool Windshield Wiper Switch parameter is Off.
 - If not the specified value, test the signal circuit terminal N for a short to ground. If the circuit tests normal, replace the BCM.
4. Verify the scan tool Wiper High Speed Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal K for a short to ground. If the circuit tests normal, replace the BCM.
5. Install a 3-amp fused jumper wire between the signal circuit terminal N and ground. Verify the scan tool Windshield Wiper Switch parameter is Switch Fault.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
6. Install a 3-amp fused jumper wire between the signal circuit terminal K and ground. Verify the scan tool Wiper High Speed Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
7. If all circuits test normal, replace the turn signal multifunction switch.

Wipers Do Not Park Circuit Test

1. Ignition OFF, disconnect the harness connector at the windshield wiper motor.
2. Ignition ON, verify the scan tool BCM Wiper Park Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 3 for a short to ground. If the circuit tests normal, replace the BCM.
3. Install a 3-amp fused jumper wire between the signal circuit terminal 3 and ground. Verify the scan tool Wiper Park Switch parameter is Active.
 - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the BCM.
4. If all circuits test normal, replace the windshield wiper motor.

Wiper Control Relay Control Circuit Test

1. Ignition OFF, disconnect the X5 harness connector at the BCM.
2. Ignition ON, verify that the low speed wipers are not on.
 - If the low speed wipers are on, test the relay control circuit terminal 20 for a short to voltage. If the circuit tests normal, replace the underhood fuse block.
3. Install a 10A fused jumper wire between B+ and the relay control circuit terminal 20.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Verify the low speed wipers are on.

- If the low speed wipers are not on, test the relay control circuit for an open/high resistance or short to ground. If the circuit tests normal replace the underhood fuse block.

4. If all circuits test normal, replace the BCM.

Wiper Speed Relay Control Circuit Test

1. Ignition OFF, disconnect the X5 harness connector at the BCM.
2. Install a 10A fused jumper wire between B+ and the WIPER CONTROL relay control circuit terminal 20.
3. Ignition ON, verify that the high speed wipers are not on.
 - If the high speed wipers are on, test the WIPER SPEED relay control circuit terminal 21 for a short to ground. If the circuit tests normal, replace the underhood fuse block.
4. Install a 10A fused jumper wire between the WIPER SPEED relay control circuit terminal 21 and ground. Verify the high speed wipers are on.
 - If the high speed wipers are not on, test the relay control circuit for an open/high resistance or short to voltage. If the circuit tests normal replace the underhood fuse block.
5. If all circuits test normal, replace the BCM.

Wiper Motor Circuit Test

1. Disconnect the harness connector at the windshield wiper motor.
2. Test for less than 1 ohm between the wiper motor ground circuit terminal 5 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the low speed motor control circuit terminal 1 and ground.
4. Ignition ON, command the Wiper Relay ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the underhood fuse block.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the underhood fuse block.
5. Connect a test lamp between the high speed motor control circuit terminal 4 and ground.
6. Wiper switch in the LOW position, command the Wiper High Speed Relay ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the underhood fuse block.
 - If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the underhood fuse block.
7. If all circuits test normal, replace the windshield wiper motor.

Component Testing

Turn Signal Multifunction Switch

1. Ignition OFF, disconnect the X1 harness connector at the turn signal multifunction switch.
2. With the wiper switch in the HIGH position, test for less than 2 ohms between the low reference terminal M and the signal terminal K.
 - If greater than the specified range, replace the windshield wiper washer switch.

IMPORTANT: If the switch tests open in any switch position other than Off, test the signal circuits for a short to voltage before replacing the switch.

3. While cycling the wiper switch through each delay and speed position, test for the specified resistance between the low reference terminal M and the signal terminal N.

Wiper Switch Values

Switch Position	Resistance
Off	Infinite
Mist	300-364 ohms
Delay 1	3.48K-4.25K ohms
Delay 2	2.52K-3.08K ohms
Delay 3	1.78K-2.18K ohms
Delay 4	1.17K-1.44K ohms
Delay 5	697-851 ohms
Low	300-364 ohms

Windshield Wiper Motor Dynamic Test

1. Ignition OFF, disconnect the harness connector at the windshield wiper motor.
2. Install a 25-amp fused jumper wire between B+ and the control terminal 1. Install a jumper wire between the terminal 5 and ground.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

3. The wiper motor should be in low speed mode.
 - If the wiper motor is not in the low speed mode replace the motor.
4. Install a 25-amp fused jumper wire between B+ and the control terminal 4. Install a jumper wire between the terminal 5 and ground.
5. The wiper motor should be in the high speed mode.
 - If the wiper motor is not in the high speed mode replace the motor.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Turn Signal Multifunction Switch Replacement**
- **Windshield Wiper System Module Replacement**
- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, setup, and programming

LOW WASHER FLUID INDICATOR MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Low Washer Fluid Switch Signal	1	2	2	-
Low Reference	-	2	-	-
1. Low washer fluid message always displayed 2. Low washer fluid message never displayed				

Circuit/System Description

The Check Washer Fluid message is controlled by the instrument panel cluster using an input from the washer fluid level switch. The washer fluid level signal circuit is supplied ignition voltage through a resistor then monitored within the instrument cluster. The washer fluid level

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

switch is normally open so the instrument cluster detects ignition voltage on the washer fluid level signal circuit whenever the washer fluid level is not low. When the washer fluid reaches the point where the driver should be informed that the washer fluid is low, the washer fluid level switch closes. When the washer fluid level switch is closed the washer fluid level signal circuit voltage is pulled low, and the instrument panel displays the Check Washer Fluid message on the driver information center. In order to prevent the Check Washer Fluid message from being displayed while sloshing is occurring in the washer fluid container, the instrument cluster is programmed with a 1 minute delay before changing states of the Check Washer Fluid message during an ignition cycle.

Reference Information

Schematic Reference

Instrument Cluster Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for Scan Tool Information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the washer fluid level switch.
2. Test for less than 1.0 ohm of resistance between the ground circuit terminal A and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

3. Ignition ON, verify the scan tool Washer Fluid Level parameter is OK.
 - If not the specified value, test the signal circuit terminal B for a short to ground. If the circuit tests normal, replace the IPC.
4. Install a 3A fused jumper wire between the signal circuit terminal B and ground. Verify the scan tool Washer Fluid Level parameter is Low.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the IPC.
5. If all circuits test normal, test or replace the washer fluid level switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Windshield Washer Solvent Level Switch Replacement (GMC)** or **Windshield Washer Solvent Level Switch Replacement (Chevrolet)**
- **Control Module References** for IPC replacement, setup, and programming

WASHER MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Windshield Washer Switch Signal	2	1	1	-
Windshield Washer Fluid Pump Control	1	1	2	-
Windshield Washer Relay Control	2	1	B3873 00	-
Windshield Washer Switch Low Reference	-	1	-	-
Windshield Washer Fluid Pump Ground	-	1	-	-

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

1. Washer Inoperative
2. Washers Always ON

Circuit/System Description

The windshield washer function is controlled by the body control module (BCM). When the washer switch is pressed, ground is applied through the switch contacts and the signal circuit to the BCM indicating the wash request. The BCM then applies ground through the control circuit to the coil side of the FRT WASH relay energizing the relay. With the relay energized, battery voltage is applied through the switch contacts of the relay, the FRT WASH fuse and the control circuit to the windshield washer fluid pump.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool Windshield Washer Switch parameter while pressing and releasing the washer switch. The reading should change between Active and Inactive.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

- If the reading does not change between the specified values, refer to the Windshield Washer Switch Circuit Test below.
- 2. Connect a test lamp between the relay side of the FRT WASH fuse and ground.
- 3. Ignition ON, verify that the test lamp turns ON and OFF while pressing and releasing the windshield washer switch.
 - If the test lamp does not turn ON and OFF while changing between the commanded states, refer to the Windshield Washer Pump Relay Control Circuit Test below.
- 4. If the washer pump does not operate, refer to the Windshield Washer Pump Circuit Test below.

Circuit/System Testing

Windshield Washer Switch Circuit Test

1. Ignition OFF, disconnect the X3 harness connector at the turn signal/multifunction switch.
2. Test for less than 20 ohms between the low reference circuit terminal M and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Windshield Washer Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal L for a short to ground. If the circuit tests normal, replace the BCM.
4. Install a 3A fused jumper wire between the signal circuit terminal L and the low reference circuit terminal M. Verify the scan tool Windshield Washer Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the turn signal multifunction switch.

Windshield Washer Pump Relay Control Circuit Test

1. Ignition OFF, disconnect the X4 harness connector at the BCM.
2. Ignition ON, verify the windshield washer pump is not on.
 - If the windshield washer pump is on, test the windshield washer pump relay control circuit terminal 15 for a short to ground. If the circuit tests normal replace the underhood fuse block.
3. Install a 10A fused jumper wire between the relay control circuit terminal 15 and ground. Verify the windshield washer pump is on.
 - If the windshield washer pump is not on, test the relay control circuit for an open/high

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

resistance or short to ground. If the circuit tests normal replace the underhood fuse block.

4. If all circuits test normal, replace the BCM.

Windshield Washer Pump Circuit Test

1. Ignition OFF, disconnect the harness connector at the windshield washer pump.
2. Test for less than 1.0 ohm between the ground circuit terminal B and ground.
 - o If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect a test lamp between the control circuit terminal A and the ground circuit terminal B.
4. Command the Wiper Washer Motor ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - o If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the underhood fuse block.
 - o If the test lamp is always OFF, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the underhood fuse block.
5. If all circuits test normal, test or replace the windshield washer pump.

Component Testing

Turn Signal Multifunction Switch

1. Ignition OFF, disconnect the X1 harness connector at the turn signal multifunction switch.
2. With the wiper switch in the HIGH position, test for less than 2 ohms between the low reference terminal M and the signal terminal K.
 - o If greater than the specified range, replace the windshield wiper washer switch.

IMPORTANT: If the switch tests open in any switch position other than Off, test the signal circuits for a short to voltage before replacing the switch.

3. While cycling the wiper switch through each delay and speed position, test for the specified resistance between the low reference terminal M and the signal terminal N.

Wiper Switch Values

Switch Position	Resistance
Off	Infinite

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Mist	300-364 ohms
Delay 1	3.48k-4.25k ohms
Delay 2	2.52k-3.08k ohms
Delay 3	1.78k-2.18k ohms
Delay 4	1.17k-1.44k ohms
Delay 5	697-851 ohms
Low	300-364 ohms
High	300-364 ohms

- If any switch position is not within the specified range, replace the turn signal multifunction switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Turn Signal Multifunction Switch Replacement**
- **Washer Pump Replacement (Silverado)**
- **Underhood Electrical Center or Junction Block Replacement**
- **Control Module References** for BCM replacement, setup, and programming

WINDSHIELD WASHER SOLVENT HEATER MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	1	1	-	-
Ignition Voltage	1	1	-	-
Washer Fluid Heated Control Switch LED Supply Voltage	B2625 00	B2625 00	B2625 00	-
Washer Fluid Heated Control	3	1	1	-

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Switch Signal				
Windshield Washer Switch Signal	4	1	4	-
Washer Fluid Heated Control Switch LED Control	3	2	3	-
Washer Solvent Heater Assembly Ground	-	1	-	-
Washer Solvent Heater Assembly Logic Ground	-	1	-	-
1. Windshield Washer Solvent Heater Malfunction 2. Windshield Washer Solvent Heater Indicator Inoperative 3. Windshield Washer Solvent Heater Indicator Always ON 4. Windshield Wiper System Malfunction				

Circuit/System Description

The windshield washer solvent heater operates with the standard windshield wiper washer system, and when a heated washer cycle is activated the solvent heater controls the windshield washers through the washer switch signal circuit to the body control module (BCM). The heater is supplied with high current power and ground circuits that are used to energize the heater coils. The low current logic voltage is supplied to the heater through the RUN relay in the underhood fuse block. The RUN relay is a PCB relay energized by the BCM only while the engine is running. The heated washer cycle operation is activated by a separate switch located on the instrument panel accessory switch assembly. When the heated washer fluid switch is pressed the heated washer switch signal circuit is momentarily grounded and the heated washer cycle is activated. During the heated wash cycle the 3 heater elements in the solvent heater are energized, and when the solvent temperature reaches approximately 70°C (160°F) the heater grounds the washer switch signal circuit until the heated solvent is dispensed. The heated washer cycle will run 4 heat and wash actions unless deactivated by the heated washer switch signal.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

Component Connector End Views

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, verify the washers operate using the washer switch.
 - If the base washer system does not operate, refer to **Washer Malfunction**.
2. Depress the heated washer switch. The heater washer fluid system should begin to cycle and the driver information center (DIC) should display the heated washer fluid pending message.
 - If the heated washer fluid system does not begin to cycle, refer to Windshield Washer Solvent Heater Malfunction below.
 - If the DIC does not display the heated washer fluid pending message, refer to Heated Washer Fluid Indicator Malfunction below.

Circuit/System Testing

Windshield Washer Solvent Heater Malfunction

1. Ignition OFF, disconnect the X1 harness connector at the windshield washer solvent heater.
2. Test for less than 5 ohms between the ground circuit terminal 2 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 1 and ground.
 - If the test lamp does not illuminate, test the B+ voltage circuit for an open/high resistance. If the circuit fuse is open, test the B+ circuit for a short to ground. If the circuit test normal, replace the windshield washer solvent heater.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

4. Ignition OFF, connect the X1 harness connector at the windshield washer solvent heater. Disconnect the X2 harness connector at the windshield washer solvent heater.
5. Test for less than 5 ohms between the ground circuit terminal 4 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
6. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal 6 and ground.
 - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance. If the circuit tests normal, refer to **Power Mode Mismatch**.
7. Verify the scan tool Windshield Washer Switch parameter displays Inactive.
 - If not the specified value, test the signal circuit terminal 5 for a short to ground. If the circuit tests normal, refer to **Washer Malfunction**.
8. Install a 3A fused jumper wire between the signal circuit terminal 5 and ground. Verify the scan tool Windshield Washer Switch parameter displays Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, refer to **Washer Malfunction**.
9. Ignition OFF, connect a test lamp between the signal circuit terminal 1 and B+.
10. Command the heated washer system ON and OFF using the heated washer switch. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the signal circuit for a short to ground. If the circuit tests normal, test or replace the headlamp switch.
 - If the test lamp is always OFF, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, test or replace the headlamp switch.
11. If all circuits test normal, test or replace the windshield washer solvent heater.

Heated Washer Fluid Indicator Malfunction

1. Ignition OFF, disconnect the X2 harness connector at the windshield washer solvent heater.
2. Verify the heated washer fluid pending message is not displayed on the DIC.
 - If the message is displayed, test the signal circuit terminal 2 for a short to ground. If the circuit tests normal, replace the IPC.
3. Ignition ON, install a 3A fused jumper wire between the signal circuit terminal 2 and ground. Verify the heated washer fluid pending message is displayed on the DIC.
 - If the message is not displayed, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the IPC.
4. If all circuits test normal, test or replace the windshield washer solvent heater.

2008 Chevrolet Silverado 1500

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Component Testing

Heated Washer Fluid Switch

1. Ignition OFF, disconnect the harness connector at the instrument panel accessory switch assembly.
2. Test for infinite resistance between the switch signal circuit terminal 7 and the ground circuit terminal 3 with the switch in the open position.
 - If less than infinite, replace the accessory switch assembly.
3. Test for less than 3 ohms between the switch signal circuit terminal 7 and the ground circuit terminal 3 with the switch in the closed position.
 - If greater than 3 ohms, replace the accessory switch assembly.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Accessory Switch Replacement (with RPO SLT)** or **Accessory Switch Replacement (without RPO SLT)**
- **Windshield Washer Solvent Heater Replacement**

MOISTURE SENSING FEATURE INOPERATIVE

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition Voltage	1	1	-	-
Outside Moisture Sensor Signal 1	1	1	1	-
Outside Moisture Sensor Signal 2	1	1	1	-
Ground	-	1	-	-

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

1. Moisture sensing feature is inoperative

Circuit/System Description

Ignition voltage is supplied to the outside moisture sensor from the body control module (BCM). Whenever the ignition is in the run or accessory positions, the BCM sends the wiper/washer switch status using a pulse width modulated (PWM) signal through the outside moisture sensor signal 1 circuit to the outside moisture sensor. When a wipe cycle is needed, the moisture sensor sends a PWM voltage signal through the moisture sensor signal 2 circuit back to the BCM requesting the wiper operation.

The outside moisture sensor uses the moisture sensor signal 2 circuit to command wiper motor wipe cycles and to confirm the moisture sensor signal 1 is being received. If at anytime a fault occurs between the outside moisture sensor and BCM, the BCM will use the inputs from the windshield wiper/washer switch in the delay positions to operate the wiper motor at continuous variable delay intervals.

Reference Information

Schematic Reference

Wiper/Washer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Wiper/Washer System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

2008 Chevrolet Silverado 1500

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Circuit/System Verification

Ignition ON, wiper switch in the low position. The windshield wipers should operate at low speed. If the windshield wipers do not operate, refer to **Windshield Wiper System Malfunction**.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the outside moisture sensor.
2. Test for less than 5.0 ohms between the ground circuit terminal 3 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between ignition circuit terminal 4 and ground.
 - If the test does not illuminate, test the ignition circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
4. Ignition OFF, connect the harness connector at the outside moisture sensor.
5. Disconnect the X4 harness connector at the BCM.
6. Ignition ON, test for 8-10 volts between the signal circuit terminal 18 and ground.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the outside moisture sensor.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the outside moisture sensor.
7. Ignition ON, test for 4-8.5 volts between the signal circuit terminal 14 and ground.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the outside moisture sensor.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the outside moisture sensor.
8. If all circuits test normal, replace the BCM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Windshield Outside Moisture Sensor Replacement**
- **Control Module References** for BCM replacement, setup, and programming

WIPER BLADE ELEMENT CHECK

2008 Chevrolet Silverado 1500

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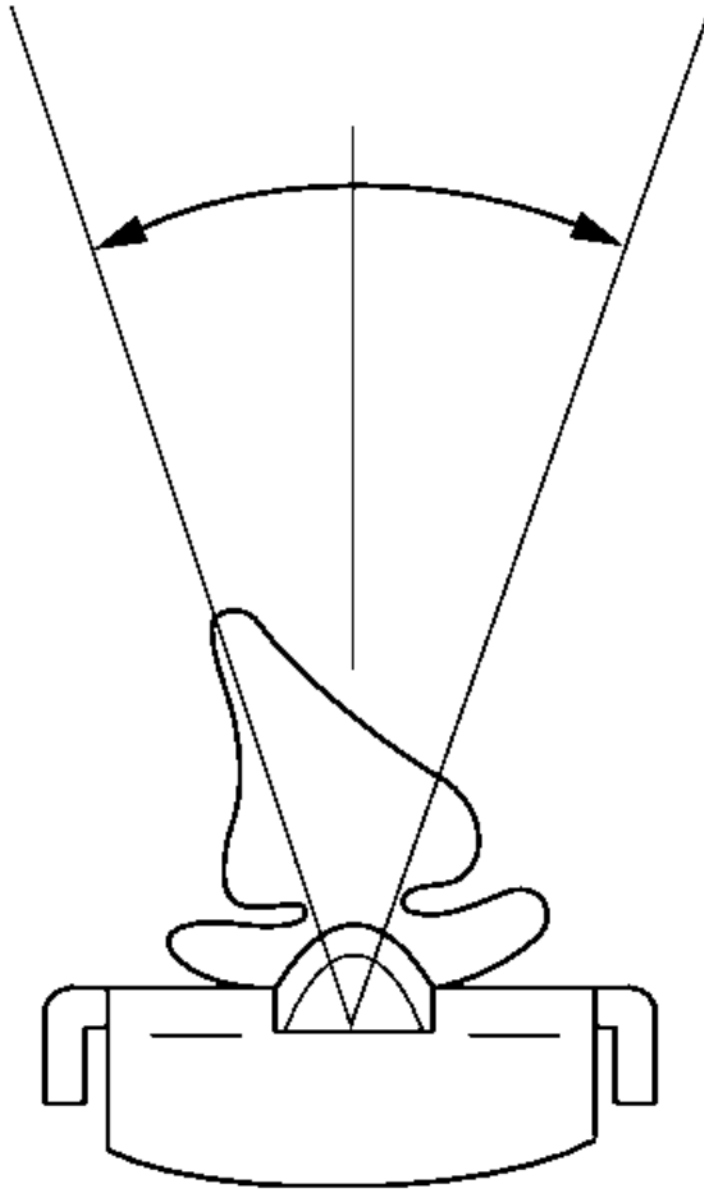


Fig. 5: Measuring Wiper Blade Element Centerline Contact
Courtesy of GENERAL MOTORS CORP.

1. Remove the wiper blades from the wiper arms. Refer to **Windshield Wiper Blade Replacement**.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

2. Look down the length of the blade element.
3. Replace the wiper blade if the rubber element which contacts the glass is not on the centerline of the blade ± 15 degrees.
4. Install the wiper blades on the wiper arms. Refer to **Windshield Wiper Blade Replacement**.

REPAIR INSTRUCTIONS

WINDSHIELD WASHER HOSE REPLACEMENT

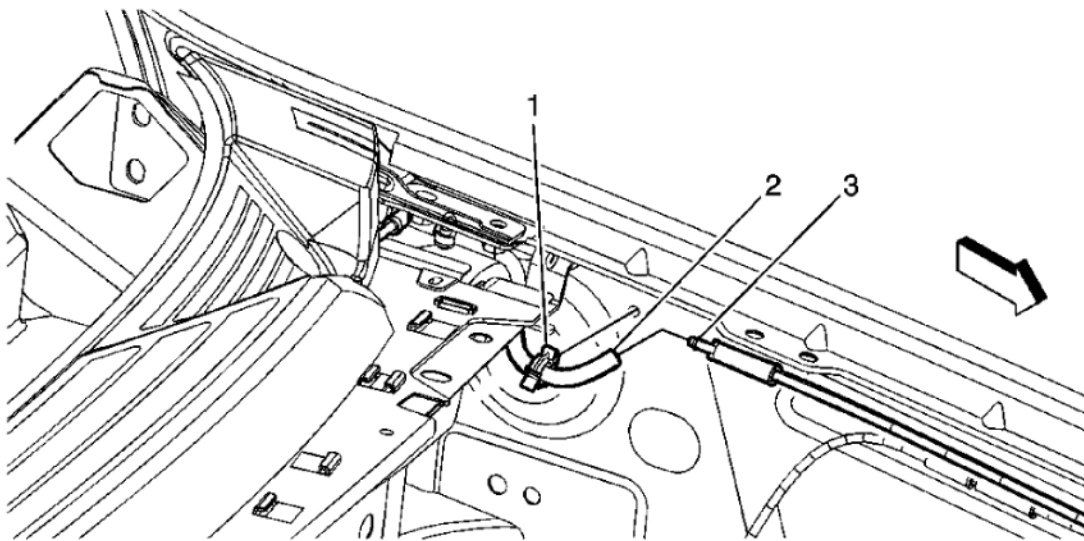


Fig. 6: View Of Windshield Washer Pump Hose Assembly & Components
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Open the hood. 2. Remove the air inlet grille panel. Refer to <u>Air Inlet Grille Panel Replacement</u>. 3. Remove the left front wheelhouse liner. Refer to <u>Front Wheelhouse Liner Replacement - Left Side (Chevrolet)</u> or <u>Front Wheelhouse Liner Replacement - Left Side (GMC)</u>. 4. Place a clean suitable container under the vehicle prior to disconnecting the washer hose. 5. Disconnect the washer hose from the washer pump spout.	

2008 Chevrolet Silverado 1500

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1	Windshield Washer Hose Retainer Clip
2	Windshield Washer Nozzle Hose Tip: Disconnect the hose at the left rear fender flange.
3	Windshield Washer Pump Hose Assembly Tip: Route the new hose in the same location as the old hose was removed from.

WINDSHIELD WASHER SOLVENT CONTAINER REPLACEMENT

Removal Procedure

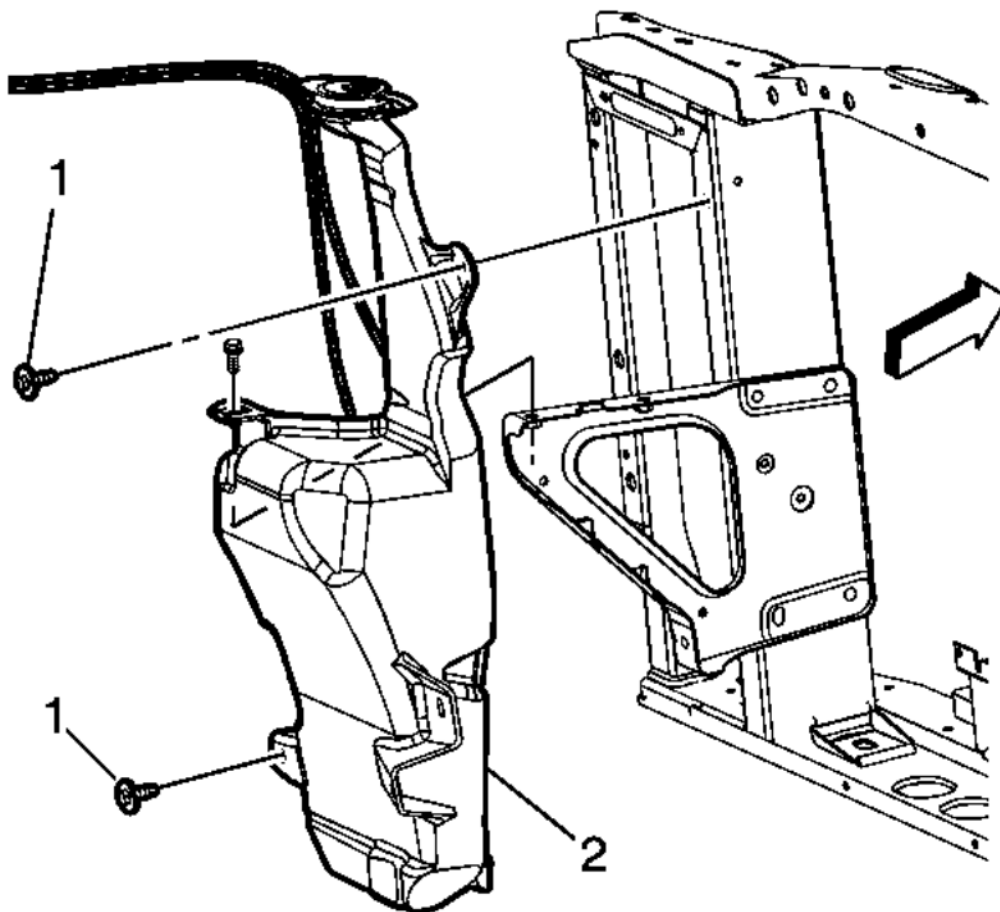


Fig. 7: View Of Washer Solvent Container & Screws

Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the left front wheel assembly. Refer to Tire and Wheel Removal and Installation .
3. Remove the left front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement - Left Side (Chevrolet) or Front Wheelhouse Liner Replacement - Left Side (GMC) .
4. Remove the lower outer bolt (1) from the washer container prior to lowering the vehicle.

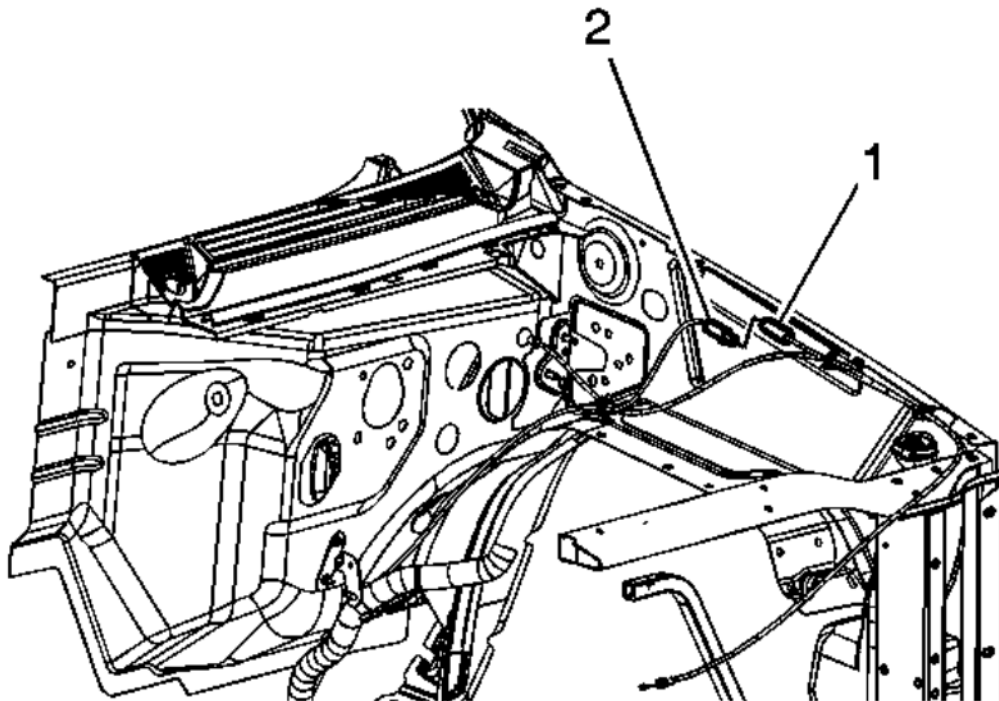


Fig. 8: Locating Washer Pump Hoses
Courtesy of GENERAL MOTORS CORP.

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5. Disconnect the washer pump hoses (1, 2) from the left side fender flange. Refer to **Windshield Washer Hose Replacement**.
6. Drain the windshield washer solvent into a suitable container.
7. Disconnect the electrical connectors.
8. Lower the vehicle in order to access the hood latch.
9. Open the hood.
10. Remove the windshield washer solvent cap.
11. Remove the auxiliary battery tray, if equipped. Refer to **Battery Tray Replacement**.

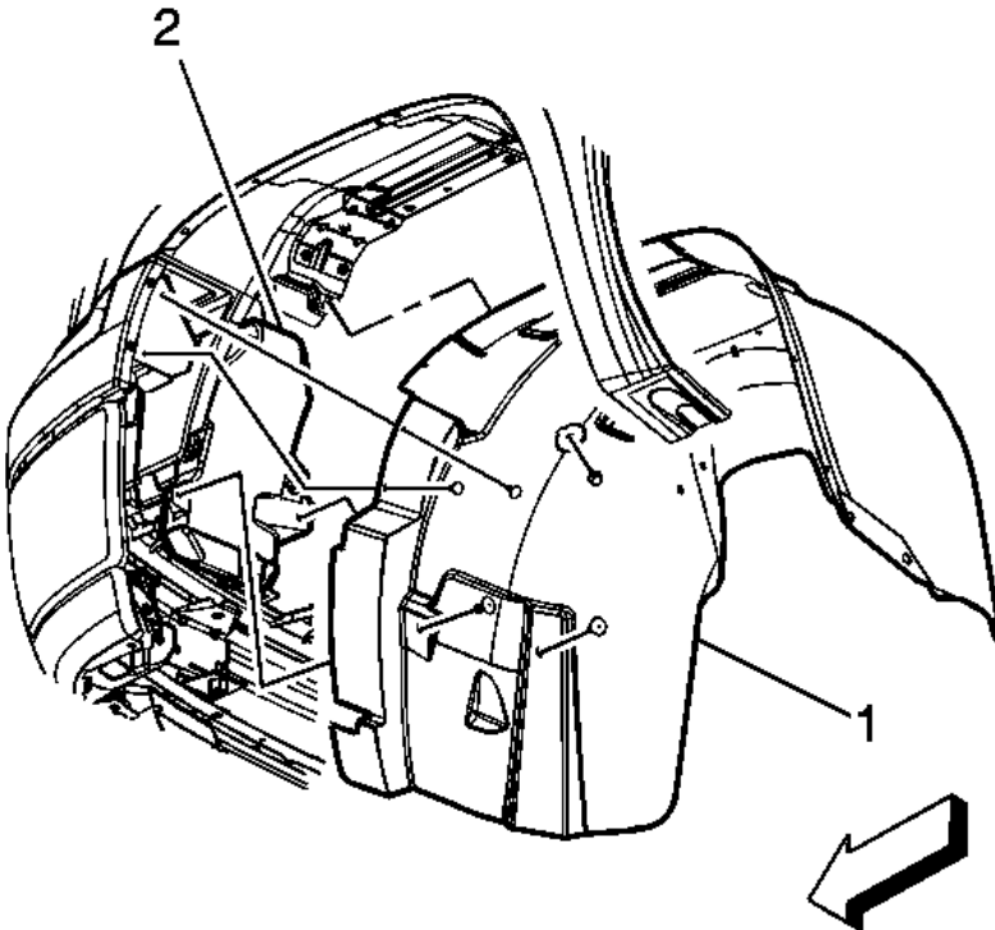


Fig. 9: View Of Wheelhouse & Windshield Washer Solvent Container Assembly

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Courtesy of GENERAL MOTORS CORP.

12. Remove the upper windshield washer container bolt from under the auxiliary battery tray, if equipped.

IMPORTANT: Remove the washer container from the underside of the vehicle through the wheelhouse opening.

13. Remove the upper windshield washer solvent container bolts.
14. Remove the windshield washer solvent container assembly (2).

Installation Procedure

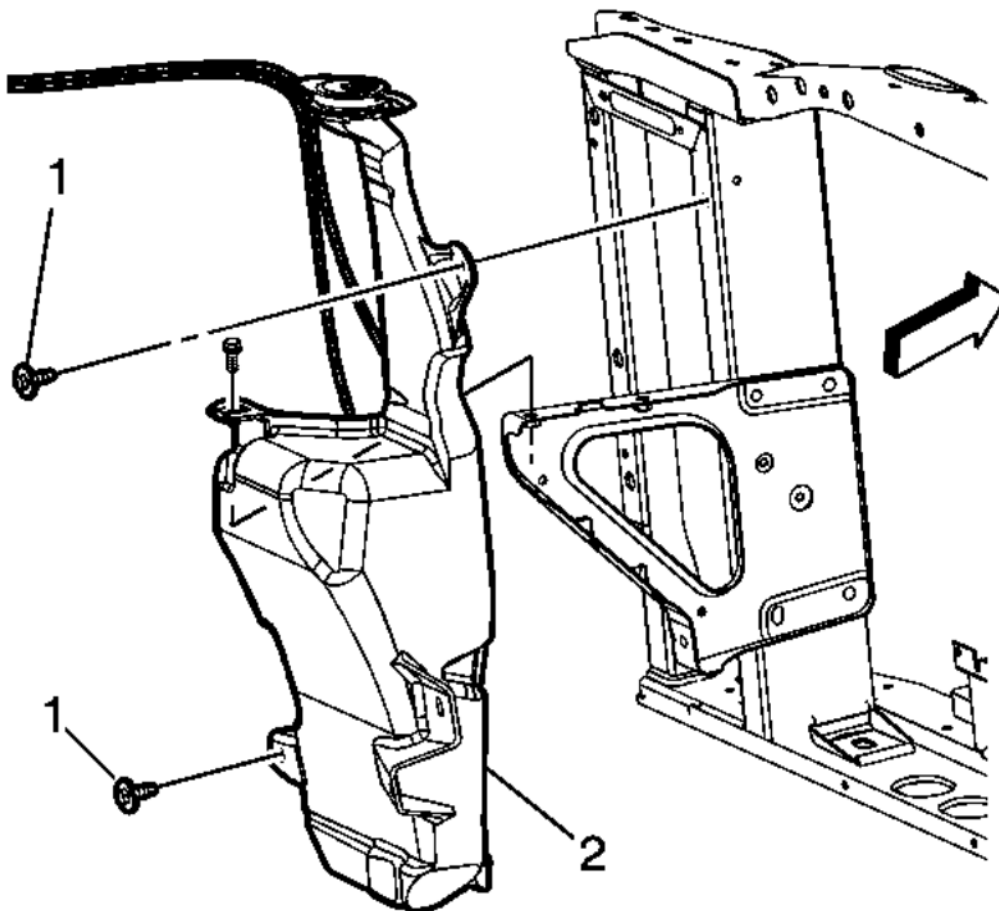


Fig. 10: View Of Washer Solvent Container & Screws
Courtesy of GENERAL MOTORS CORP.

1. Transfer washer pumps and level indicator to the new washer solvent container.

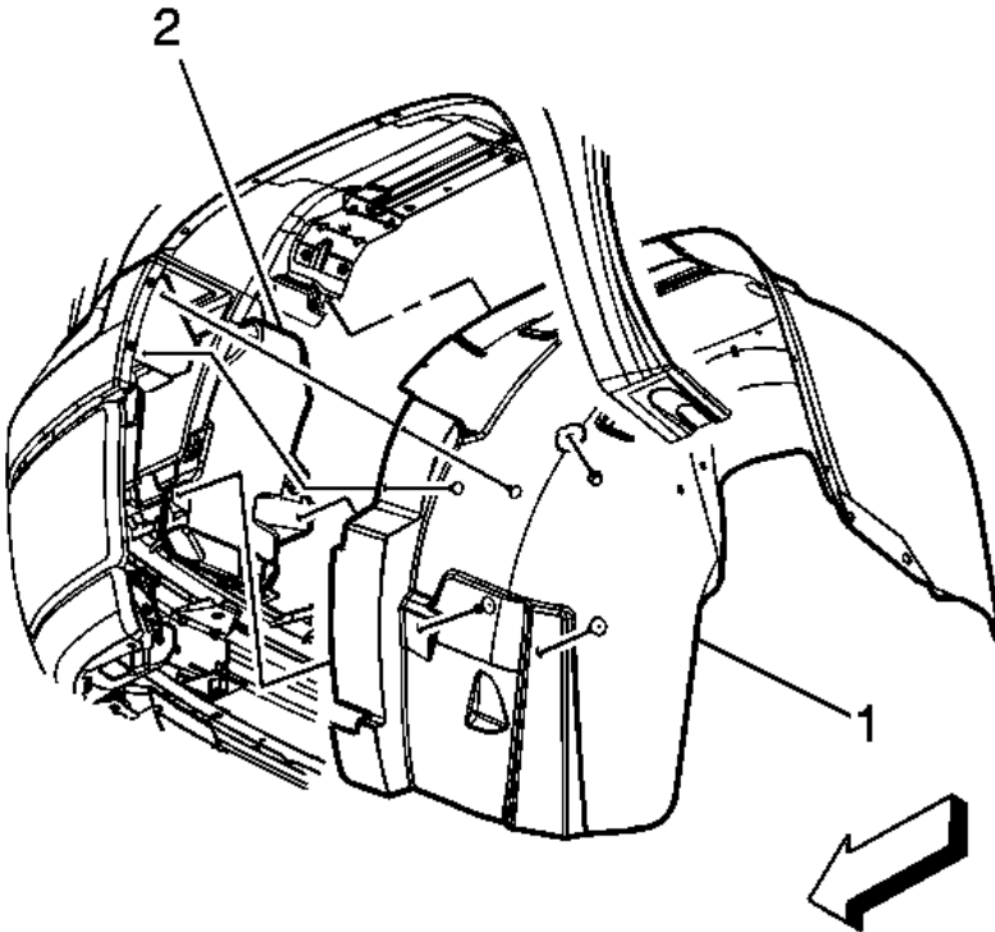


Fig. 11: View Of Wheelhouse & Windshield Washer Solvent Container Assembly
Courtesy of GENERAL MOTORS CORP.

2. Install the windshield washer container assembly.
3. Install the upper windshield washer container bolt to the auxiliary battery tray, if equipped.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

NOTE: Refer to Fastener Notice .

4. Install the upper windshield washer solvent container bolts.

Tighten: Tighten the bolts to 9 N.m (80 lb in).

5. Install the auxiliary battery tray, if equipped. Refer to Battery Tray Replacement .
6. Install the windshield washer solvent cap.
7. Connect the electrical connectors.

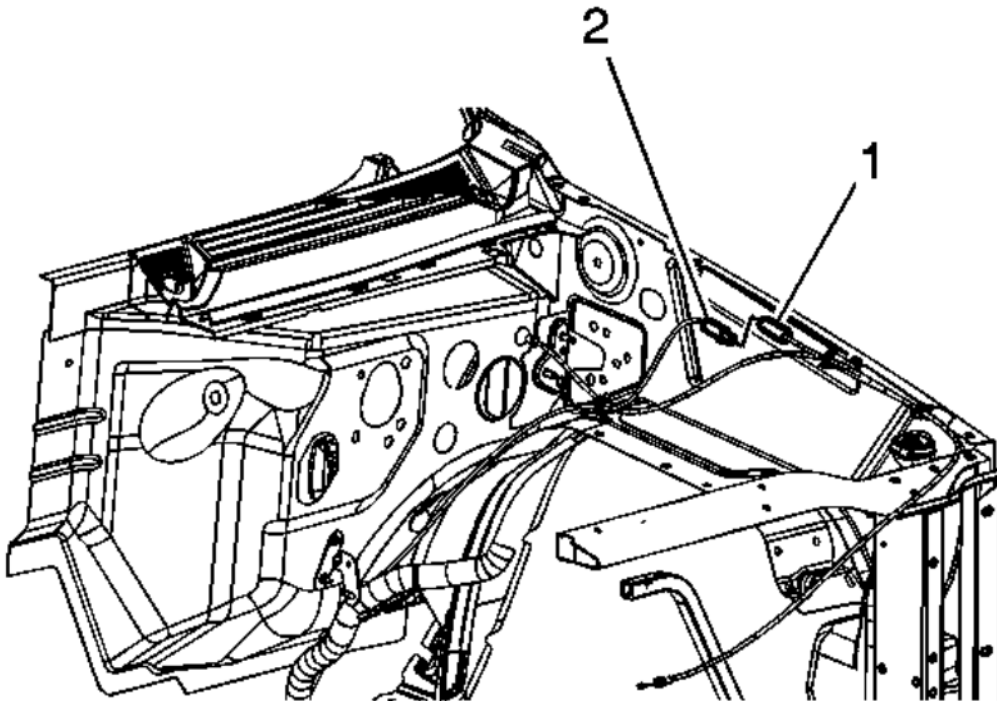


Fig. 12: Locating Washer Pump Hoses
Courtesy of GENERAL MOTORS CORP.

2008 Chevrolet Silverado 1500

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8. Connect the washer pump hoses (1, 2). Refer to Windshield Washer Hose Replacement.
9. Install the lower outer washer container bolt.
10. Install the left front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement - Left Side (Chevrolet) or Front Wheelhouse Liner Replacement - Left Side (GMC).
11. Install the left front wheel assembly. Refer to Tire and Wheel Removal and Installation.
12. Fill the washer solvent container with windshield solvent. Refer to Fluid and Lubricant Recommendations.

WASHER PUMP REPLACEMENT (SILVERADO)

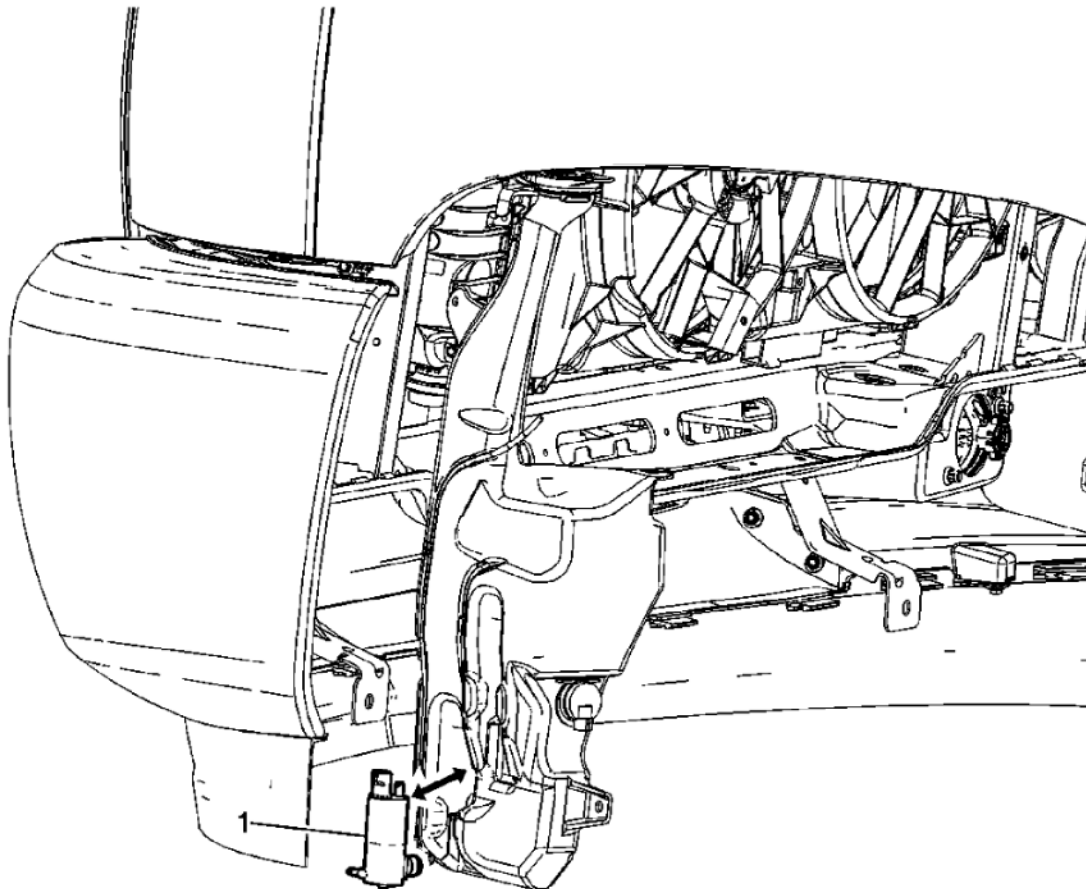


Fig. 13: View Of Windshield Washer Pump (Silverado)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	

2008 Chevrolet Silverado 1500

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1. Remove the windshield washer system container. Refer to **Windshield Washer Solvent Container Replacement**.
2. Place the washer container on a bench top and secure.
3. Using two flat-bladed tools, pry gently upward on the pump in order to disengage the pump from the washer container grommet.
4. Discard the grommet.

1

Windshield Washer Pump

Tip: Use full strength windshield washer solvent for a lubricant on the pump spout in order to ease the installation of the new washer pump into the new grommet.

WINDSHIELD WASHER SOLVENT LEVEL SWITCH REPLACEMENT (GMC)

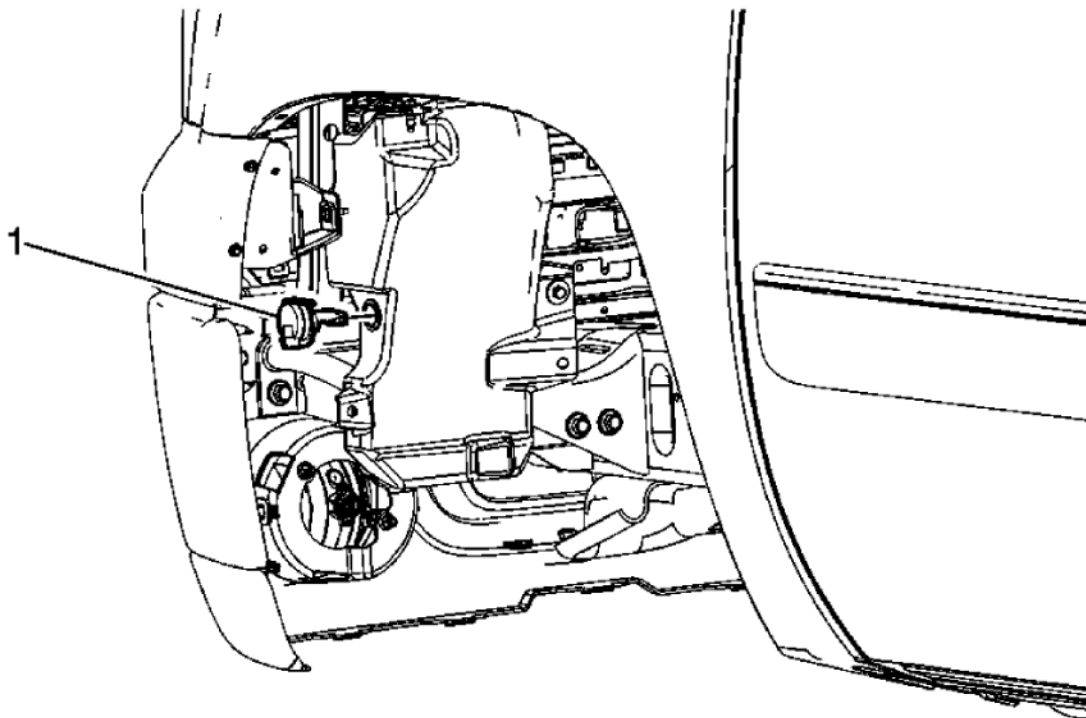


Fig. 14: View Of Windshield Washer Solvent Level Switch (GMC)

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1.	Remove the windshield washer container. Refer to <u>Windshield Washer Solvent</u>

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Container Replacement.

2. Using two flat-bladed tools placed under the edges of the level indicator pry outward to release the level sensor from the washer container.
3. Discard the level indicator grommet.

1

Windshield Washer Solvent Level Indicator

Tip: Ensure the square edge of the level indicator faces upward upon installation.

WINDSHIELD WASHER SOLVENT LEVEL SWITCH REPLACEMENT (CHEVROLET)

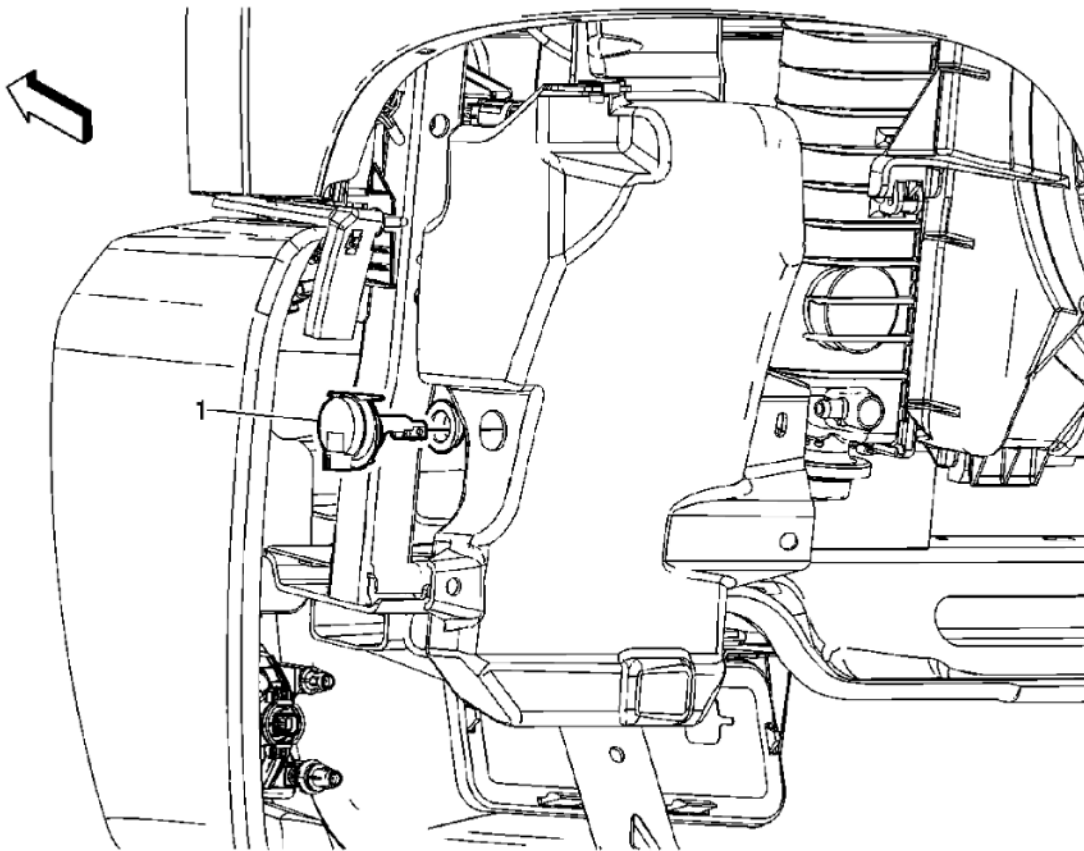


Fig. 15: Windshield Washer Solvent Level Switch (Chevrolet)

Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1.	Remove the windshield washer container. Refer to Windshield Washer Solvent

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

Container Replacement.

2. Using two flat-bladed tools placed under the edges of the level indicator pry outward to release the level sensor from the washer container.
3. Discard the level indicator grommet.

1

Windshield Washer Solvent Level Indicator

Tip: Ensure the square edge of the level indicator faces upward upon installation.

WINDSHIELD WASHER SOLVENT HEATER REPLACEMENT

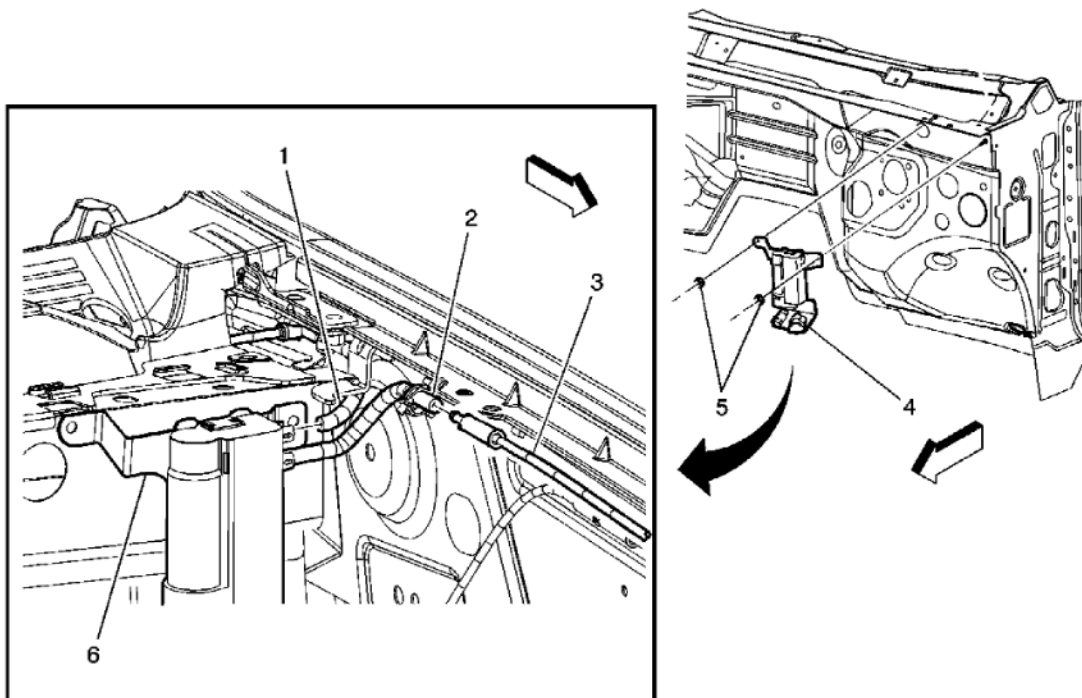


Fig. 16: View Of Windshield Washer Solvent Heater Assembly & Components
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front fender rear upper brace in order to access the washer solvent heater assembly. Refer to <u>Front Fender Rear Upper Brace Replacement</u> .	
1	Windshield Washer Nozzle Hose (Outlet) Tip: Disconnect the air inlet panel hose from the outlet side of the heater assembly.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

2	Windshield Washer Pump Hose (Inlet)
3	Windshield Washer Pump Hose
4	Windshield Washer Solvent Heater Assembly Electrical Connectors (Qty: 2) Tip: Disconnect the electrical connectors.
5	Windshield Washer Solvent Heater Assembly Nuts (Qty: 2) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 9 N.m (80 lb in)
6	Windshield Washer Solvent Heater Assembly Procedure 1. Disconnect the electrical connectors after removing the heater from the lower plenum panel studs. 2. Prime the heated washer fluid unit after installation. 3. Cycle the normal wash function until washer fluid sprays from the windshield washer nozzles. 4. The normal wash function fills the heated washer unit with washer solvent after replacement. 5. Activate the heated washer spray function and inspect for proper operation.

AIR INLET GRILLE PANEL REPLACEMENT

2008 Chevrolet Silverado 1500

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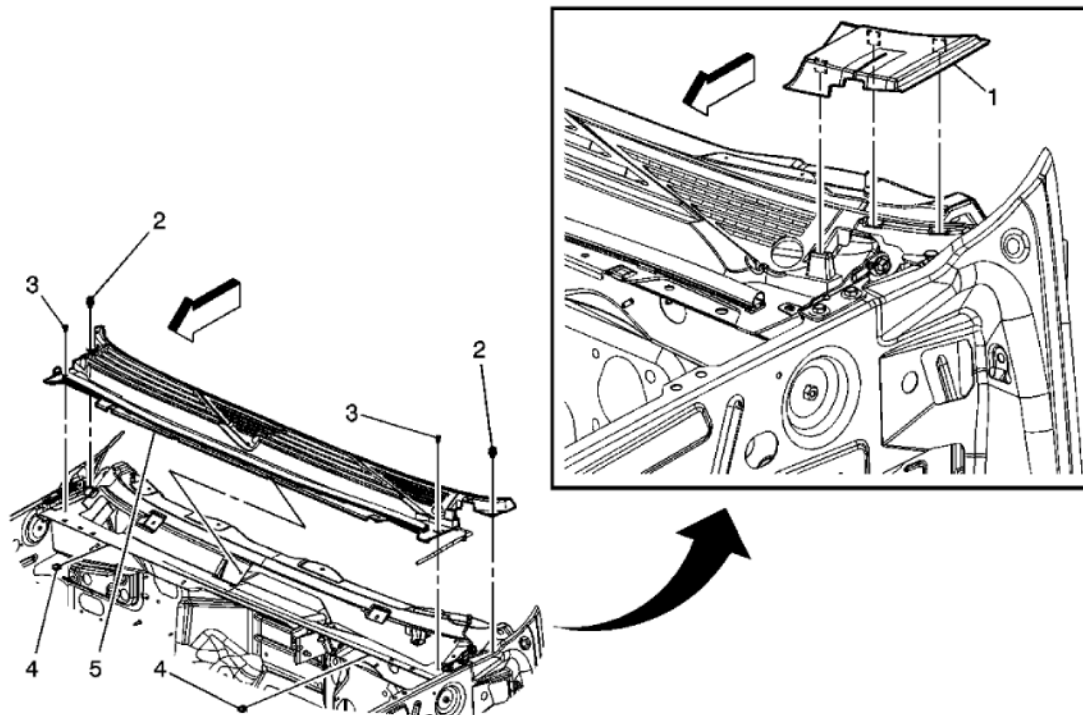


Fig. 17: View Of Air Inlet Panel & Components
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure	
1. Remove the fixed antenna, if equipped. Refer to <u>Radio Antenna Replacement</u> .	
2. Remove the windshield wiper arms. Refer to <u>Windshield Wiper Arm Replacement (LD)</u> .	
3. Remove the rear hood seal. Refer to <u>Hood Rear Seal Replacement</u> .	
4. Remove the two outer clips securing the air inlet grille panel to the flange on the air plenum.	
1	Air Inlet Grille Panel End Panel (Qty: 2)
2	Air Inlet Grille Panel Retainer (Qty: 2)
3	Air Inlet Grille Panel Screw (Qty: 2)
	NOTE: Refer to <u>Fastener Notice</u> .
Tighten: 1.3 N.m (12 lb in)	

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

4	Air Inlet Grille Panel Clip
5	Air Inlet Grille Panel

WINDSHIELD WIPER ARM REPLACEMENT (LD)

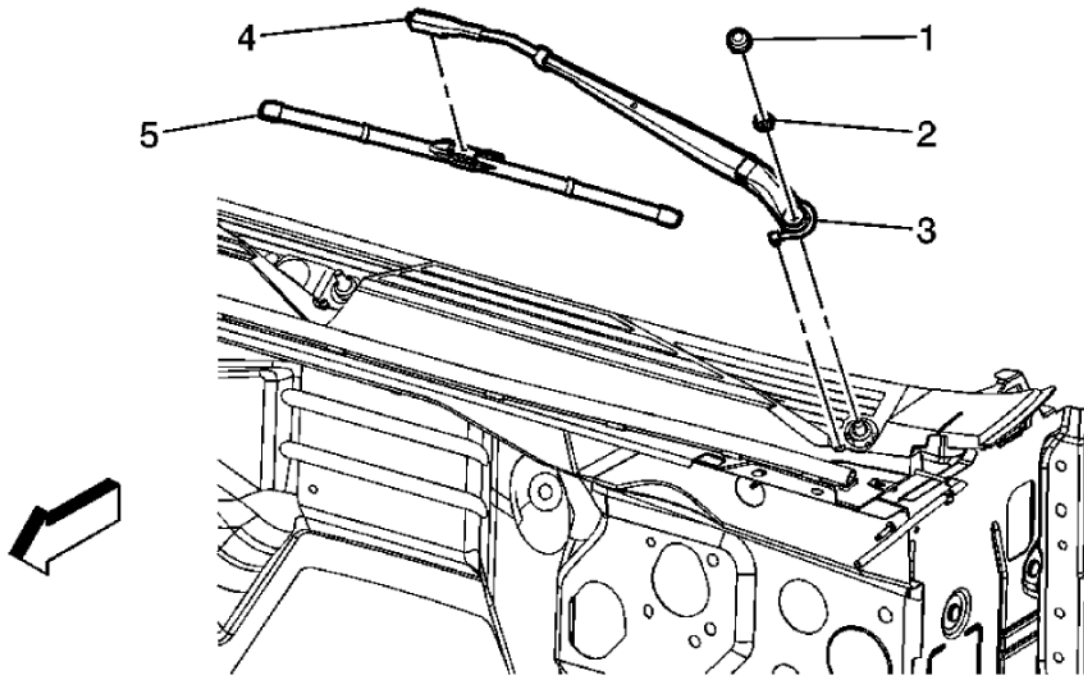


Fig. 18: View Of Windshield Washer Blade Assembly & Components (LD)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Open the hood in order to access and remove the wiper arm assembly.	
1	Windshield Washer Arm Finish Cap Tip: Use a small flat-bladed tool to remove the finish cap.
2	Windshield Washer Arm Nut NOTE: Refer to <u>Fastener Notice</u> . Tip: Hold the wiper blade to the vertical black bar target mark located at the lower center portion of the windshield.

2008 Chevrolet Silverado 1500

2008 ACCESSORIES & EQUIPMENT Wipers and Washers - Cab & Chassis Sierra, Cab & Chassis Silverado, Sierra & Silverado

	Tighten: 30 N.m (22 lb ft)
3	Windshield Washer Arm Hose Tip: Rotate the hose clockwise around the end of the washer wiper arm upon installation.
4	Windshield Washer Arm Assembly Tip: Use the J 39637 . Special Tools: J 39637 Wiper Arm Puller
5	Windshield Washer Blade Assembly Tip: Pinch the 2 outer tabs on the arm, rotate the blade rearward and slide the blade forward to release the wiper blade from the wiper arm assembly.

WINDSHIELD WIPER BLADE REPLACEMENT