SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

Note: All fasteners listed in this table can be reused after removal.	
Application	Specification Metric (English)
Assist Step Assembly to Underbody Fastener (Assembly-BRS)	20 N.m (15 lb ft)
Assist Step Bracket Bolt (BRS)	12 N.m (106 lb in)
Assist Step End Cap Fastener (BRS)	2.5 N.m (22 lb in)
Assist Step Motor Bolt (BRS)	12 N.m (106 lb in)
Assist Step Motor Wedge Bolt (BRS)	8 N.m (71 lb in)
Assist Step Pad Fastener (BRS)	12 N.m (106 lb in)
Assist Step Shield Bolt (BRS)	5 N.m (44 lb in)
Assist Step Support Bolt (BRS)	18 N.m (13 lb ft)
Assist Step Support Fastener (BRS-100 Series Crewcab)	22 N.m (16 lb ft)
Body Mounting Cushion 1 Bolt	165 N.m (122 lb ft)
Body Mounting Cushion 2 Bolt	165 N.m (122 lb ft)
Body Mounting Cushion 3 Bolt	165 N.m (122 lb ft)
Body Mounting Front Cushion Bolt	70 N.m (52 lb ft)
Drivetrain and Front Suspension Frame Front Crossmember Nut (Light Duty)	
First Pass:	70 N.m (52 lb ft)
Final Pass:	110 Degrees
Drivetrain and Front Suspension Frame Front Crossmember Nut (Heavy Duty)	
First Pass:	70 N.m (52 lb ft)
Final Pass:	110 Degrees
Frame Reinforcement Bolt	135 N.m (100 lb ft)
Front Frame Heat Shield Bolt (Front Axle Bushing)	12 N.m (106 lb in)
Front Tow Hook Bolt - Long (Heavy Duty)	105 N.m (77 lb ft)
Front Tow Hook Bolt - Short (Heavy Duty)	85 N.m (63 lb ft)
Front Tow Hook Bolt (Light Duty)	80 N.m (59 lb ft)
Front Tow Hook Nut (Light Duty)	80 N.m (59 lb ft)
Front Wheelhouse Liner Fastener	2.5 N.m (22 lb in)
Front Wheelhouse Panel Brace Fastener	9 N.m (80 lb in)
Front Wheelhouse Panel Front Bracket Fastener	9 N.m (80 lb in)
Fuel Tank Shield Fastener	12 N.m (106 lb in)
Kick Switch Fastener (BRS)	2.5 N.m (22 lb in)
Power Assist Step Controller Bolt (BRS)	6 N.m (53 lb in)

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Power Assist Step Front Bracket Bolt (BRS)	6 N.m (53 lb in)
Power Assist Step Front Bracket Nut (BRS)	10 N.m (89 lb in)
Rear Tire Front Air Deflector Fastener	6 N.m (53 lb in)
Rear Wheelhouse Liner Fastener	2.5 N.m (22 lb in)
Rear Wheelhouse Panel Liner Fastener	2.5 N.m (22 lb in)
Side Rail Splash Shield Fastener	12 N.m (106 lb in)
Spare Wheel Heat Shield Fastener	12 N.m (106 lb in)
Steering Gear Skid Shield Bracket Bolt	20 N.m (15 lb ft)
Steering Gear Skid Shield to Frame Bolt	20 N.m (15 lb ft)
Steering Gear Skid Shield to Steering Gear Skid Shield Bracket Bolt	9 N.m (80 lb in)
Trailer Hitch Mounting Nut (Heavy Duty with Z82)	140 N.m (103 lb ft)
Trailer Hitch Mounting Nut (Light Duty)	140 N.m (103 lb ft)
Trailer Hitch Platform Mounting Bolt (Heavy Duty)	140 N.m (103 lb ft)
Trailer Hitch Platform Mounting Nut (Heavy Duty with Z82)	112 N.m (83 lb ft)
Trailer Hitch Platform Mounting Nut (Light Duty)	112 N.m (83 lb ft)
Trailer Hitch to Rear Bumper Bar Bolt (Heavy Duty)	22 N.m (16 lb ft)
Trailer Hitch to Rear Bumper Bar Bolt (Light Duty with Z82)	22 N.m (16 lb ft)
Trailer Hitch to Side Frame Nut (Light Duty with Z82)	70 N.m (52 lb ft)
Trailer Hitch to Side Frame Nut (Light Duty without Z82)	140 N.m (103 lb ft)
Transfer Case Skid Shield Fastener	28 N.m (21 lb ft)
Transmission Mount to Support Nut (1500 Series)	55 N.m (41 lb ft)
Transmission Mount to Support Nut (2500/3500 Series)	107 N.m (79 lb ft)
Transmission Support Crossmember to Frame Bolt (Heavy Duty)	
First Pass:	120 N.m (89 lb ft)
Final Pass:	90 Degrees
Transmission Support Crossmember to Frame Bolt (Light Duty)	95 N.m (70 lb ft)
Underbody Rear Air Deflector Bolt	9 N.m (80 lb in)
Underbody Skid Shield Fastener	28 N.m (21 lb ft)
Underbody Splash Shield Fastener	20 N.m (15 lb ft)

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
Trailer Hitch Mounting Bolt	Blue LoctiteÂ® 242	12345382	10953489
Transmission Crossmember Bolt	Threadlocker	12345493	10953488

SCHEMATIC WIRING DIAGRAMS

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STEP/RUNNING BOARD WIRING SCHEMATICS

Step/Running Board (BRS)

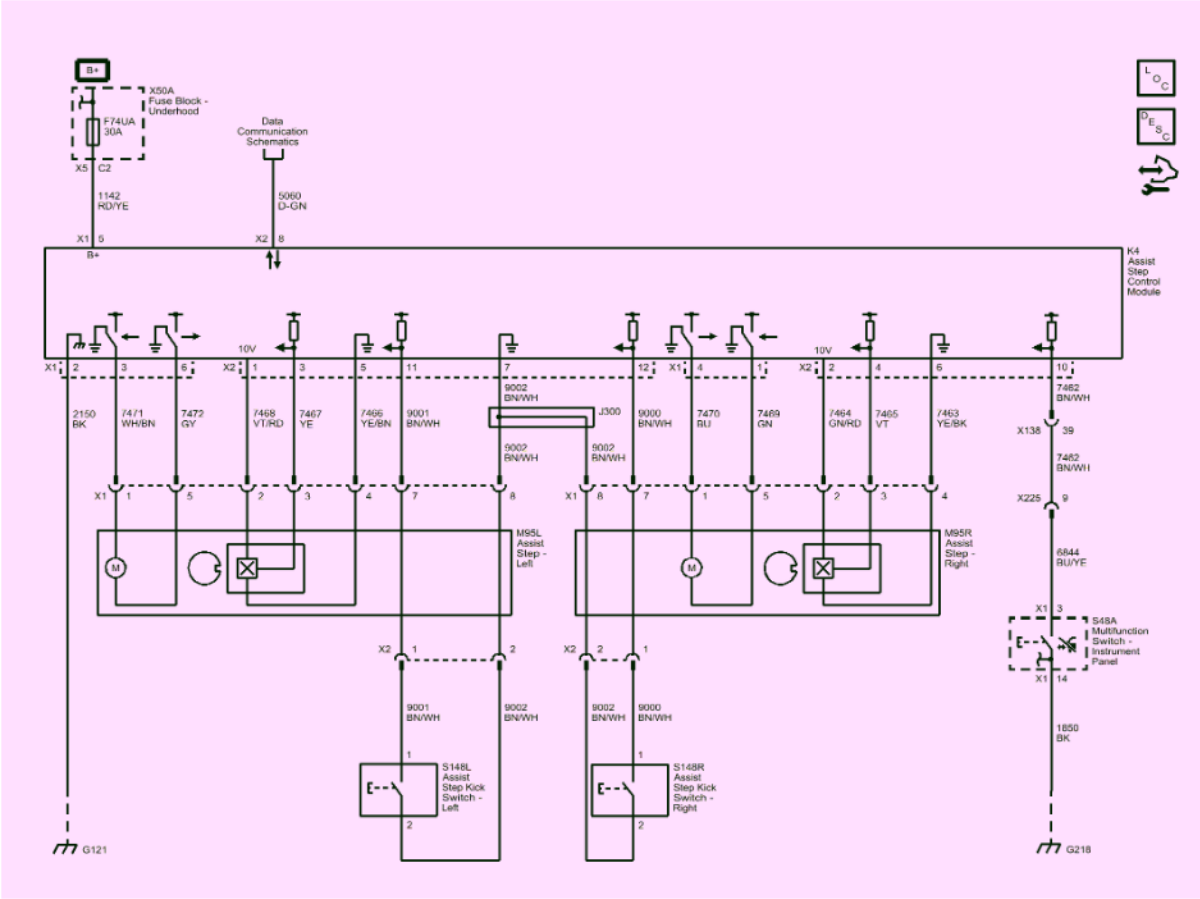


Fig. 1: Step/Running Board (BRS)
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B051A OR B051B: SIDE ASSIST STEP MOTOR

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 Descriptors

DTC B051A

Left Side Assist Step Motor Control Circuit

DTC B051B

Right Side Assist Step Motor Control Circuit

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For symptom byte information, refer to **Symptom Byte List** .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Motor Control Terminal 3 X1	B051A 02	B051A 04	B051A 01	-
Left Motor Control Terminal 6 X1	B051A 02	B051A 04	B051A 01	-
Right Motor Control Terminal 4 X1	B051B 02	B051B 04	B051B 01	-
Right Motor Control Terminal 1 X1	B051B 02	B051B 04	B051B 01	-

Circuit/System Description

The assist step control module controls the running board actuators to extend or retract the running boards. The assist step control module supplies the actuator motor with a 12 V control circuit and a ground control circuit. The assist step control module controls the direction of the actuator by changing the polarity of the control circuit.

Conditions for Running the DTC

- The ignition is ON.
- Ignition voltage is between 9-16 V.
- The assist step disable switch is not pressed.

Conditions for Setting the DTC

B051A 0B, B051B 0B

The motor control circuits are shorted together.

B051A 01, B051B 01

A motor control circuit is shorted to battery voltage.

B051A 02, B051B 02

A motor control circuit is shorted to ground.

B051A 04, B051B 04

A motor control circuit is open.

Action Taken When the DTC Sets

The motor drive circuits are deactivated for the appropriate actuator.

Conditions for Clearing the DTC

- The DTC becomes history when the assist step control module no longer detects the condition that set the

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DTC.

- The history DTC will clear after 50 fault free ignition cycles.

Reference Information

Schematic Reference

Step/Running Board Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Running Board Description

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.
2. Verify the scan tool Assist Step System Status parameter is Enabled.
    - **If the parameter is Disabled**

      Press and hold running board switch for 4 s to enable boards.

    - **If the parameter is Enabled**
3. Verify the left and right side running boards extend and retract when opening and closing the left and right side doors.
    - **If either or both running boards do not extend or retract**

      Perform Circuit/System Testing.

    - **If the running boards extend and retract**
4. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate M95 Assist Step.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuits listed below and ground.

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- M95 Assist Step - Control circuit terminal 1
- M95 Assist Step - Control circuit terminal 5
- **If the test lamp illuminates**

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K4 Assist Step Control Module, Ignition ON.
2. Test for less than 1 V between each control circuit and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V, replace the K5 Assist Step Control Module.

- **If the test lamp does not illuminate**

3. Connect a test lamp between control circuit terminal 1 and the control circuit terminal 5.
4. Verify the test lamp turns on and off momentarily while commanding the appropriate board to Extend and Retract with a scan tool.

NOTE: **The test lamp will momentarily light while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

- **If the test lamp does not turn ON and OFF**

1. Ignition OFF, disconnect the harness connector at the K4 Assist Step Control Module, ignition ON.
2. Remove the test lamp, test for infinite resistance between the control circuits.
    - If less than infinite resistance, repair the short between the circuits.
    - If infinite resistance
3. Test for infinite resistance between each control circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
4. Test for less than 2 Ω in the control circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K4 Assist Step Control Module.

- **If the test lamp turns ON and OFF**

5. Test or replace the appropriate M95 Assist Step motor.

Component Testing

1. Ignition OFF, disconnect the harness connector at the appropriate M95 Assist Step.
2. Test for 0.8-1.45 Ω between the control terminal 1 and the control circuit terminal 5.
    - **If not between 0.8-1.45 Ω**

      Replace the M95 Assist Step motor.

    - **If between 0.8-1.45 Ω**
3. Test for infinite resistance between each terminal and the sensor housing/case.
    - **If less than infinite resistance**

      Replace the M95 Assist Step motor.

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- **If infinite resistance**

4. All OK

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Assist Step Motor Replacement (BRS)**
- **Control Module References** for appropriate control module replacement, programming and setup.

DTC B051C OR B051D: ASSIST STEP POSITION SENSOR

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 Descriptors

DTC B051C

Left Assist Step Position Sensor Circuit

DTC B051D

Right Assist Step Position Sensor Circuit

For symptom byte information, refer to **Symptom Byte List** .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Side Step 10-Volt Reference	B052B 02	B051C 29	B052B 01	-
Right Side Step 10-Volt Reference	B052B 02	B051D 29	B052B 01	-
Left Position Sensor Signal	B051C 29	B051C 29	B051C 29, B052B 01	-
Right Position Sensor Signal	B051D 29	B051D 29	B051D 29, B052B 01	-
Left Position Sensor Low Reference	-	B051C 29	-	-
Right Position Sensor Low Reference	-	B051D 29	-	-

Circuit/System Description

The assist step control module controls the running board actuators to extend or retract the running boards. Each actuator consists of an electric motor and a hall-effect switch. The module supplies a low reference and 10 V reference source voltage to the hall-effect switch. The assist step control module monitors the signal from the hall effect switch on the signal circuit. When the actuator shaft rotates, the hall-effect switch provides pulses to

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the assist step control module which uses the pulses as counts to determine the location of the assist steps. The assist step control module supplies the actuator motor with a 12 V control circuit and a ground control circuit. The assist step control module controls the direction of the actuator by changing the polarity of the control circuits.

Conditions for Running the DTC

- The ignition is ON.
- Ignition voltage is between 9-16 V.
- The assist step disable switch is not pressed.

Conditions for Setting the DTC

B051C 2A, B051D 2A

The hall sensor counts are greater than what is required to extend or stow the running board.

B051C 22, B051D 22

The hall sensor signal is noisy.

B051C 29, B051D 29

No hall sensor counts are detected while the motor is active.

B051C 62, B051D 62

The running board stow time is greater than 4 s.

B051C 63, B051D 63

The running board extend time is greater than 4 s.

Action Taken When the DTC Sets

The motor drive circuits are deactivated for the appropriate actuator.

Conditions for Clearing the DTC

- The DTC becomes history when the K4 Assist Step Control Module no longer detects the condition that set the DTC.
- The history DTC will clear after 50 fault free ignition cycles.

Reference Information

Schematic Reference

Step/Running Board Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

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Running Board Description

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.
2. Verify the scan tool Assist Step System Status parameter is Enabled.
   - **If the parameter is Disabled**

     Press and hold running board switch for 4 s to enable boards.

   - **If the parameter is Enabled**
3. Verify DTC B051C and/or B051D with symptom bytes 62, 63, or 2A are not set.
   - **If DTCs are set**

     Verify that the assist step motor wedge is present and the assist step motor wedge bolt is tight. Refer to Assist Step Motor Replacement (BRS) for part location and tightening specifications.

   - **If DTCs are not set**
4. Verify the left and right side running boards extend and retract when opening and closing the left and right side doors.
   - **If one or both running boards do not extend or retract**

     Perform Circuit/System Testing.

   - **If both running boards extend and retract**
5. All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF. It may take up to 2 min for all vehicle systems to power down. Disconnect the harness connectors at the M95L Assist Step - Left and M95R Assist Step - Right.

   NOTE: When disconnecting a running board step, B051A or B051B will set for the running board disconnected.

2. Test for less than 10 Ω between the low reference circuits listed below ground.
   - M95L Assist Step - Left - Low reference circuit terminal 4
   - M95R Assist Step - Right - Low reference circuit terminal 4
   - **If 10 Ω or greater**

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1. Ignition OFF, disconnect the harness connector at the K4 Assist Step Control Module.
2. Test for less than 2 Ω in the low reference circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K4 Assist Step Control Module.

- **If less than 10 Ω**

3. Ignition ON.
4. Test for 9 - 11 V between the 10 V reference circuit terminals listed below and ground while commanding the appropriate Assist Step Motor to Extend and Retract with the scan tool.

NOTE: **The voltage reading will appear momentarily while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

- M95L Assist Step - Left - 10 V reference circuit terminal 2
- M95R Assist Step - Right - 10 V reference circuit terminal 2
- **If less than 9 V**

1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K4 Assist Step Control Module.
2. Test for infinite resistance between the 10 V reference circuit terminal and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
3. Test for less than 2 Ω in the 10 V reference circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω replace the K4 Assist Step Control Module.

- **If greater than 11 V**

1. Ignition OFF, disconnect the harness connector at the K4 Assist Step Control Module control module, ignition ON.
2. Test for less than 1 V between 10 V reference circuit and ground.
    - If 1 V or greater, repair the short to voltage on the appropriate circuit.
    - If less than 1 V, replace the K4 Assist Step Control Module.

- **If between 9-11 V**

5. Ignition OFF, connect the harness connector at the M95L Assist Step - Left, ignition ON.
6. Test for 9 - 11 V between the M95R Assist Step - Right 10 V reference circuit terminal 2 and ground while commanding the Right Assist Step Motor to Extend and Retract with the scan tool.

NOTE: **The voltage reading will appear momentarily while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

- **If not between 9-11 V**

  Test or replace the M95L Assist Step - Left.

- **If between 9-11 V**

7. Ignition OFF. Disconnect the harness connector at the M95L Assist Step - Left, connect the harness

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connector at the M95R Assist Step - Right. Ignition ON.

8. Test for 9 - 11 V between the 10 V reference circuit terminal 2 at the left side and ground while commanding the Left Assist Step Motor to Extend and Retract with the scan tool.

NOTE: **The voltage reading will appear momentarily while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

- **If not between 9-11 V**

  Test or replace M95R Assist Step - Right .

- **If between 9-11 V**

9. Test for 9 - 11 V between the appropriate signal circuit terminal listed below and ground while commanding the Assist Step Motor to Extend and Retract with the scan tool.

NOTE: **The voltage reading will appear momentarily while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

- M95L Assist Step - Left - Signal circuit terminal 3
- M95R Assist Step - Right - Signal circuit terminal 3
- **If less than 9 V**

1. Ignition OFF, disconnect the X2 harness connector at the K4 Assist Step Control Module.
2. Test for infinite resistance between the signal circuit terminals and ground.
   - If less than infinite resistance, repair the short to ground on the appropriate circuit.
   - If infinite resistance
3. Test for less than 2 Ω in the signal circuits end to end.
   - If 2 Ω or greater, repair the open/high resistance in the circuit.
   - If less than 2 Ω replace the K4 Assist Step Control Module.

- **If greater than 11 V**

1. Test for less than 1 V signal circuit ground.
   - If 1 V or greater, repair the short to voltage on the appropriate circuit.
   - If less than 1 V, replace the K4 Assist Step Control Module.

- **If between 9-11 V**

10. Test or replace the appropriate M95L Assist Step - Left or M95R Assist Step - Right.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Assist Step Motor Replacement (BRS)**
- **Control Module References** for control module replacement, programming and setup.

DTC B051E: ASSIST STEP DISABLE SWITCH

Diagnostic Instructions

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- 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 B051E 02

Assist Step Disable Switch Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B051E 02	1	1	-
Ground	-	1	1	-
1. Disable switch inoperative.				

Circuit/System Description

The assist step control module monitors a signal circuit to the assist step disable switch. When the switch is pressed, a ground path is provided to the signal circuit. Pressing the switch with the doors closed while in Park or Neutral will extend the boards for washing. Pressing and holding the switch for 4 s will disable/enable running boards by putting them in "Locked" mode.

Conditions for Running the DTC

- The ignition is ON.
- Ignition voltage is between 9-16V.

Conditions for Setting the DTC

- The signal circuit is shorted to ground for longer than 1 min.
- The switch was pressed for longer than 1 min.

Action Taken When the DTC Sets

Assist steps are disabled.

Conditions for Clearing the DTC

- The DTC becomes history when the assist step control module no longer detects the condition that set the DTC.
- The history DTC will clear after 50 fault free ignition cycles.

Diagnostic Aids

Pressing the switch longer than 1 min will set this DTC.

Reference Information

Schematic Reference

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Step/Running Board Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Running Board Description

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 and all vehicle systems OFF, disconnect the harness connector at the S48A Multifunction Switch - Instrument Panel. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 14 and ground:
    - **If 10 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, repair the open/high resistance in the ground connection.
    - **If less than 10 Ω**
3. Ignition ON.
4. Verify the scan tool Assist Step Disable Switch parameter is Inactive.
    - **If not Inactive**
    1. Ignition OFF, disconnect the X2 harness connector at the Assist Step Control Module.
    2. Test for infinite resistance between the K4 Assist Step Control Module signal circuit terminal 10 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K4 Assist Step Control Module.
    - **If Inactive**
5. Install a 3 A fused jumper wire between the signal circuit terminal 3 and ground:
6. Verify the scan tool Assist Step Disable Switch parameter is Active.

NOTE: **DTC B051E will set after approximately 1 min.**

- **If not Active**

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1. Ignition OFF, remove the jumper wire, disconnect the X2 harness connector at the K4 Assist Step Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K4 Assist Step Control Module.

- **If Active**

7. Test or replace the S48A Multifunction Switch - Instrument Panel.

Component Testing

1. Ignition OFF, disconnect the harness connector at the S48A Multifunction Switch.
2. Test for infinite resistance between the terminals shown below with the switch in the open position:
    - S48A Multifunction Switch - Instrument Panel - signal circuit terminal 3 and ground circuit terminal 14
    - **If less than infinite resistance**

      Replace the S48A Multifunction Switch - Instrument Panel.

    - **If infinite resistance**
3. Test for less than 10 Ω between the signal terminal the terminals shown below with the switch in the closed position:
    - S48A Multifunction Switch - Instrument Panel - signal circuit terminal 3 and ground circuit terminal 14
    - **If 10 Ω or greater**

      Replace the S48A Multifunction Switch - Instrument Panel.

    - **If less than 10 Ω**
4. All OK

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Vehicle Stability Control System Switch Replacement** for assist step switch replacement.
- **Control Module References** for control module replacement, programming and setup.

DTC B052B: ASSIST STEP POSITION SENSOR SUPPLY

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 Descriptors

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DTC B052B 01

Assist Step Position Sensor Supply Circuit short to battery

DTC B052B 02

Assist Step Position Sensor Supply Circuit short to ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Side Step 10-Volt Reference	B052B 02	B051C 29	B052B 01	-
Right Side Step 10-Volt Reference	B052B 02	B051D 29	B052B 01	-
Left Position Sensor Signal	B051C 29	B051C 29	B051C 29, B052B 01	-
Right Position Sensor Signal	B051D 29	B051D 29	B051D 29, B052B 01	-
Left Position Sensor Low Reference	-	B051C 29	-	-
Right Position Sensor Low Reference	-	B051D 29	-	-

Circuit/System Description

The assist step control module controls the running board actuators to extend or retract the running boards. Each actuator consists of an electric motor and a hall-effect switch. The module supplies a low reference and 10 V reference source voltage to the hall-effect switch. The assist step control module monitors the signal from the hall effect switch on the signal circuit. When the actuator shaft rotates, the hall-effect switch provides pulses to the assist step control module which uses the pulses as counts to determine the location of the assist steps. The assist step control module supplies the actuator motor with a 12 V control circuit and a ground control circuit. The assist step control module controls the direction of the actuator by changing the polarity of the control circuits.

Conditions for Running the DTC

- The ignition is ON.
- Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

B052B 01

The position sensor circuit is shorted to battery voltage.

B052B 02

The position sensor circuit is shorted to ground.

Action Taken When the DTC Sets

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The motor drive circuits are deactivated for the appropriate running board step.

Conditions for Clearing the DTC

- The DTC becomes history when the assist step control module no longer detects the condition that set the DTC.
- The history DTC will clear after 50 fault free ignition cycles.

Reference Information

Schematic Reference

Step/Running Board Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Running Board Description

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.
2. Verify the scan tool Assist Step System Status parameter is Enabled.
    - **If the parameter is Disabled**

      Press and hold running board switch for 4 s to enable boards.

    - **If the parameter is Enabled**
3. Verify the left and right side running boards extend and retract when opening and closing the left and right side doors.
    - **If the both running boards do not extend or retract**

      Perform Circuit/System Testing

    - **If the running boards extend and retract**
4. All OK.

Circuit/System Testing

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1. Ignition OFF and all vehicle systems OFF. It may take up to 2 min for all vehicle systems to power down. Disconnect the harness connectors at the M95L Assist Step - Left and M95R Assist Step - Right.

NOTE: **When disconnecting a running board step, B051A or B051B will set for the running board disconnected.**

2. Test for less than 10 Ω between the following circuit terminals and ground.
   - M95L Assist Step - Left - low reference circuit terminal 4
   - M95R Assist Step - Right - low reference circuit terminal 4
   - **If 10 Ω or greater**
   1. Ignition OFF, disconnect the harness connector at the K4 Assist Step Control Module.
   2. Test for less than 2 Ω in the low reference circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, replace the K4 Assist Step Control Module.
   - **If less than 10 Ω**
3. Ignition ON.
4. Test for 9 - 11 V between the 10 V reference circuit terminals listed below and ground while commanding the appropriate Assist Step Motor to Extend and Retract with the scan tool.

NOTE: **The voltage reading will appear momentarily while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

   - M95L Assist Step - Left - 10 V reference circuit terminal 2
   - M95R Assist Step - Right - 10 V reference circuit terminal 2
   - **If less than 9 V**
   1. Ignition OFF, remove the test lamp, disconnect the harness connector at the K4 Assist Step Control Module.
   2. Test for infinite resistance between the 10 V reference circuit terminal and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance
   3. Test for less than 2 Ω in the 10 V reference circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω replace the K4 Assist Step Control Module.
   - **If greater than 11 V**
   1. Ignition OFF, disconnect the harness connector at the K4 Assist Step Control Module control module, ignition ON.
   2. Test for less than 1 V between 10 V reference circuit and ground.
      - If 1 V or greater, repair the short to voltage on the appropriate circuit.
      - If less than 1 V, replace the K4 Assist Step Control Module.
   - **If between 9-11 V**
5. Ignition OFF, connect the harness connector at the M95L Assist Step - Left, ignition ON.
6. Test for 9 - 11 V between the M95R Assist Step - Right 10 V reference circuit terminal 2 and ground while commanding the Right Assist Step Motor to Extend and Retract with the scan tool.

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NOTE: **The voltage reading will appear momentarily while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

- **If not between 9-11 V**

  Test or replace the M95L Assist Step - Left.

- **If between 9-11 V**

7. Ignition OFF. Disconnect the harness connector at the M48L Running Board Step - Left, connect the harness connector at the M48R Running Board Step - Right. Ignition ON.
8. Test for 9 - 11 V between the 10 V reference circuit terminal 2 at the left side and ground while commanding the Left Assist Step Motor to Extend and Retract with the scan tool.

NOTE: **The voltage reading will appear momentarily while toggling back and forth between Extend and Retract with a scan tool. After 4 tries, you must wait at least 10 s to repeat.**

- **If not between 9-11 V**

  Test or replace M95R Assist Step - Right .

- **If between 9-11 V**

9. Replace the K4 Assist Step Control Module.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Assist Step Motor Replacement (BRS)**
- **Control Module References** for control module replacement, programming and setup.

DTC B052C OR B052D: ASSIST STEP SWITCH

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 B052C 02

Left Assist Step Switch Circuit Short to Ground

DTC B052D 02

Right Assist Step Switch Circuit Short to Ground

Diagnostic Fault Information

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	B052C 02, B052D 02	1	1	-
Ground	-	1	1	-
1. Kick switch inoperative.				

Circuit/System Description

The assist step control module monitors the left and right signal circuit to the left and right assist step kick switch. When the left or right kick switch is pressed, a ground path is provided to the signal circuit.

Conditions for Running the DTC

- The ignition is ON.
- Ignition voltage is between 9-16V.

Conditions for Setting the DTC

- The signal circuit is shorted to ground for longer than 40 s.
- The switch was pressed for longer than 40 s.

Action Taken When the DTC Sets

Assist steps are disabled.

Conditions for Clearing the DTC

- The DTC becomes history when the assist step control module no longer detects the condition that set the DTC.

Diagnostic Aids

Pressing the switch longer than 40 s will set this DTC.

Reference Information

Schematic Reference

Step/Running Board Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Running Board Description

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**

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- **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.
2. Verify the scan tool Left Assist Step Switch parameter changes between Active and Inactive when pressing and releasing the Left Assist Step Kick Switch.
    - **If the parameter does not change**

      Refer to Circuit/System Testing - Left Assist Step Switch Malfunction

    - **If the parameter changes**
3. Verify the scan tool Right Assist Step Switch parameter changes between Active and Inactive when pressing and releasing the Right Assist Step Kick Switch.
    - **If the parameter does not change**

      Refer to Circuit/System Testing - Right Assist Step Switch Malfunction

    - **If the parameter changes**
4. All OK.

Circuit/System Testing

Left Assist Step Kick Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S148L Assist Step Kick Switch - Left . It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 2 and ground:
    - **If 10 Ω or greater**
    1. Ignition OFF.
    2. Test for less than 2 Ω in the ground circuit end to end.
        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K4 Assist Step Control Module.
    - **If less than 10 Ω**
3. Ignition ON.
4. Verify the scan tool Left Assist Step Switch parameter is Inactive.
    - **If not Inactive**
    1. Ignition OFF, disconnect the X2 harness connector at the K4 Assist Step Control Module.
    2. Test for infinite resistance between the K4 Assist Step Control Module signal circuit terminal 11 and ground.
        - If less than infinite resistance, repair the short to ground on the circuit.
        - If infinite resistance, replace the K4 Assist Step Control Module.

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- **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground:
6. Verify the scan tool Left Assist Step Switch parameter Active.

NOTE: DTC B052C 02 will set after approximately 1 min.

- **If not Active**

1. Ignition OFF, remove the jumper wire, disconnect the X2 harness connector at the K4 Assist Step Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit and ground.
   - If 1 V or greater, repair the short to voltage on the circuit.
   - If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
   - If 2 Ω or greater, repair the open/high resistance in the circuit.
   - If less than 2 Ω, replace the K4 Assist Step Control Module.

- **If Active**

7. Test or replace the S148L Assist Step Kick Switch - Left.

Right Assist Step Kick Switch Malfunction

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the S148R Assist Step Kick Switch - Right. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 2 and ground:
   - **If 10 Ω or greater**

   1. Ignition OFF.
   2. Test for less than 2 Ω in the ground circuit end to end.
      - If 2 Ω or greater, repair the open/high resistance in the circuit.
      - If less than 2 Ω, replace the K4 Assist Step Control Module.

   - **If less than 10 Ω**

3. Ignition ON.
4. Verify the scan tool Right Assist Step Switch parameter is Inactive.
   - **If not Inactive**

   1. Ignition OFF, disconnect the X2 harness connector at the K4 Assist Step Control Module.
   2. Test for infinite resistance between the K4 Assist Step Control Module signal circuit terminal 12 and ground.
      - If less than infinite resistance, repair the short to ground on the circuit.
      - If infinite resistance, replace the K4 Assist Step Control Module.

   - **If Inactive**

5. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground:
6. Verify the scan tool Right Assist Step Switch parameter is Active.

NOTE: DTC B052D 02 will set after approximately 1 min.

- **If not Active**

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1. Ignition OFF, remove the jumper wire, disconnect the X2 harness connector at the K4 Assist Step Control Module, ignition ON.
2. Test for less than 1 V between the signal circuit and ground.
    - If 1 V or greater, repair the short to voltage on the circuit.
    - If less than 1 V
3. Test for less than 2 Ω in the signal circuit end to end.
    - If 2 Ω or greater, repair the open/high resistance in the circuit.
    - If less than 2 Ω, replace the K4 Assist Step Control Module.

- **If Active**

7. Test or replace the S148R Assist Step Kick Switch - Right.

Component Testing

1. Ignition OFF, disconnect the harness connector at the appropriate S148 Assist Step Kick Switch.
2. Test for infinite resistance between the terminals shown below with the switch in the open position:
    - Assist Step Kick Switch - signal circuit terminal 1 and ground circuit terminal 2
    - **If less than infinite resistance**

      Replace the Assist Step Kick Switch.

    - **If infinite resistance**
3. Test for less than 10 Ω between the signal terminal the terminals shown below with the switch in the closed position:
    - Assist Step Kick Switch - signal circuit terminal 1 and ground circuit terminal 2
    - **If 10 Ω or greater**

      Replace the Assist Step Kick Switch.

    - **If less than 10 Ω**
4. All OK

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Control Module References** for control module replacement, programming and setup.

SYMPTOMS - POWER ASSIST STEPS

NOTE: **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 are true:
    - There are no DTCs set.
    - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following **Running Board Description**.

Visual/Physical Inspection

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- Inspect for aftermarket devices which could affect the operation of the assist step system. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

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

Symptom List

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

Power Assist Step Malfunction

POWER ASSIST STEP 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	-	-
Left Side Step 10-Volt Reference	B052B 02	B051C 29	B052B 01	-
Right Side Step 10-Volt Reference	B052B 02	B051D 29	B052B 01	-
Left Position Sensor Signal	B051C 29	B051C 29	B051C 29, B052B 01	-
Right Position Sensor Signal	B051D 29	B051D 29	B051D 29, B052B 01	-
Disable Switch Signal	B051E 02	2	2	-
Left Assist Step Kick Switch Signal	B052C 02	3	3	-
Right Assist Step Kick Switch Signal	B052D 02	4	4	-
Left Motor Extend Control	B051A 02	B051A 04	B051A 01	-
Left Motor Retract Control	B051A 02	B051A 04	B051A 01	-
Right Motor Extend Control	B051B 02	B051B 04	B051B 01	-
Right Motor Retract Control	B051B 02	B051B 04	B051B 01	-
Left Position Sensor Low Reference	-	B051C 29	1	-
Right Position Sensor Low Reference	-	B051D 29	1	-
Ground	-	1	-	-

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Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
1. Assist Steps Inoperative 2. Disable Switch Inoperative 3. Left Assist Step Kick Switch Inoperative 4. Right Assist Step Kick Switch Inoperative				

Circuit/System Description

The assist step control module controls the assist step actuators to extend or retract the assist steps. Each actuator consists of an electric motor and a potentiometer. The module supplies a low reference and 10 V reference source voltage to the potentiometer. The module monitors the voltage drop across the potentiometer on the position signal circuit. When the actuator shaft rotates, the voltage on the position signal circuit changes. The module supplies the actuator motor with a 12 V control circuit and a ground control circuit. The module controls the direction of the actuator by changing the polarity of the control circuits.

Diagnostic Aids

- The running boards can be manually deployed by pressing the assist step switch while the transmission is in park or neutral. The assist steps will be retracted with a second push of the disable switch, if the transmission is switched out of park or neutral, or if vehicle speed exceeds 8 kph (5 mph).
- If a door is ajar, the boards may retract and extend as vehicle speed goes above and below 3 kph (2 mph). Verify proper operation of door ajar switches and that all doors are tightly shut.
- If boards are stuck in extended or retracted position, verify there is nothing that can prohibit normal operation such as physical damage, or a build up of mud, snow, or ice on boards and mechanical linkages.

Reference Information

Schematic Reference

Step/Running Board Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Running Board Description

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

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1. Ignition ON.
2. Verify scan tool can communicate with K4 Assist Step Control Module.
    - **If scan tool does not communication with module**

      Refer to **Scan Tool Does Not Communicate with Low Speed GMLAN Device** .

    - **If scan tool communicates with module**
3. Verify the scan tool Assist Step System Status parameter is Enabled.
    - **If the parameter is Disabled**

      Press and hold running board switch for 4 s to enable boards.

    - **If the parameter is Enabled**
4. Verify all scan tool Door Ajar Switch parameters change between Active and Inactive when opening and closing the appropriate doors.
    - **If one or more parameters do not change**

      Refer to **Door Ajar Indicator Malfunction** .

    - **If all parameters change**
5. Verify Right Assist Step Command and Left Assist Step Command parameters are not Object Detected while commanding the running boards to Extend and Retract using the scan tool.
    - **If one or both boards are Object Detected**

      Check for mechanical binding of running board. Refer to **Assist Step Replacement (Assembly - BRS)Assist Step Replacement (BRS - 100 Series Crewcab)** for how to manually move boards.

    - **If parameters are not Object Detected**
6. Verify the scan tool Assist Step Disable Switch parameter changes between Active and Inactive pressing and releasing the Assist Step Disable Switch.
    - **If the parameter does not change**

      Refer to **DTC B051E** .

    - **If the parameter changes**
7. Verify the scan tool Left and Right Assist Step Disable Kick switch parameters change between Active and Inactive pressing and releasing the Left Assist Step Kick Switch and Right Assist Step Kick Switch.
    - **If the parameter does not change**

      Refer to **DTC B052C or B052D** .

    - **If the parameter changes**
8. Verify the assist steps extend when each vehicle door is opened and retract when the door is closed.
    - **If the assist steps do not properly extend and retract**

      Refer to Diagnostic Aids.

    - **If the assist steps properly extend and retract**
9. All OK.

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REPAIR INSTRUCTIONS

FRONT TOW HOOK REPLACEMENT (LIGHT DUTY)

Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

NOTE: **The left tow hook mounting bolt has to be cut in order to remove it. The replacement bolt can be inserted from the opposite side with the mounting nut.**

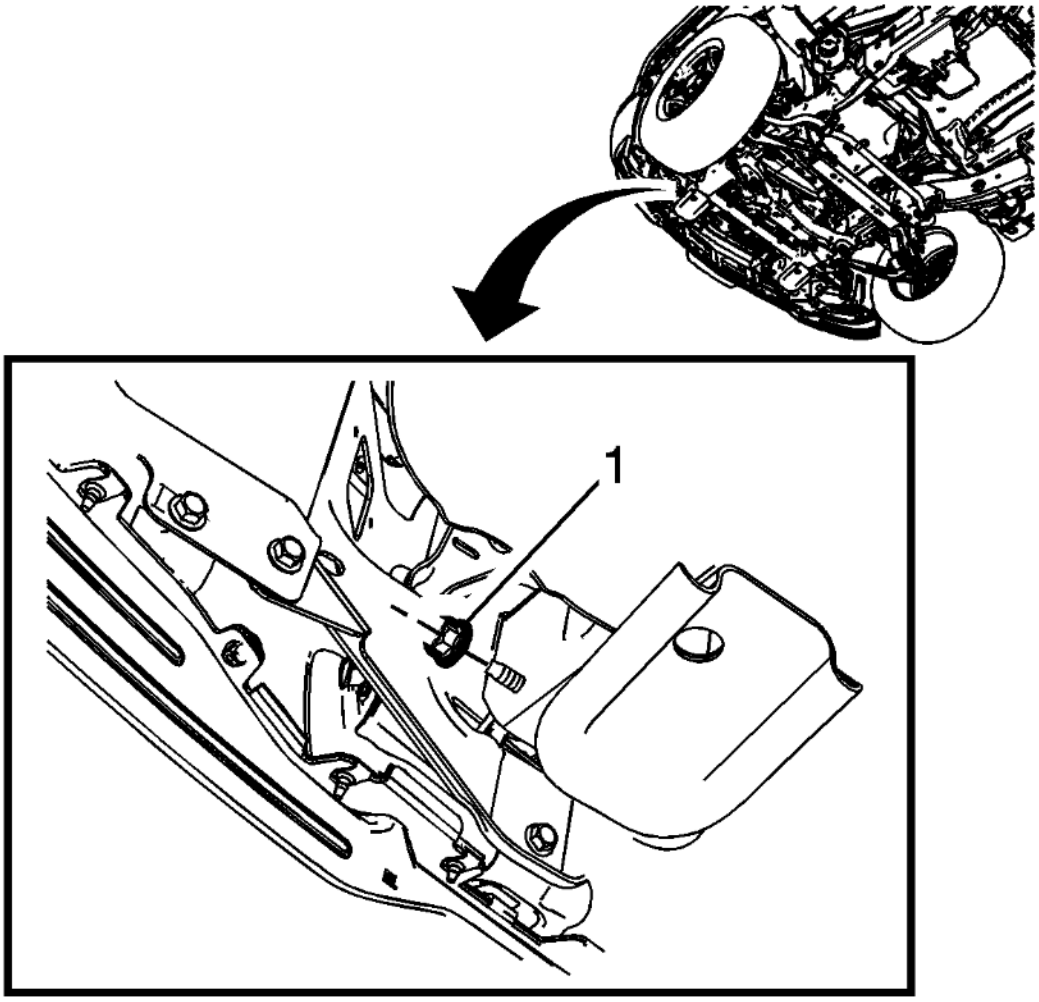


Fig. 2: Left Side Tow Hook Mounting Nut
Courtesy of GENERAL MOTORS COMPANY

2. Remove the left side tow hook mounting nut. 1

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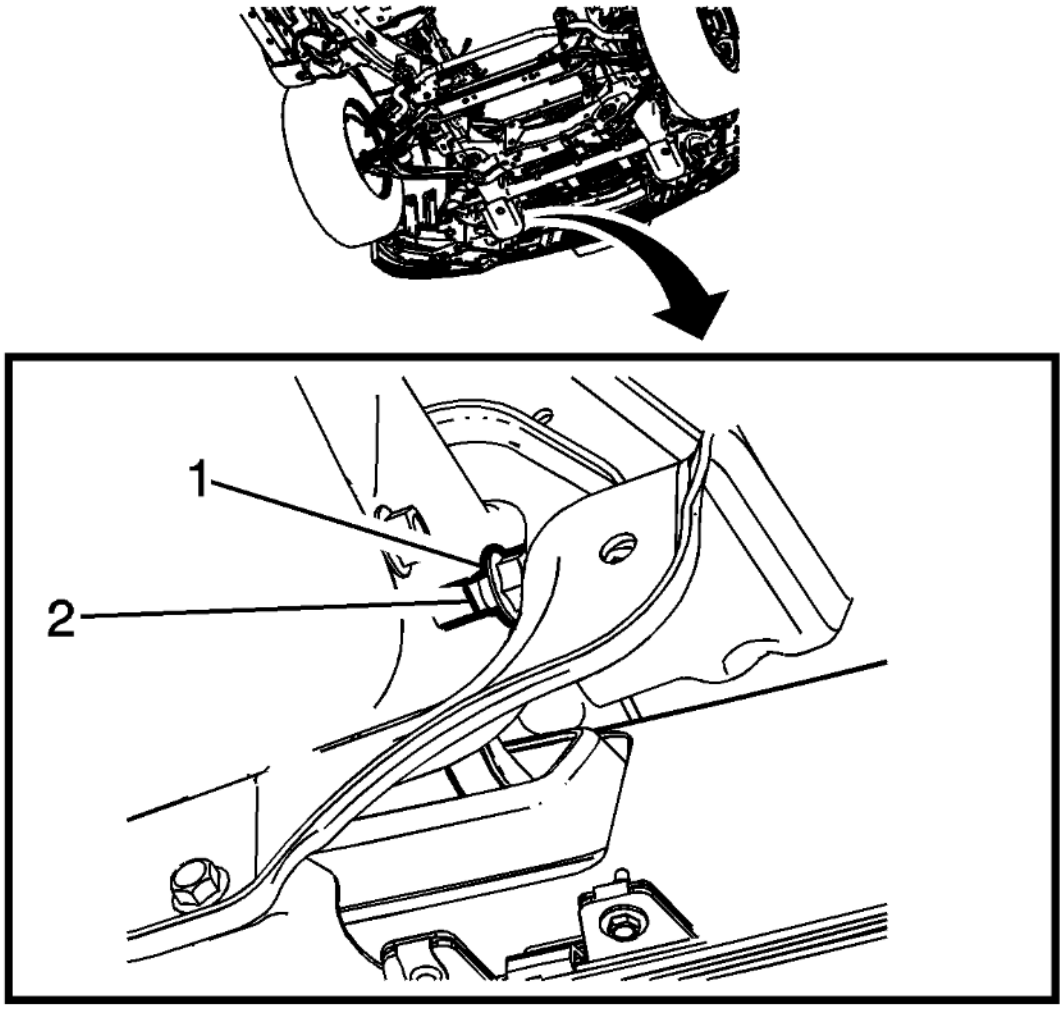


Fig. 3: Mounting Bolt
Courtesy of GENERAL MOTORS COMPANY

3. Slide the mounting bolt (1) out and cut the bolt near the marked position shown (2).
4. Slide the bolt back through to the other side and remove.

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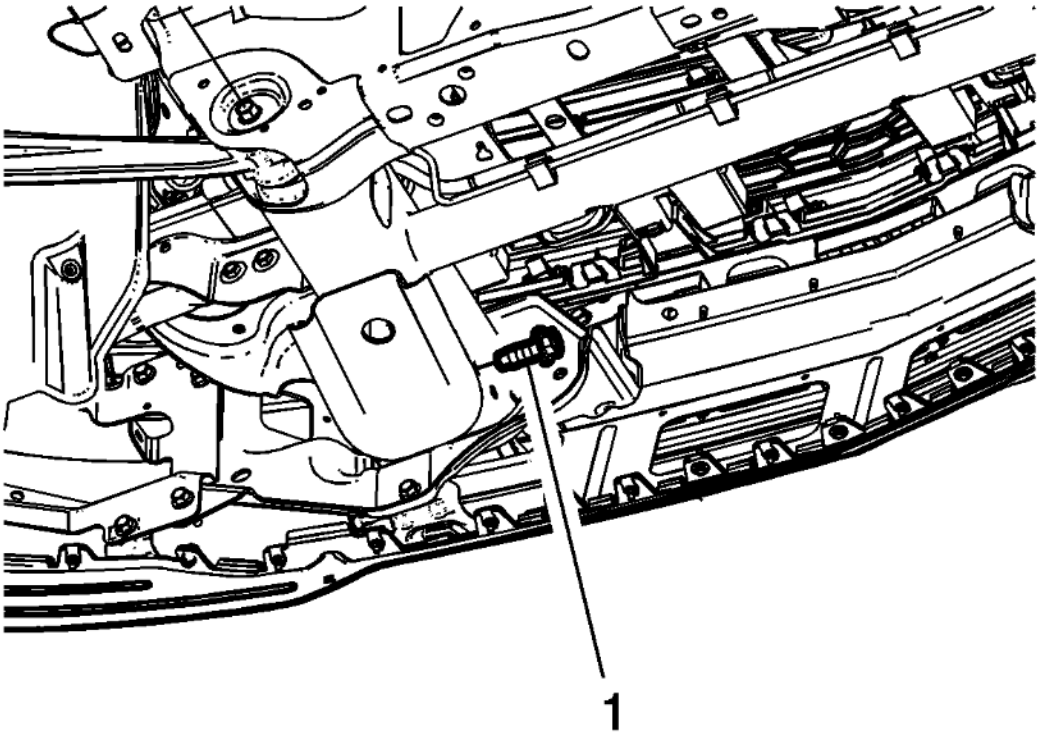


Fig. 4: Left Side Tow Hook Mounting Bolt
Courtesy of GENERAL MOTORS COMPANY

5. Remove the left tow hook mounting bolt. 1

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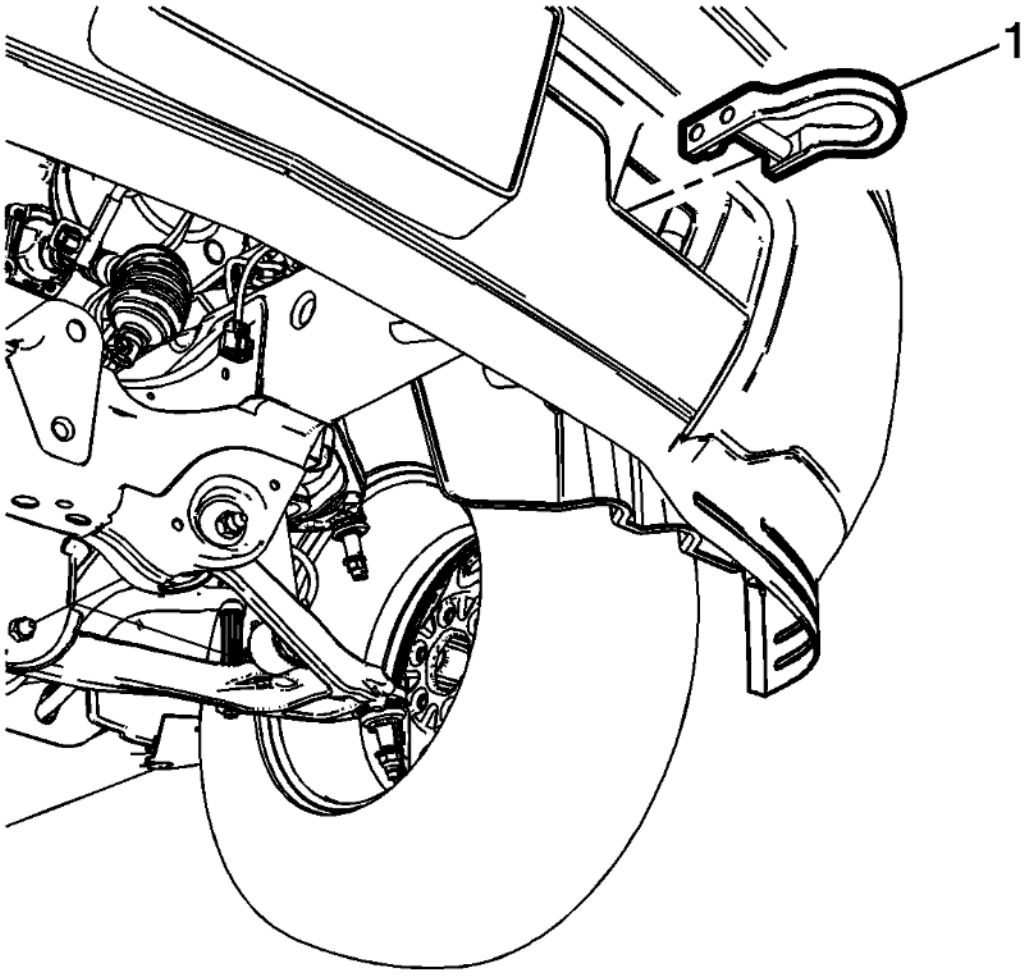


Fig. 5: Left Side Tow Hook
Courtesy of GENERAL MOTORS COMPANY

6. Remove the left tow hook from the vehicle. 1

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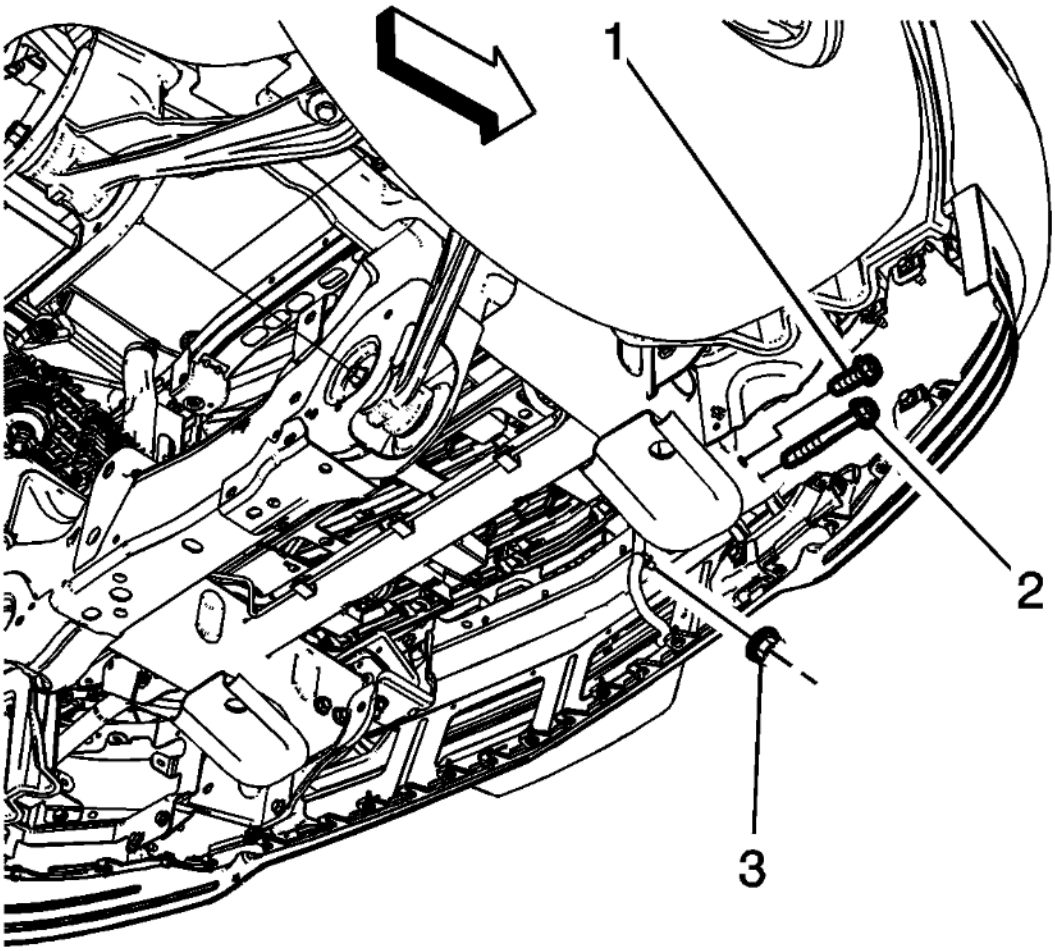


Fig. 6: Right Tow Hook Mounting Bolts
Courtesy of GENERAL MOTORS COMPANY

7. Remove the right tow hook mounting bolts (1, 2) and nut (3).

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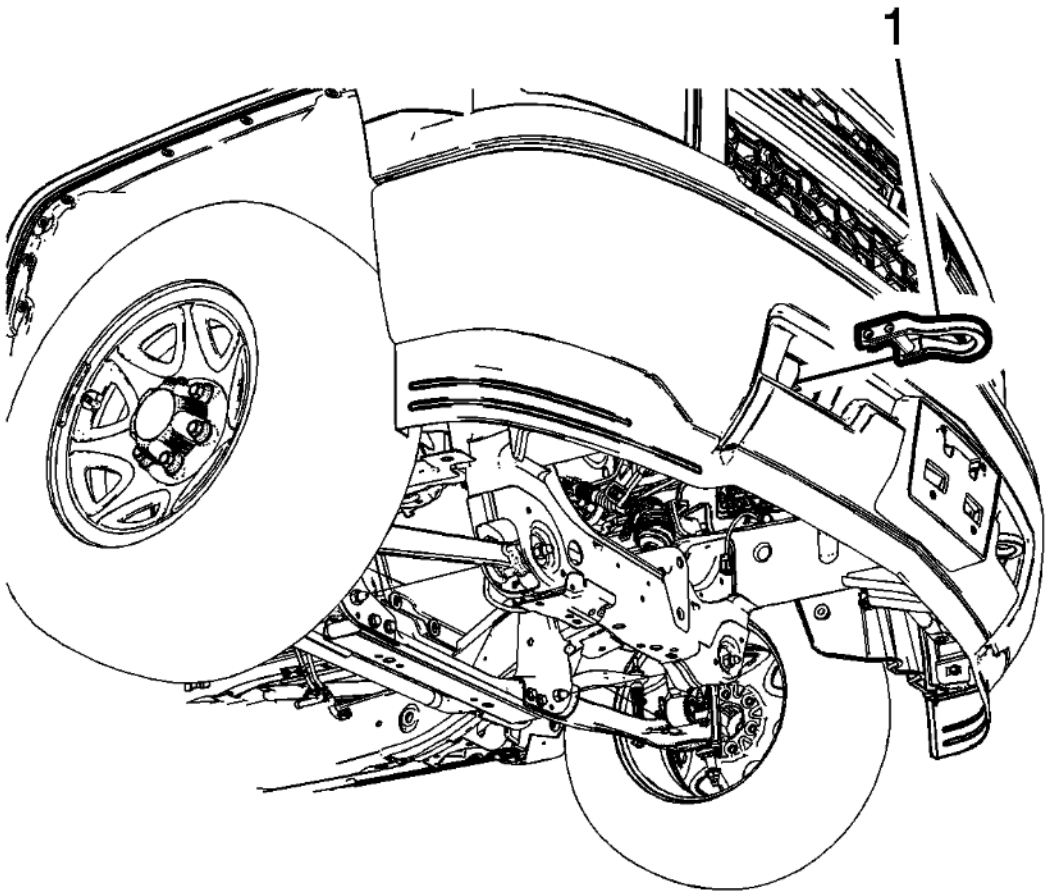


Fig. 7: Right Tow Hook
Courtesy of GENERAL MOTORS COMPANY

8. Remove the right tow hook (1) from the vehicle.

Installation Procedure

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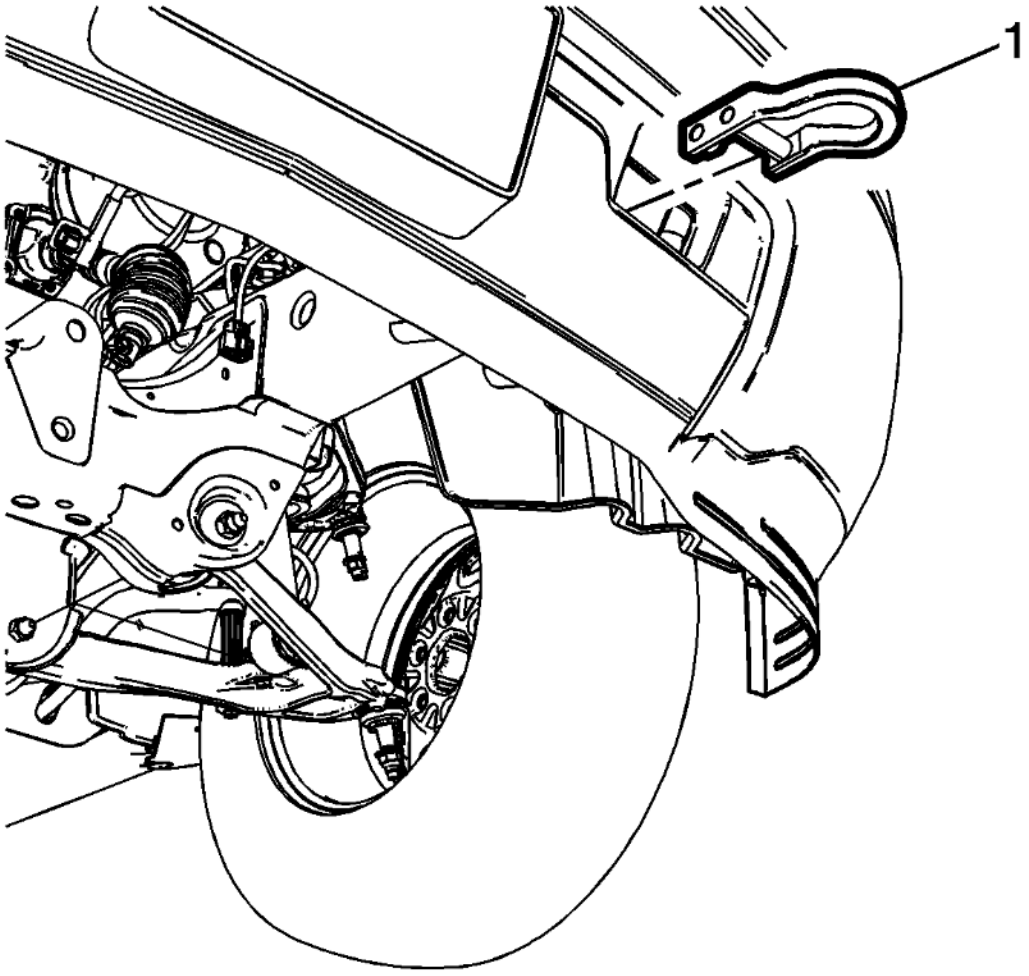


Fig. 8: Left Side Tow Hook
Courtesy of GENERAL MOTORS COMPANY

1. Install the left tow hook into position on the frame. 1

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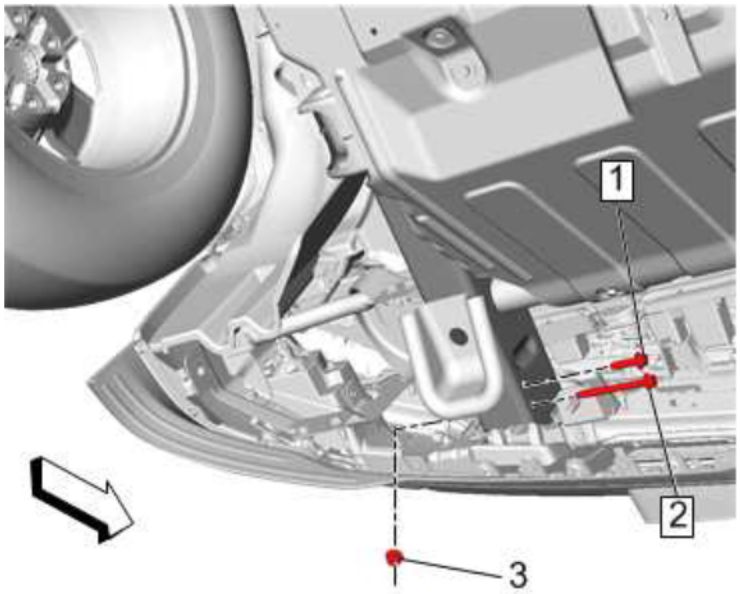


Fig. 9: Left Tow Hook
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution**

2. Install the left tow hook mounting bolt (2) and nut (3) and tighten the bolt to 80 N.m (59 lb ft)
3. Install the left tow hook mounting bolt (1) and tighten to 80 N.m (59 lb ft)

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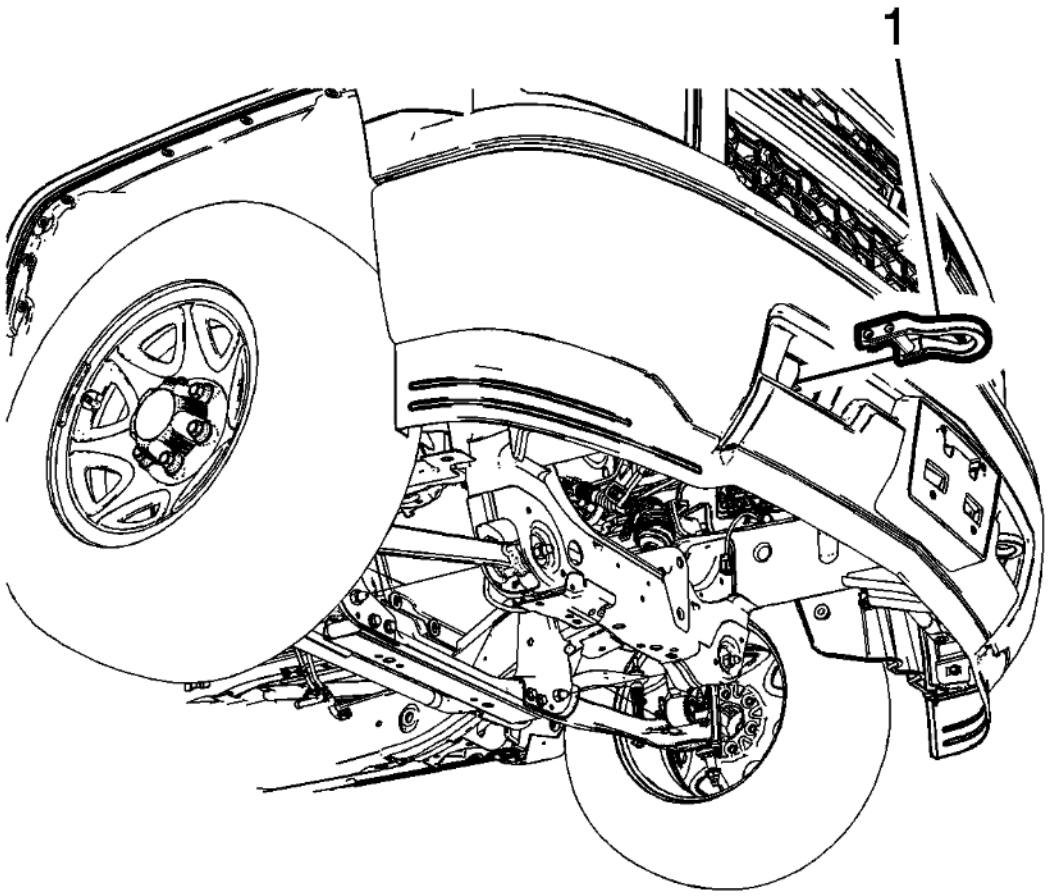


Fig. 10: Right Tow Hook
Courtesy of GENERAL MOTORS COMPANY

4. Install the right tow hook into position on the frame.

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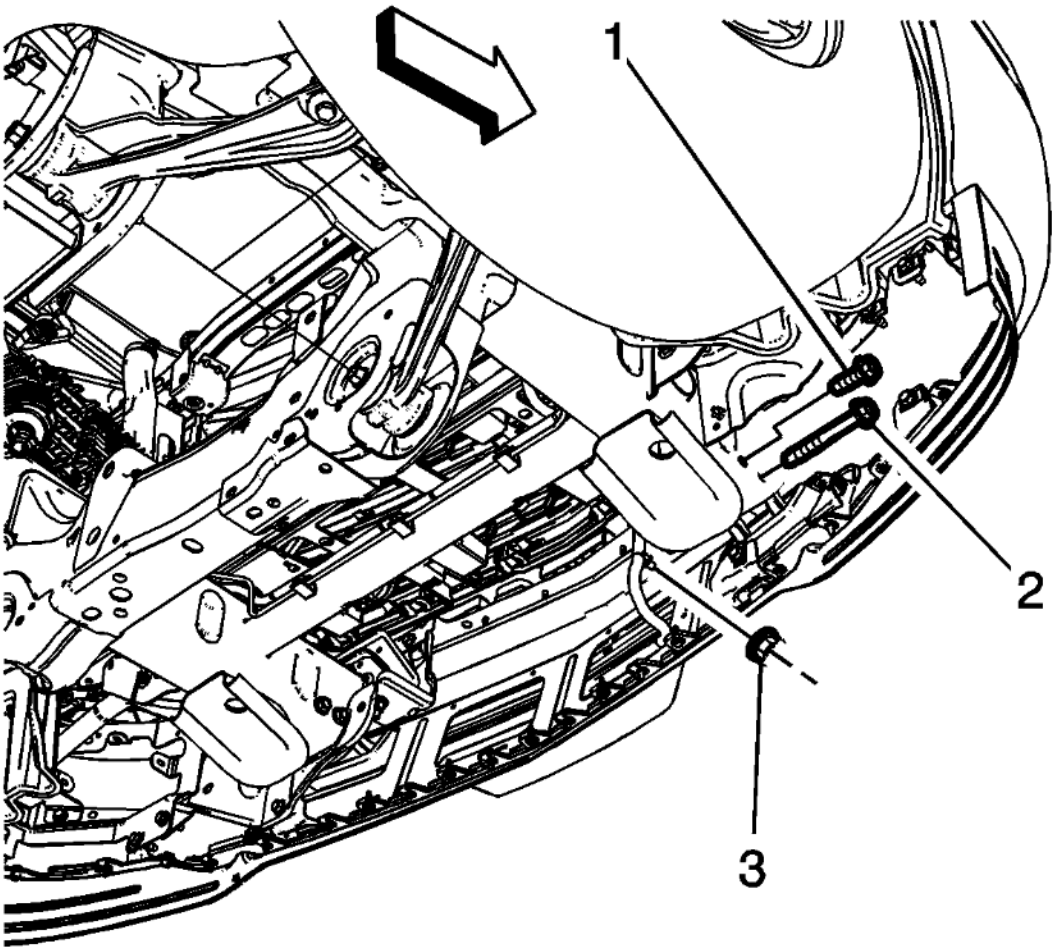


Fig. 11: Right Tow Hook Mounting Bolts
Courtesy of GENERAL MOTORS COMPANY

5. Install the right tow hook mounting bolt (2) and nut (3) and tighten the bolt to 80 N.m (59 lb ft)
6. Install the right tow hook mounting bolt (1) and tighten to 80 N.m (59 lb ft)
7. Lower the vehicle.

FRONT TOW HOOK REPLACEMENT (HEAVY DUTY)

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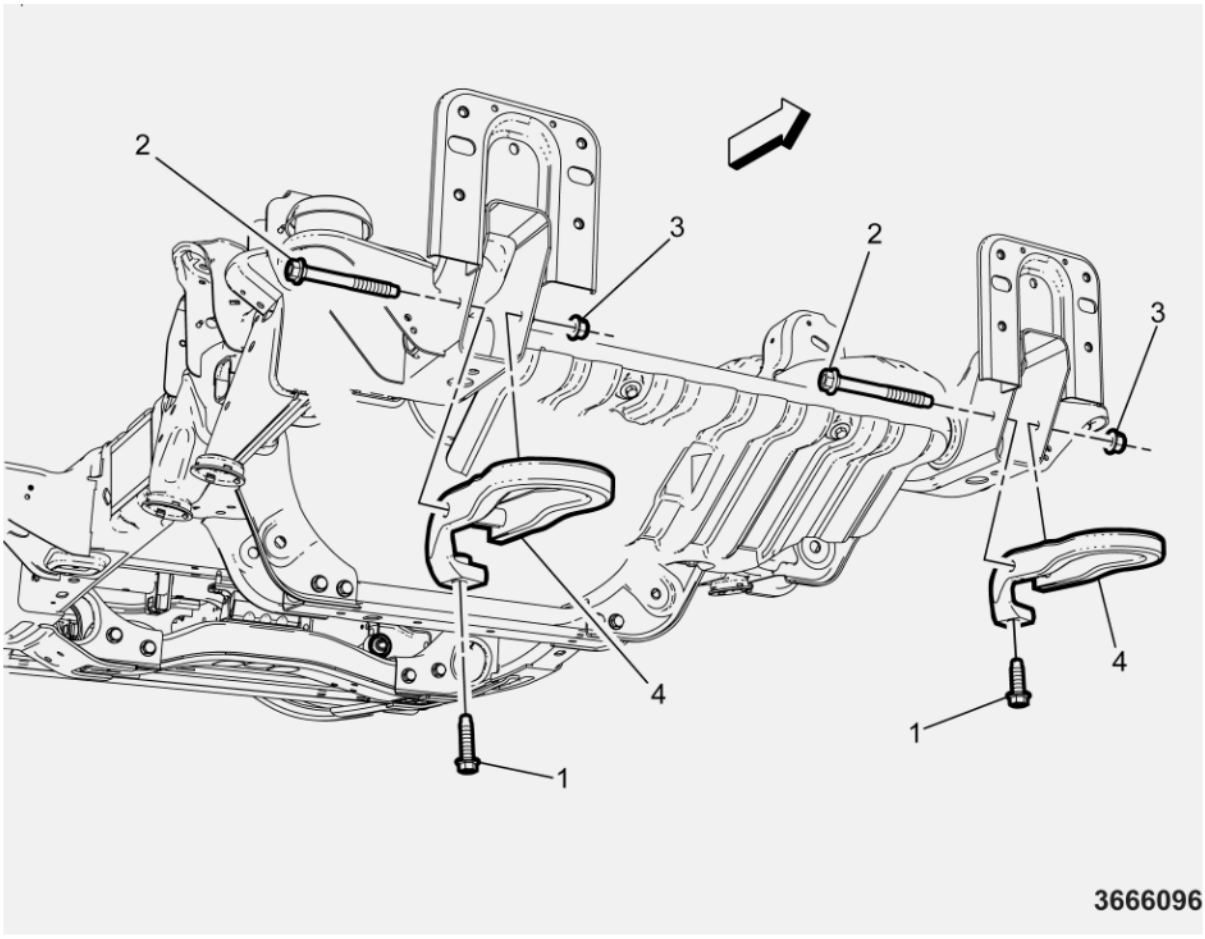


Fig. 12: Front Tow Hook (Heavy Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Tow Hook Bolt (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 85 N.m (63 lb ft)
2	Tow Hook Bolt (Qty: 2)
3	Tow Hook Nut (Qty: 2) **Tighten** 105 N.m (77 lb ft)
4	Tow Hook (Qty: 2)

STEERING GEAR SKID SHIELD REPLACEMENT

Removal Procedure

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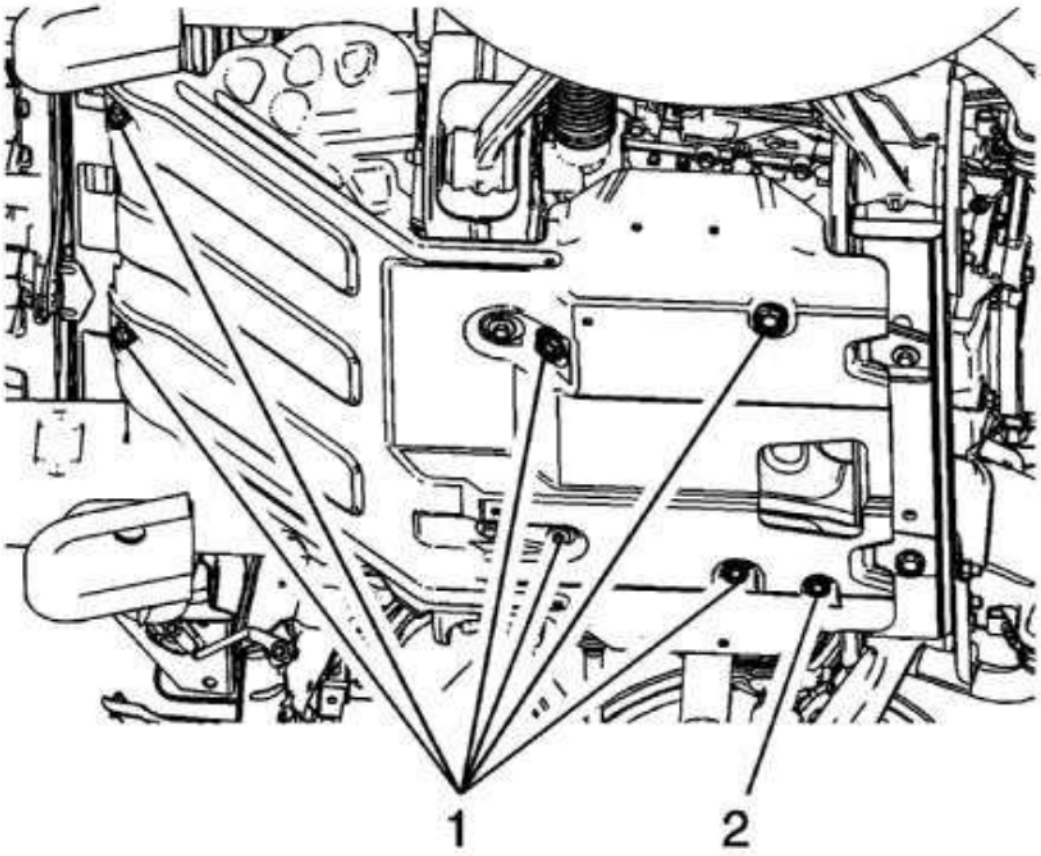


Fig. 13: Steering Gear Skid Shield Mounting Fasteners
Courtesy of GENERAL MOTORS COMPANY

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the steering gear skid shield mounting fasteners (1).
3. Remove the steering gear skid shield (2).

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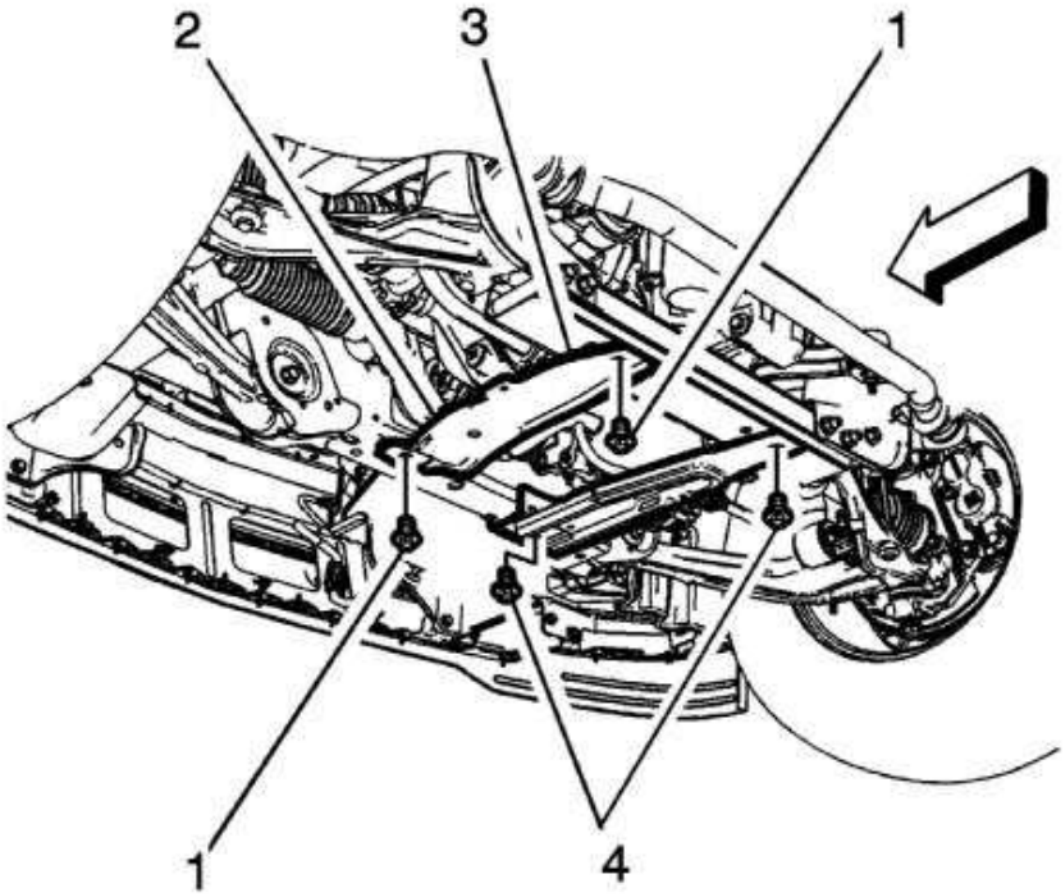


Fig. 14: Left Steering Gear Skid Shield Bracket Fasteners
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If not servicing the steering gear skid shield, remove the steering gear skid shield brackets as required.**

4. Remove the left steering gear skid shield bracket fasteners (1) and remove the left steering gear shield bracket (2).
5. Remove the right steering gear skid shield bracket fasteners (4) and remove the right steering gear skid shield bracket (3).

Installation Procedure

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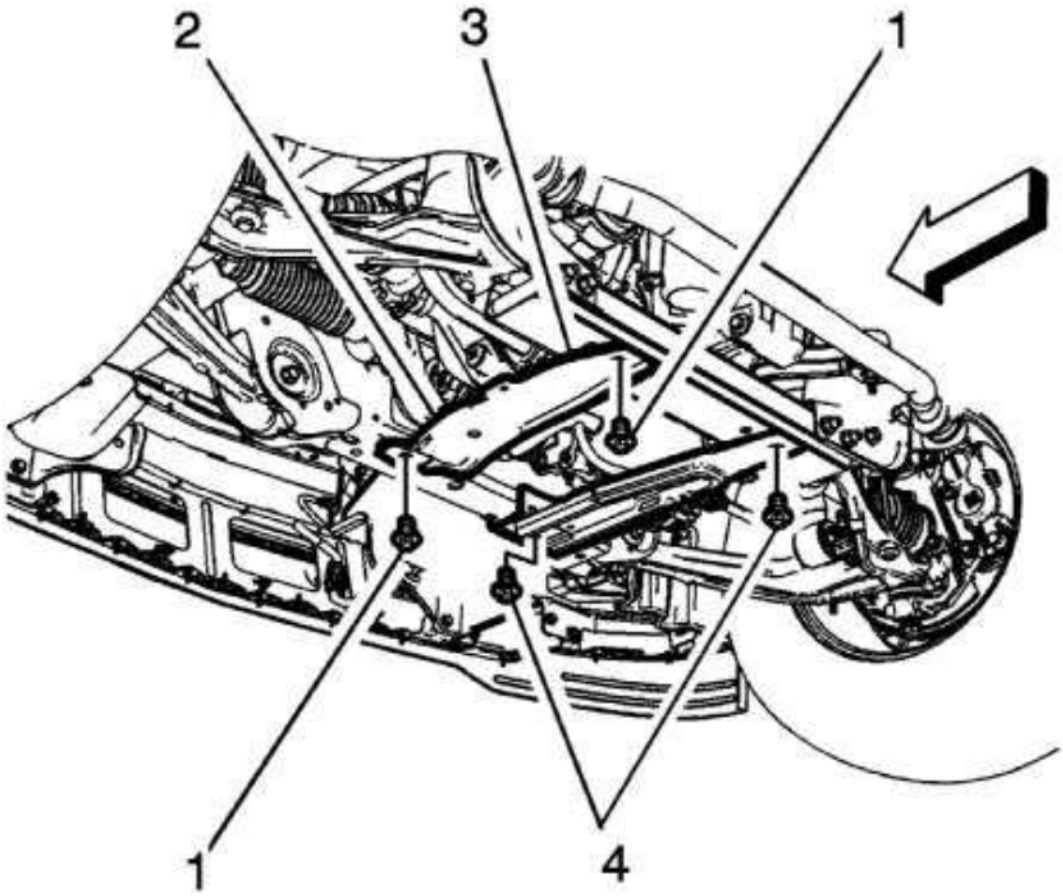


Fig. 15: Left Steering Gear Skid Shield Bracket Fasteners
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

1. Install the right steering gear skid shield bracket (3) and tighten the fasteners (4) to 20 N.m (15 lb ft).
2. Install the left steering gear skid shield bracket (2) and tighten the fasteners (1) to 20 N.m (15 lb ft).

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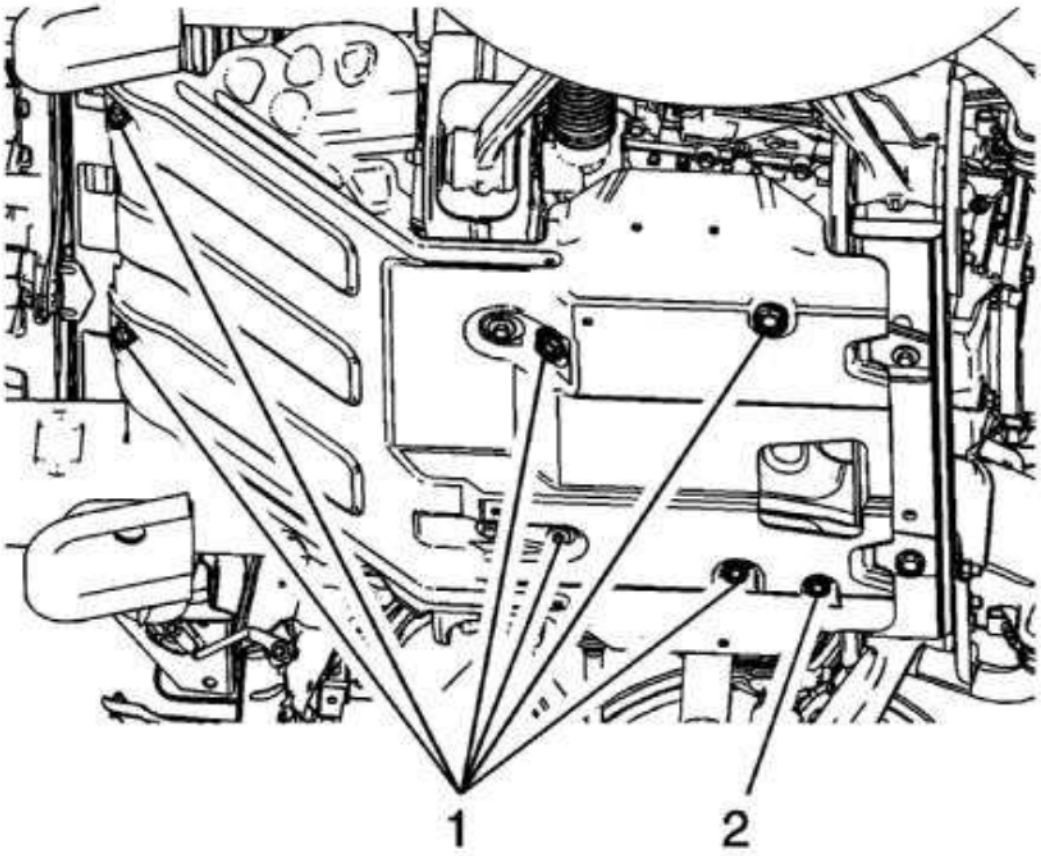


Fig. 16: Steering Gear Skid Shield Mounting Fasteners
Courtesy of GENERAL MOTORS COMPANY

3. Position the steering gear skid shield (2) on the frame.
4. Install the steering gear skid shield mounting fasteners (1) and tighten to:
    - Tighten the steering gear skid shield to frame bolts to 20 N.m (15 lb ft).
    - Tighten the steering gear skid shield to steering gear skid shield bracket bolts to 9 N.m (80 lb in).

FRONT FRAME HEAT SHIELD REPLACEMENT (FRONT AXLE BUSHING)

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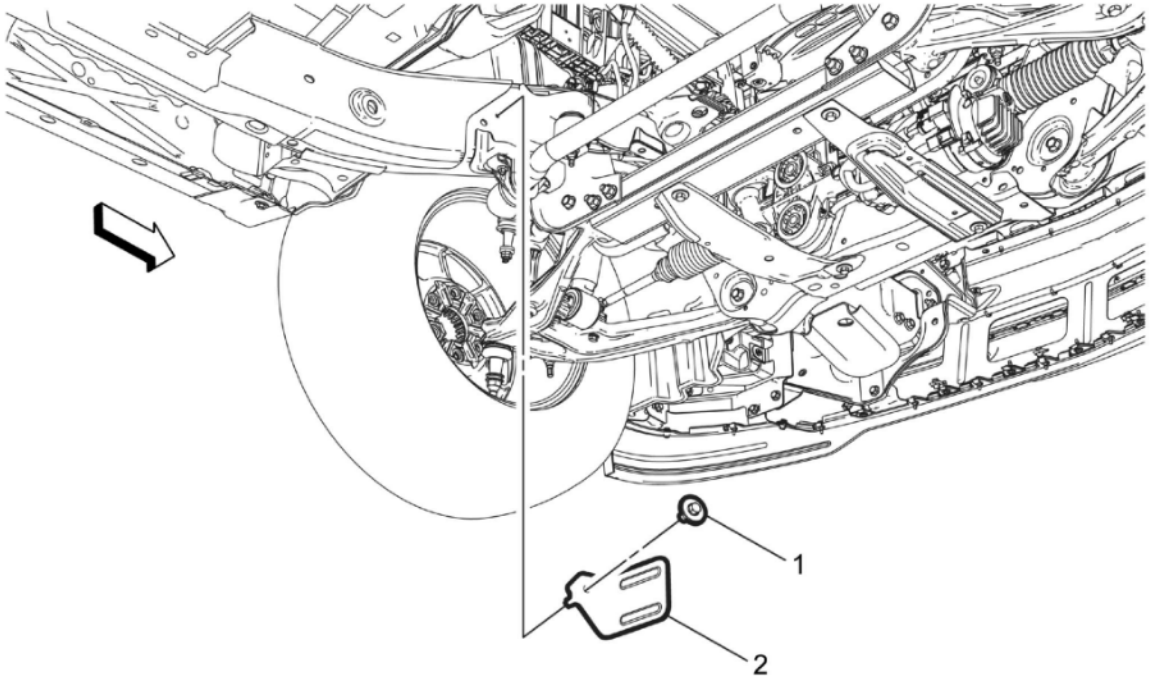


Fig. 17: Front Frame Heat Shield (Front Axle Bushing)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Front Frame Heat Shield Fastener **CAUTION:** **Refer to** **Fastener** **Caution** . **Tighten:** 12 N.m (106 lb in)
2	Front Frame Heat Shield - Front Axle Bushing

FRONT FRAME HEAT SHIELD REPLACEMENT (BRAKE PIPE-L96)

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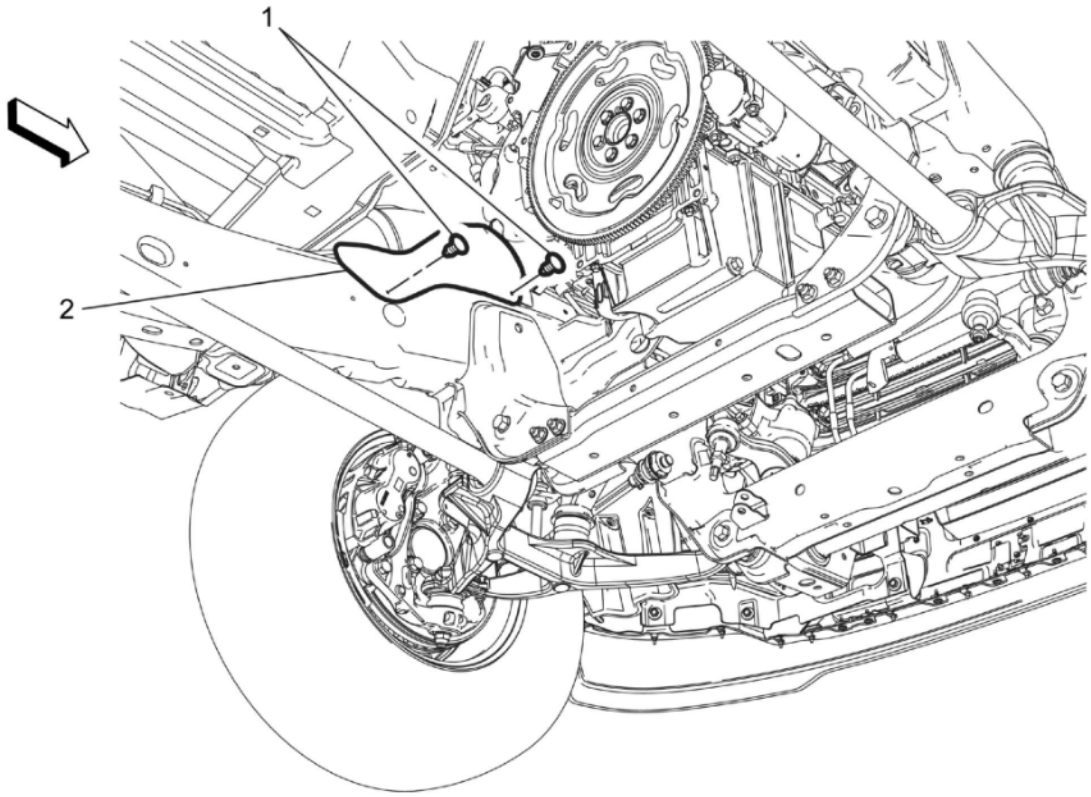


Fig. 18: Front Frame Heat Shield (Brake Pipe-L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Front Frame Heat Shield Retainers (Qty: 2)
2	Front Frame Heat Shield - Brake Pipe

FRONT FRAME HEAT SHIELD REPLACEMENT (TORSION BAR-LC8, L96)

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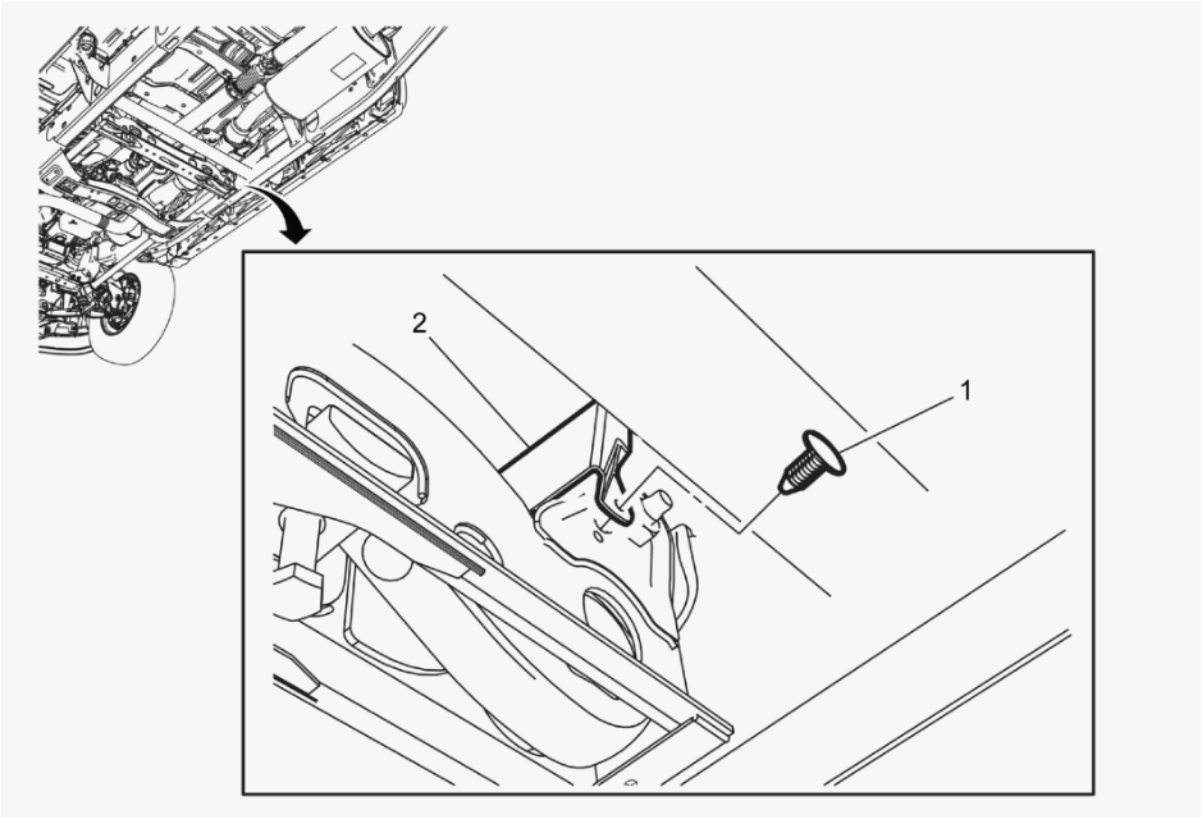


Fig. 19: Front Frame Heat Shield (Torsion Bar-LC8, L96)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Front Frame Heat Shield Retainer
2	Front Frame Heat Shield - Torsion Bar

SIDE RAIL SPLASH SHIELD REPLACEMENT

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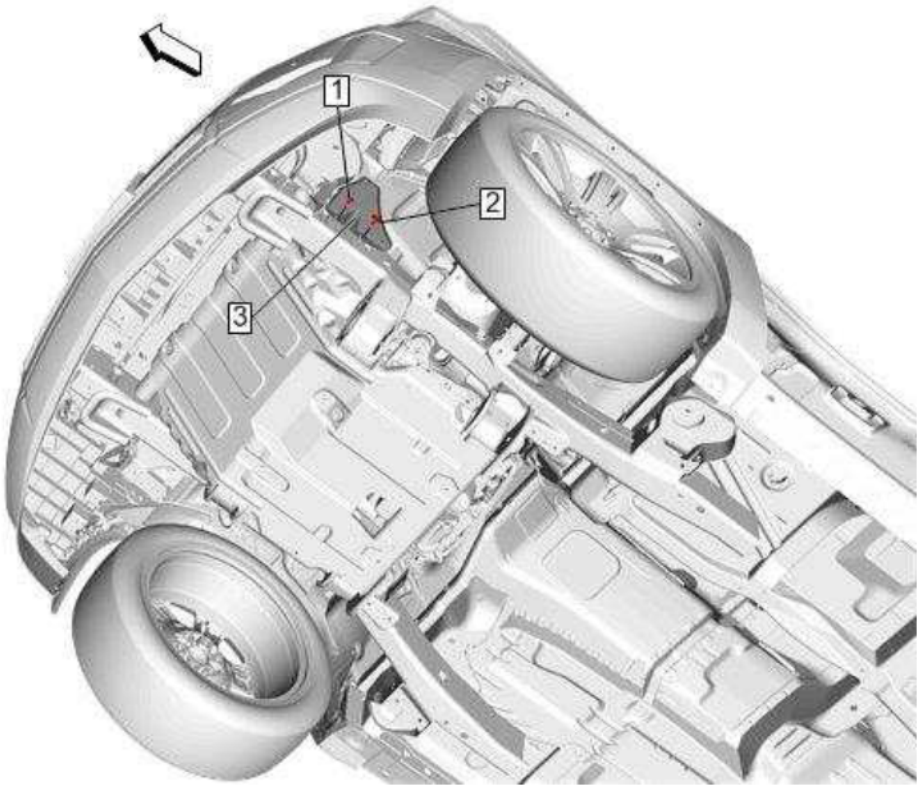


Fig. 20: Side Rail Splash Shield
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Side Rail Splash Shield Push-Pin Fastener
2	Side Rail Splash Shield Fastener **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 12 N.m (106 lb in)
3	Side Rail Splash Shield

UNDERBODY REAR AIR DEFLECTOR REPLACEMENT

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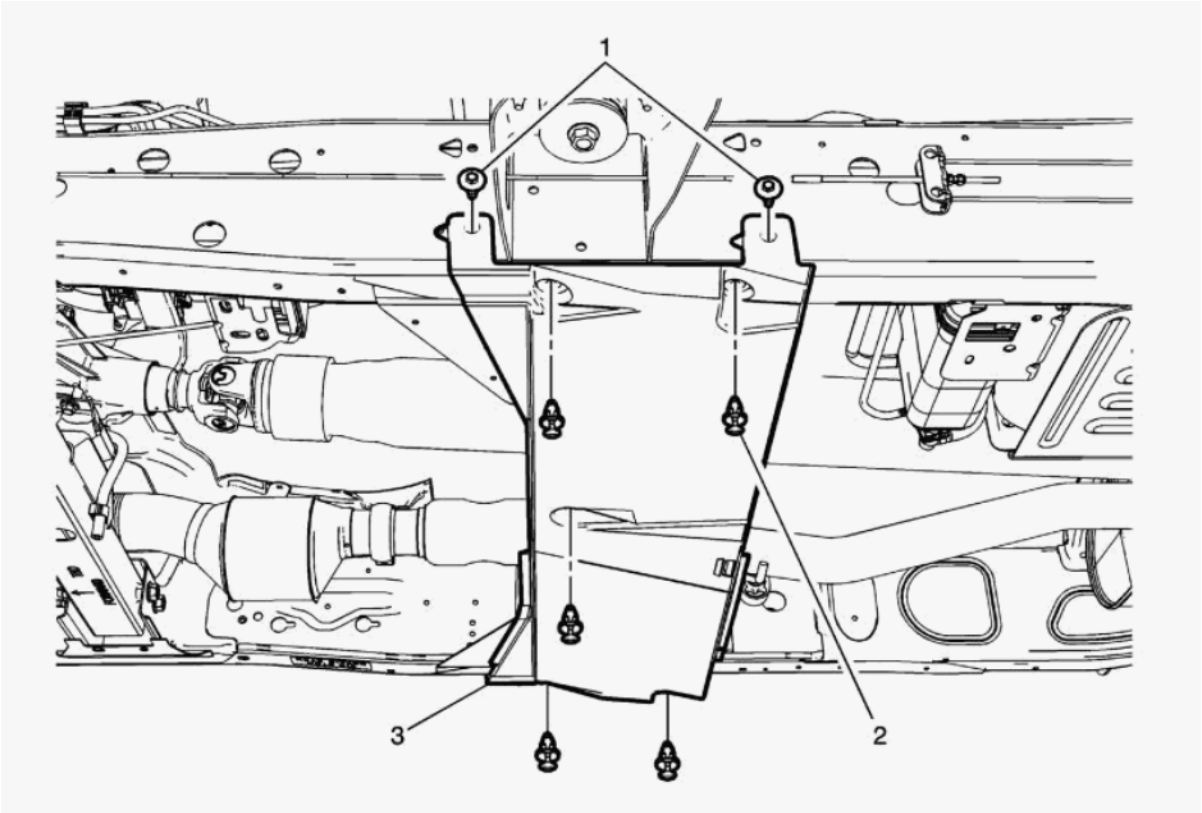


Fig. 21: Underbody Rear Air Deflector
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Underbody Rear Air Deflector Bolt (Qty: 4) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 9 N.m (80 lb in)
2	Plastic Retainer (Qty: 5)
3	Underbody Rear Air Deflector

TRANSFER CASE SKID SHIELD REPLACEMENT

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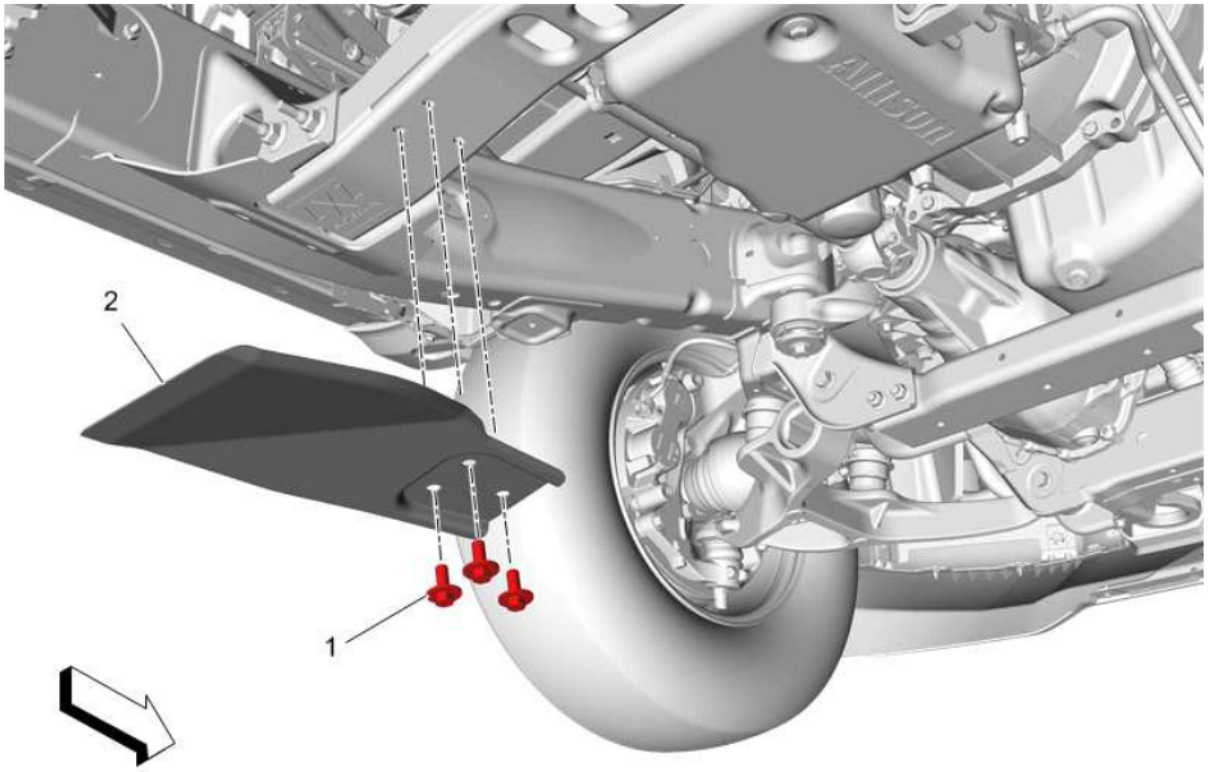


Fig. 22: Transfer Case Skid Shield
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. **Lifting and Jacking the Vehicle** .	
1	Transfer Case Skid Shield Bolt **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 28 N.m (21 lb ft)
2	Transfer Case Skid Shield

UNDERBODY SKID SHIELD REPLACEMENT

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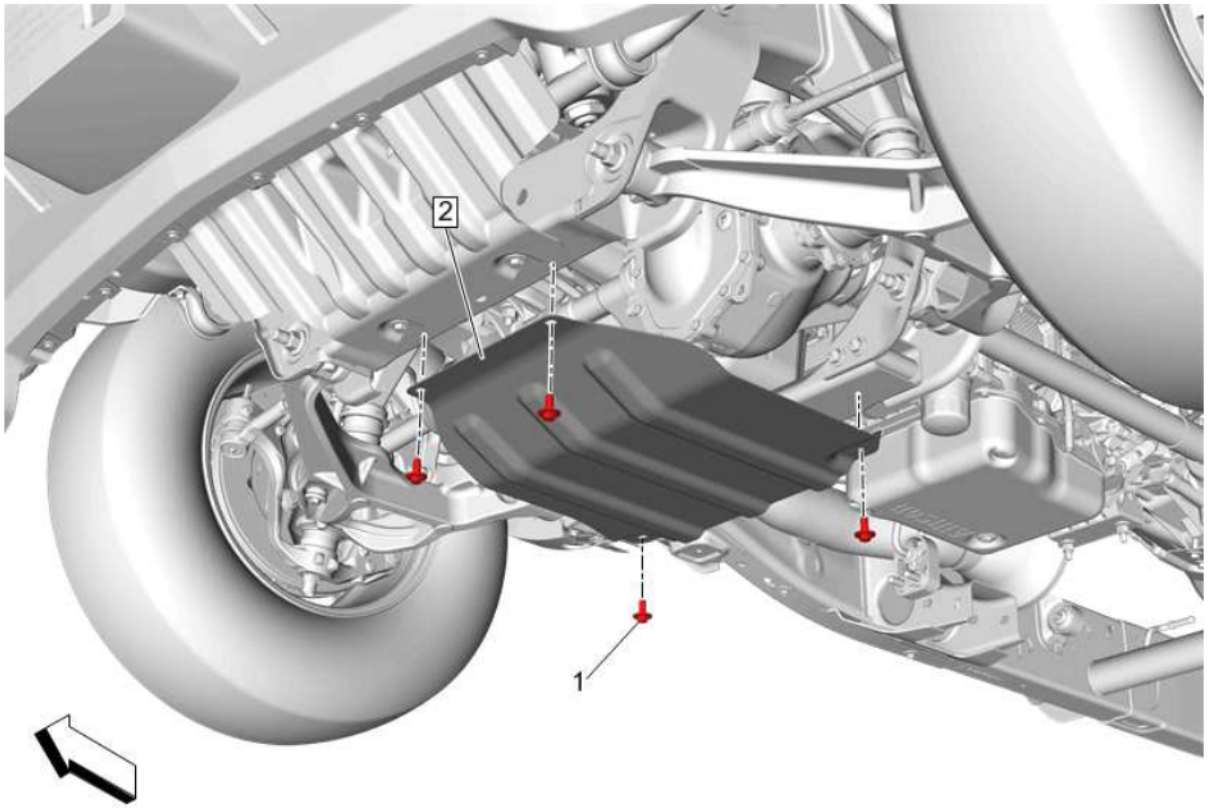


Fig. 23: Underbody Skid Shield
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Lifting and Jacking the Vehicle	
1	Underbody Skid Shield Fastener **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 28 N.m (21 lb ft)
2	Underbody Skid Shield

UNDERBODY SPLASH SHIELD REPLACEMENT

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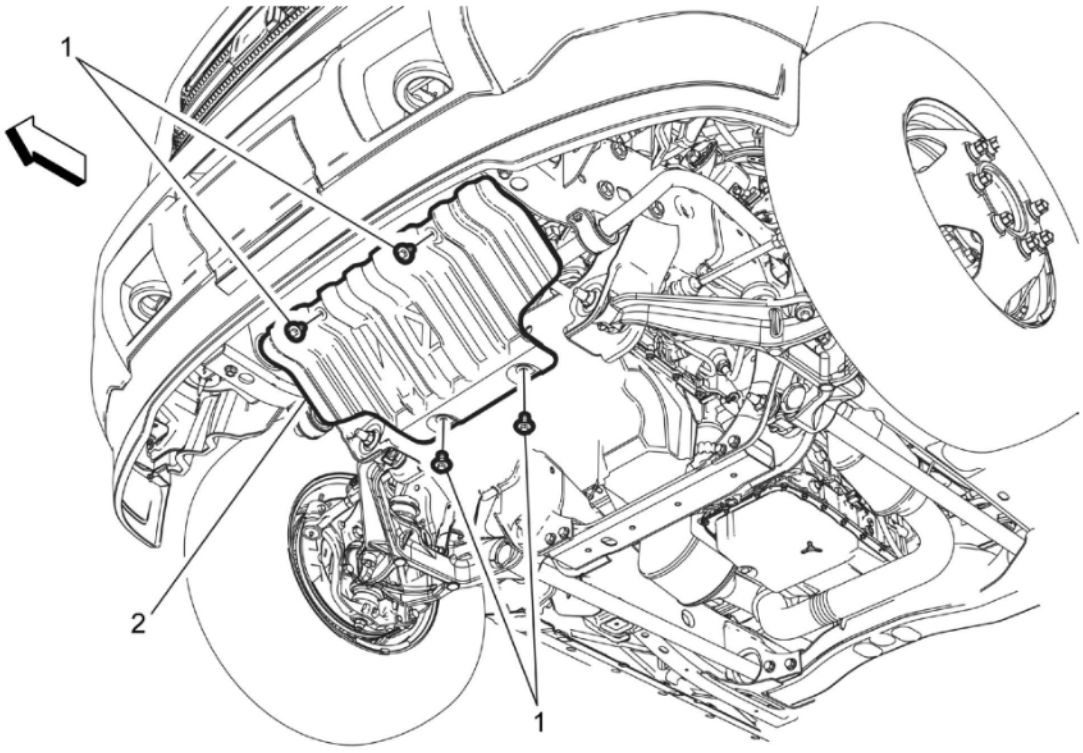


Fig. 24: Underbody Splash Shield
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Underbody Splash Shield Fasteners (Qty: 4) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 20 N.m (15 lb ft)
2	Underbody Splash Shield **Procedure** Disconnect the radiator hose retainer attached to the underside of the underbody splash shield.

FUEL TANK SHIELD REPLACEMENT

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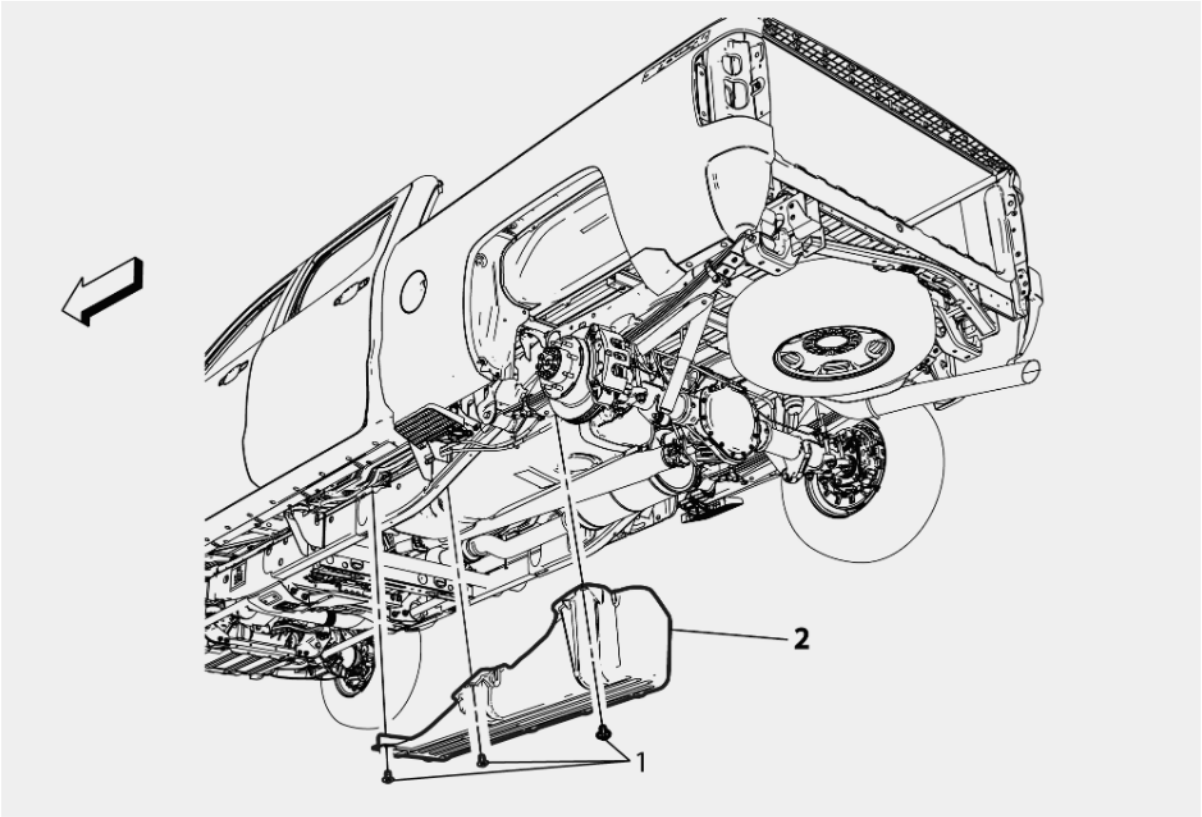


Fig. 25: Fuel Tank Shield
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Fasteners (Qty: 3) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 12 N.m (106 lb in)
2	Fuel Tank Shield

FRAME REINFORCEMENT REPLACEMENT (LEFTHAND REINFORCEMENT)

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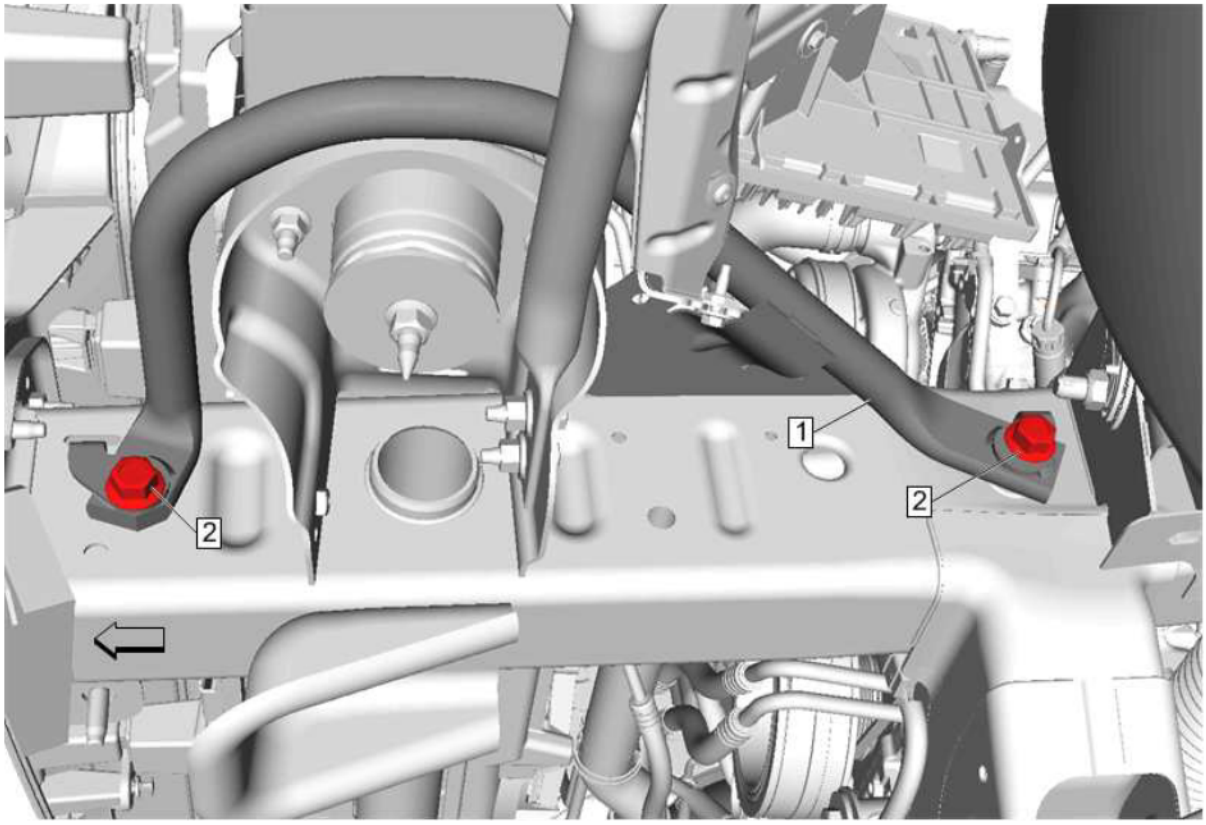


Fig. 26: Frame Reinforcement (Lefthand Reinforcement)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. **Lifting and Jacking the Vehicle** **NOTE:** **Front fascia and wheelhouse liner not shown for clarity.**	
1	Frame Reinforcement **NOTE:** **Ensure the clips are located into the T slots in the frame.**
2	Frame Reinforcement Bolt **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . Tighten 135 N.m (100 lb ft)

FRAME REINFORCEMENT REPLACEMENT (RIGHTHAND REINFORCEMENT)

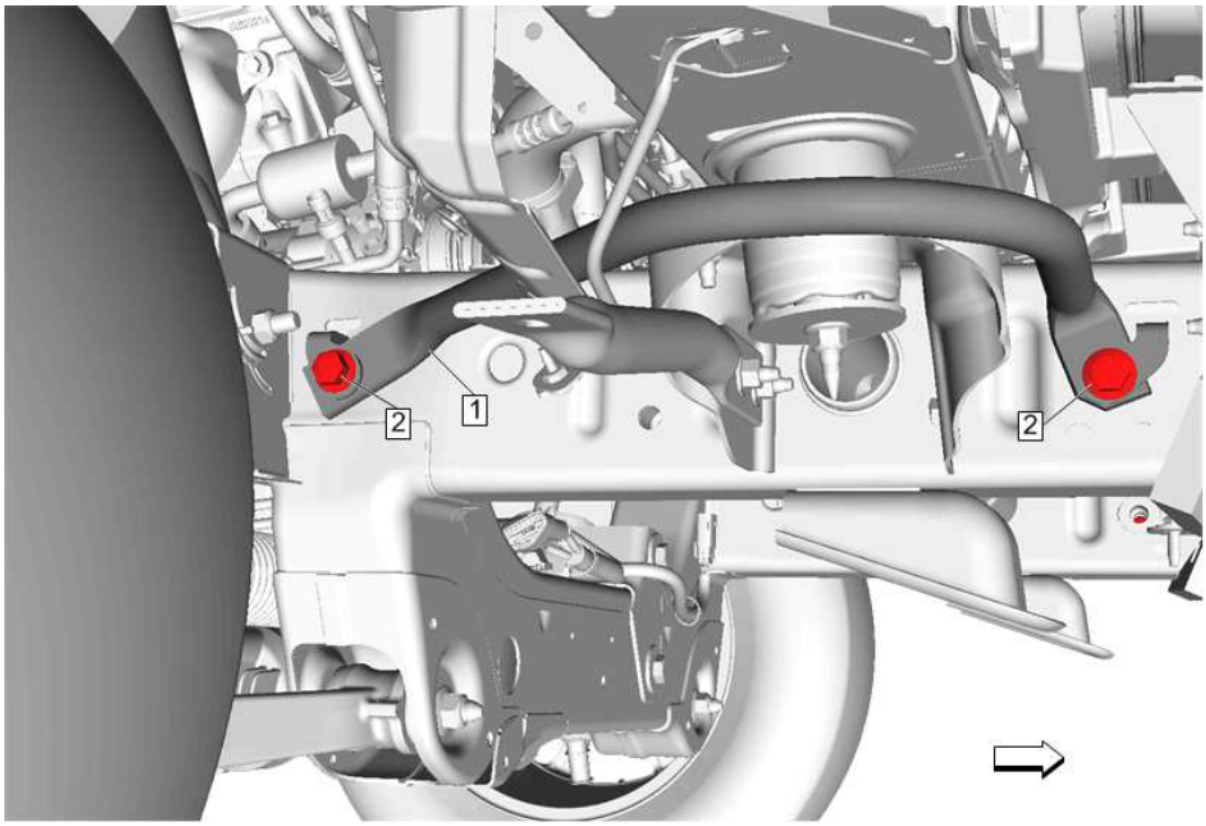


Fig. 27: Frame Reinforcement (Righthand Reinforcement)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Lifting and Jacking the Vehicle **NOTE:** Front fascia and wheelhouse liner not shown for clarity.	

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Callout	Component Name
1	Frame Reinforcement **NOTE:** **Ensure the clips are located into the T slots in the frame.**
2	Frame Reinforcement Bolt **CAUTION:** **Refer to Fastener Caution .** **Tighten** 135 N.m (100 lb ft)

DRIVETRAIN AND FRONT SUSPENSION FRAME FRONT CROSSMEMBER REPLACEMENT (LIGHT DUTY)

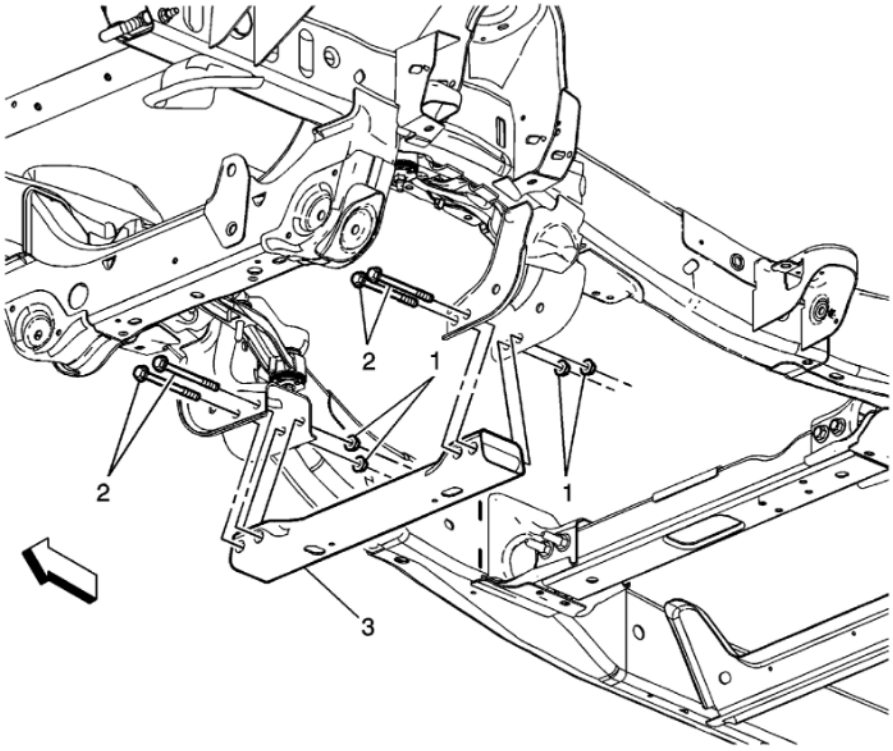


Fig. 28: Lower Control Arm Crossmember, Front Crossmember Bolts & Nuts
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	

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Callout	Component Name
Steering Gear Skid Shield Replacement	
1	Engine Front Crossmember Nut **CAUTION:** **Refer to Fastener Caution .** **Tighten** 1. First Pass: 70 N.m (52 lb ft) 2. Final Pass: 110 degrees
2	Engine Front Crossmember Bolt
3	Lower Control Arm Crossmember

DRIVETRAIN AND FRONT SUSPENSION FRAME FRONT CROSSMEMBER REPLACEMENT (HEAVY DUTY)

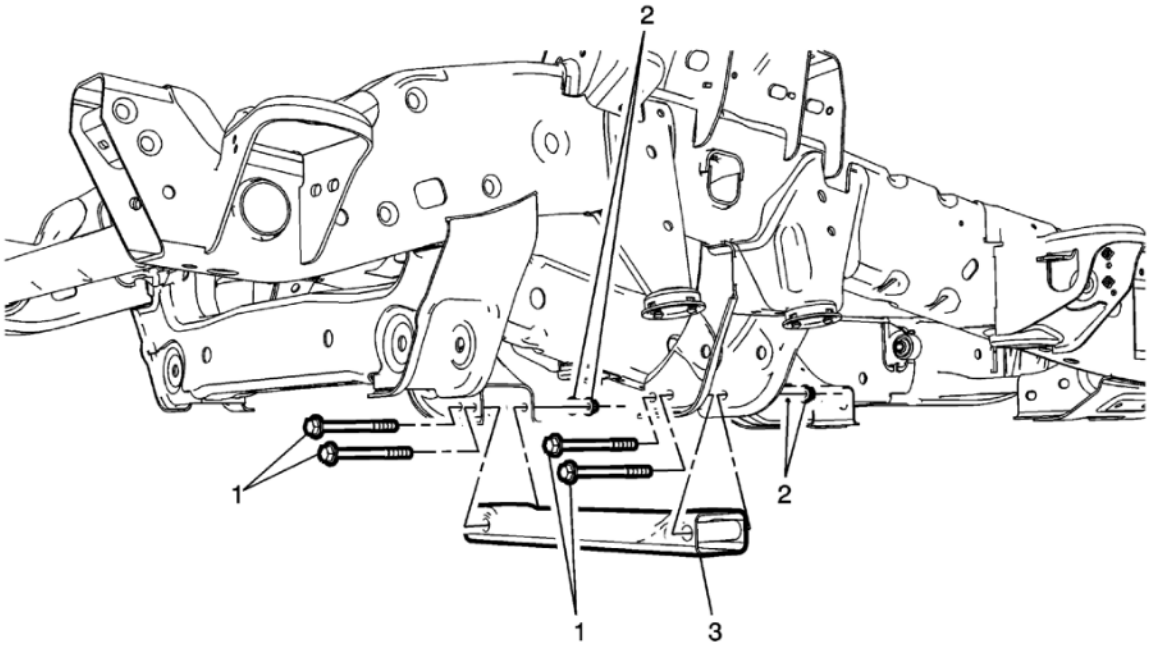


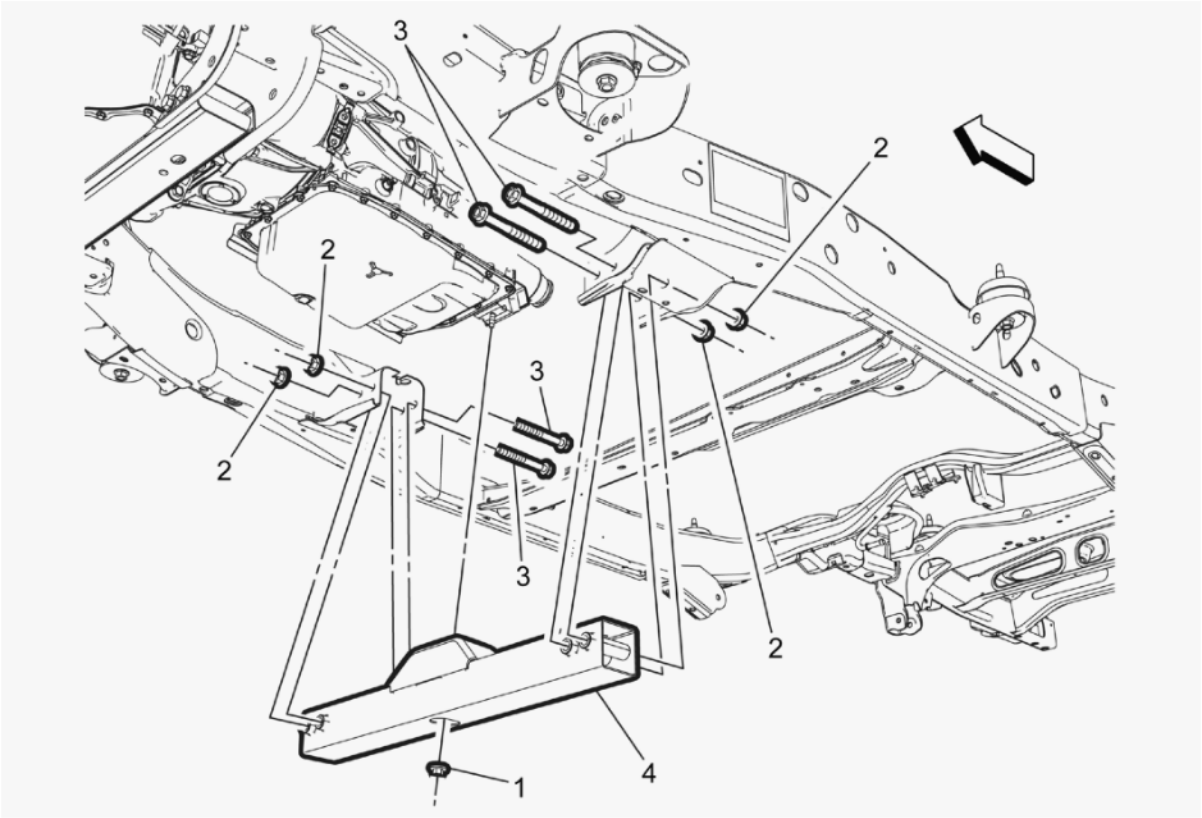
Fig. 29: Drivetrain and Front Suspension Frame Front Crossmember (Heavy Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
1. Raise and support the vehicle. **Lifting and Jacking the Vehicle** 2. **Underbody Skid Shield Replacement**	
1	Drivetrain and Front Suspension Frame Front Crossmember Bolt **Procedure** 1. Remove all traces of the original adhesive patch. 2. Clean the threads of the bolts with denatured alcohol or equivalent and allow to dry. 3. Apply thread locking adhesive to the fasteners. **Adhesives, Fluids, Lubricants, and Sealers**.
2	Drivetrain and Front Suspension Frame Front Crossmember Nut **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 70 N.m (52 lb ft) plus 110 degrees
3	Drivetrain and Front Suspension Frame Front Crossmember

TRANSMISSION SUPPORT CROSSMEMBER REPLACEMENT (2WD - LIGHT DUTY)



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Fig. 30: Transmission Support Crossmember (2WD - Light Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. **Lifting and Jacking the Vehicle** 2. Support the transmission with a suitable jack. 3. Remove the transfer case skid shield, if equipped. Refer to **Transfer Case Skid Shield Replacement**	
1	Transmission Mount Nut **CAUTION:** **Refer to Fastener Caution** **Tighten** 55 N.m (41 lb ft)
2	Transmission Crossmember Nut **Tighten** 95 N.m (70 lb ft)
3	Transmission Crossmember Bolt
4	Transmission Crossmember

TRANSMISSION SUPPORT CROSSMEMBER REPLACEMENT (2WD - HEAVY DUTY)

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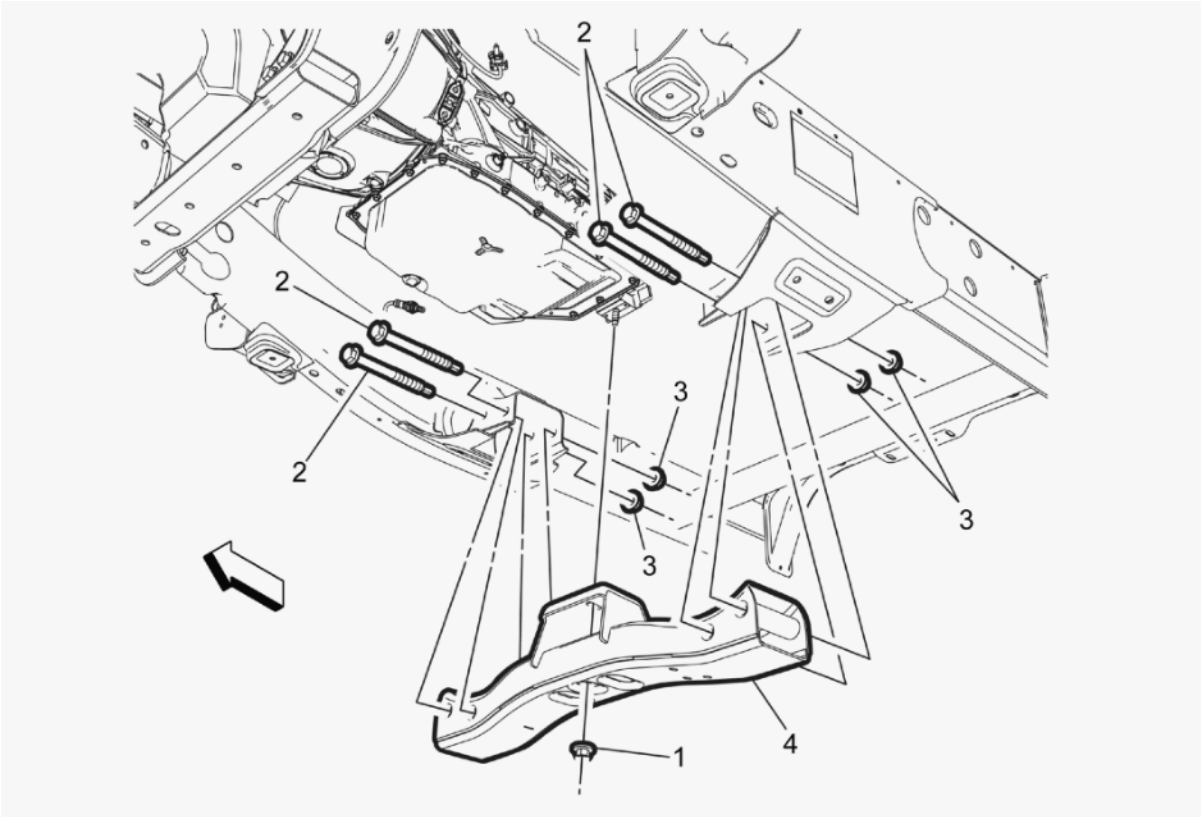


Fig. 31: Transmission Support Crossmember (2WD - Heavy Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** . 2. Support the transmission with a transmission jack. 3. Remove the transfer case skid shield, if equipped. Refer to **Transfer Case Skid Shield Replacement**. 4. If equipped with the LML engine, remove the front exhaust bracket and loosen the front clamp of the oxidation catalytic converter. Refer to **Oxidation Catalytic Converter Replacement (L5P)** .	
1	Transmission Mount to Crossmember Nut **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 107 N.m (79 lb ft)
2	Transmission Crossmember Bolts (Qty: 4) **Procedure**

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Callout	Component Name
	1. Remove all traces of the original adhesive patch. 2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry. 3. Apply threadlocker. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
3	Transmission Crossmember Nuts (Qty: 4) **Tighten** 120 N.m (89 lb ft) plus 90 Degrees
4	Transmission Crossmember

TRANSMISSION SUPPORT CROSSMEMBER REPLACEMENT (4WD - LIGHT DUTY)

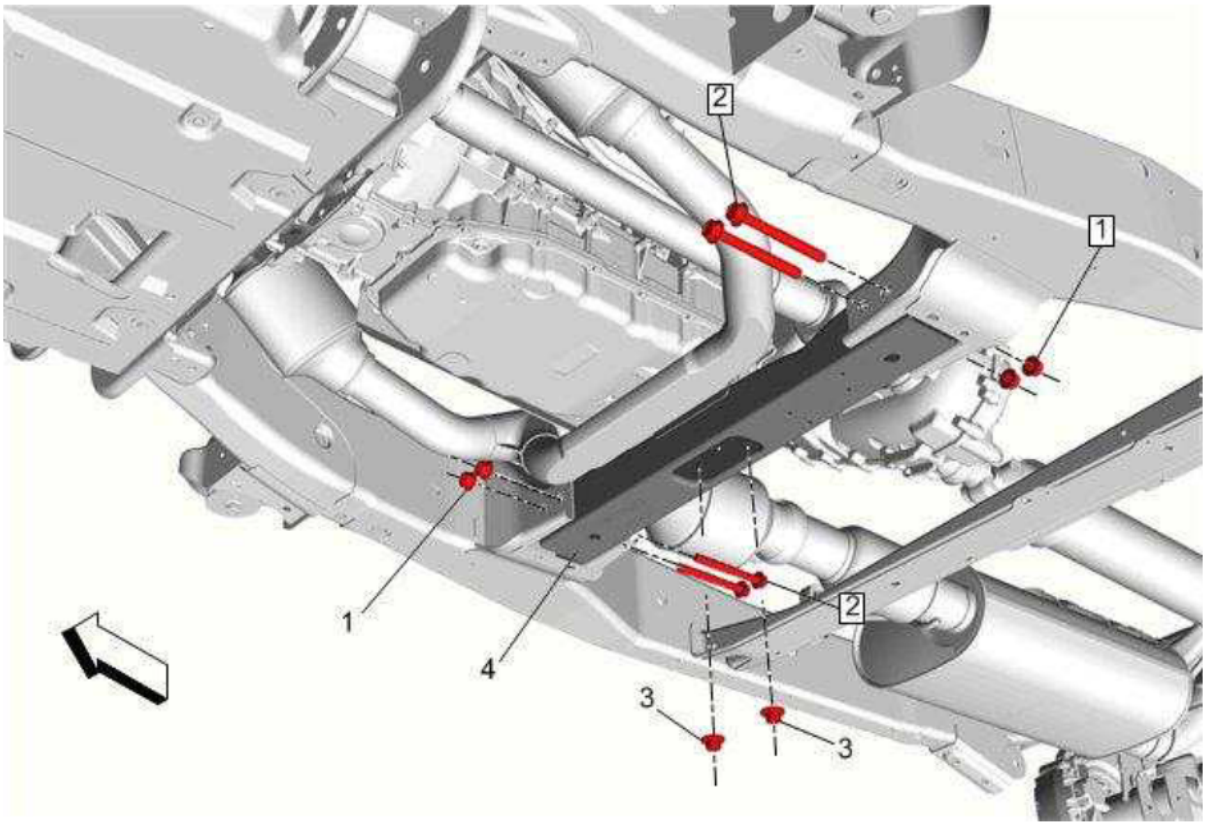


Fig. 32: Transmission Support Crossmember (4WD - Light Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** . 2. Support the transmission with a transmission jack. 3. Remove the transfer case skid shield, if equipped. Refer to **Transfer Case Skid Shield Replacement**.	
1	Transmission Crossmember Nut (Qty: 4) **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . **Tighten** 95 N.m (70 lb ft)
2	Transmission Crossmember Bolt (Qty: 4) **Procedure** 1. Remove all traces of the original adhesive patch. 2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry. 3. Apply threadlocker. Refer to Adhesives, Fluids, Lubricants, and Sealers.
3	Transmission Mount to Crossmember Nut (Qty: 2) **Tighten** 55 N.m (41 lb ft)
4	Transmission Crossmember

TRANSMISSION SUPPORT CROSSMEMBER REPLACEMENT (4WD - HEAVY DUTY)

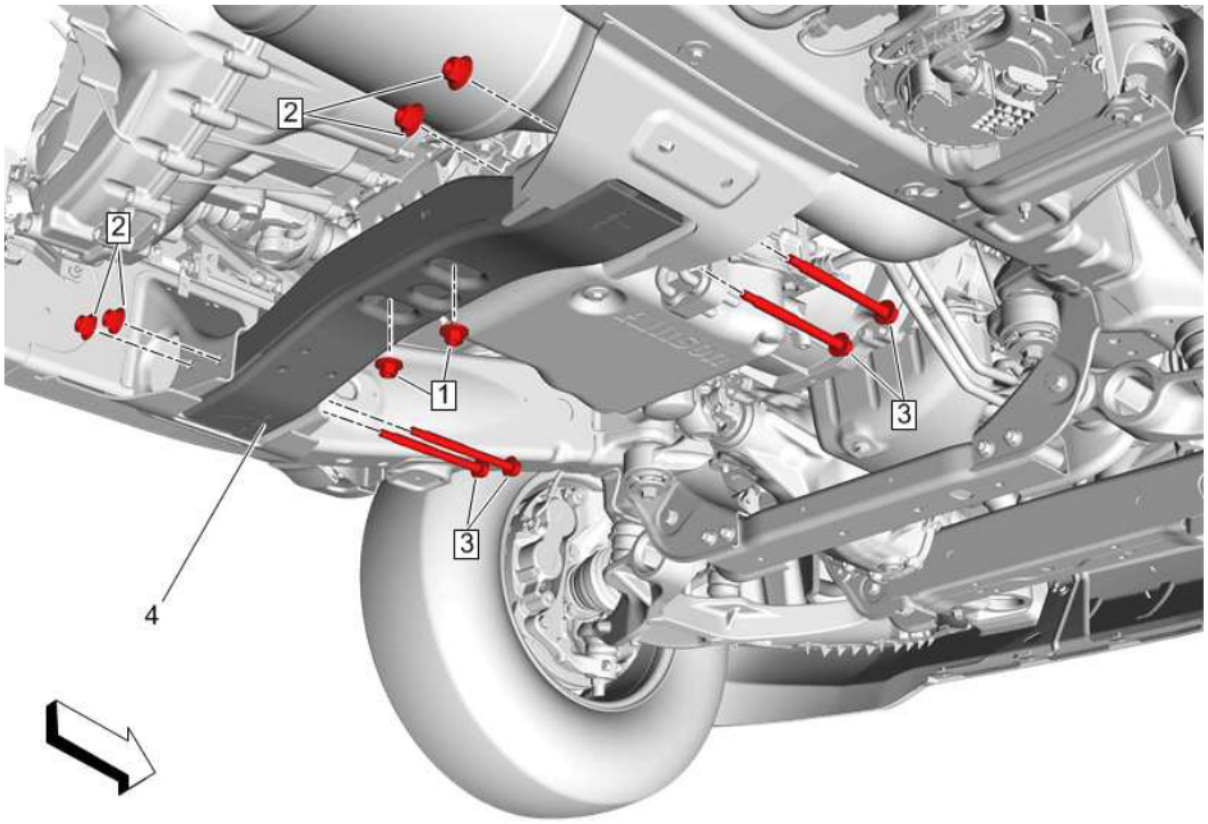


Fig. 33: Transmission Support Crossmember (4WD - Heavy Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

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Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. **Lifting and Jacking the Vehicle** 2. Support the transmission with a suitable jack. 3. { If equipped } Transfer Case Skid Shield - Remove - **Transfer Case Skid Shield Replacement**	
1	Transmission Mount Nut **CAUTION:** **Refer to Fastener Caution .** **Tighten** 107 N.m (79 lb ft)
2	Transmission Support Crossmember Nut
3	Transmission Support Crossmember Bolt **Tighten** 120 N.m (89 lb ft) + 90 Degrees **Procedure** 1. Remove all traces of the original adhesive patch. 2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry. 3. Apply threadlocker. **Adhesives, Fluids, Lubricants, and Sealers**
4	Transmission Support Crossmember

SPARE WHEEL HEAT SHIELD REPLACEMENT

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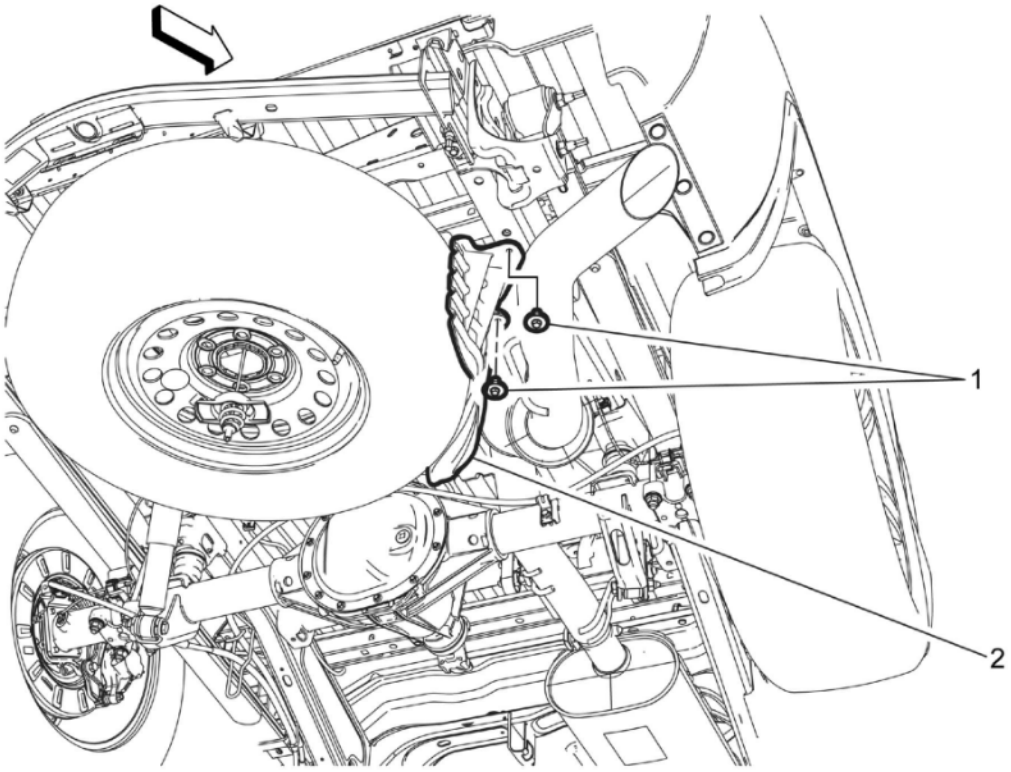


Fig. 34: Spare Wheel Heat Shield
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Spare Tire Heat Shield Fastener (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 12 N.m (106 lb in)
2	Spare Tire Heat Shield

BODY MOUNT UPPER AND LOWER CUSHION REPLACEMENT (CREW CAB AND EXTENDED CAB - LIGHT DUTY)

Removal Procedure

NOTE: **It is critical to properly support the body while lowering the frame/chassis and related parts evenly.**

NOTE: **Ensure that the vehicle is unloaded prior to body removal.**

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1. Remove the master cylinder. Perform the following steps:
    1. Remove the nuts retaining the master cylinder to the brake booster.
    2. Remove the master cylinder from the brake booster.
    3. Secure the cylinder away from the booster.

NOTE: **The air cleaner outlet duct, must be removed (to prevent damage to the duct) when the body is raised for service.**

2. On vehicles equipped with the 4.3L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

3. On vehicles equipped with the 5.3L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
4. Raise the vehicle on the hoist. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the park brake equalizer intermediate cable. Perform the following steps:
    1. Remove the nut from the park brake equalizer intermediate cable.
    2. Remove the intermediate cable from the equalizer.
    3. Depress the retaining tabs that secure the park brake cable to the frame.
    4. Pull slightly on the cable from the mounting area in order to provide slack for body movement without binding the cable.

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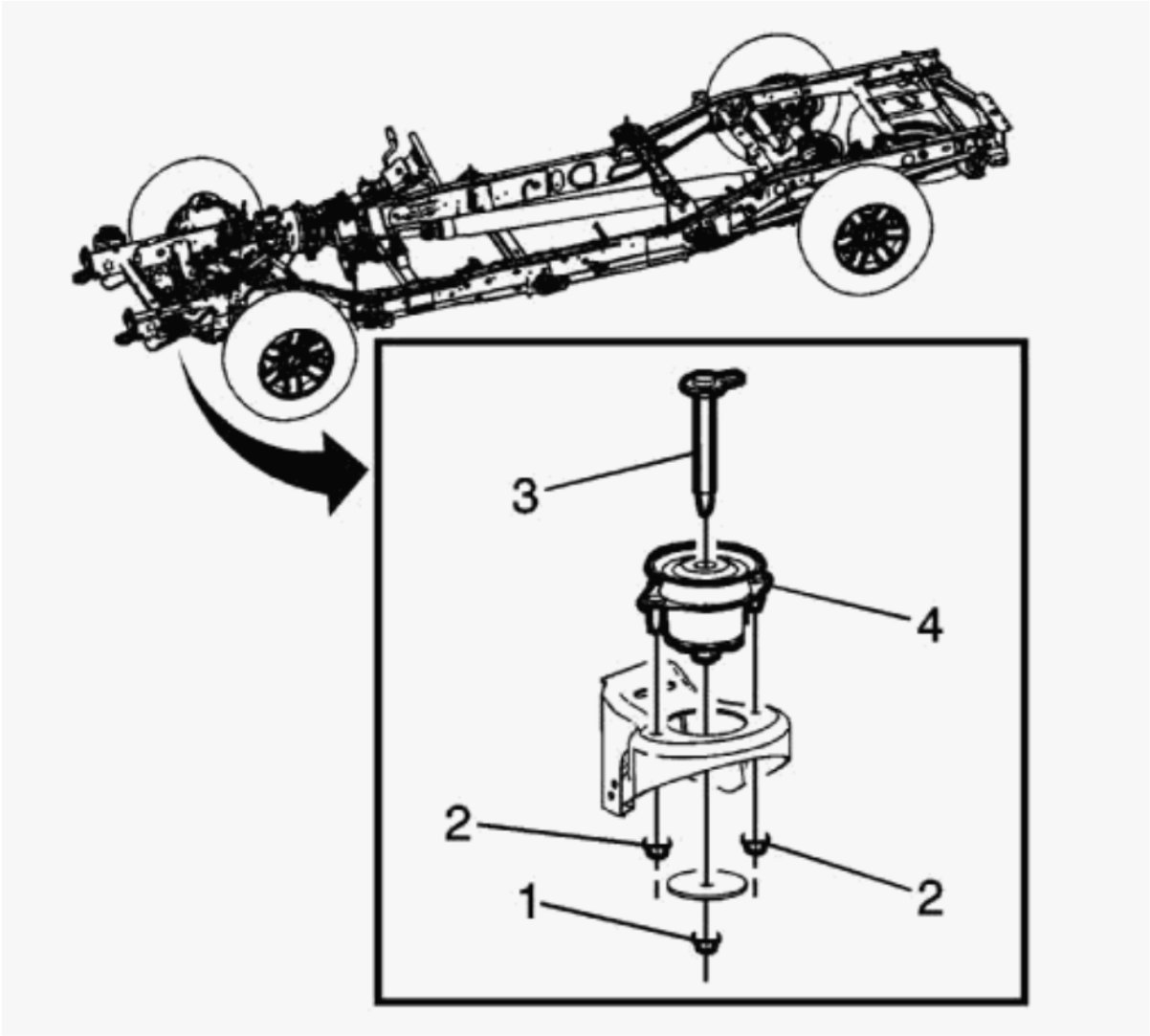


Fig. 35: Body Mount Fasteners And Bolt
Courtesy of GENERAL MOTORS COMPANY

6. Properly support the body in the area that the mounts will be replaced.
7. Remove the body mount fasteners (1, 2).
8. Remove the body mount bolt (3).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

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9. Lower the chassis accordingly in order to remove the cushions (4) as necessary.

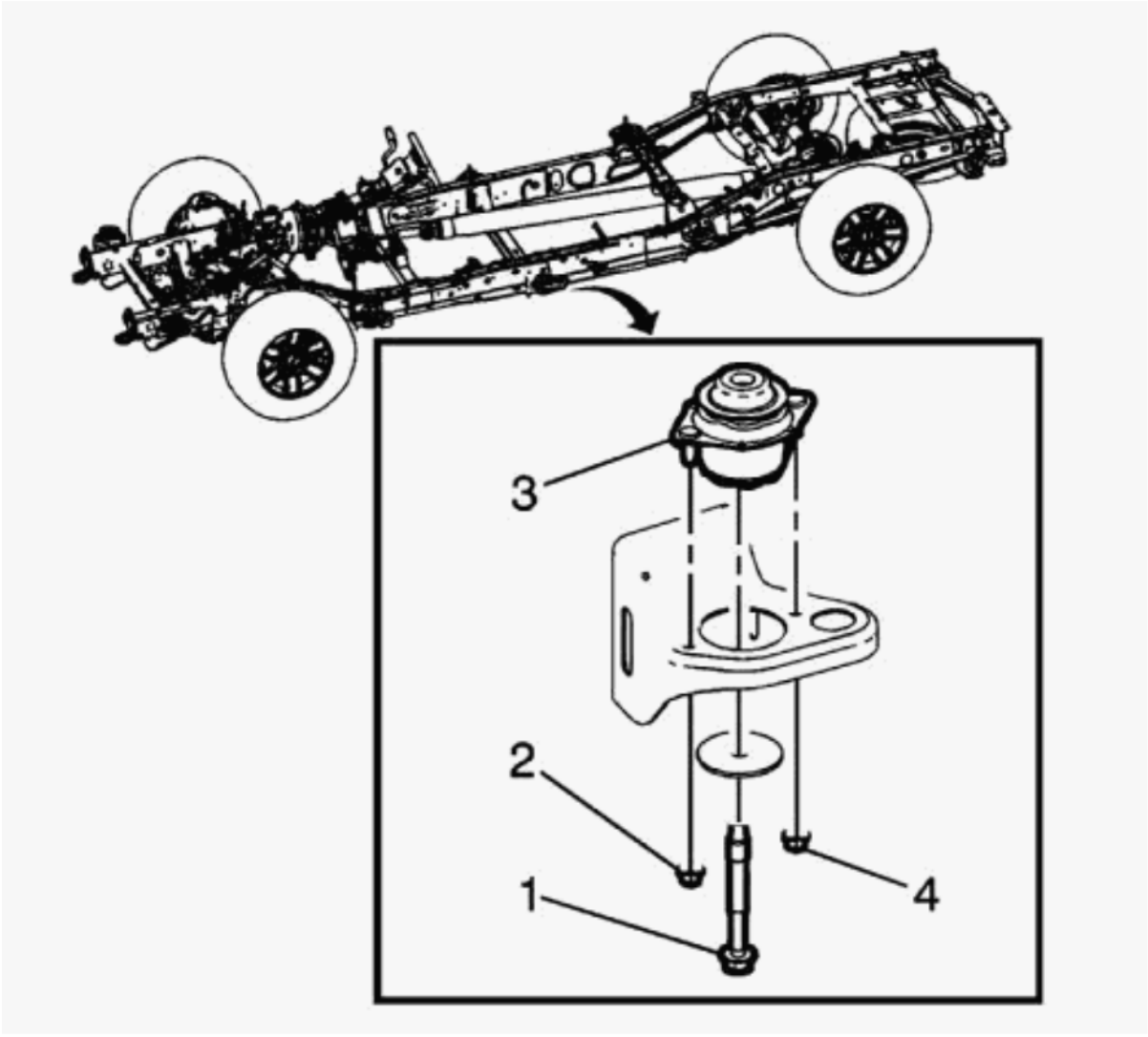


Fig. 36: Body Mount Fastener
Courtesy of GENERAL MOTORS COMPANY

10. Properly support the body in the area that the mounts will be replaced.
11. Remove the body mount fastener (1) and the fasteners (2).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

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12. Lower the chassis accordingly in order to remove the cushions (3) as necessary.

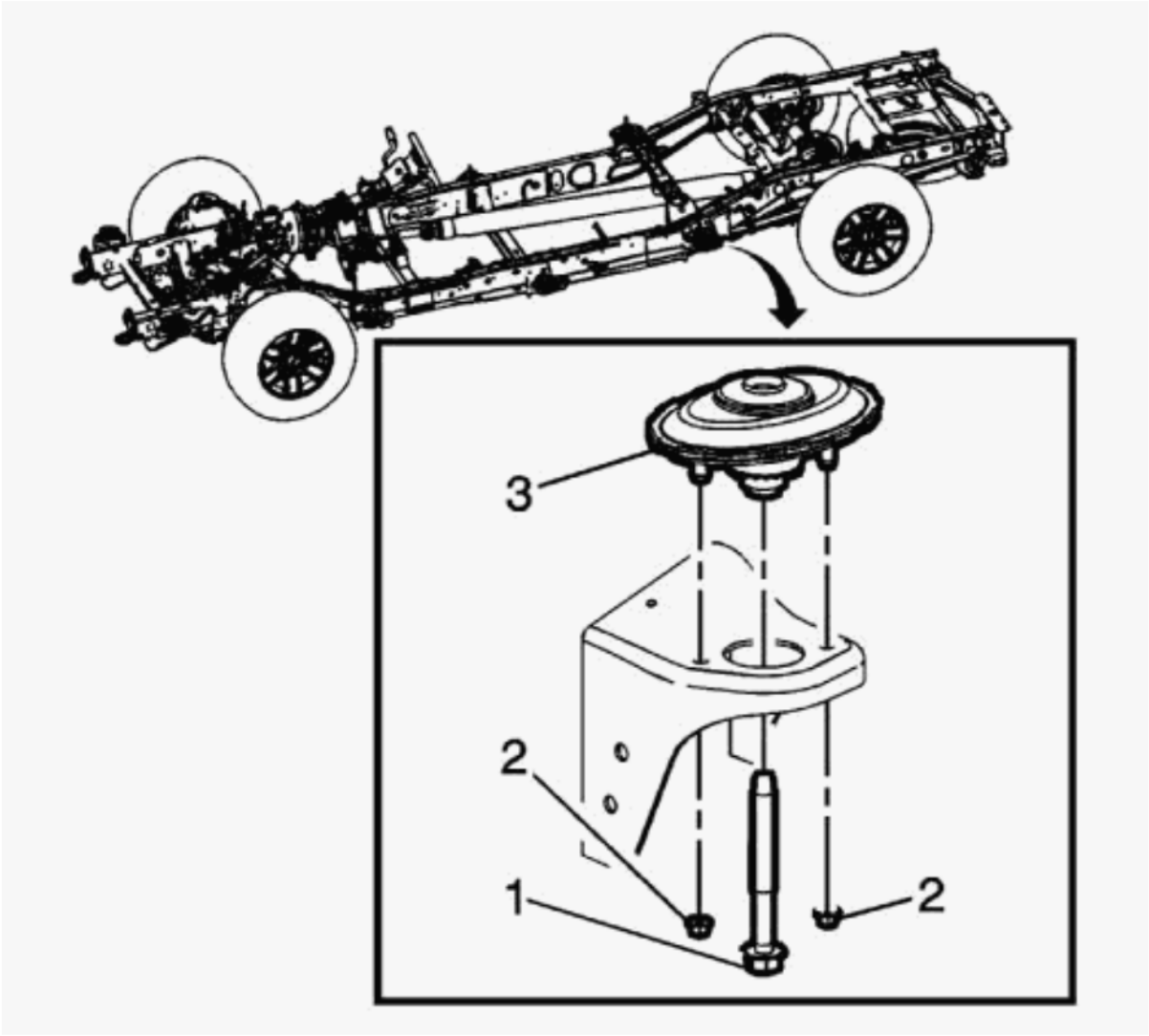


Fig. 37: Body Mount Fastener
Courtesy of GENERAL MOTORS COMPANY

13. Properly support the body in the area that the mounts will be replaced.
14. Remove the body mount fastener (1) and the fasteners (2).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

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15. Lower the chassis accordingly in order to remove the cushions (3) as necessary.

Installation Procedure

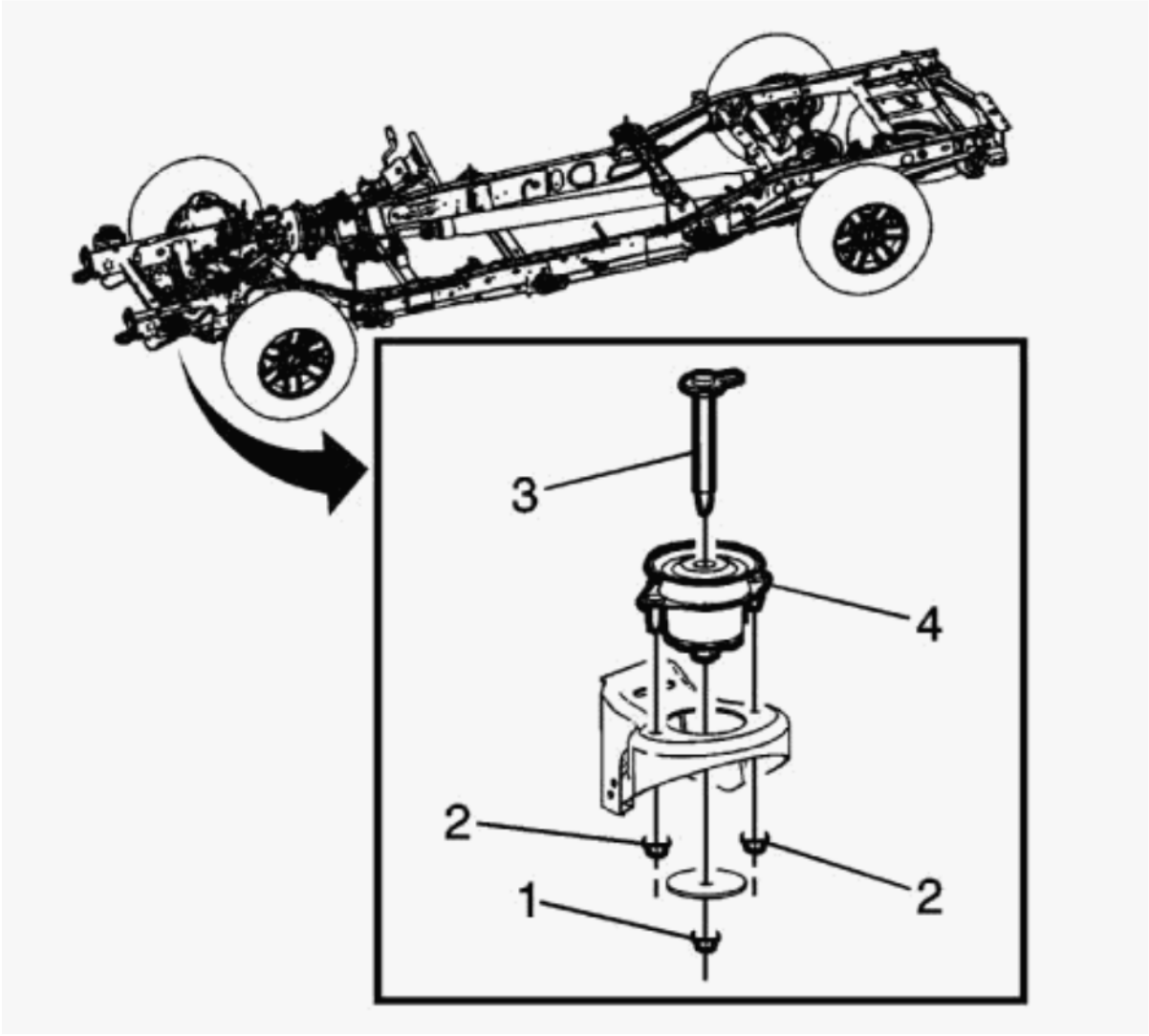


Fig. 38: Body Mount Fasteners And Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Install the cushions (4) as necessary and raise the chassis accordingly.
2. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).

CAUTION: Refer to Fastener Caution .

3. Install the body mount bolt (3) and tighten the fastener (1) to 70 N.m (52 lb ft).
4. Install the body mount fasteners (2) and tighten to 43 N.m (32 lb ft).

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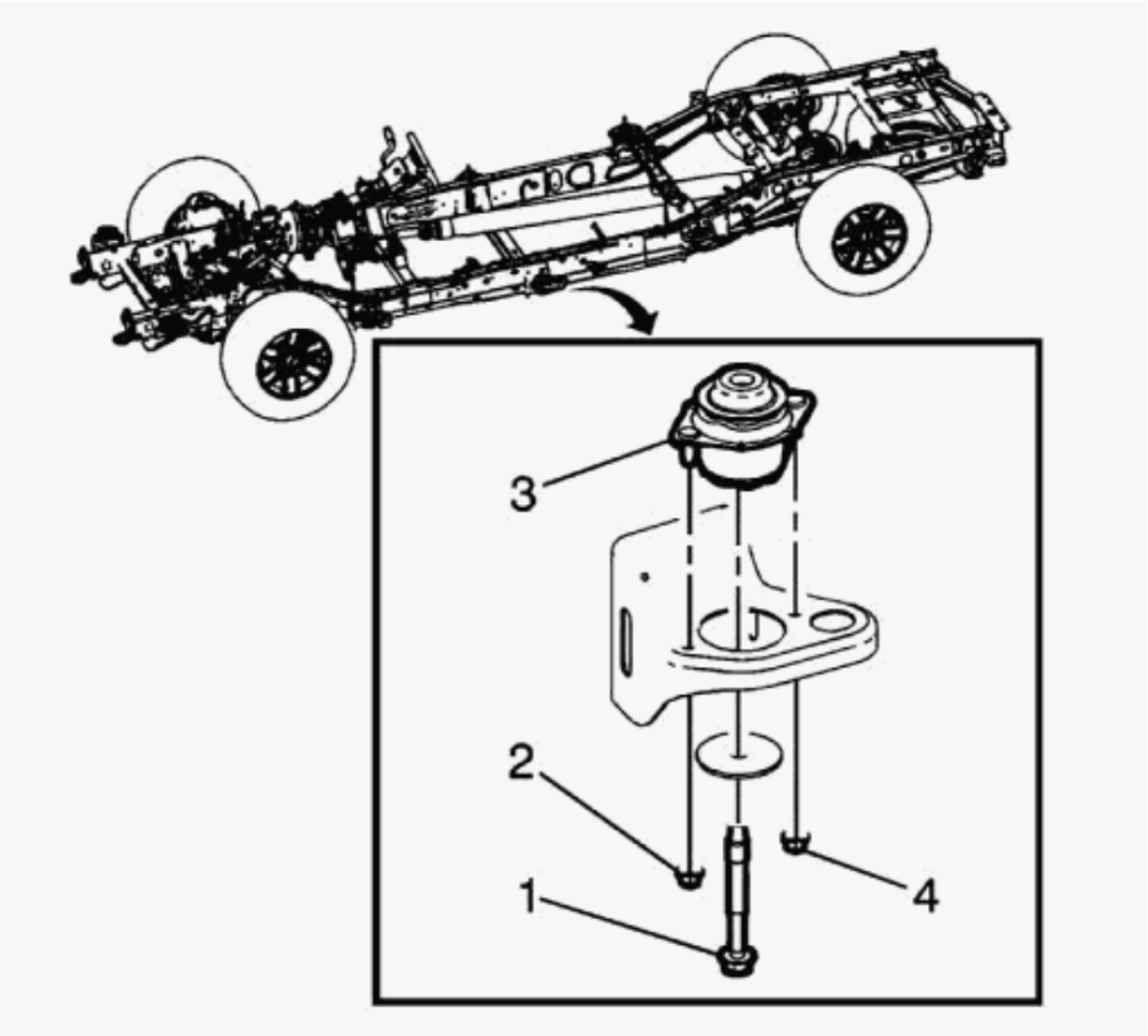


Fig. 39: Body Mount Fastener
Courtesy of GENERAL MOTORS COMPANY

5. Install the cushions (3) as necessary and raise the chassis accordingly.
6. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).
7. Install the body mount bolt (1) and tighten to 165 N.m (122 lb ft).
8. Install the body mount fasteners (2) and tighten to 43 N.m (32 lb ft).

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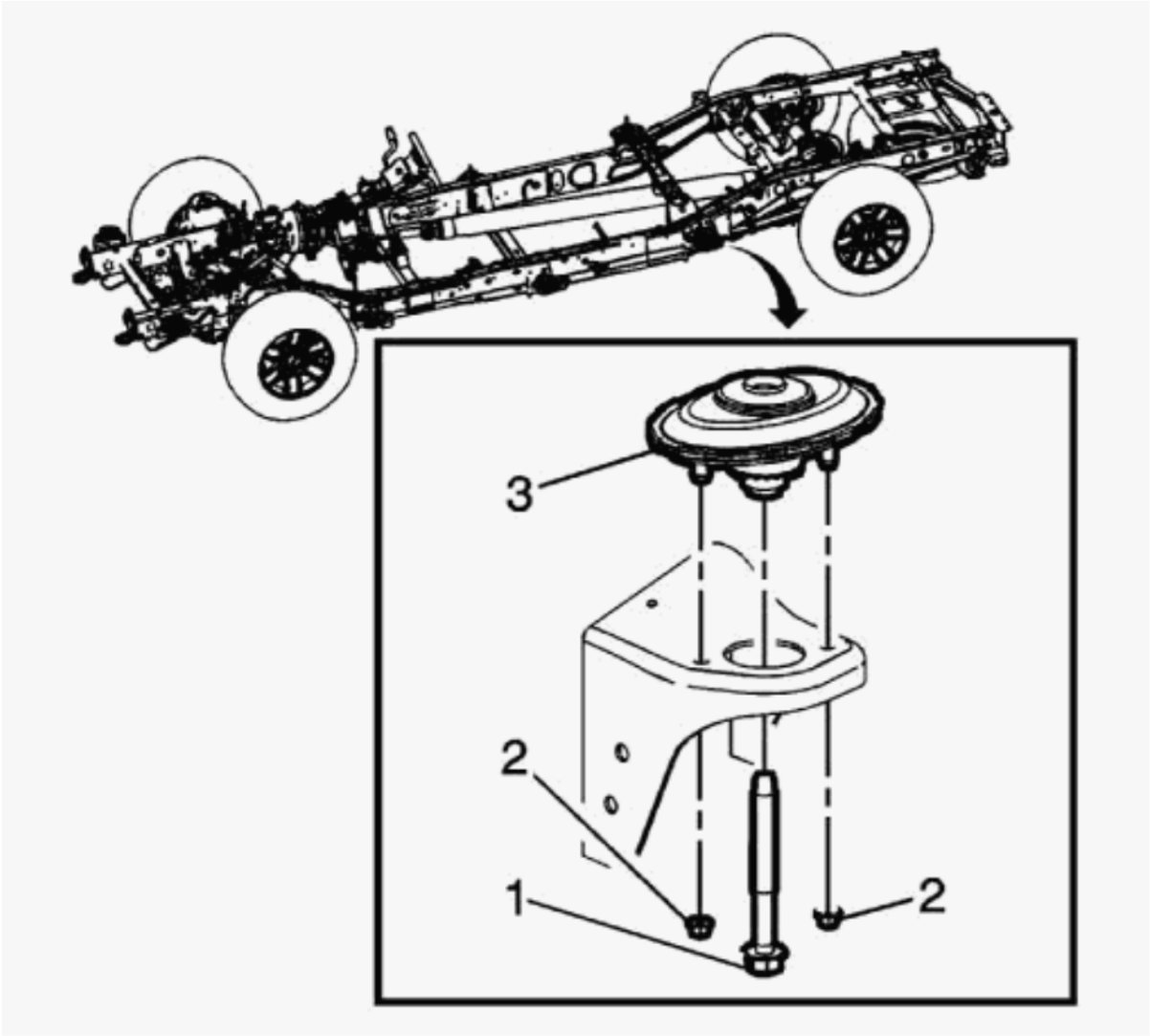


Fig. 40: Body Mount Fastener
Courtesy of GENERAL MOTORS COMPANY

9. Install the cushions (3) as necessary and raise the chassis accordingly.
10. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).
11. Install the body mount bolt (1) and tighten to 165 N.m (122 lb ft).
12. Install the body mount fasteners (2) and tighten to 43 N.m (32 lb ft).
13. Install the park brake equalizer intermediate cable. Perform the following steps:
    1. Pull rearward on the park brake cable to the original position.
    2. Secure the cable retaining tabs to the frame.
    3. Install the intermediate cable end to the equalizer.
    4. Install the nut to the threaded end of the intermediate cable. Tighten the nut to 4 N.m (35 lb in).
14. Lower the vehicle.
15. Install the master cylinder. Perform the following steps:

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1. Mount the master cylinder to the brake booster.
2. Install the master cylinder mounting nuts and tighten to 36 N.m (27 lb ft).

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

16. On vehicles equipped with the 4.3L engine, install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, must be removed (to prevent damage to the duct) when the body is raised for service.**

17. On vehicles equipped with the 5.3L engine, Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

BODY MOUNT UPPER AND LOWER CUSHION REPLACEMENT (REGULAR CAB - LIGHT DUTY)

Removal Procedure

NOTE: **Ensure that the vehicle is unloaded prior to body removal.**

1. Remove the master cylinder. Perform the following steps:
    1. Remove the nuts retaining the master cylinder to the brake booster.
    2. Remove the master cylinder from the brake booster.
    3. Secure the cylinder away from the booster.

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

2. On vehicles equipped with the 4.3L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

3. On vehicles equipped with the 5.3L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
4. Raise the vehicle on the hoist. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the park brake equalizer intermediate cable. Perform the following steps:
    1. Remove the nut from the park brake equalizer intermediate cable.
    2. Remove the intermediate cable from the equalizer.
    3. Depress the retaining tabs that secure the park brake cable to the frame.
    4. Pull slightly on the cable from the mounting area in order to provide slack for body movement without binding the cable.

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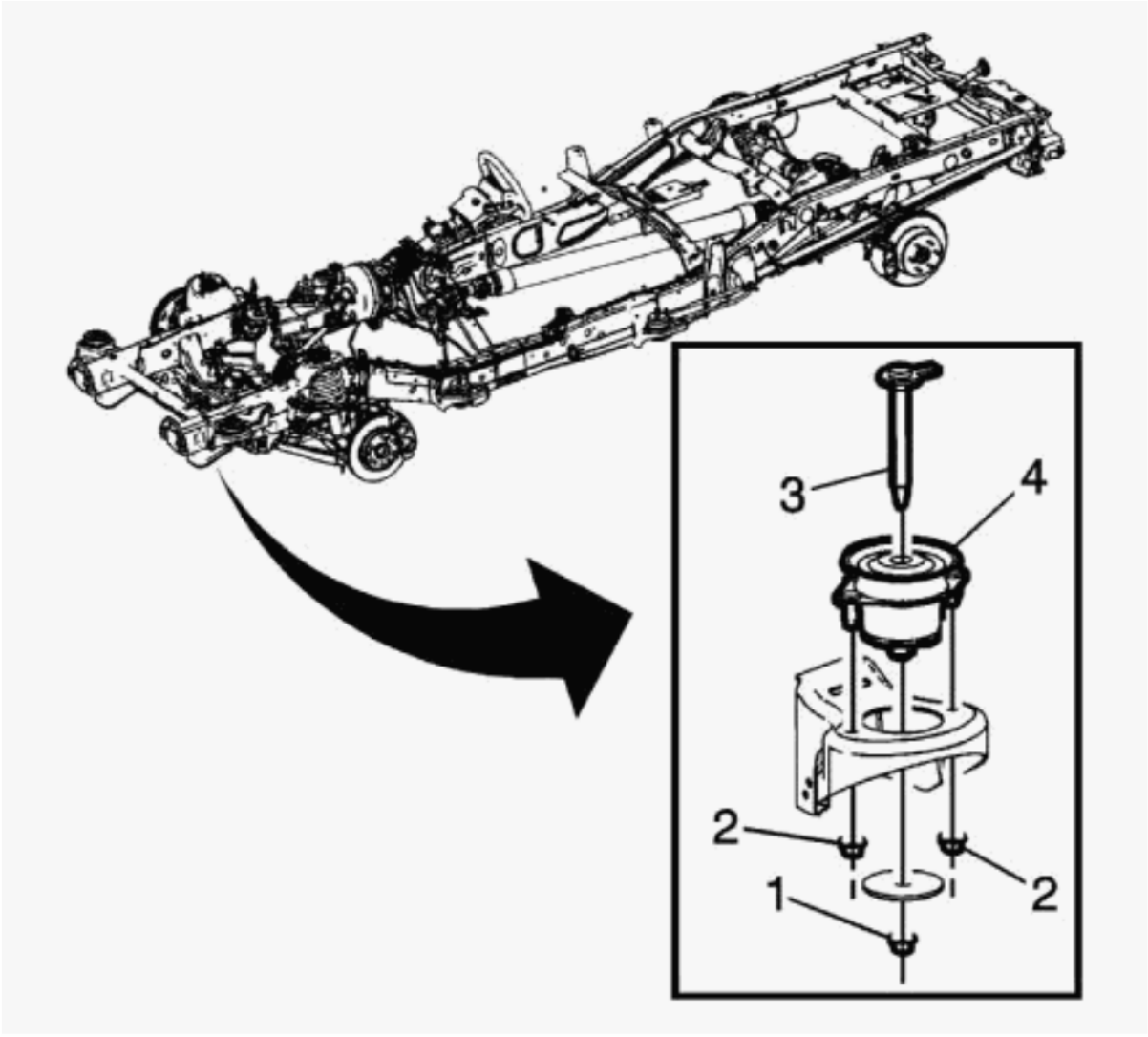


Fig. 41: Supporting Body In Area That Mounts Will Be Replaced
Courtesy of GENERAL MOTORS COMPANY

6. Properly support the body in the area that the mounts will be replaced.
7. Remove the front body mount fastener (1) and remove the body mount upper bolt (3).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

8. Lower the chassis accordingly in order to remove the cushions (4) as necessary.

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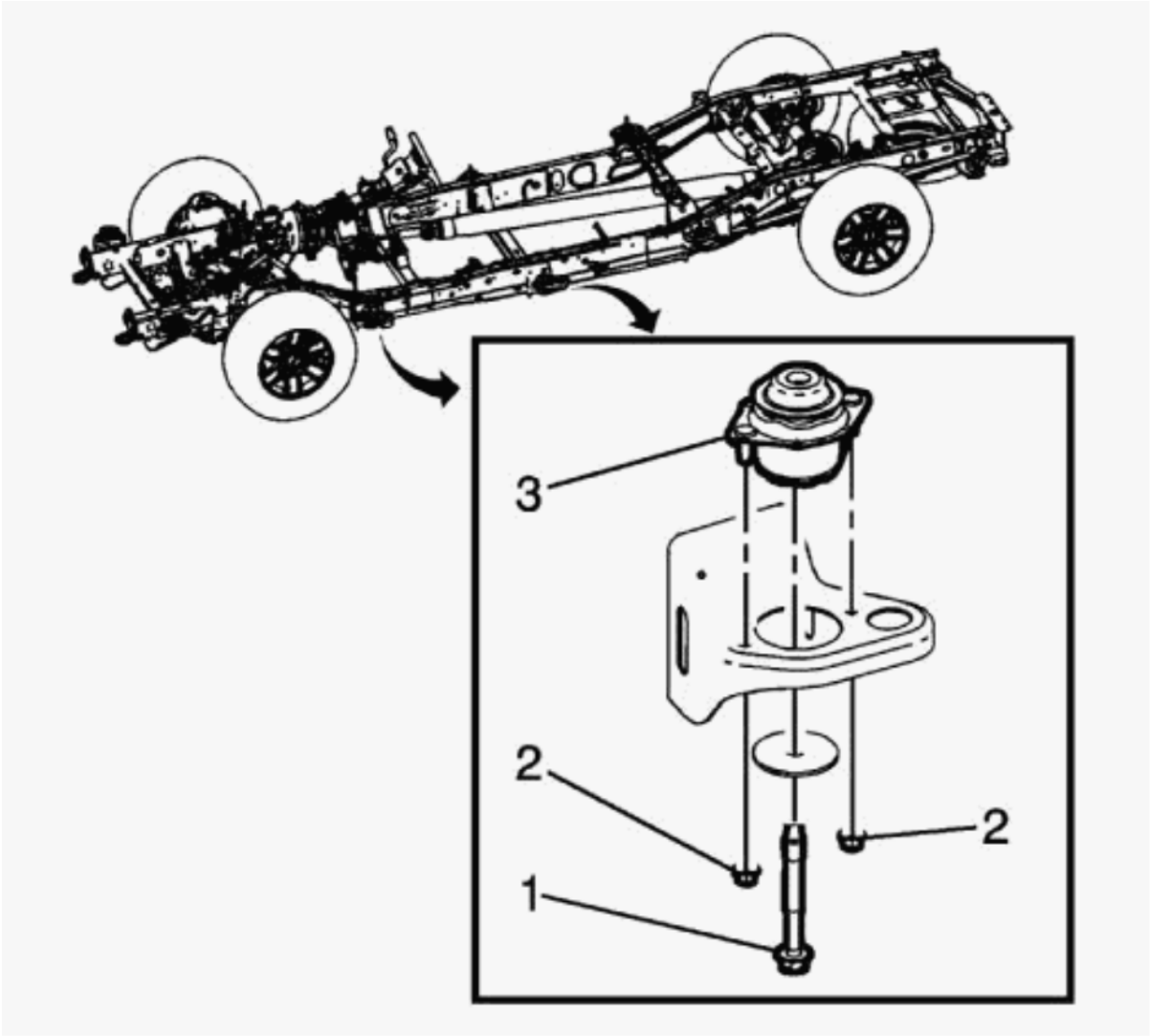


Fig. 42: Supporting Body In Area That Mounts Will Be Replaced
Courtesy of GENERAL MOTORS COMPANY

9. Properly support the body in the area that the mounts will be replaced.
10. Remove the front body mount fasteners (2) and remove the body mount lower bolt (1).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

11. Lower the chassis accordingly in order to remove the cushions (4) as necessary.

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Installation Procedure

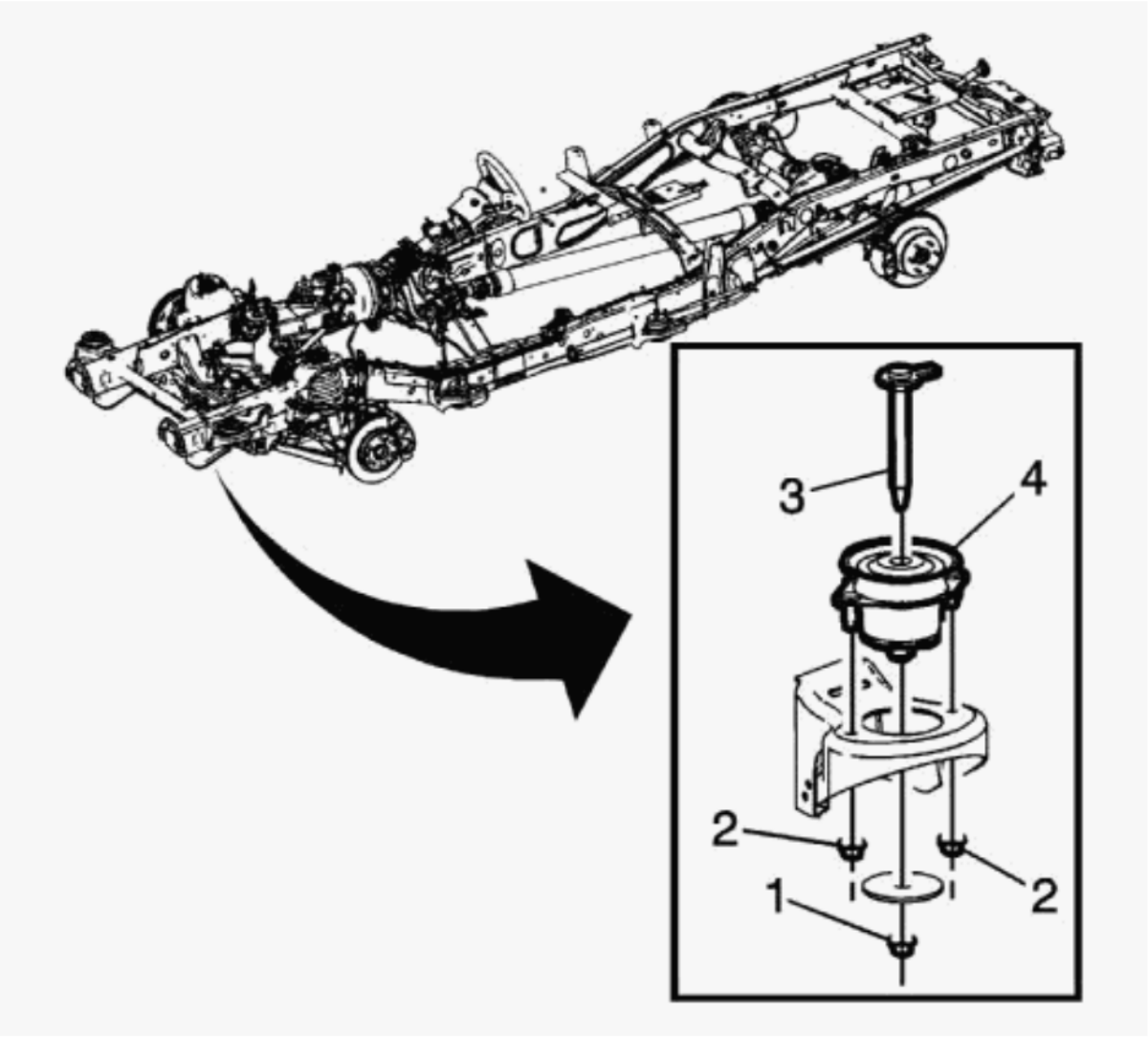


Fig. 43: Supporting Body In Area That Mounts Will Be Replaced
Courtesy of GENERAL MOTORS COMPANY

1. Install the cushions (4) as necessary and raise the chassis accordingly.
2. Perform the following procedure before installing the bolt.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).

CAUTION: Refer to Fastener Caution .

3. Install the front body mount bolt (3) and tighten the fastener (1) to 70 N.m (52 lb ft).
4. Install the front body mount fasteners (2) and tighten to 43 N.m (32 lb ft).

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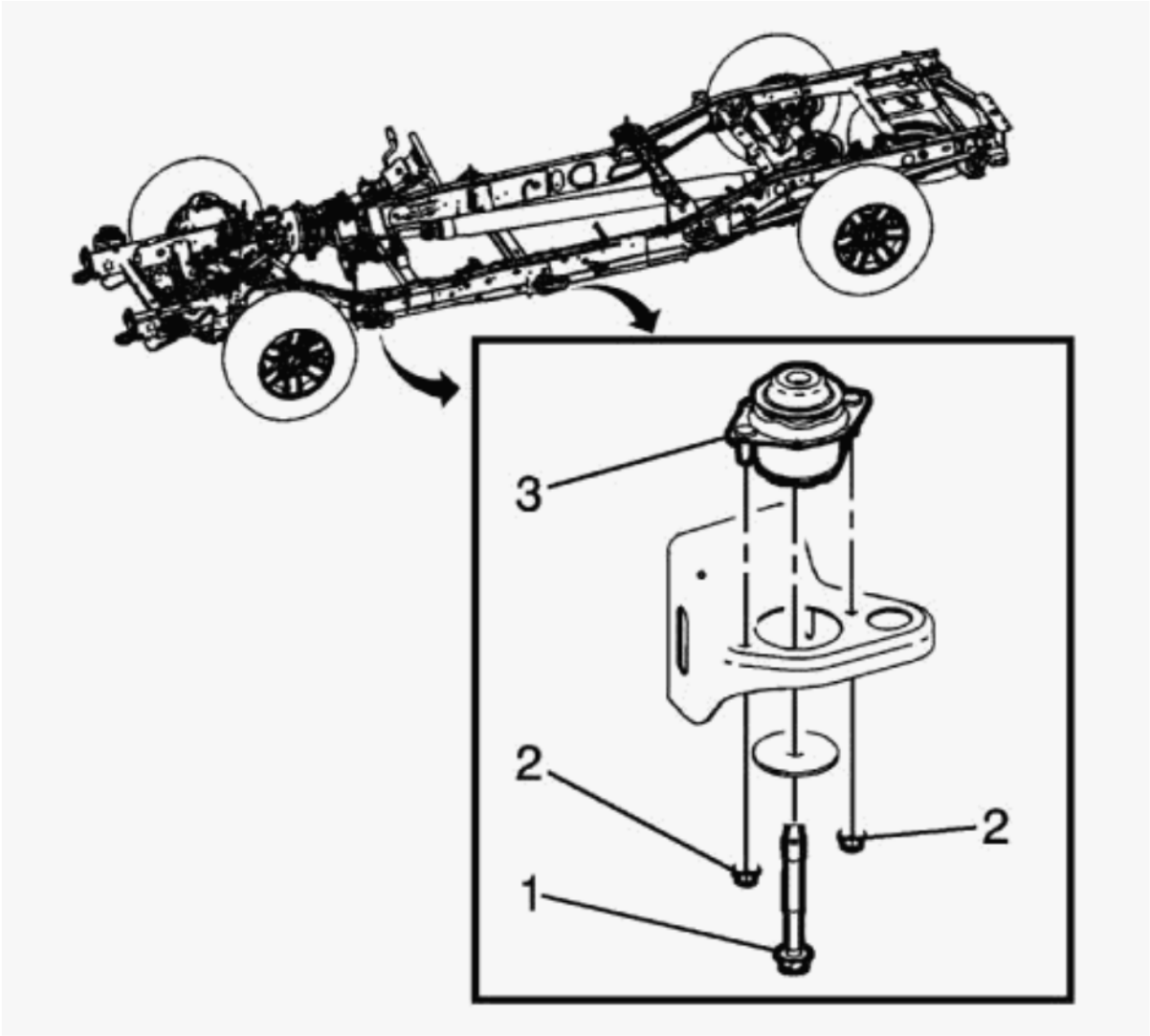


Fig. 44: Supporting Body In Area That Mounts Will Be Replaced
Courtesy of GENERAL MOTORS COMPANY

5. Install the cushions (3) as necessary and raise the chassis accordingly.
6. Perform the following procedure before installing the bolts.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).
7. Install the mid body mount bolt (1) and tighten to 165 N.m (122 lb ft).
8. Install the mid body mount fasteners (2) and tighten to 43 N.m (32 lb ft).
9. Install the park brake equalizer intermediate cable. Perform the following steps:
    1. Pull rearward on the park brake cable to the original position.
    2. Secure the cable retaining tabs to the frame.
    3. Install the intermediate cable end to the equalizer.
    4. Install the nut to the threaded end of the intermediate cable. Tighten the nut to 4 N.m (35 lb in).
10. Lower the vehicle.
11. Install the master cylinder. Perform the following steps:

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1. Mount the master cylinder to the brake booster.
2. Install the master cylinder mounting nuts and tighten to 36 N.m (27 lb ft).

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

12. On vehicles equipped with the 4.3L engine, install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

13. On vehicles equipped with the 5.3L engine, Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

BODY MOUNT UPPER AND LOWER CUSHION REPLACEMENT (CREW CAB AND EXTENDED CAB - HEAVY DUTY)

Removal Procedure

NOTE: **Ensure that the vehicle is unloaded prior to body removal.**

1. Remove the master cylinder. Perform the following steps:
   1. Remove the nuts retaining the master cylinder to the brake booster.
   2. Remove the master cylinder from the brake booster.
   3. Secure the cylinder away from the booster.

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body is raised for service.**

2. On vehicles equipped with the 5.3L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body is raised for service.**

3. On vehicles equipped with the 6.0L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body is raised for service.**

4. On vehicles equipped with the 6.6L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
5. On vehicles equipped with the 6.6L engine, remove the front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement - Left Side**.
6. Raise the vehicle on the hoist. Refer to **Lifting and Jacking the Vehicle** .
7. Remove the park brake equalizer intermediate cable. Perform the following steps:
   1. Remove the nut from the park brake equalizer intermediate cable.

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2. Remove the intermediate cable from the equalizer.
3. Depress the retaining tabs that secure the park brake cable to the frame.
4. Pull slightly on the cable from the mounting area in order to provide slack for body movement without binding the cable.

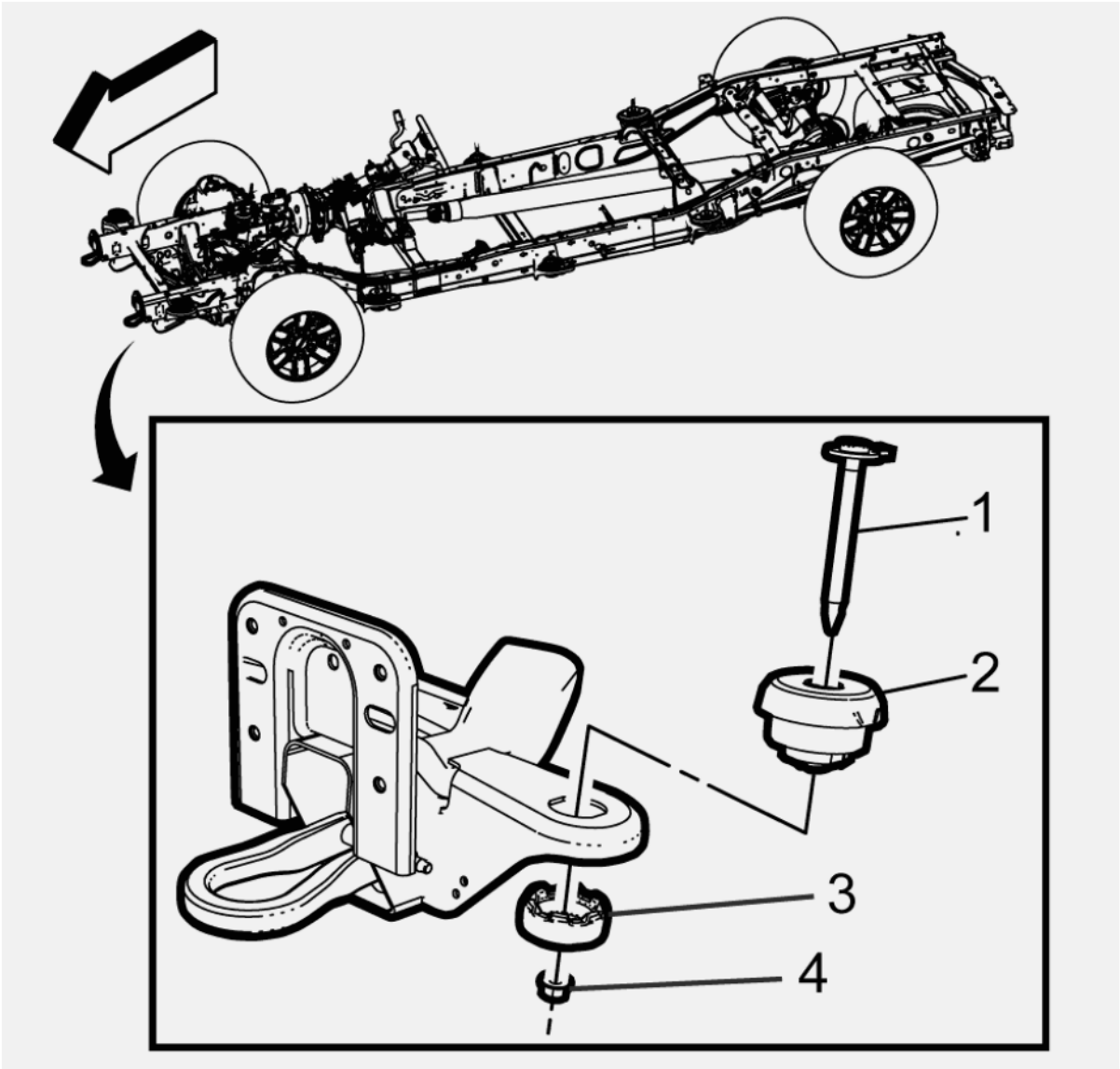


Fig. 45: Cushions
Courtesy of GENERAL MOTORS COMPANY

8. Properly support the body in the area that the mounts will be replaced.
9. Remove the body mount fastener (4).
10. Remove the body mount bolt (1).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**

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- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

11. Lower the chassis accordingly in order to remove the cushions (2) as necessary.

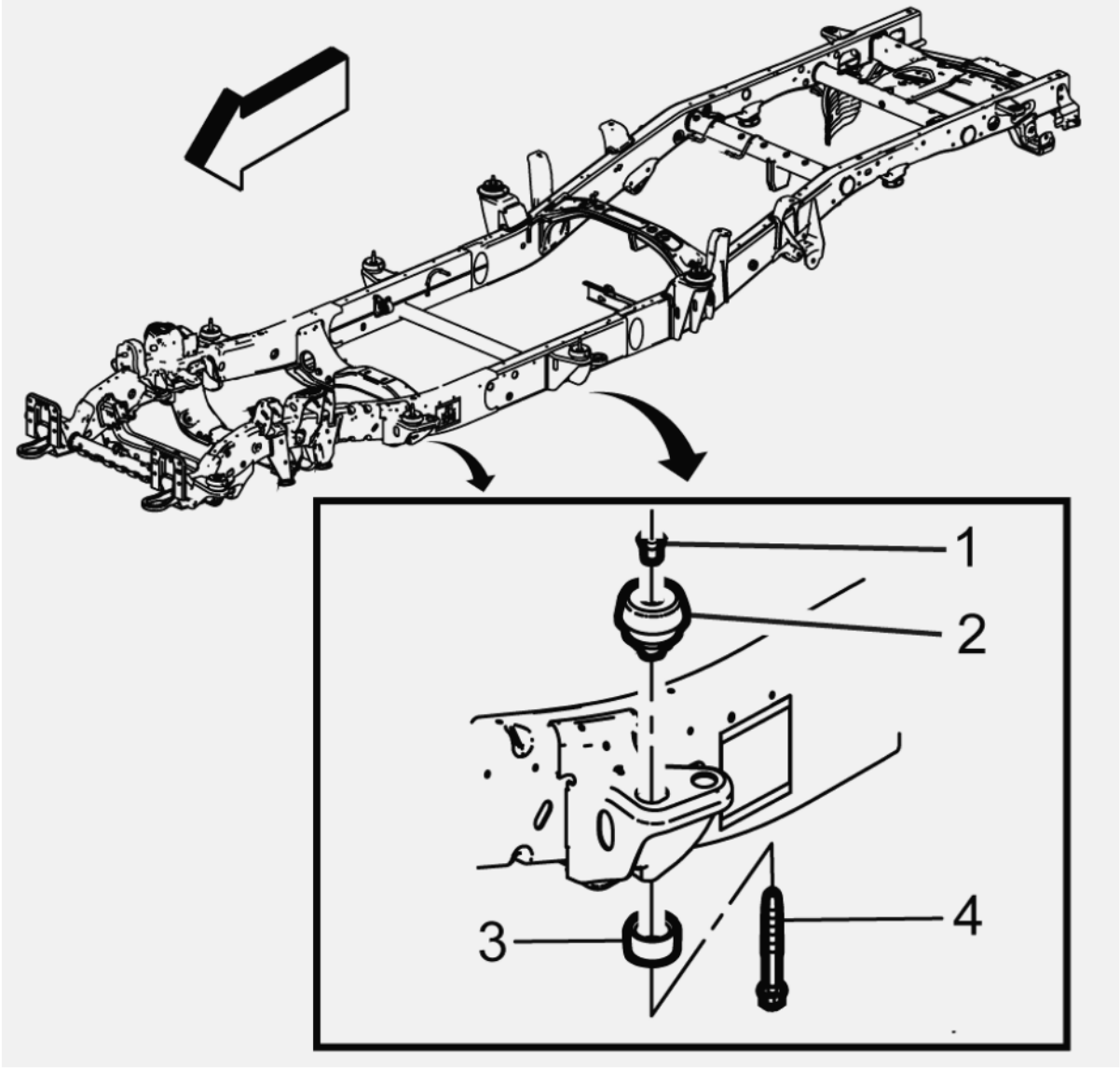


Fig. 46: Cushions
Courtesy of GENERAL MOTORS COMPANY

12. Properly support the body in the area that the mounts will be replaced.
13. Remove the body mount bolt (4).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

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- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

14. Lower the chassis accordingly in order to remove the cushions (2) as necessary.

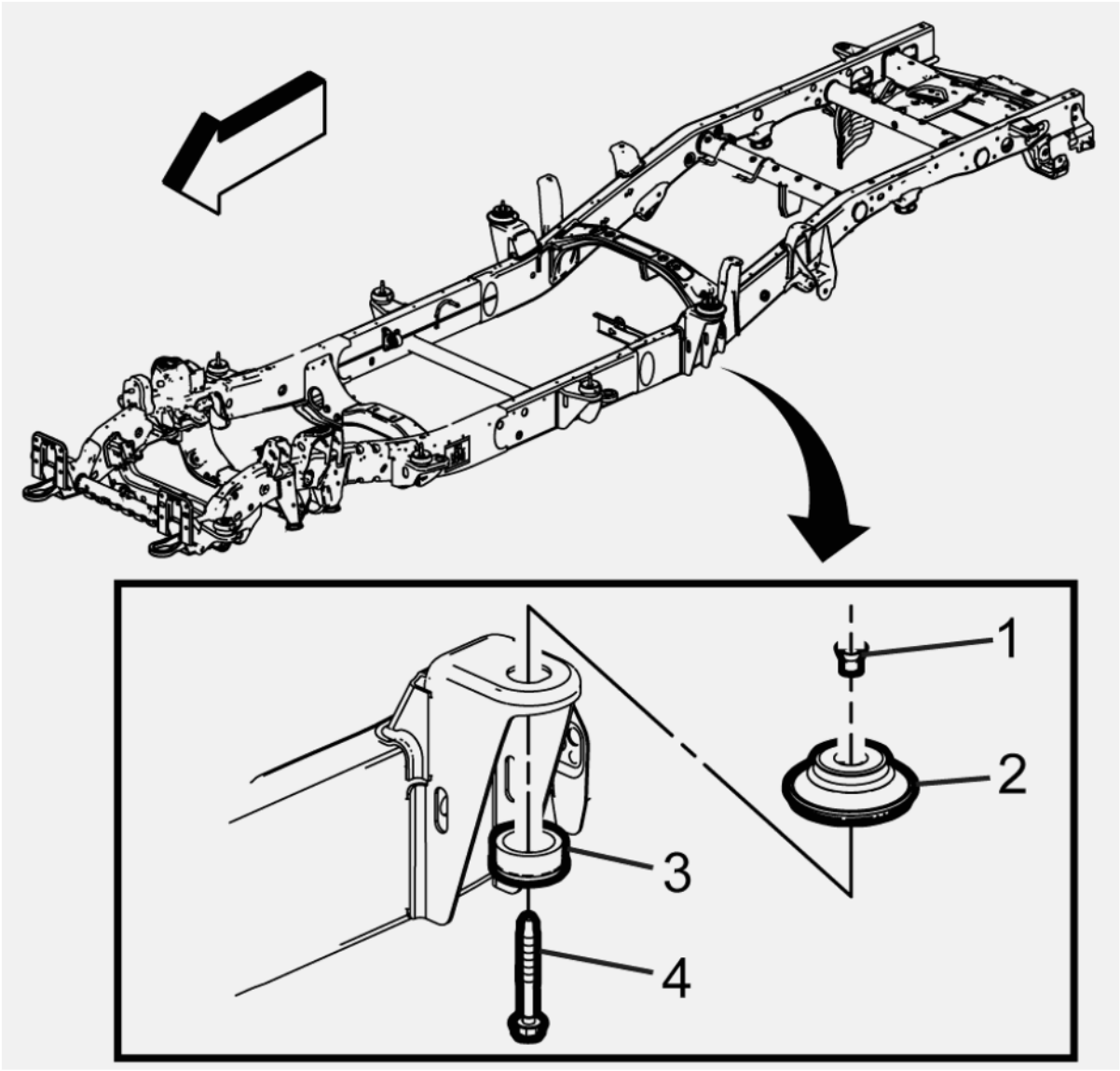


Fig. 47: Cushions
Courtesy of GENERAL MOTORS COMPANY

15. Properly support the body in the area that the mounts will be replaced.
16. Remove the body mount bolt (4).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to

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multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

17. Lower the chassis accordingly in order to remove the cushions (2) as necessary.

Installation Procedure

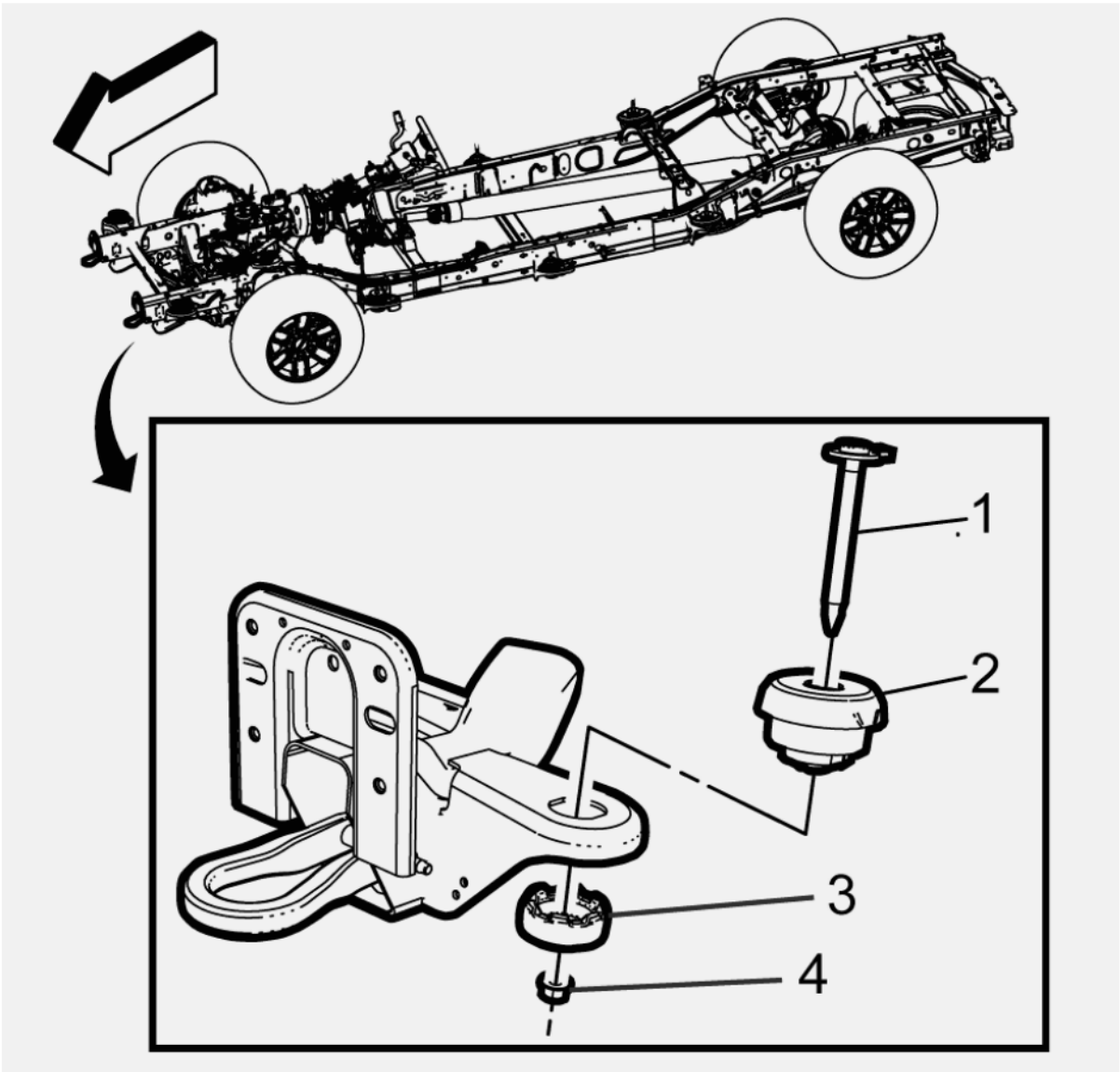


Fig. 48: Cushions
Courtesy of GENERAL MOTORS COMPANY

1. Install the cushions (2) as necessary and raise the chassis accordingly.

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2. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).

CAUTION: **Refer to Fastener Caution .**

3. Install the body mount bolt (1) and tighten the fastener (4) to 70 N.m (52 lb ft).

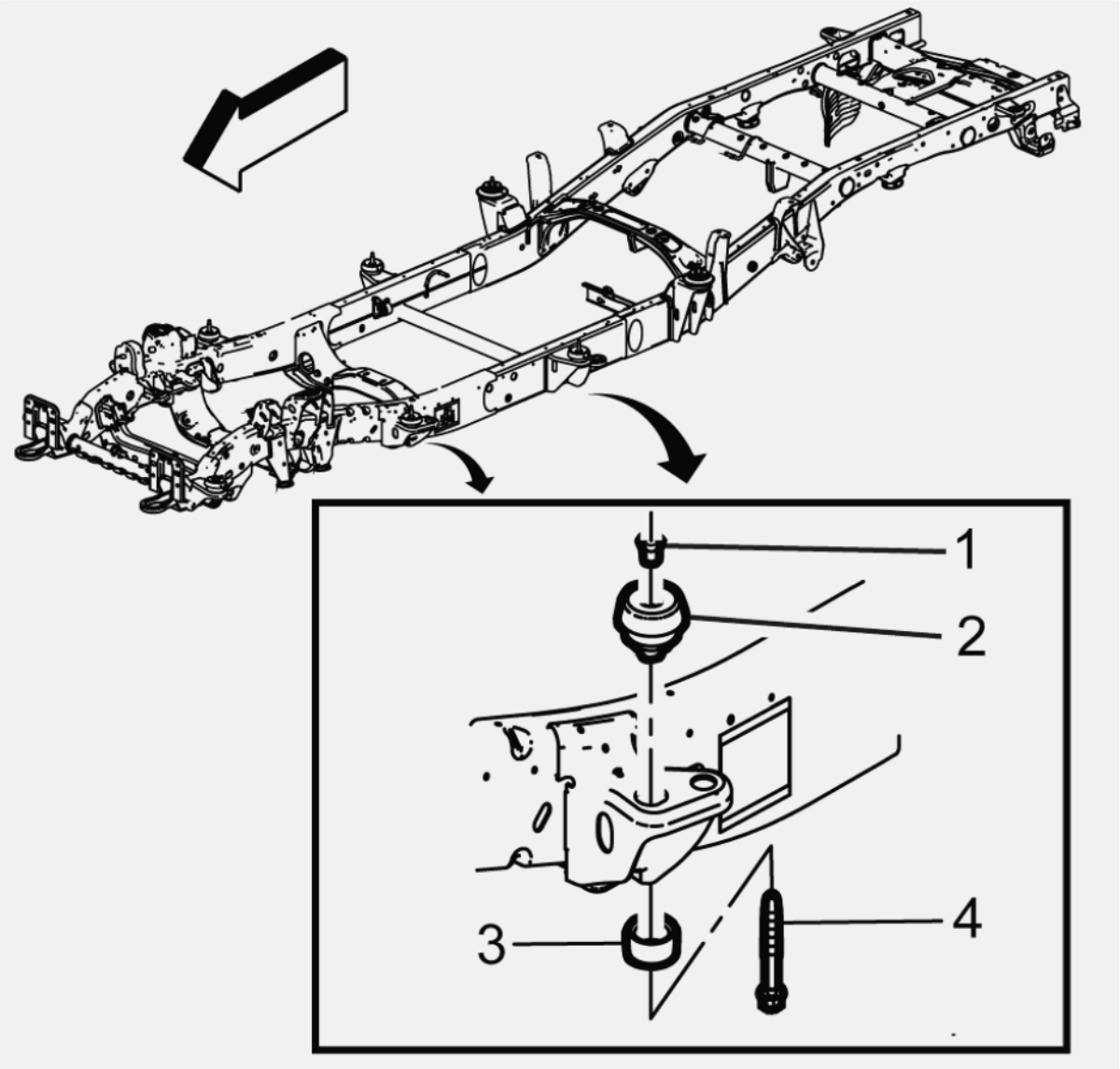


Fig. 49: Cushions
Courtesy of GENERAL MOTORS COMPANY

4. Install the cushions (2) as necessary and raise the chassis accordingly.
5. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).

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6. Install the body mount bolt (4) and tighten to 165 N.m (122 lb ft).

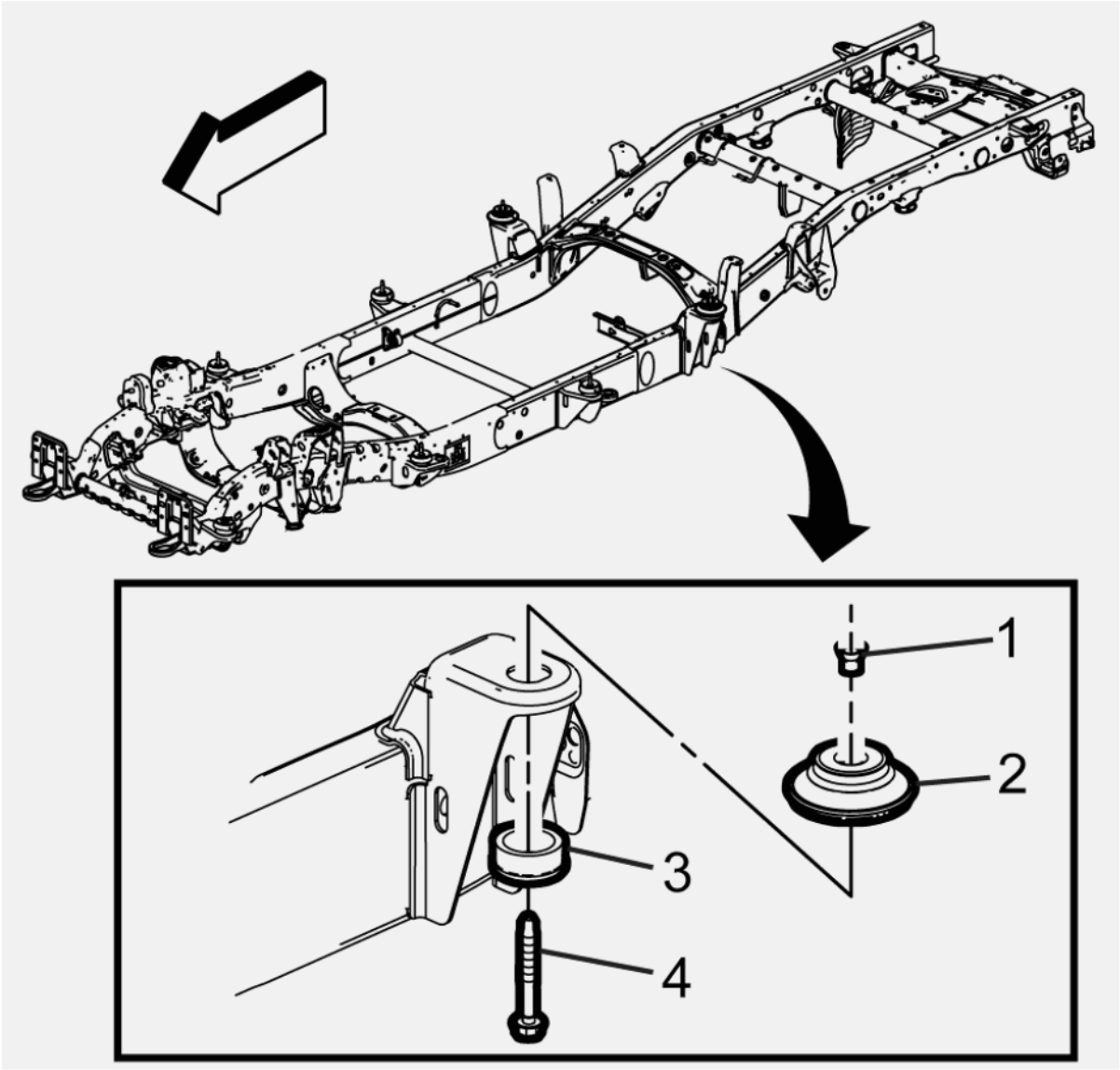


Fig. 50: Cushions
Courtesy of GENERAL MOTORS COMPANY

7. Install the cushions (2) as necessary and raise the chassis accordingly.
8. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).
9. Install the body mount bolt (4) and tighten to 165 N.m (122 lb ft).
10. Install the park brake equalizer intermediate cable. Perform the following steps:
    1. Pull rearward on the park brake cable to the original position.
    2. Secure the cable retaining tabs to the frame.
    3. Install the intermediate cable end to the equalizer.
    4. Install the nut to the threaded end of the intermediate cable. Tighten the nut to 4 N.m (35 lb in).
11. Lower the vehicle.

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12. Install the master cylinder. Perform the following steps:
    1. Mount the master cylinder to the brake booster.
    2. Install the master cylinder mounting nuts and tighten to 36 N.m (27 lb ft).
13. On vehicles equipped with the 6.6L engine, install the front wheelhouse liner. Refer to **Front Wheelhouse Liner Replacement - Left Side**.

NOTE: **The air cleaner outlet duct, must be removed (to prevent damage to the duct) when the body is raised for service.**

14. On vehicles equipped with the 5.3L engine, Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body is raised for service.**

15. On vehicles equipped with the 6.0L engine, install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body is raised for service.**

16. On vehicles equipped with the 6.6L engine, install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

BODY MOUNT UPPER AND LOWER CUSHION REPLACEMENT (REGULAR CAB - HEAVY DUTY)

Removal Procedure

NOTE: **Ensure that the vehicle is unloaded prior to body removal.**

1. Remove the master cylinder. Perform the following steps:
    1. Remove the nuts retaining the master cylinder to the brake booster.
    2. Remove the master cylinder from the brake booster.
    3. Secure the cylinder away from the booster.

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

2. On vehicles equipped with the 5.3L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

3. On vehicles equipped with the 6.0L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the**

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Duct) when the body Is raised for service.

4. On vehicles equipped with the 6.6L engine, remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
5. Raise the vehicle on the hoist. Refer to **Lifting and Jacking the Vehicle** .
6. Remove the park brake equalizer intermediate cable. Perform the following steps:
    1. Remove the nut from the park brake equalizer intermediate cable.
    2. Remove the intermediate cable from the equalizer.
    3. Depress the retaining tabs that secure the park brake cable to the frame.
    4. Pull slightly on the cable from the mounting area in order to provide slack for body movement without binding the cable.

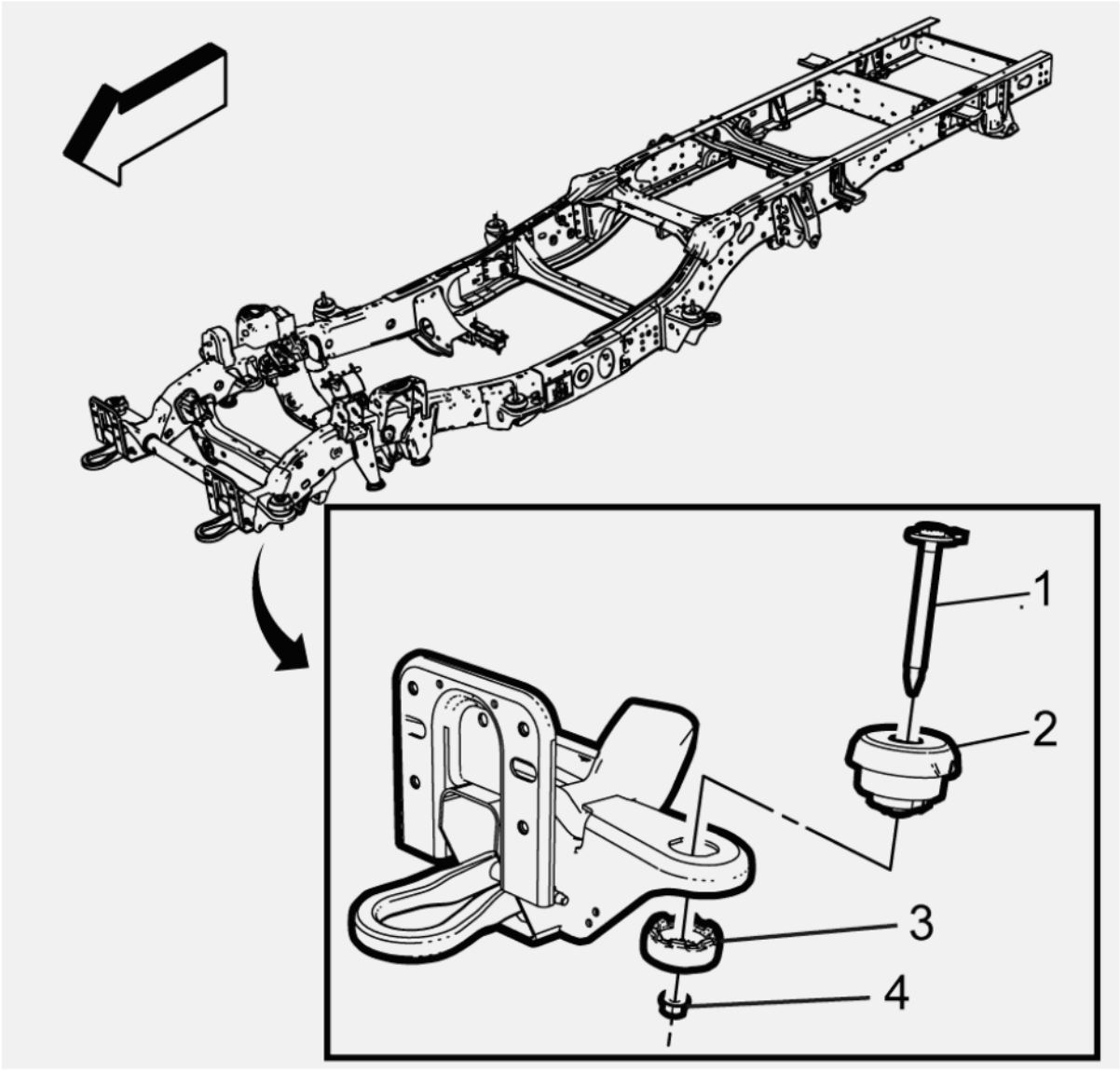


Fig. 51: Cushion
Courtesy of GENERAL MOTORS COMPANY

7. Properly support the body in the area that the mounts will be replaced.
8. Remove the body mount fastener (4).

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9. Remove the body mount bolt (1).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

10. Lower the chassis accordingly in order to remove the cushions (2) as necessary.

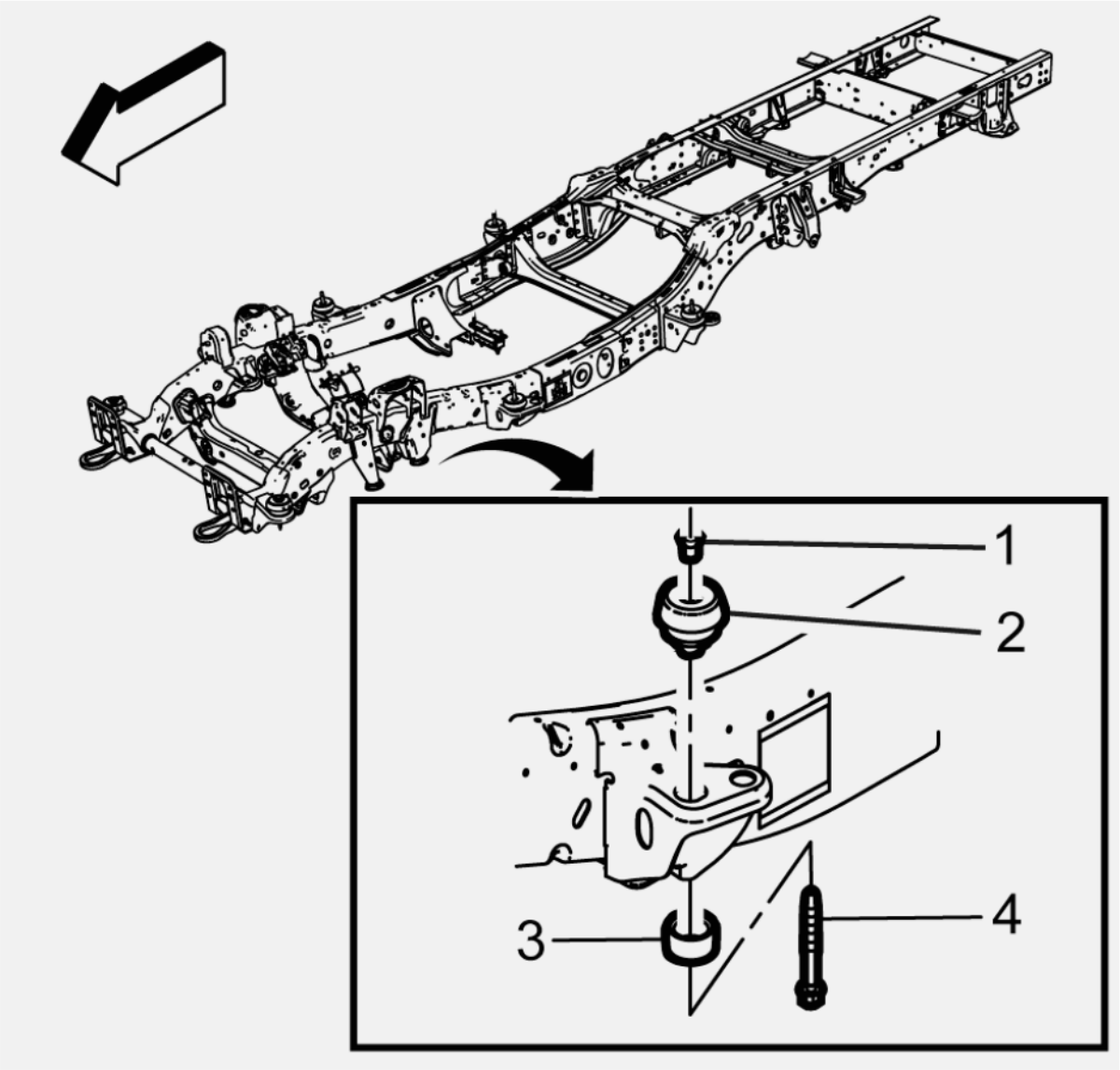


Fig. 52: Cushions
Courtesy of GENERAL MOTORS COMPANY

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11. Properly support the body in the area that the mounts will be replaced.
12. Remove the body mount bolt (4)

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

13. Lower the chassis accordingly in order to remove the cushions (2) as necessary.

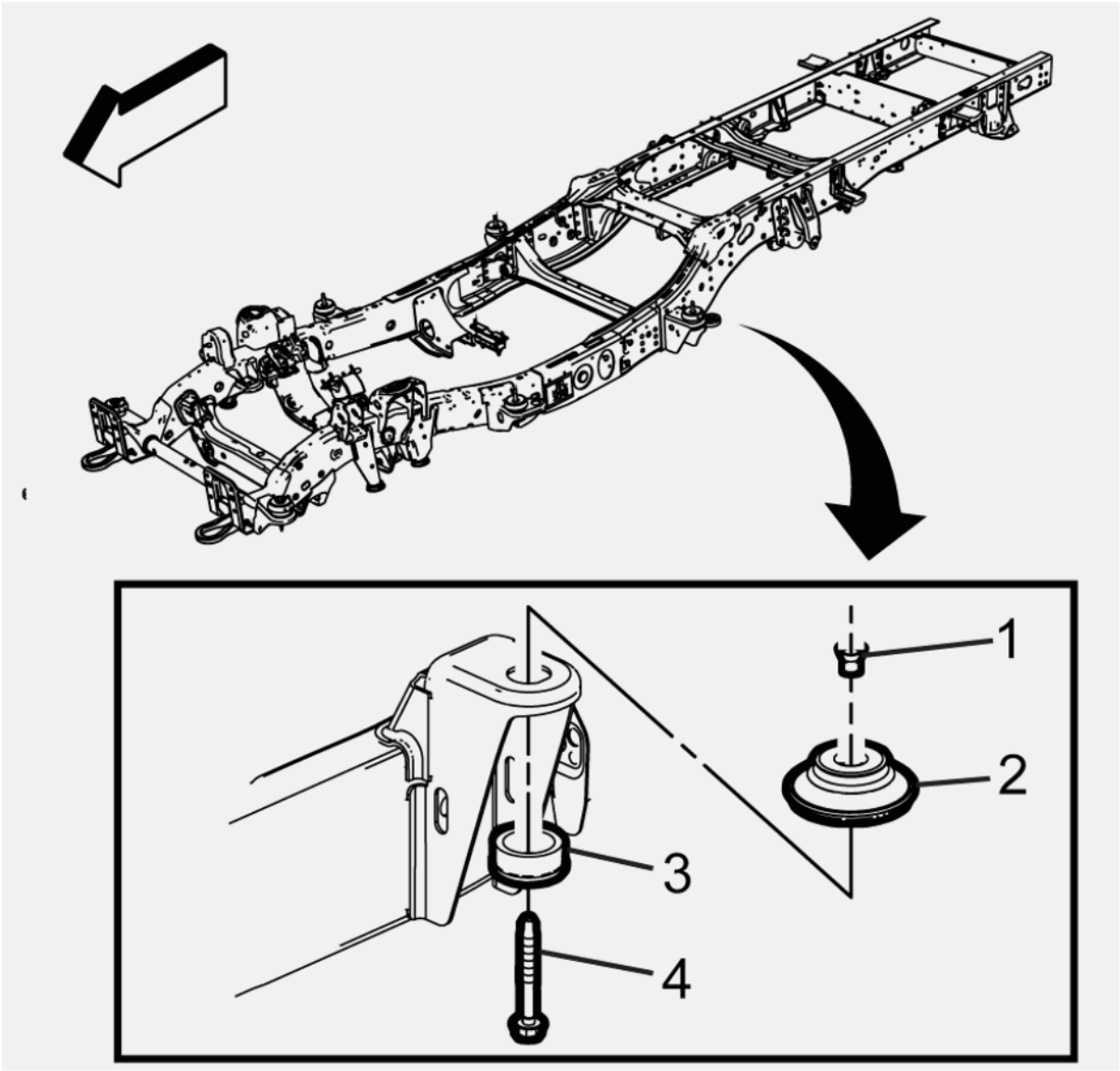


Fig. 53: Cushions

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Courtesy of GENERAL MOTORS COMPANY

14. Properly support the body in the area that the mounts will be replaced.
15. Remove the body mount bolt (4).

WARNING: When you remove the body cushions, do NOT separate the frame from the body more than is necessary. Possible personal injury and damage to multiple parts may result if you do not follow the guides outlined below:

- **Intermediate steering shaft-Do not allow the shaft to extend more than 25 mm (1 in).**
- **Fuel tank filler hose-Do not stretch the hose excessively.**
- **Tail/Turn signal lamp wiring/rear lamps junction block-Leave slack in the wires.**
- **Park brake cable-Leave slack in the cable.**
- **Body ground straps-Leave slack in the wire.**

16. Lower the chassis accordingly in order to remove the cushions (2) as necessary.

Installation Procedure

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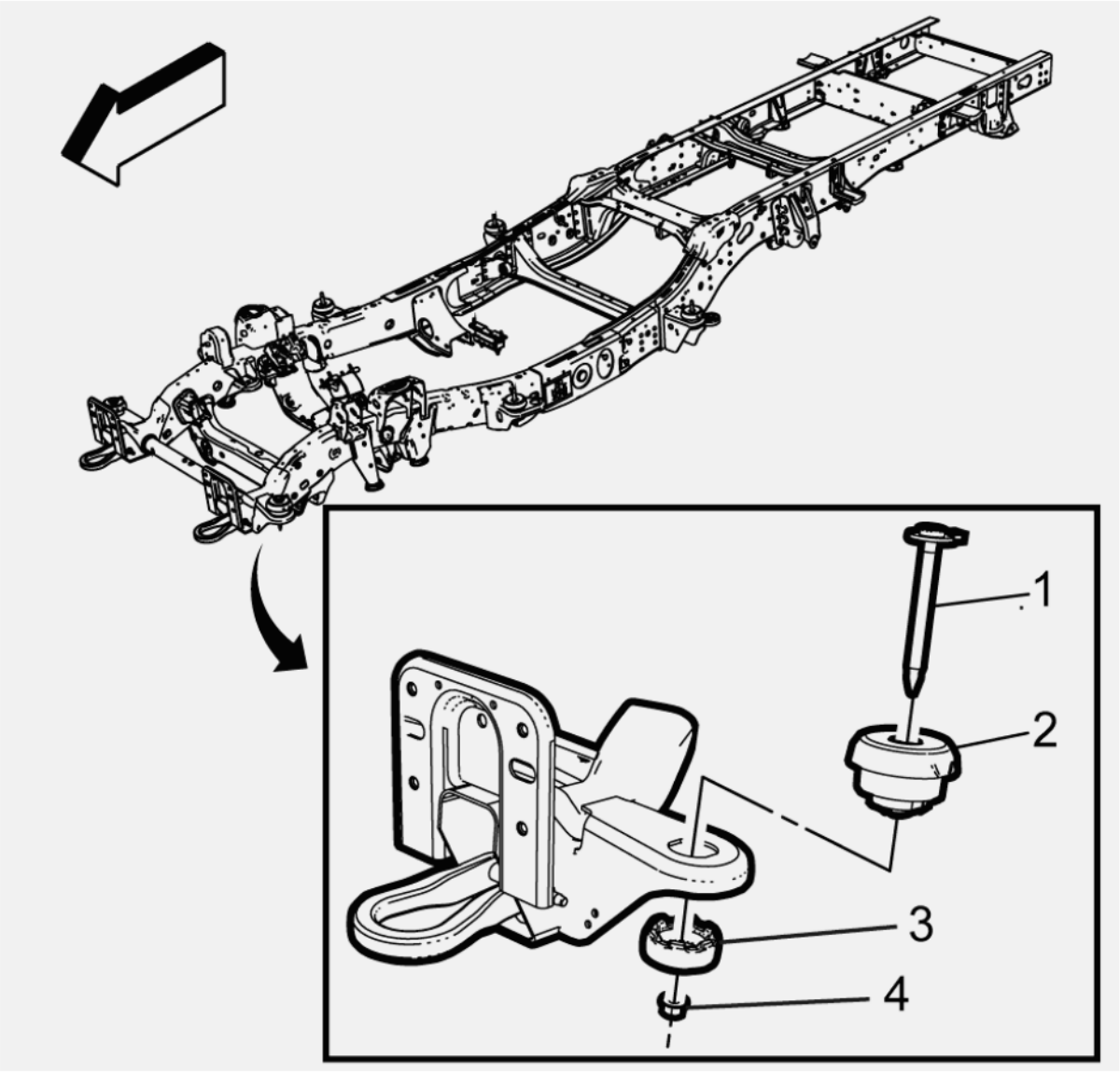


Fig. 54: Cushion
Courtesy of GENERAL MOTORS COMPANY

1. Install the cushions (2) as necessary and raise the chassis accordingly.
2. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).

CAUTION: Refer to Fastener Caution .

3. Install the body mount bolt (1) and tighten the fastener (4) to 70 N.m (52 lb ft).

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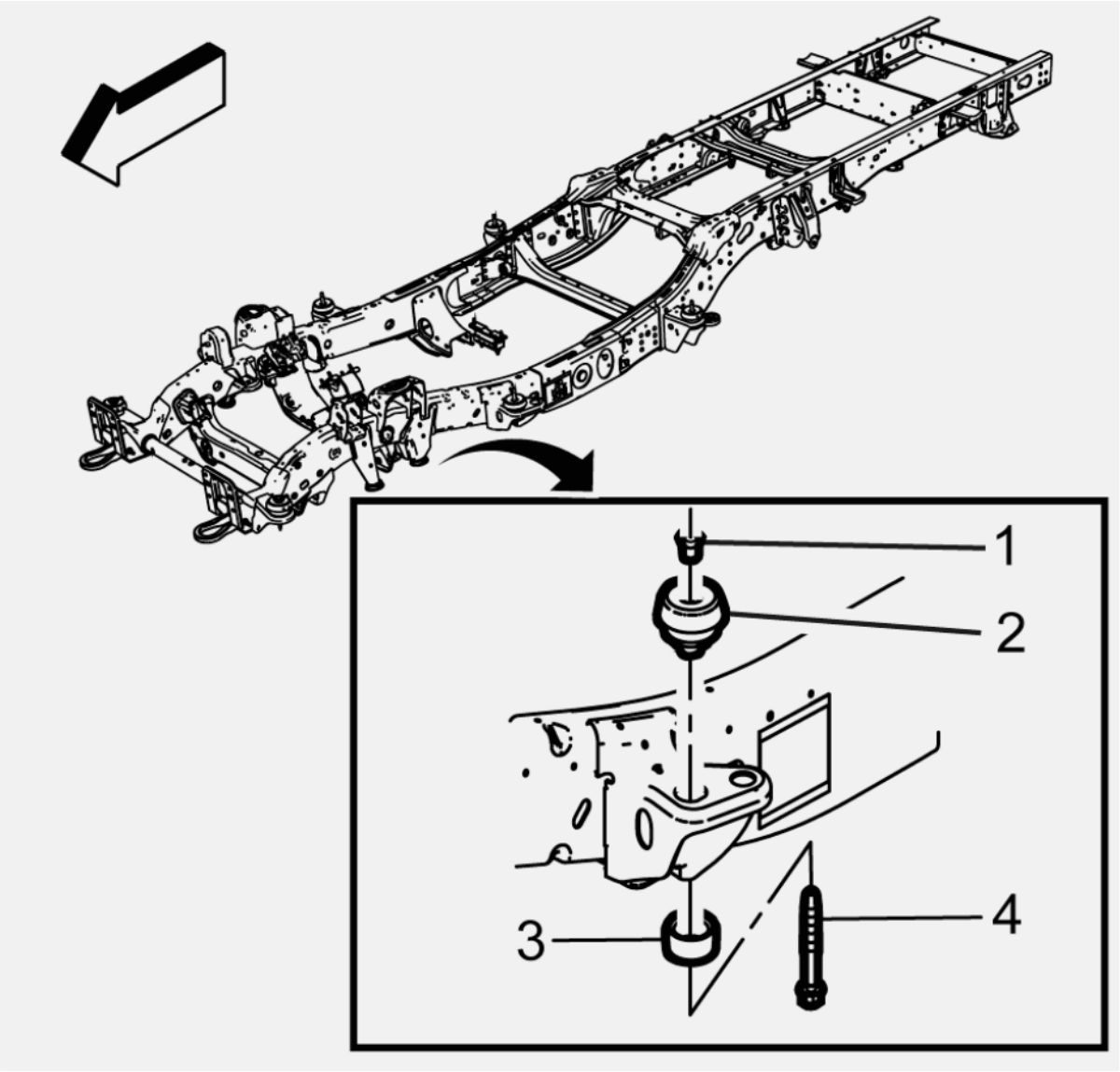


Fig. 55: Cushions
Courtesy of GENERAL MOTORS COMPANY

4. Install the cushions (2) as necessary and raise the chassis accordingly.
5. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).
6. Install the body mount bolt (4) and tighten to 165 N.m (122 lb ft).

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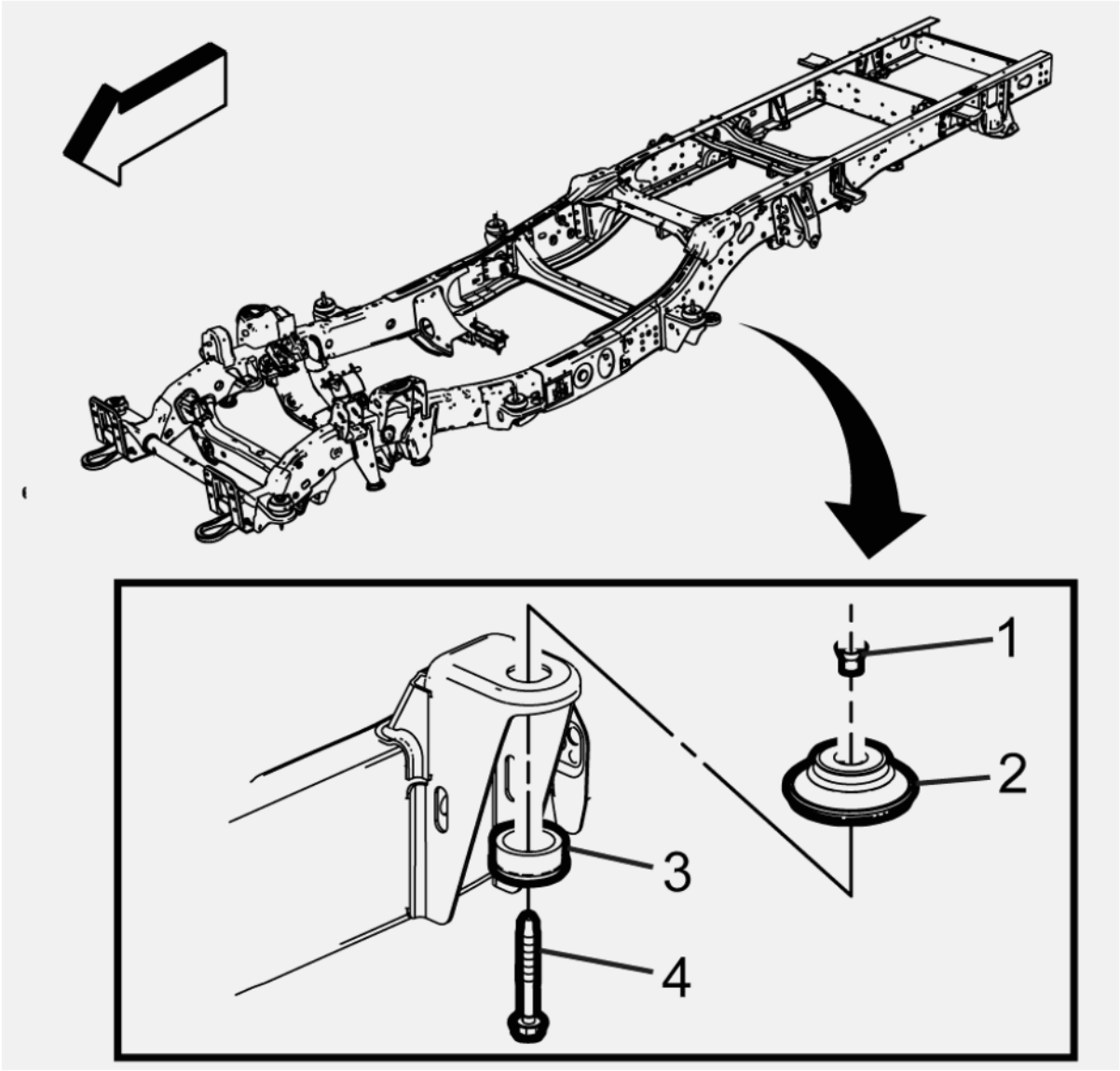


Fig. 56: Cushions
Courtesy of GENERAL MOTORS COMPANY

7. Install the cushions (2) as necessary and raise the chassis accordingly.
8. Perform the following procedure before installing the body mount fasteners.
    1. Remove all traces of the original adhesive patch.
    2. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.
    3. Apply Threadlocker GM P/N 12345493 (Canadian P/N 10953488).
9. Install the body mount bolt (4) and tighten to 165 N.m (122 lb ft).
10. Install the park brake equalizer intermediate cable. Perform the following steps:
    1. Pull rearward on the park brake cable to the original position.
    2. Secure the cable retaining tabs to the frame.
    3. Install the intermediate cable end to the equalizer.
    4. Install the nut to the threaded end of the intermediate cable. Tighten the nut to 4 N.m (35 lb in).
11. Lower the vehicle.
12. Install the master cylinder. Perform the following steps:

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1. Mount the master cylinder to the brake booster.
2. Install the master cylinder mounting nuts and tighten to 36 N.m (27 lb ft).

NOTE: **The air cleaner outlet duct, must be removed (to prevent damage to the duct) when the body is raised for service.**

13. On vehicles equipped with the 5.3L engine, Install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

14. On vehicles equipped with the 6.0L engine, install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

NOTE: **The air cleaner outlet duct, Must Be Removed (To Prevent Damage to the Duct) when the body Is raised for service.**

15. On vehicles equipped with the 6.6L engine, install the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .

FRONT WHEELHOUSE LINER REPLACEMENT - RIGHT SIDE

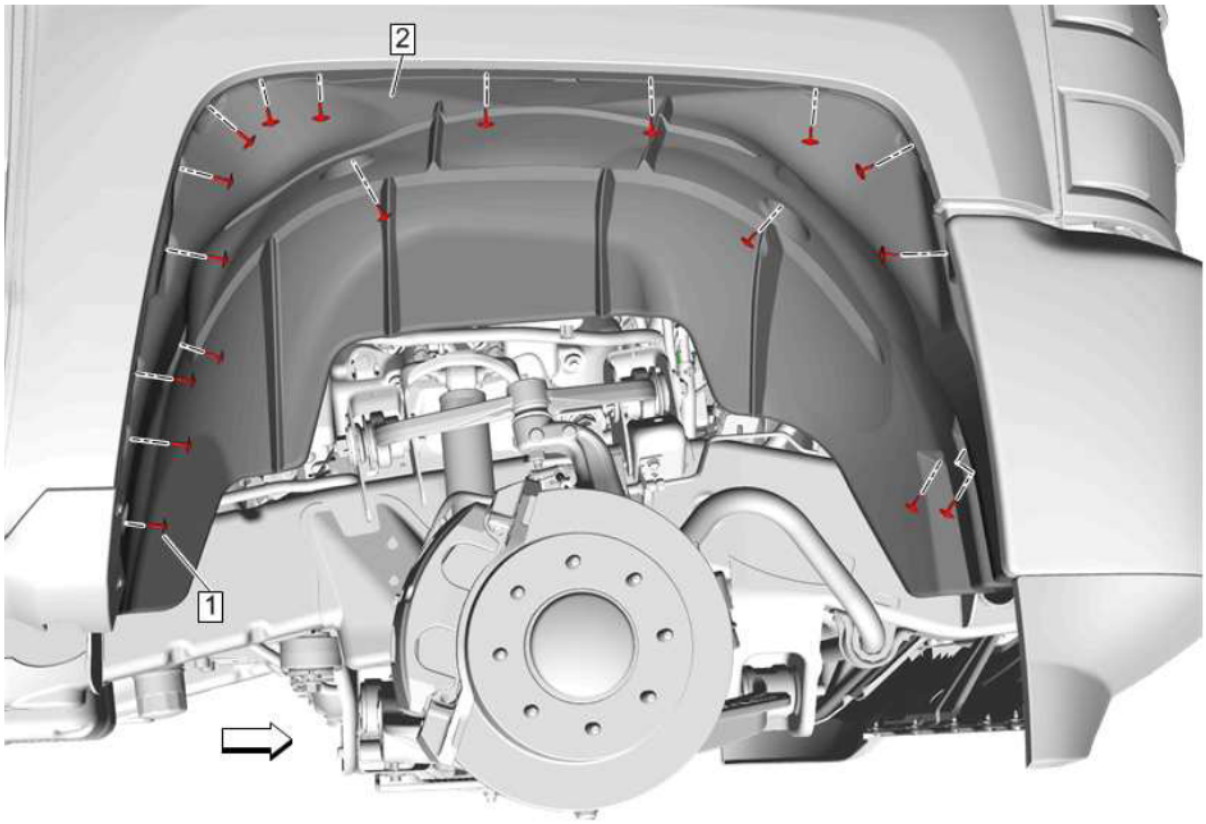


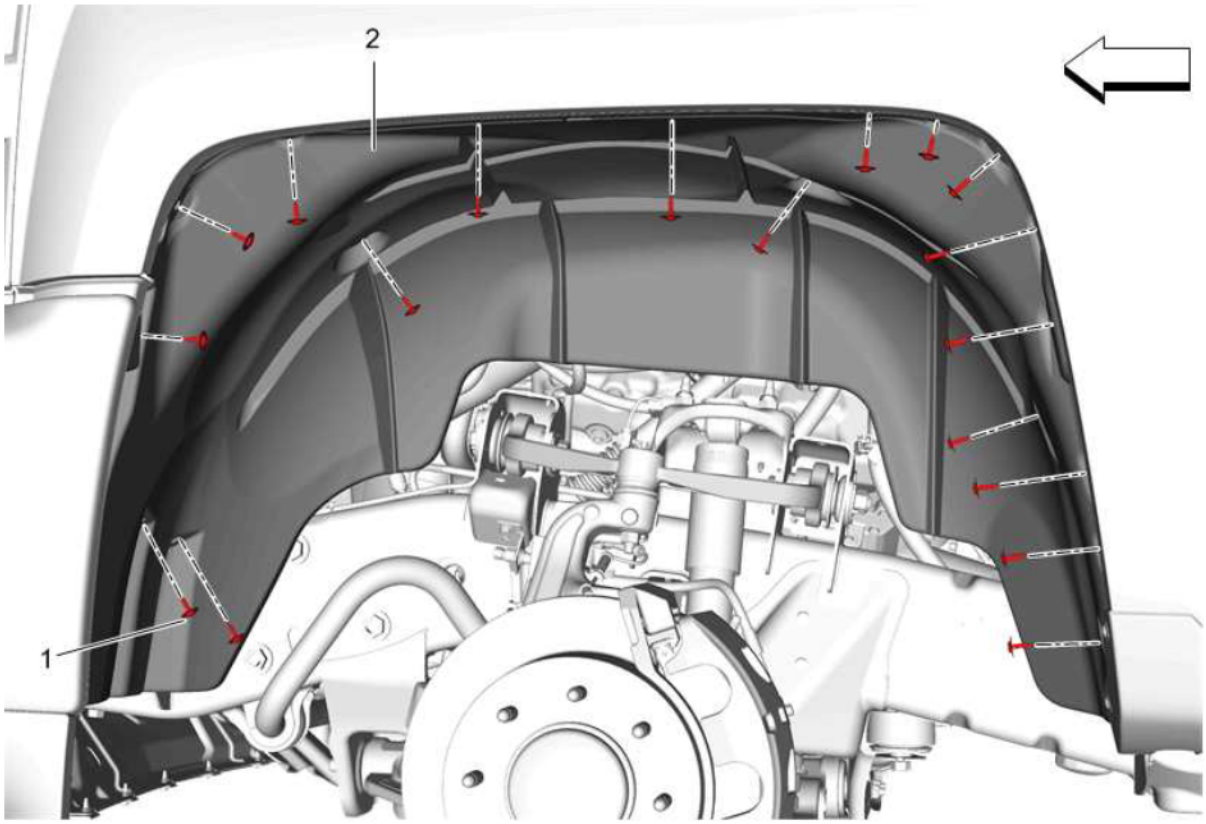
Fig. 57: Front Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
1. Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) Tire and Wheel Removal and Installation (Dual Rear Wheels) 2. Front Wheel Opening Molding Replacement	
1	Front Wheelhouse Liner Screw **CAUTION:** **Refer to Fastener Caution** **Tighten** 2.5 N.m (22 lb in)
2	Front Wheelhouse Liner **NOTE:** **Disconnect any electrical harnesses/connectors and attached parts from the right side front wheelhouse liner as needed.**

FRONT WHEELHOUSE LINER REPLACEMENT - LEFT SIDE



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Fig. 58: Front Wheelhouse Liner-Left Side
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) Tire and Wheel Removal and Installation (Dual Rear Wheels) 2. Front Wheel Opening Molding Replacement	
1	Front Wheelhouse Liner Screw **CAUTION:** **Refer to Fastener Caution** **Tighten** 2.5 N.m (22 lb in)
2	Front Wheelhouse Liner **NOTE:** **Disconnect any electrical harnesses/connectors and attached parts from the right side front wheelhouse liner as needed.**

REAR WHEELHOUSE PANEL LINER REPLACEMENT - RIGHT SIDE (CHEVROLET)

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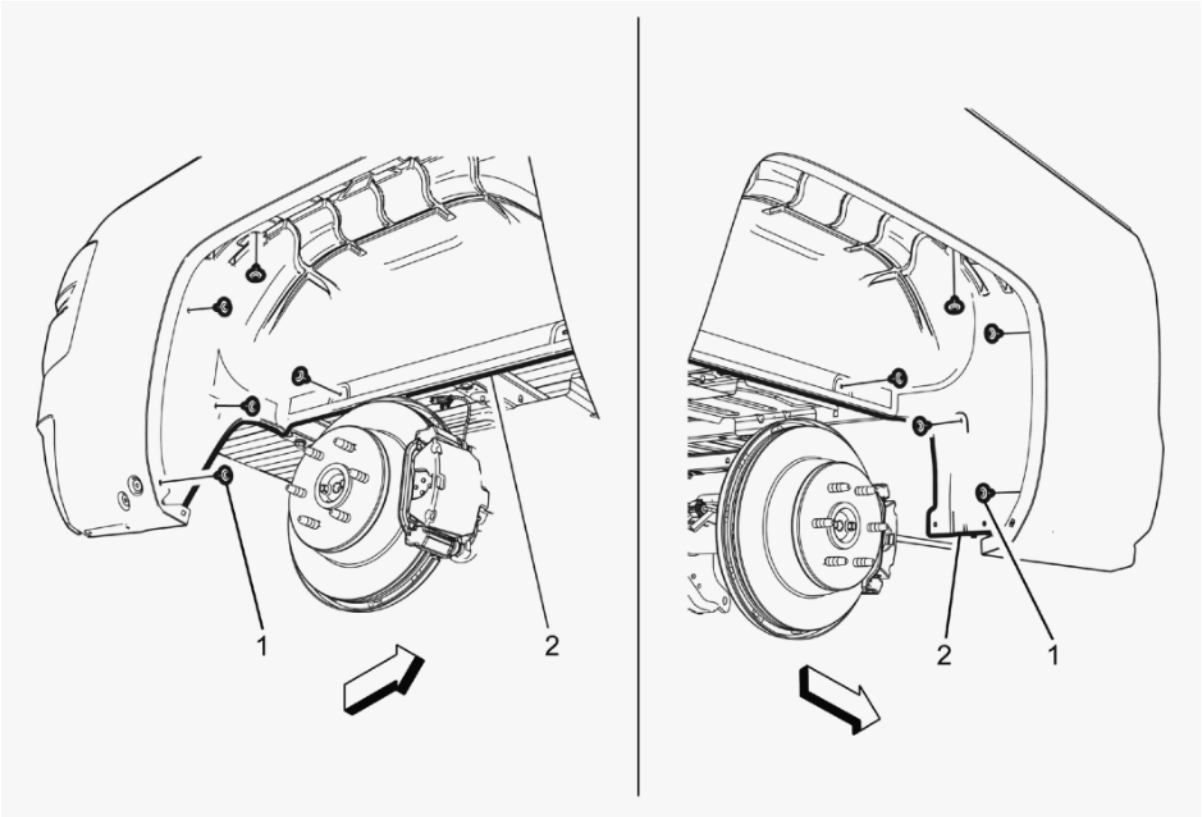


Fig. 59: Rear Wheelhouse Panel Liner - Right Side (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** **Tire and Wheel Removal and Installation (Dual Rear Wheels)** . 2. Remove the rear wheel opening molding. Refer to **Rear Wheel Opening Molding Replacement** 3. Remove the rear tire front air deflector. Refer to **Rear Tire Front Air Deflector Replacement**.	
1	Right Rear Wheelhouse Liner Fastener (Qty: 10) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Right Rear Wheelhouse Liner

REAR WHEELHOUSE PANEL LINER REPLACEMENT - RIGHT SIDE (GMC)

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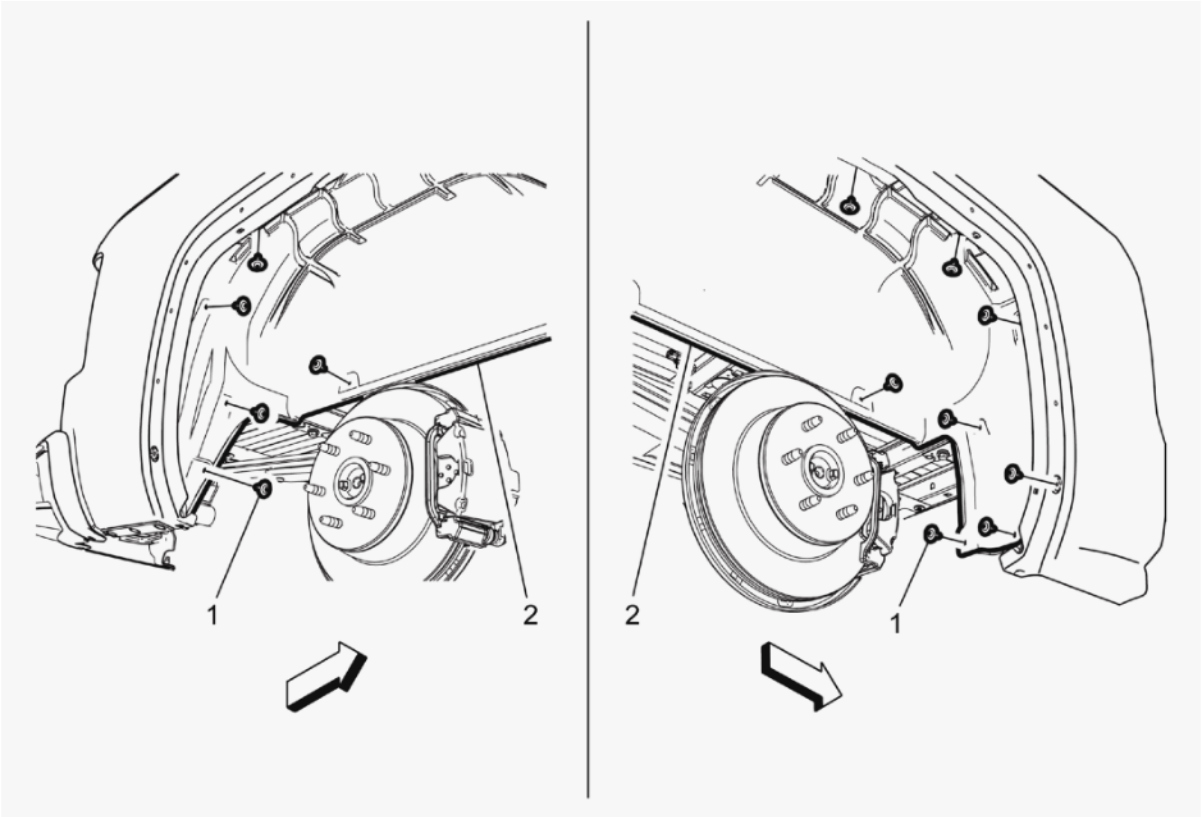


Fig. 60: Rear Wheelhouse Panel Liner - Right Side (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** **Tire and Wheel Removal and Installation (Dual Rear Wheels)** . 2. Remove the rear wheel opening molding. Refer to **Rear Wheel Opening Molding Replacement** 3. Remove the rear tire front air deflector. Refer to **Rear Tire Front Air Deflector Replacement**.	
1	Right Rear Wheelhouse Liner Fastener (Qty: 13) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Right Rear Wheelhouse Liner

REAR WHEELHOUSE PANEL LINER REPLACEMENT - LEFT SIDE (CHEVROLET)

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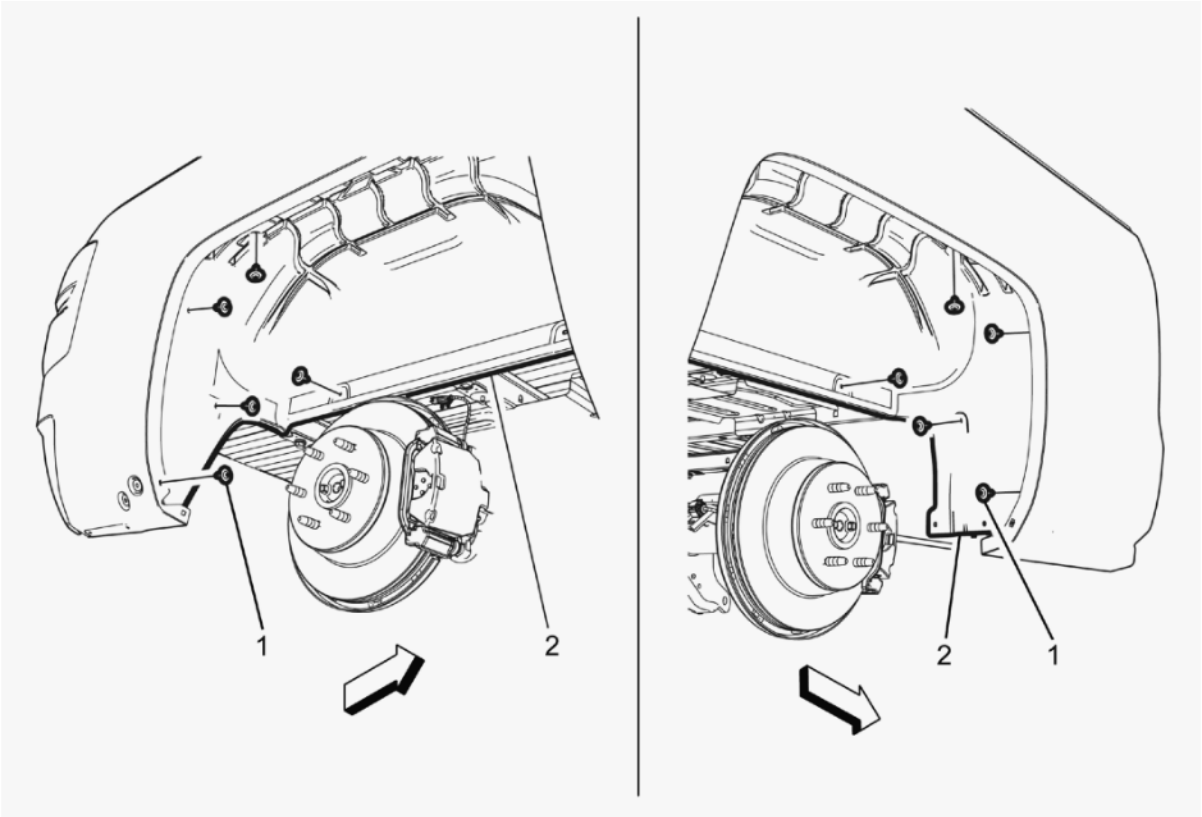


Fig. 61: Rear Wheelhouse Panel Liner - Right Side (Chevrolet)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** **Tire and Wheel Removal and Installation (Dual Rear Wheels)** . 2. Remove the rear wheel opening molding. Refer to **Rear Wheel Opening Molding Replacement** 3. Remove the rear tire front air deflector. Refer to **Rear Tire Front Air Deflector Replacement**.	
1	Left Rear Wheelhouse Liner Fastener (Qty: 10) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Left Rear Wheelhouse Liner

REAR WHEELHOUSE PANEL LINER REPLACEMENT - LEFT SIDE (GMC)

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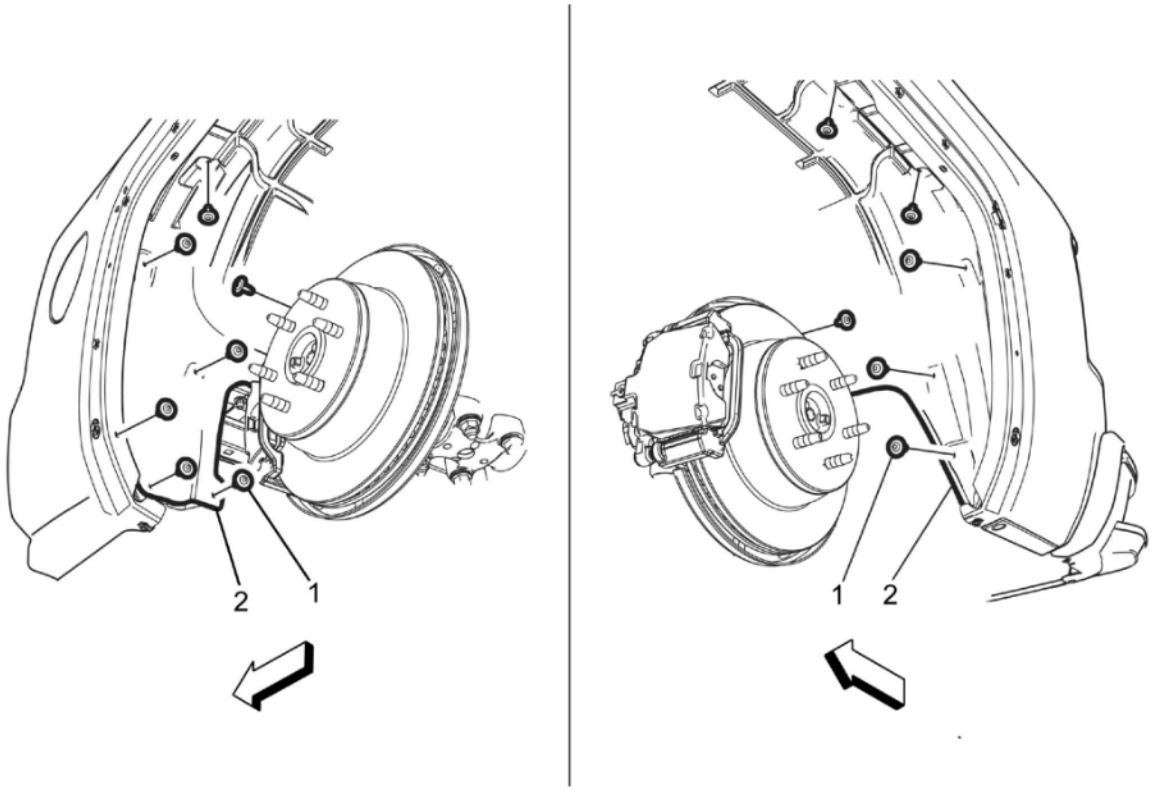


Fig. 62: Rear Wheelhouse Panel Liner - Left Side (GMC)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** **Tire and Wheel Removal and Installation (Dual Rear Wheels)** . 2. Remove the rear wheel opening molding. Refer to **Rear Wheel Opening Molding Replacement** 3. Remove the rear tire front air deflector. Refer to **Rear Tire Front Air Deflector Replacement**.	
1	Left Rear Wheelhouse Liner Fastener (Qty: 13) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Left Rear Wheelhouse Liner

FRONT WHEELHOUSE PANEL FRONT BRACKET REPLACEMENT

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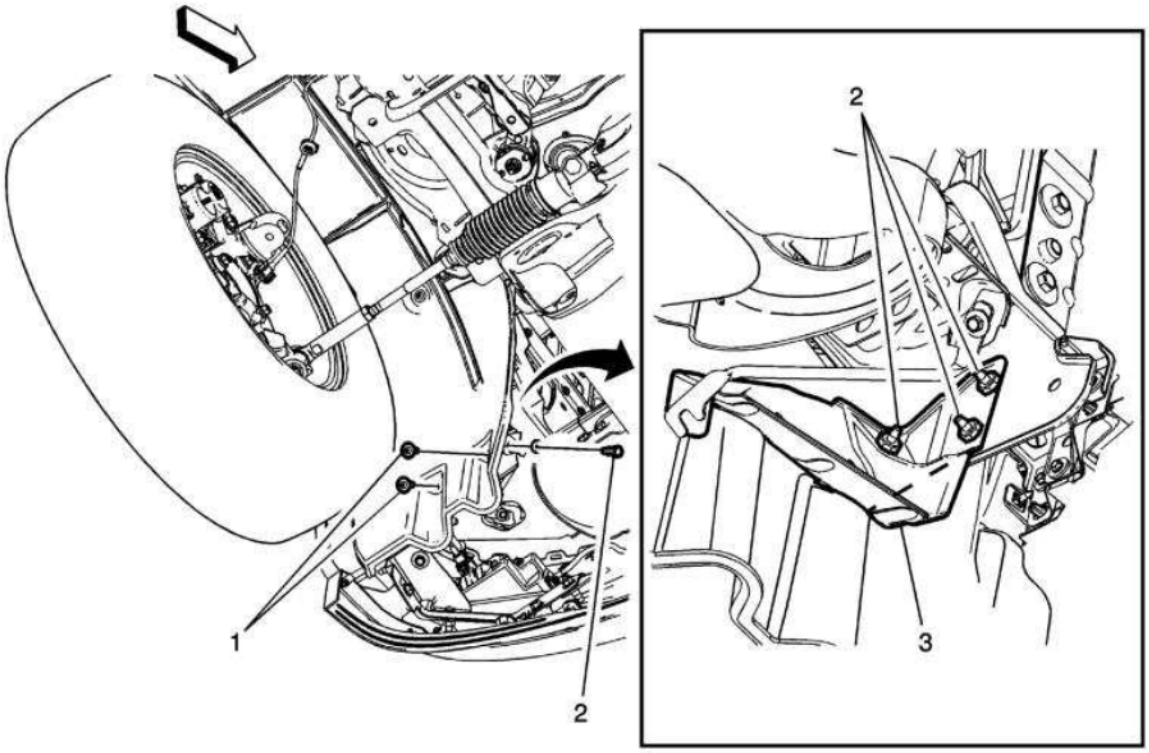


Fig. 63: Front Wheelhouse Panel Front Bracket
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Front Wheelhouse Liner Fasteners (Qty 2) **CAUTION:** **Refer to** **Fastener** **Caution** . **Tighten** 2.5 N.m (22 lb in)
2	Front Wheelhouse Panel Front Bracket Fasteners (Qty 4) **Tighten** 9 N.m (80 lb in)
3	Front Wheelhouse Panel Front Bracket

FRONT WHEELHOUSE PANEL BRACE REPLACEMENT

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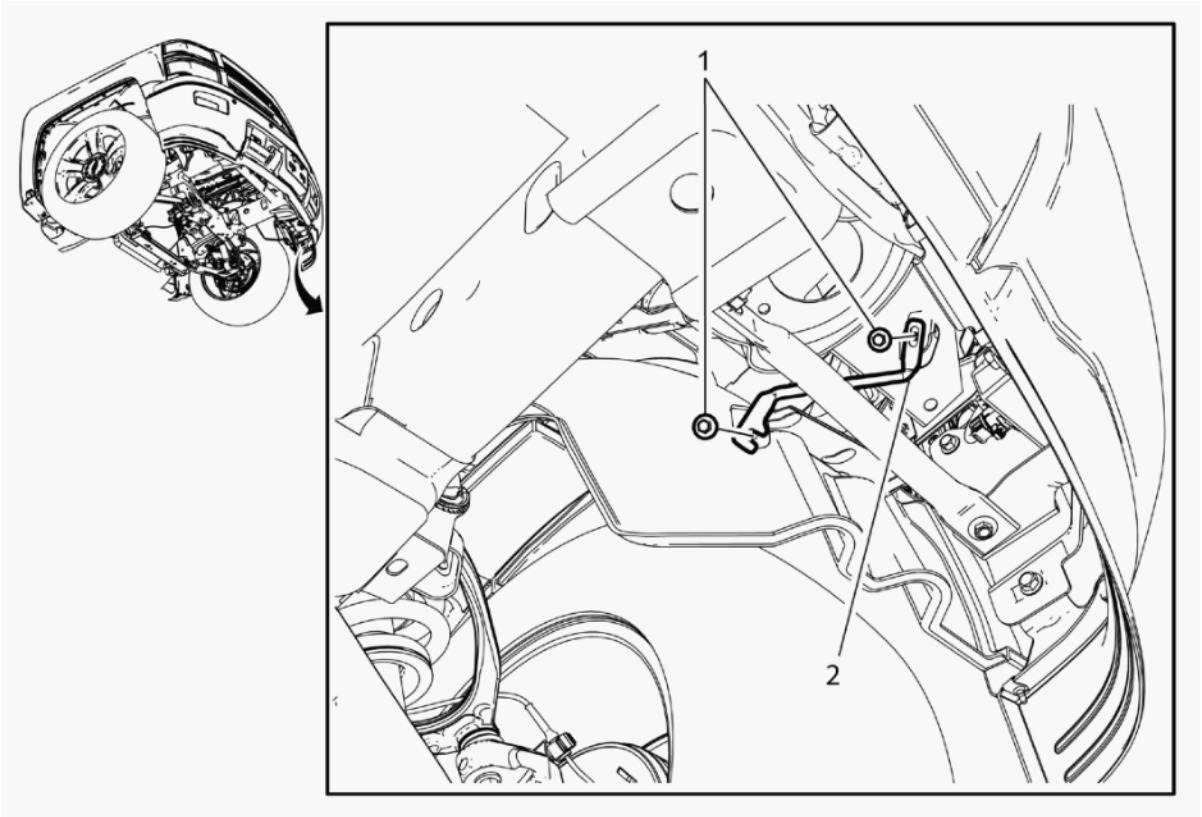


Fig. 64: Front Wheelhouse Panel Brace
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Front Wheelhouse Panel Brace Fasteners (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 9 N.m (80 lb in)
2	Front Wheelhouse Panel Brace

PICKUP BOX WHEELHOUSE PANEL LINER REPLACEMENT (DUAL REAR WHEELS)

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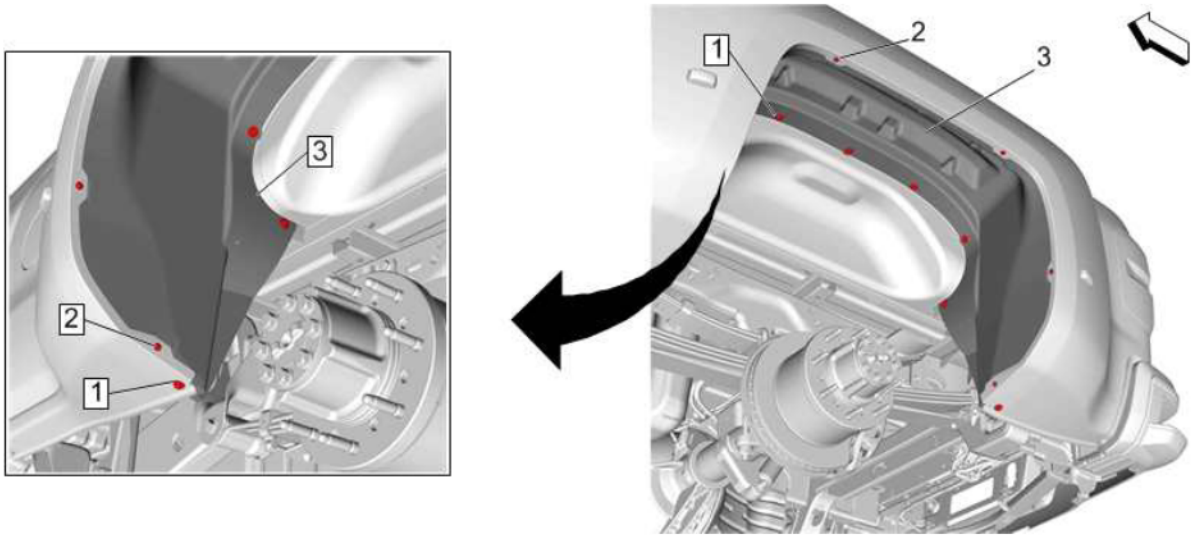


Fig. 65: Pickup Box Wheelhouse Panel Liner (Dual Rear Wheels)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Removal Procedure Remove the rear tire and wheel assembly. Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) Tire and Wheel Removal and Installation (Dual Rear Wheels)	
1	Pickup Box Wheelhouse Panel Liner Bolt **CAUTION:** **Refer to** Fastener Caution . **Tighten** 25 N.m (18 lb ft)
2	Pickup Box Wheelhouse Panel Liner Screw **Tighten** 9 N.m (80 lb in)
3	Pickup Box Wheelhouse Panel Liner

REAR TIRE FRONT AIR DEFLECTOR REPLACEMENT

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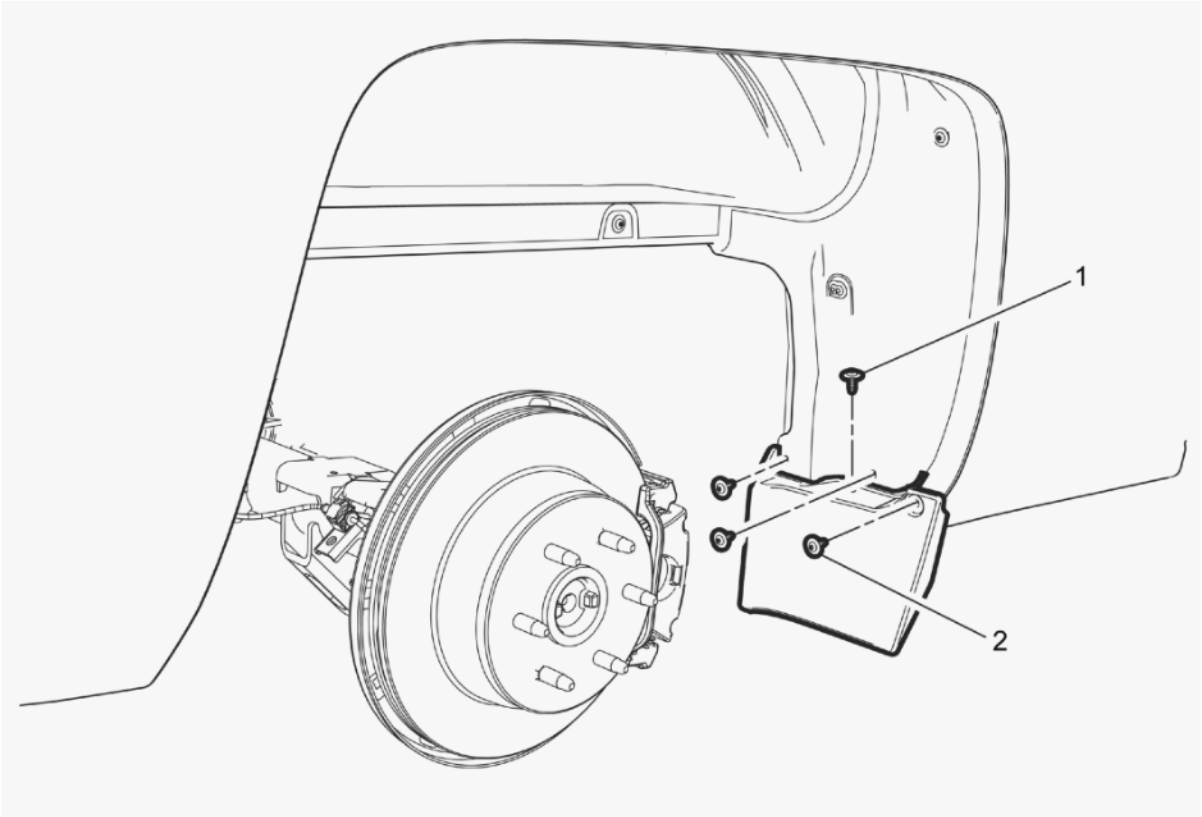


Fig. 66: Rear Tire Front Air Deflector
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Rear Tire Front Air Deflector Retainers (Qty 4) **CAUTION:** **Refer to** **Fastener Caution** . **Tighten** 6 N.m (53 lb in)
2	Rear Tire Front Air Deflector

ASSIST STEP REPLACEMENT (ASSEMBLY - BRS)

Removal Procedure

1. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (L96 LC8)** **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)** **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (L5P)** .
2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Deploy the power assist step. If the motor fails to deploy, perform the following:

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1. Remove the two plastic shield cover screws and cover on the side of the motor assembly.
2. Remove the motor housing screws and housing cover from the motor assembly.
3. Rotate the armature by hand to fully extend the assist step.

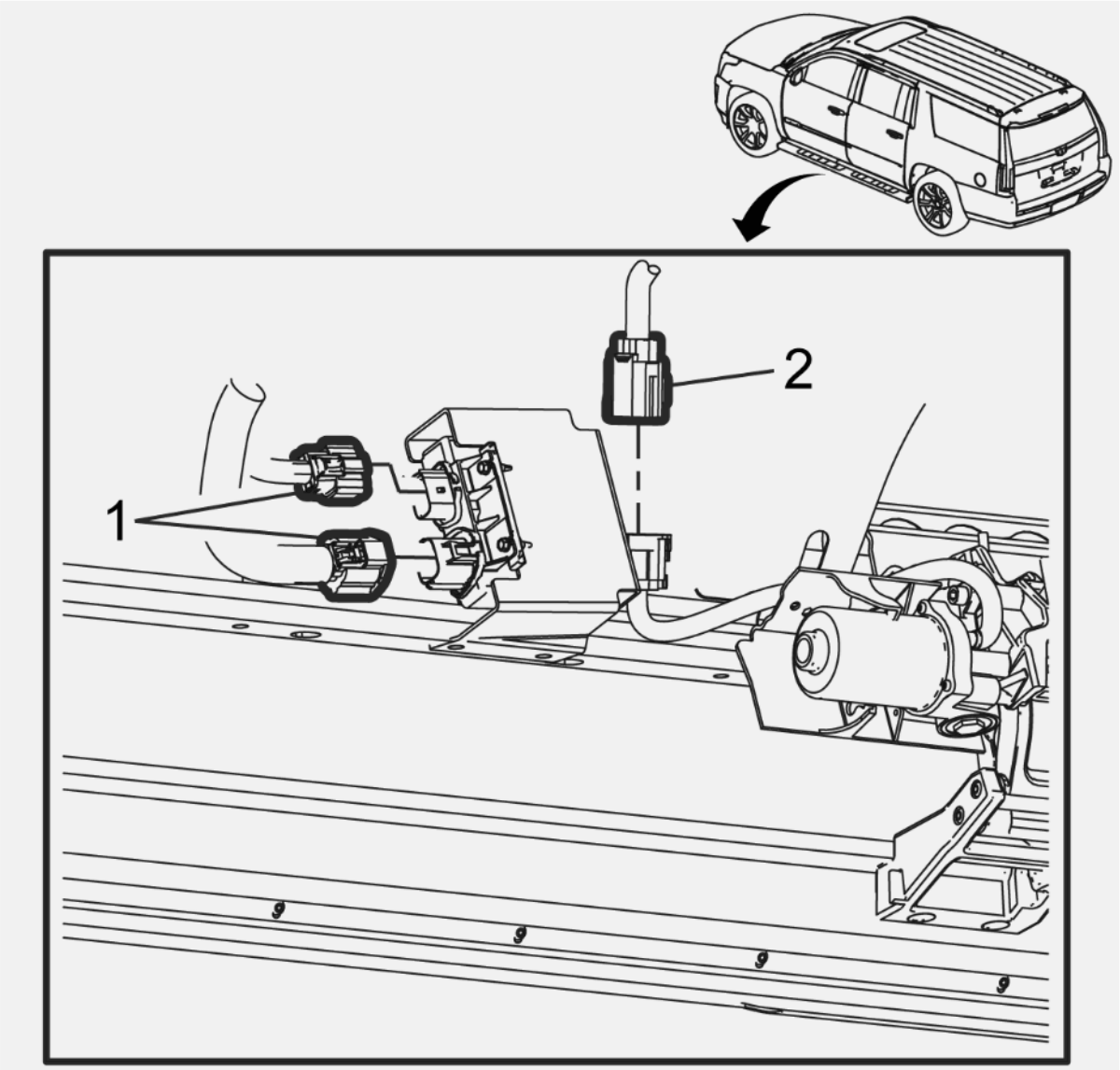


Fig. 67: Assist Step Control Module Connectors
Courtesy of GENERAL MOTORS COMPANY

4. If replacing the left side assist step, disconnect the assist step control module connectors (1).
5. Disconnect the assist step motor connector (2).
6. Disconnect the lighted assist step harness connector.

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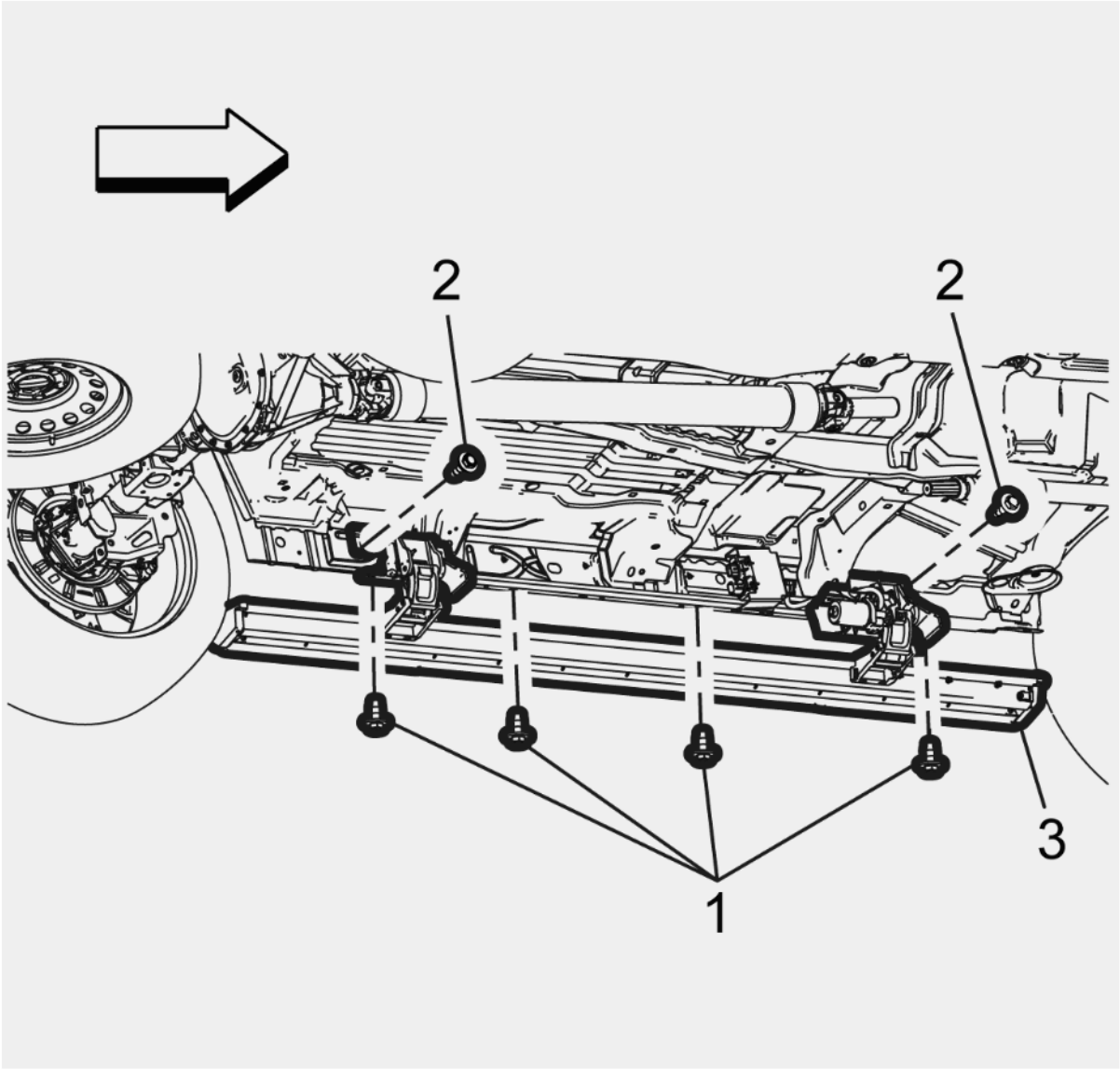


Fig. 68: Assist Step Fasteners
Courtesy of GENERAL MOTORS COMPANY

7. Remove the assist step fasteners (1).
8. Remove the assist step fasteners (2) and remove the assist step assembly (3) from the underbody.

Installation Procedure

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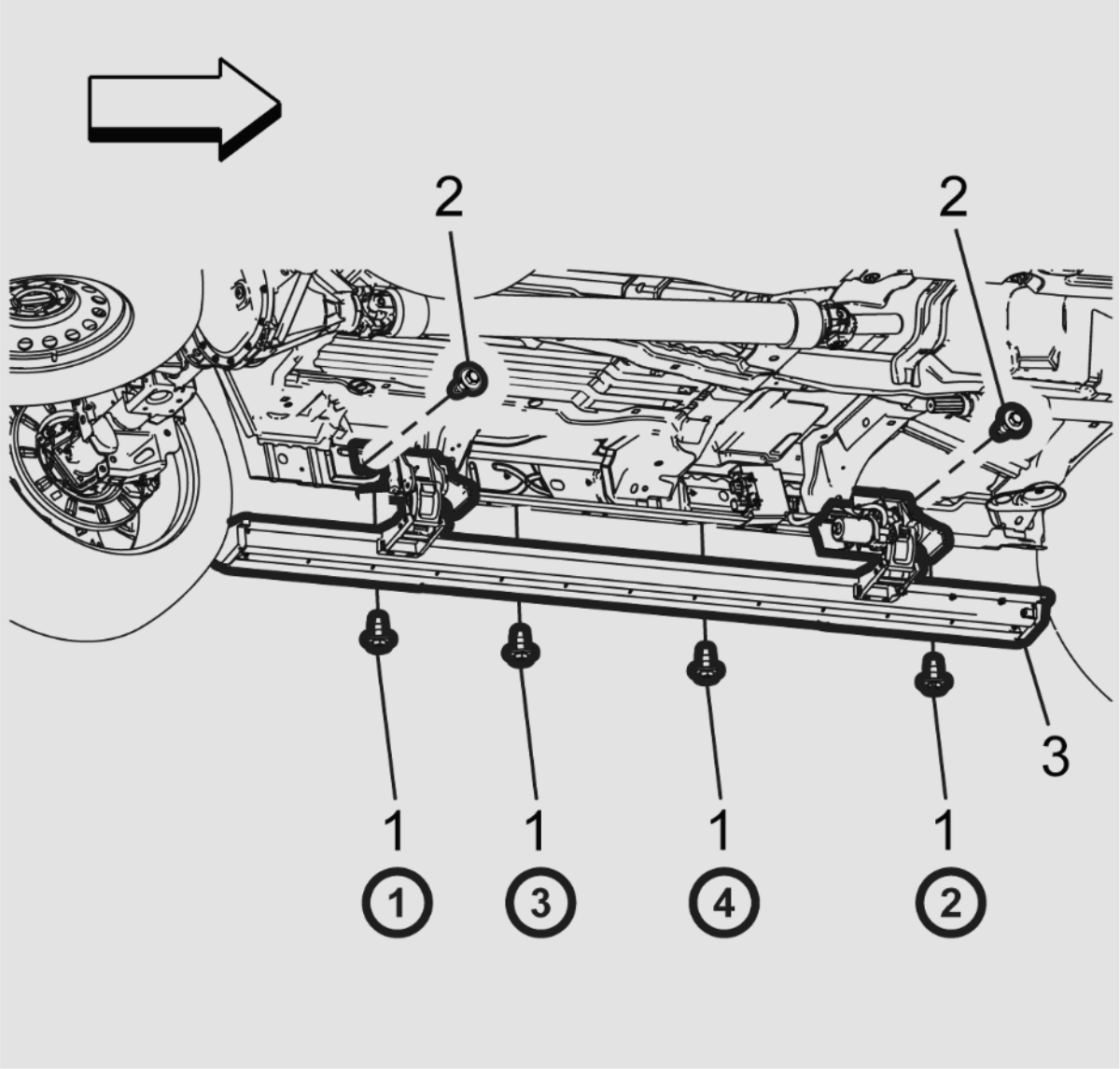


Fig. 69: Assist Step Assembly
Courtesy of GENERAL MOTORS COMPANY

1. Install the assist step assembly (3) to the underbody and loosely tighten the fasteners (2).

CAUTION: Refer to Fastener Caution .

2. Install the fasteners (1) and tighten in the sequence shown to 20 N.m (15 lb ft).
3. Tighten the fasteners (2) to 20 N.m (15 lb ft).

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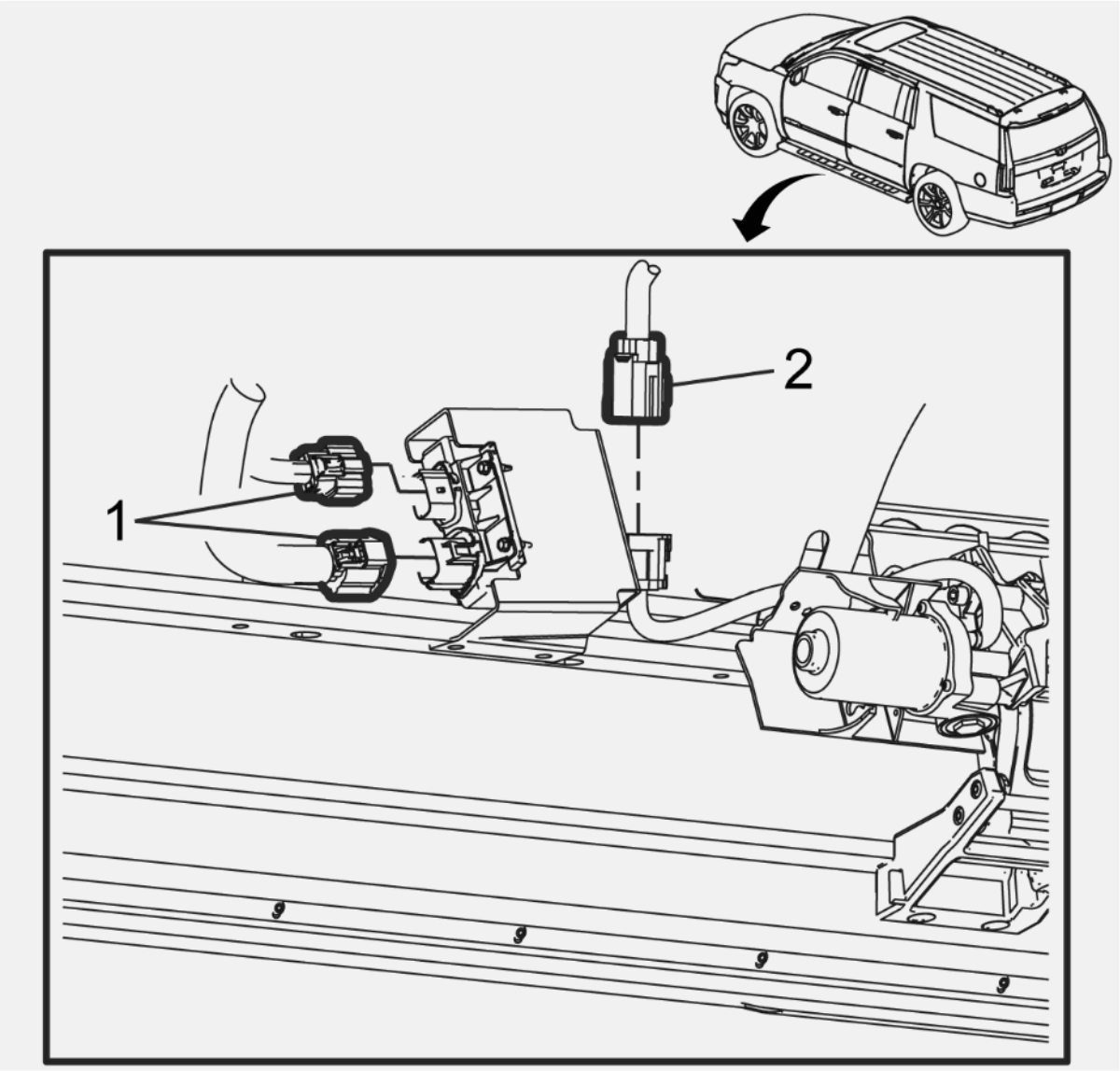


Fig. 70: Assist Step Control Module Connectors
Courtesy of GENERAL MOTORS COMPANY

4. If replacing the left side assist step assembly, connect the assist step control module connectors (1) then connect the assist step motor connector (2).
5. Connect the lighted assist step harness connector.
6. Lower the vehicle.
7. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (L96 LC8)** **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)** **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (L5P)** .

ASSIST STEP REPLACEMENT (BRS - 100 SERIES CREWCAB)

Removal Procedure

1. Deploy the power assist step.
2. Disconnect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L96 LC8)** **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)** **Battery Negative**

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Cable Disconnection and Connection (Dual Battery) Battery Negative Cable Disconnection and Connection (L5P)

3. Raise and support the vehicle. Lifting and Jacking the Vehicle

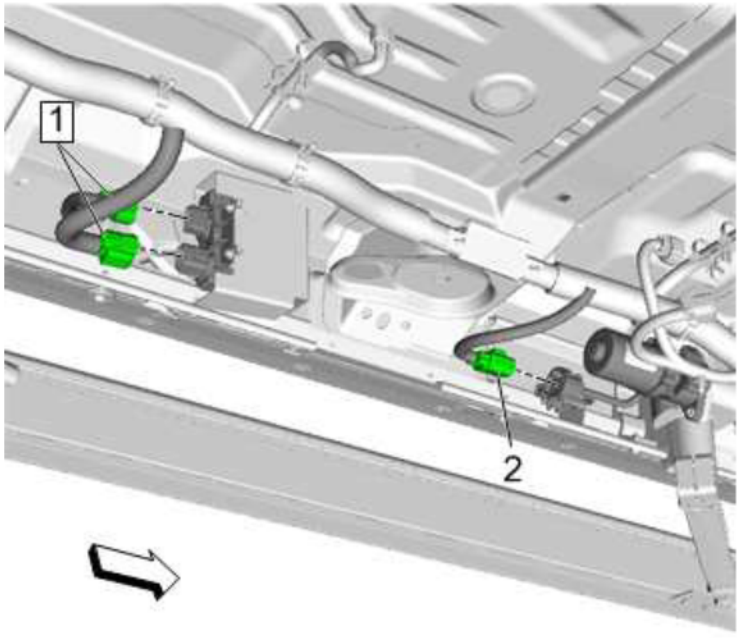


Fig. 71: Assist Step Control Module And Assist Step Motor Connectors
Courtesy of GENERAL MOTORS COMPANY

4. If replacing the left side assist step, disconnect the assist step control module connectors (1).
5. Disconnect the assist step motor connector (2).

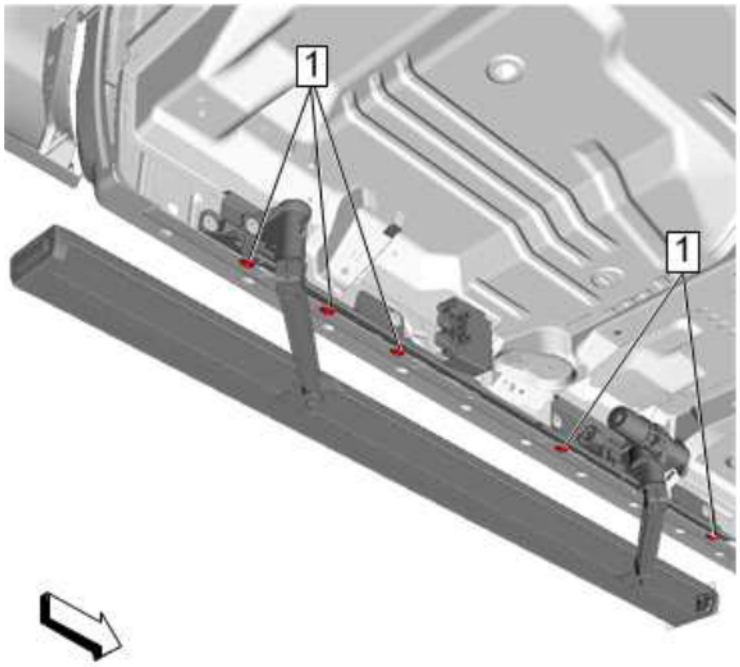


Fig. 72: Assist Step Fastener
Courtesy of GENERAL MOTORS COMPANY

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6. Assist Step Fastener 1 - Remove

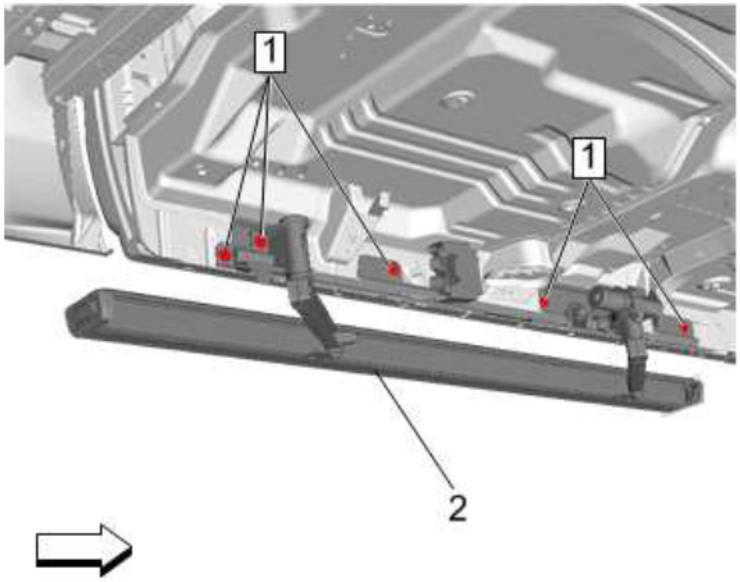


Fig. 73: Assist Step
Courtesy of GENERAL MOTORS COMPANY

7. Assist Step Fastener 1 - Remove
8. Assist Step 2 - Remove

Installation Procedure

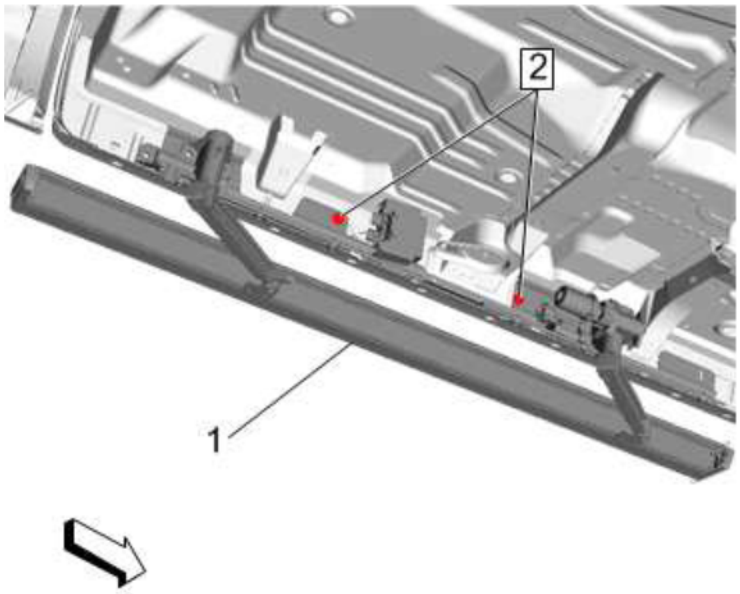


Fig. 74: Assist Step
Courtesy of GENERAL MOTORS COMPANY

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1. Assist Step 1 - Install
2. Assist Step Fastener 2 - Loosely install

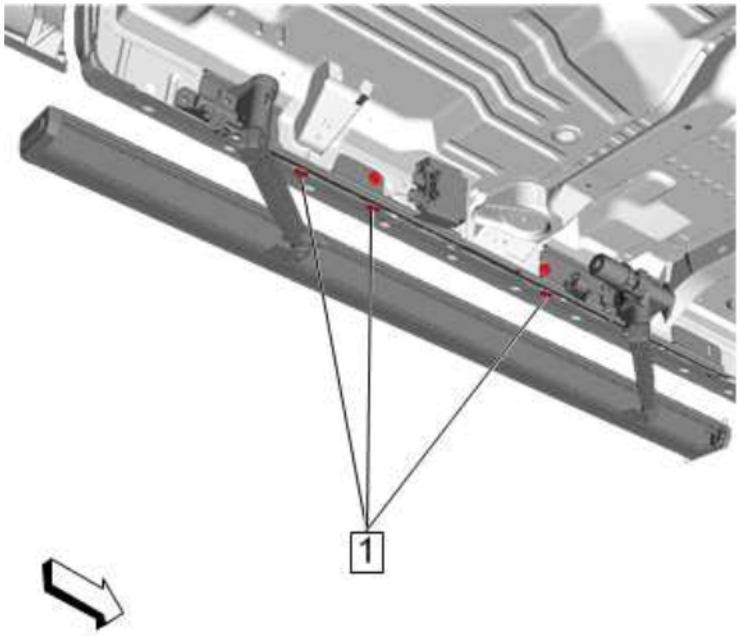


Fig. 75: Assist Step Fastener
Courtesy of GENERAL MOTORS COMPANY

3. Assist Step Fastener 1 - Loosely install

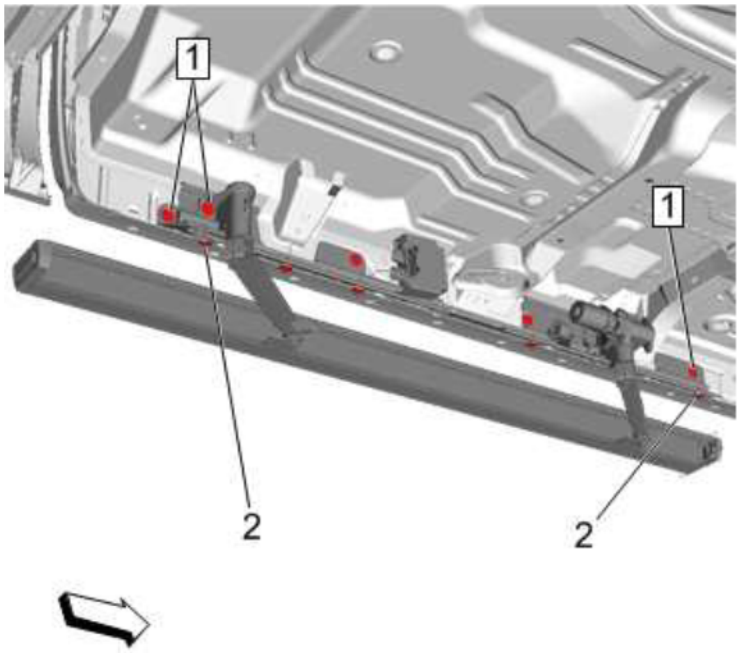


Fig. 76: Assist Step Fastener
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

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4. Assist Step Fastener 1 - Install and tighten 22 N.m (16 lb ft)
5. Assist Step Fastener 2 - Install and tighten 22 N.m (16 lb ft)

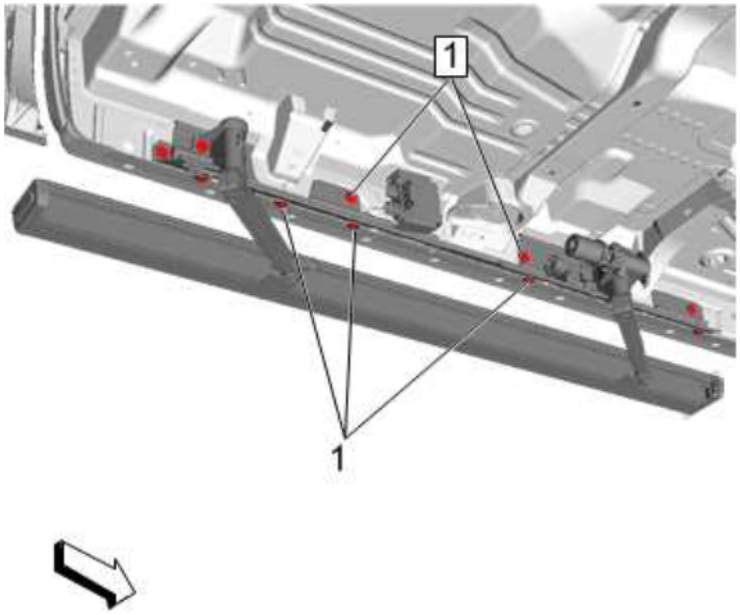


Fig. 77: Assist Step Fastener
Courtesy of GENERAL MOTORS COMPANY

6. Assist Step Fastener 1 - Tighten 22 N.m (16 lb ft)
7. Lower the vehicle.
8. Connect the negative battery cable. **Battery Negative Cable Disconnection and Connection (L96 LC8)** **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)** **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (L5P)**

ASSIST STEP PAD REPLACEMENT (BRS)

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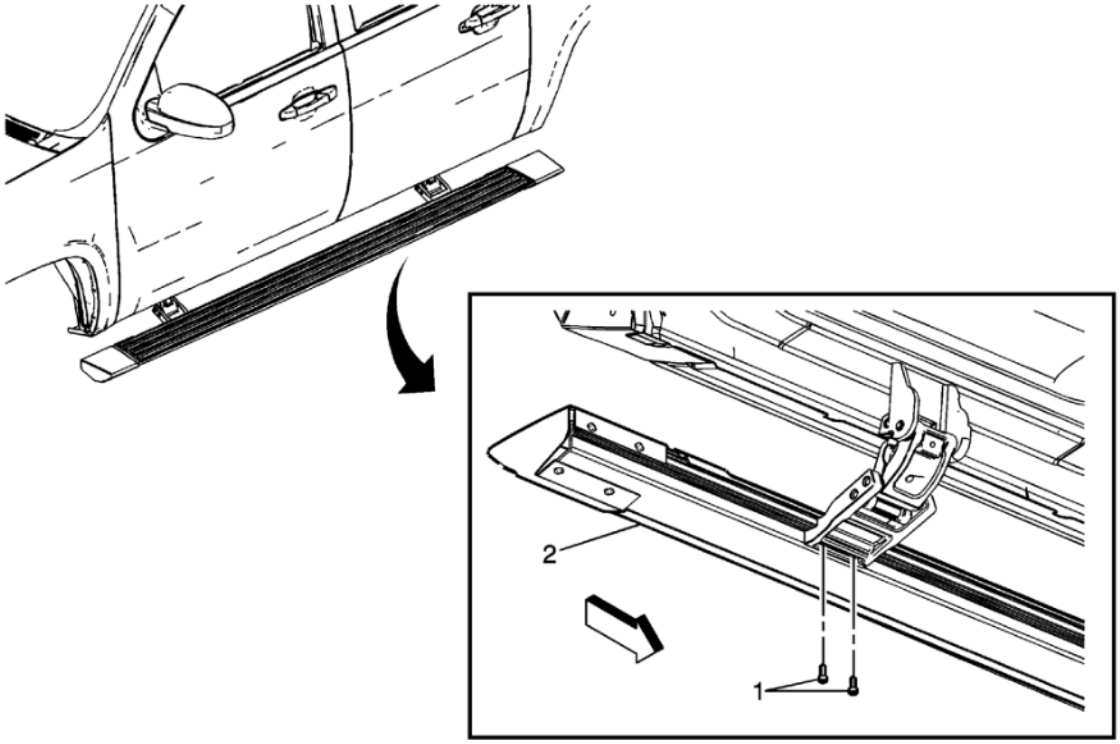


Fig. 78: Assist Step Pad (BRS)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Preliminary Procedures

1. Deploy the power assist step. If the motor fails to deploy perform the following.

   Remove the two plastic shield cover screws and cover on the side of the motor assembly.

   Remove the motor housing screws and housing cover from the motor assembly.

   Rotate the armature by hand to fully extend the assist step.

2. Disconnect the battery negative cable. Refer to **Battery Negative Cable Disconnection and Connection (L96 LC8)** **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)** **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (L5P)** .
3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
4. Mark the location of the front T-slotted bracket and measure to the front of the assist step with a grease pencil and tape measure.
5. Transfer the measurement to the new assist step with the grease pencil and tape measure.
6. Disconnect the lighted assist step harness connector and remove the two fasteners holding the harness to the assist step bracket.
7. Mark the location of the rear T-slotted bracket and measure to the rear of the assist step with a grease pencil and tape measure.
8. Transfer the measurement to the new assist step with the grease pencil and tape measure.

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ASSIST STEP FRONT BRACKET REPLACEMENT (BRS)

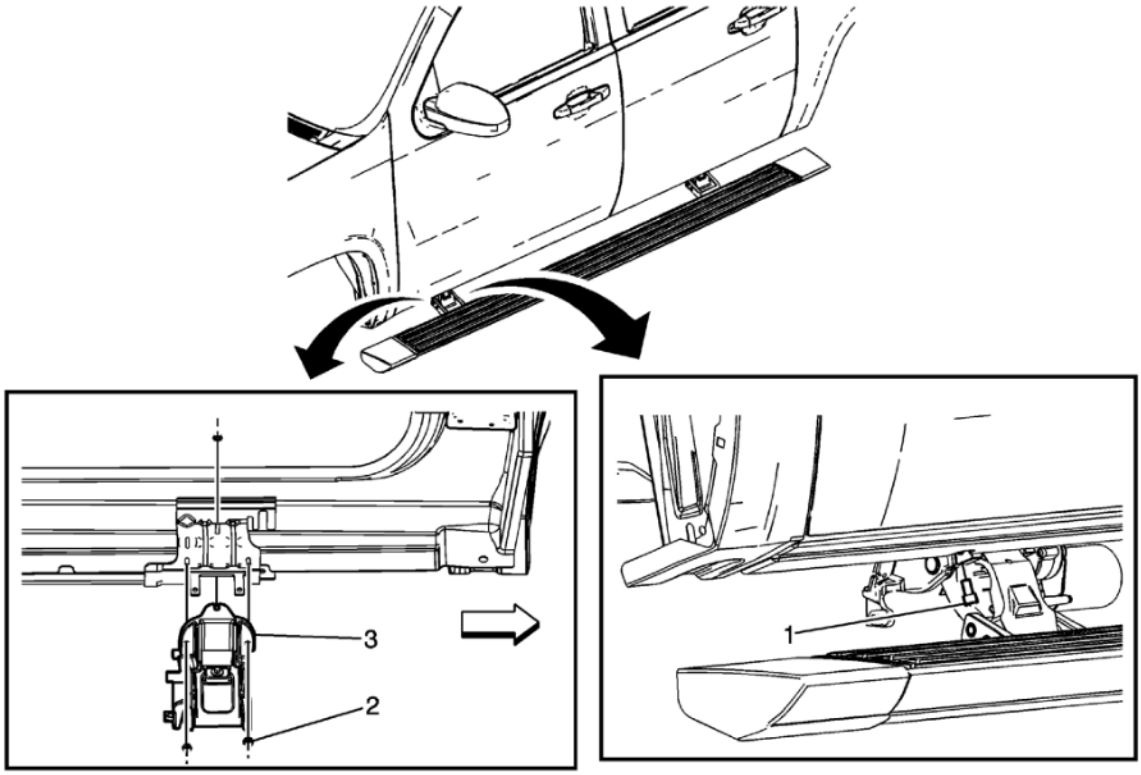


Fig. 79: Assist Step Front Bracket (BRS)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Deploy and support the power assist step. 2. Disconnect the battery negative cable. Refer to **Battery Negative Cable Disconnection and Connection (L96 LC8)** **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)** **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (L5P)** . 3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** . 4. Use a grease pencil to outline the location of the power assist step front bracket location on the power assist step. 5. Remove the power assist front bracket to power assist step bolts. Refer to **Assist Step Replacement (Assembly - BRS)Assist Step Replacement (BRS - 100 Series Crewcab)** 6. Remove the power assist step motor. Refer to **Assist Step Motor Replacement (BRS)**. 7. Disconnect the lighted assist step harness and support the assist step with a suitable jack.	
1	Power Assist Step Front Bracket Bolts (Qty: 2) **CAUTION:** **Refer to** **Fastener**

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Callout	Component Name
	Caution . **Tighten** 6 N.m (53 lb in)
2	Power Assist Step Front Bracket Nuts (Qty: 3) **Tighten** 10 N.m (89 lb in)
3	Power Assist Step Front Bracket

ASSIST STEP CENTER BRACKET REPLACEMENT (BRS)

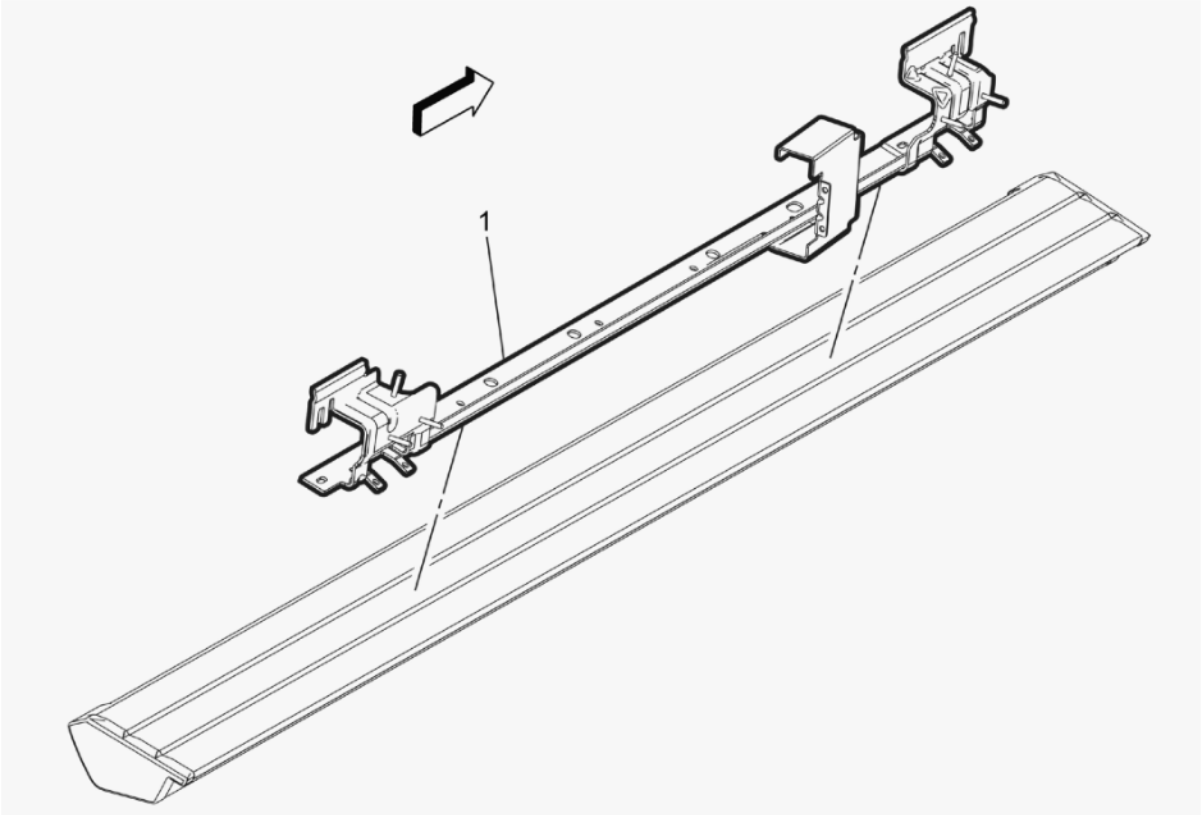


Fig. 80: Assist Step Center Bracket (BRS)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Deploy and support the power assist step. 2. Remove the assist step assembly. Refer to **Assist Step Replacement (Assembly - BRS)Assist Step Replacement (BRS - 100 Series Crewcab)**.	
1	Assist Step Center Bracket **Procedure** Transfer parts as necessary.

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ASSIST STEP REAR BRACKET REPLACEMENT (BRS)

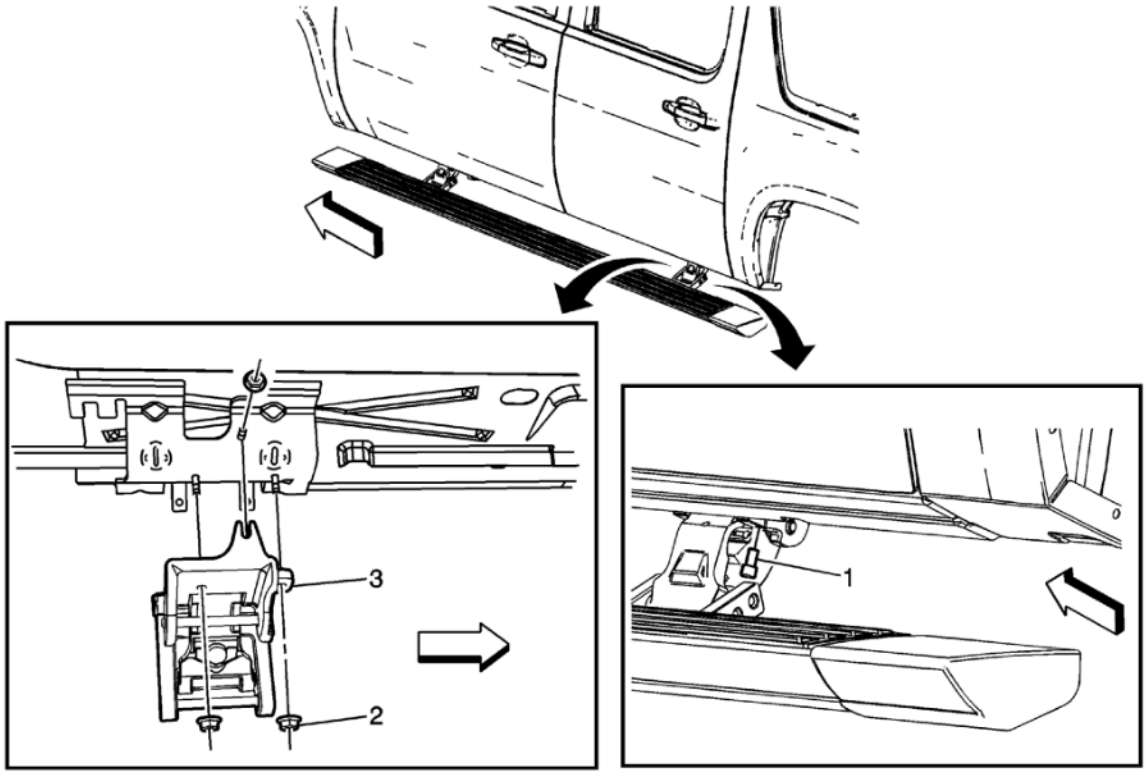


Fig. 81: Assist Step Rear Bracket (BRS)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Deploy the power assist step. 2. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (L96 LC8)** **Battery Negative Cable Disconnection and Connection (L83, L8B, LV3)** **Battery Negative Cable Disconnection and Connection (Dual Battery)** **Battery Negative Cable Disconnection and Connection (L5P)** . 3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** . 4. Use a grease pencil to outline the location of the power assist step rear bracket location on the power assist step. 5. Remove the power assist rear bracket to power assist step bolts and support the assist step with a suitable jack. Refer to **Assist Step Replacement (Assembly - BRS)Assist Step Replacement (BRS - 100 Series Crewcab)**	
1	Power Assist Step Rear Bracket Bolts (Qty: 2) **CAUTION:** **Refer to** **Fastener Caution** .

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Callout	Component Name
	Tighten 6 N.m (53 lb in)
2	Power Assist Step Rear Bracket Nuts (Qty: 3) **Tighten** 10 N.m (89 lb in)
3	Power Assist Step Rear Bracket

ASSIST STEP CONTROL MODULE REPLACEMENT (BRS)

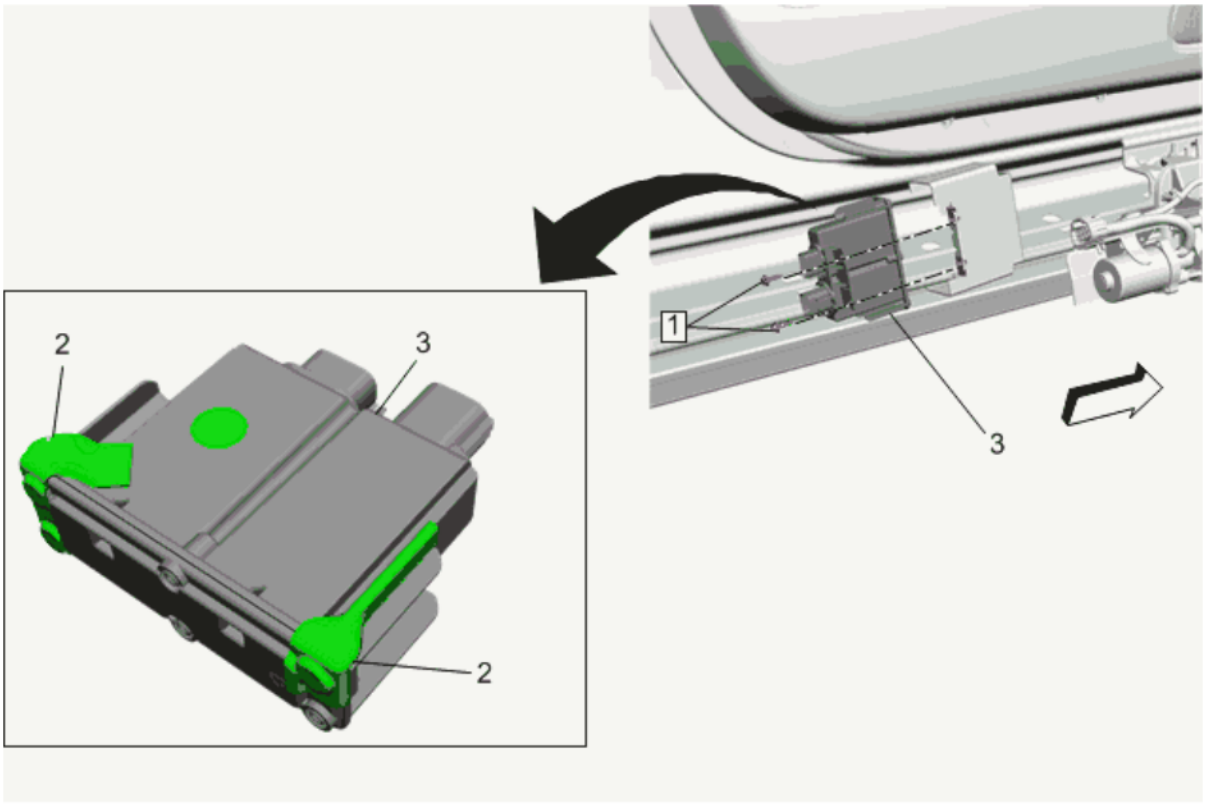


Fig. 82: Assist Step Control Module (BRS)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Power Assist Step Controller Bolt (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 6 N.m (53 lb in)

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Callout	Component Name
2	Insulating Foam Tape **NOTE:** **Do not apply foam tape to the label side of the module.**
3	Power Assist Step Controller **Procedure** 1. Disconnect any electrical connectors. 2. Reprogram the new controller if necessary. Refer to **Control Module References** .

ASSIST STEP SWITCH REPLACEMENT (BRS)

Removal Procedure

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**

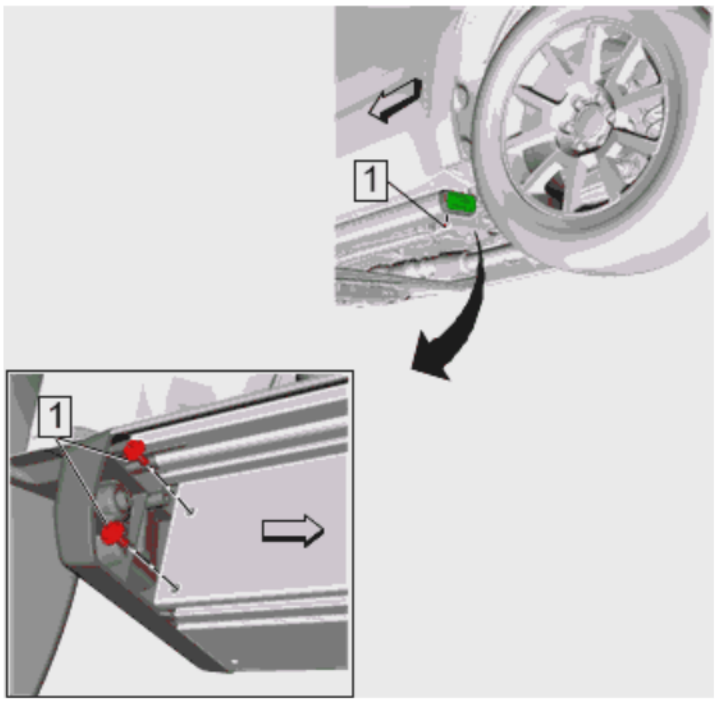


Fig. 83: Assist Step End Cap Fastener
Courtesy of GENERAL MOTORS COMPANY

2. Assist Step End Cap Fastener 1 - Remove

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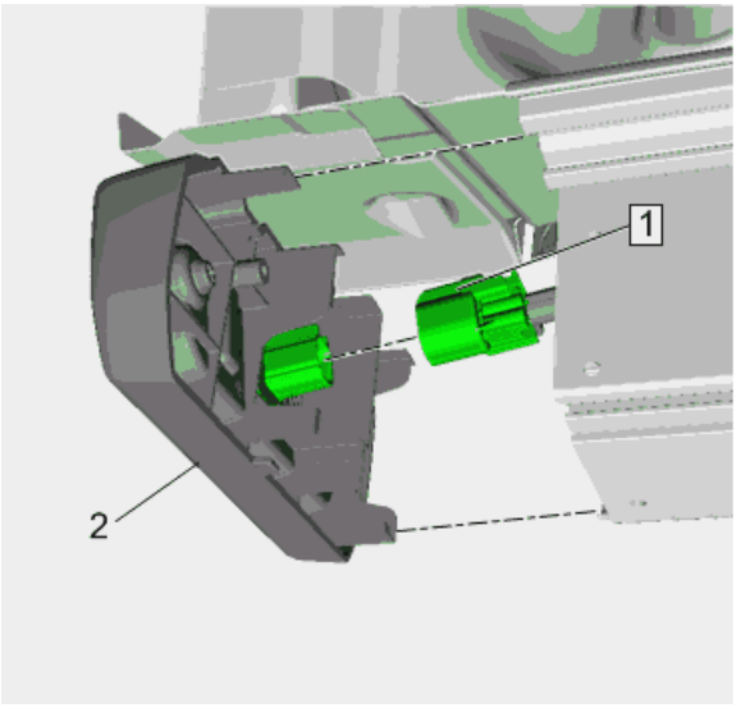


Fig. 84: Electrical Connector
Courtesy of GENERAL MOTORS COMPANY

3. Electrical Connector 1 - Disconnect
4. Remove the assist step end cap 2

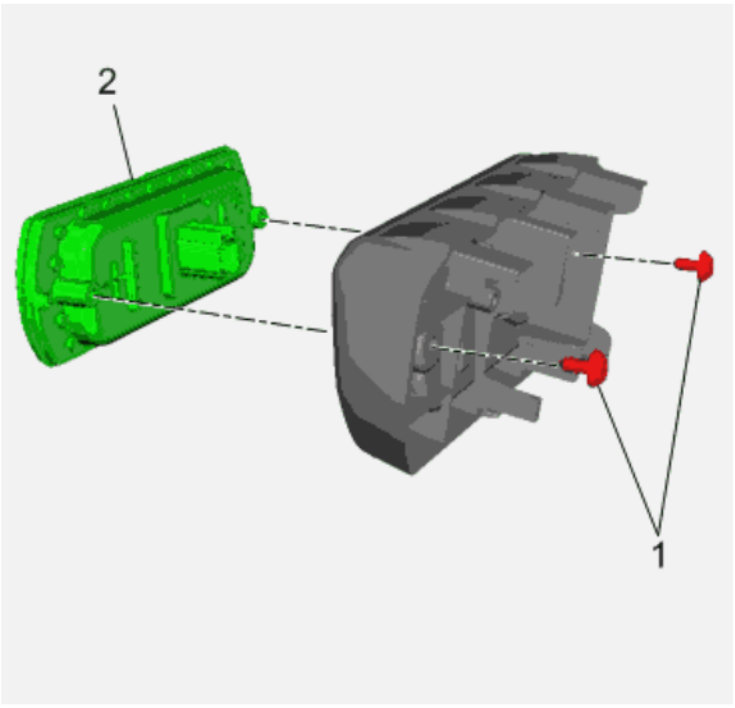


Fig. 85: Kick Switch
Courtesy of GENERAL MOTORS COMPANY

5. Kick Switch Fastener 1 - Remove
6. Kick Switch 2 - Remove

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Installation Procedure

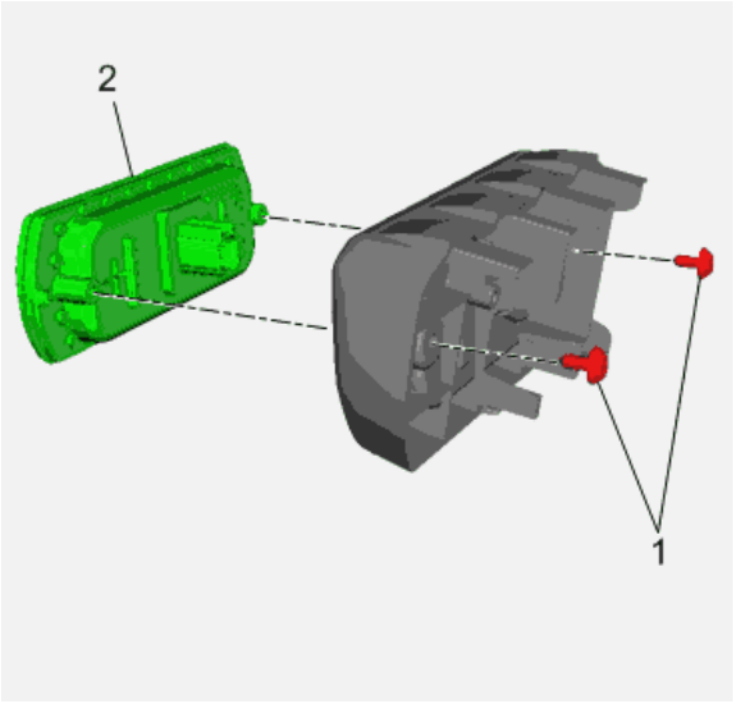


Fig. 86: Kick Switch
Courtesy of GENERAL MOTORS COMPANY

1. Kick Switch 2 - Install

CAUTION: Refer to Fastener Caution

2. Kick Switch Fastener 1 - Install and tighten 2.5 N.m (22 lb in)

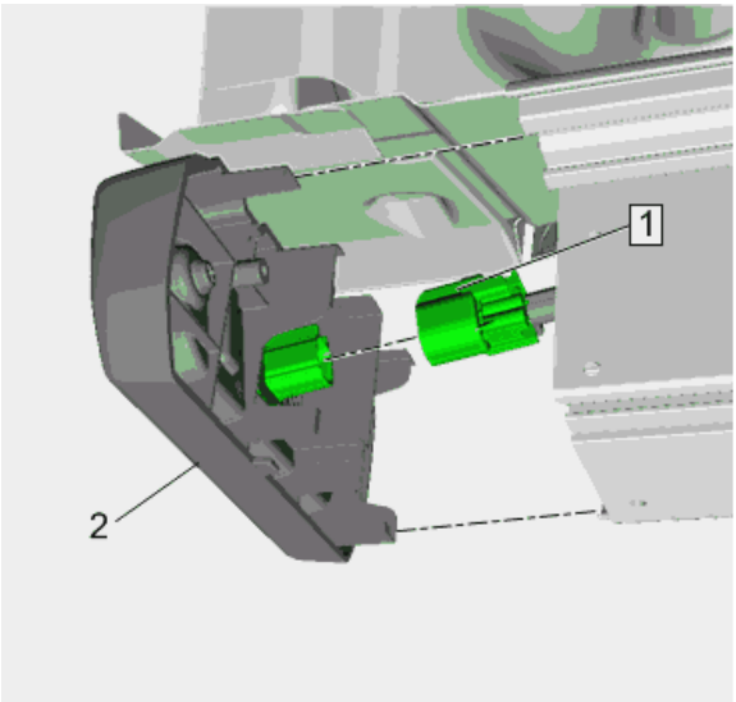


Fig. 87: Electrical Connector

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Courtesy of GENERAL MOTORS COMPANY

3. Electrical Connector 1 - Connect
4. Install the assist step end cap 2

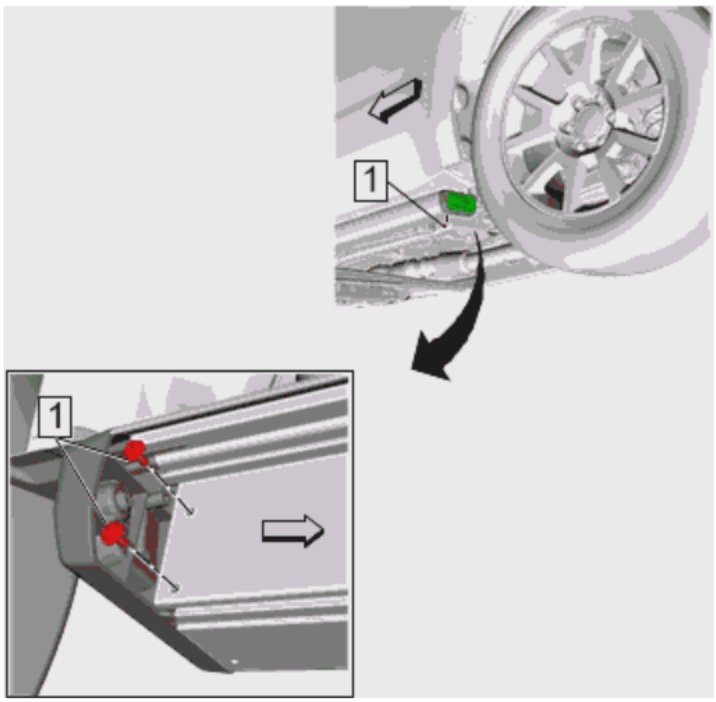


Fig. 88: Assist Step End Cap Fastener
Courtesy of GENERAL MOTORS COMPANY

5. Assist Step End Cap Fastener 1 - Install and tighten 2.5 N.m (22 lb in)
6. Lower the vehicle.

ASSIST STEP MOTOR REPLACEMENT (BRS)

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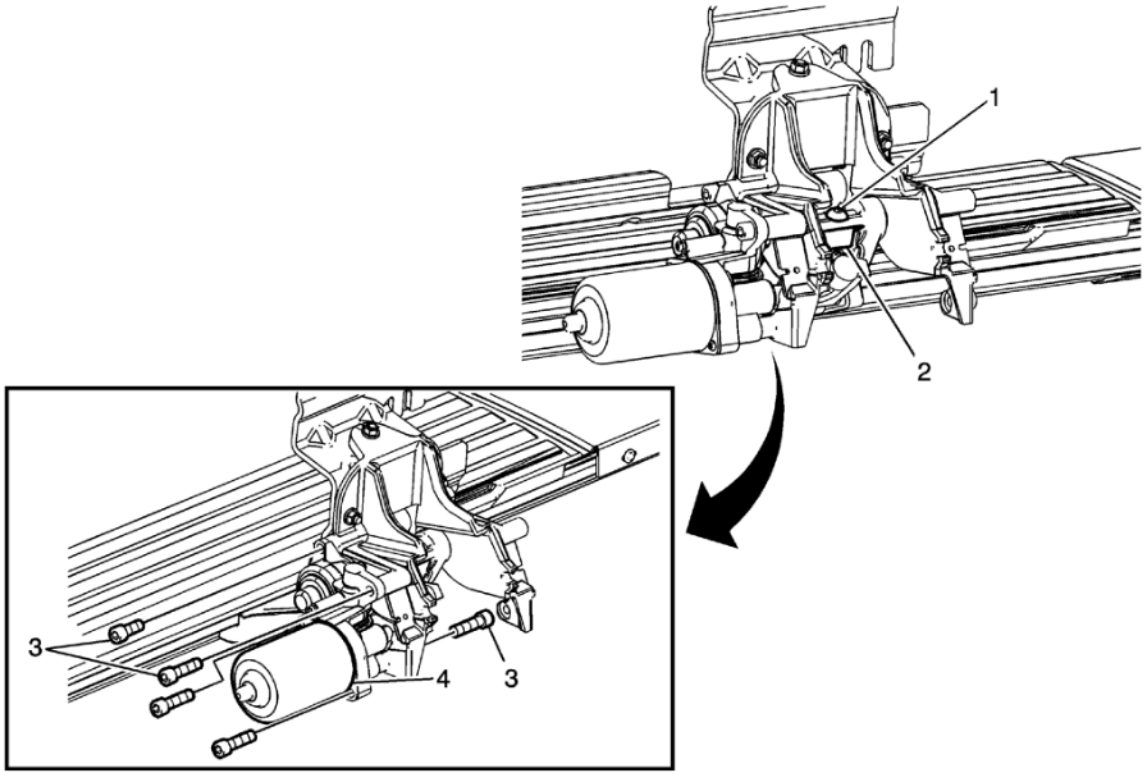


Fig. 89: Assist Step Motor (BRS)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Deploy the power assist step. If the motor fails to deploy perform the following. 1. Remove the two plastic shield cover screws and cover on the side of the motor assembly. 2. Remove the motor housing screws and housing cover from the motor assembly. 3. Rotate the armature by hand to fully extend the assist step. 2. Remove the two motor cover bolts. 3. Disconnect any electrical connectors. 4. Remove the three motor bolts. 5. Remove the wedge bolt and wedge. 6. Loosen the link nuts, but Do Not Remove. 7. Pull the motor inboard and rearward in order to clear the weld joint. 8. Remove the motor.	
1	Assist Step Motor Wedge Bolt **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Tighten 8 N.m (71 lb in)
2	Assist Step Motor Wedge
3	Assist Step Motor Bolt (Qty: 3) **Tighten** 12 N.m (9 lb ft)
4	Assist Step Motor **Procedure** 1. Pull the motor inboard and wiggle forward to position and install the motor in place. 2. Install the two link bolts. 3. Tighten the three link nuts. 4. Install the motor bolts. 5. Install the wedge and wedge bolt. The wedge shape should point upward and outward to position correctly. 6. Install the cover and two motor cover bolts. • Make sure the flat on the motor is parallel to the floor before installing. All new motors should be shipped with motor flat in the correct position. As the motor is installed shake the board up and down gently to make sure the wedge and flat seat together correctly or unwanted noise could result. • Once the installation of the new motor is completed the assist step must be cycled once for the module to learn the positioning.

TRAILER HITCH PLATFORM REPLACEMENT (LIGHT DUTY - WITH Z82)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the spare tire. Refer to **Spare Wheel Hoist Replacement** .
3. Support the trailer hitch with a suitable jack.

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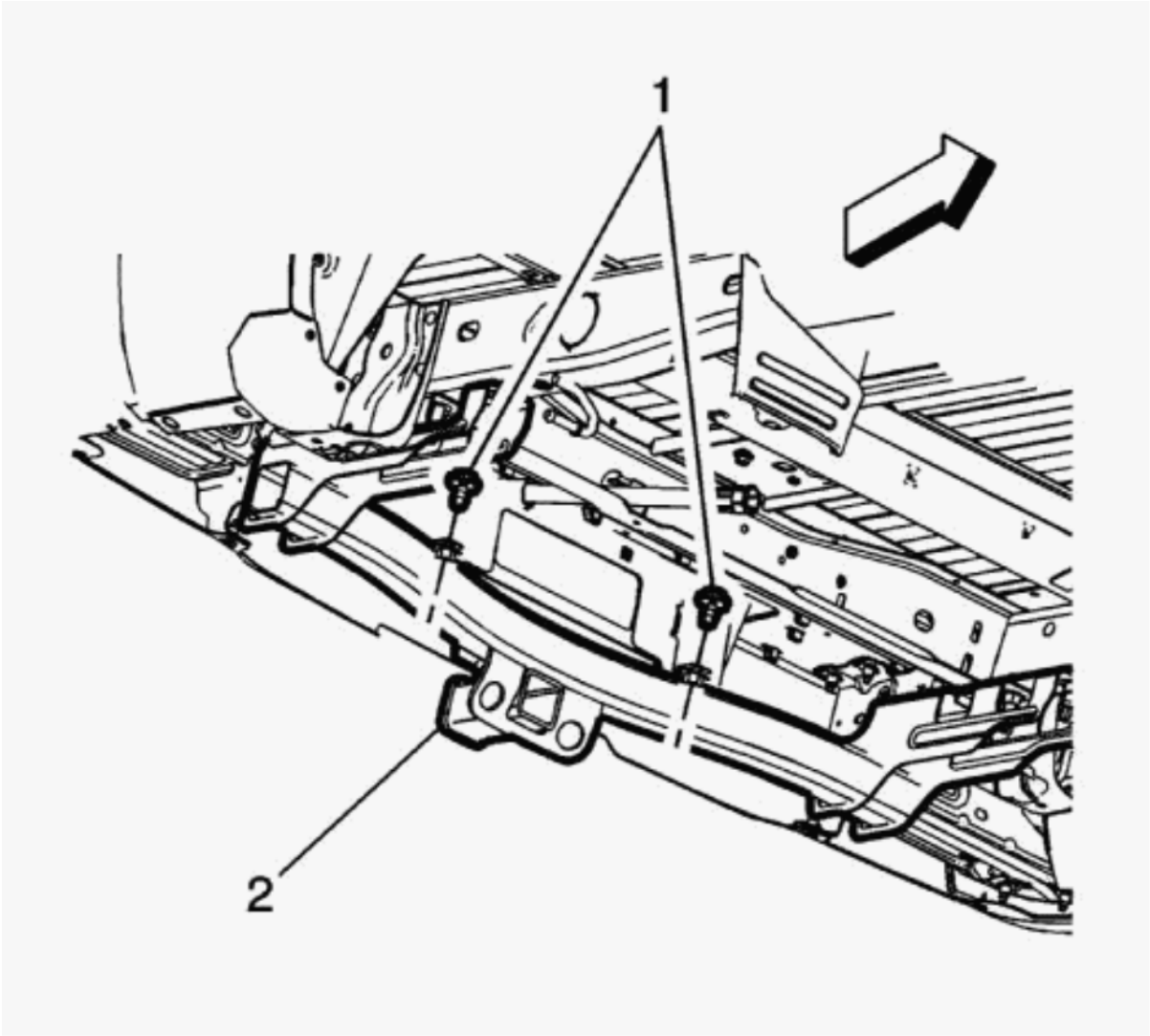


Fig. 90: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

4. Remove the rear bumper bar fasteners (1) to the trailer hitch (2).

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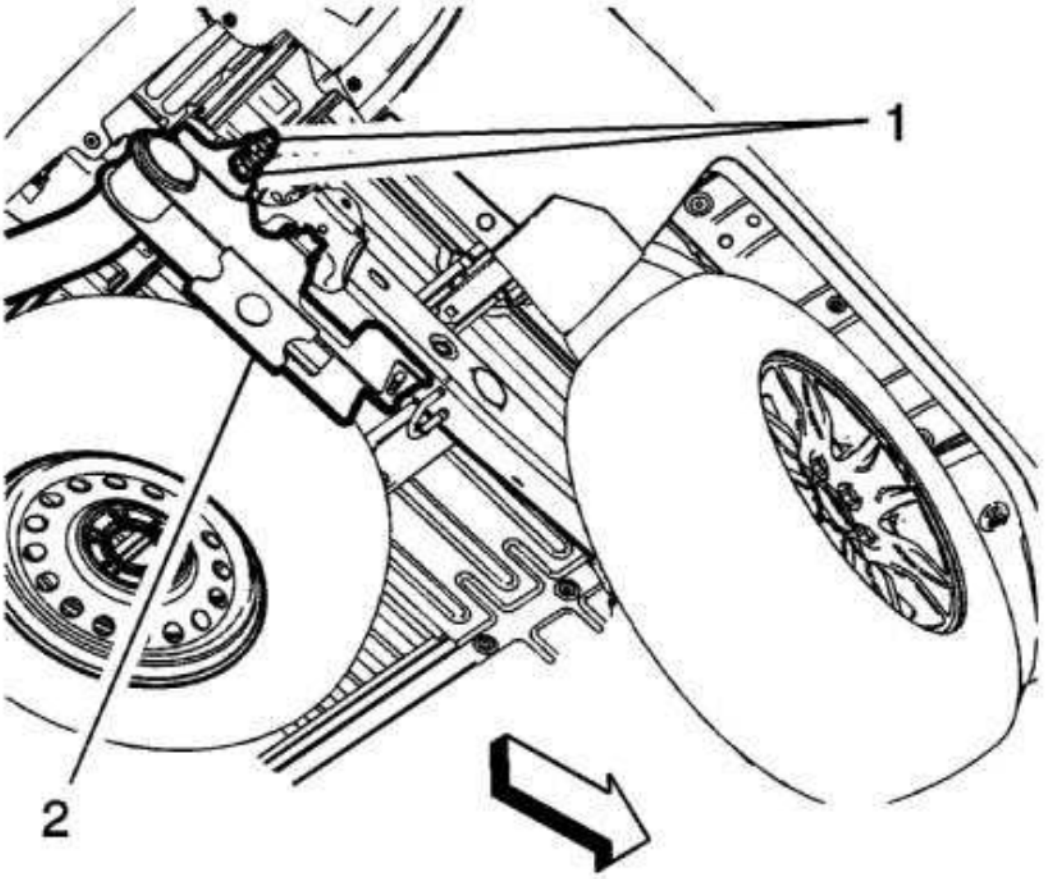


Fig. 91: Securing Trailer Hitch Platform To Right Frame Rail
Courtesy of GENERAL MOTORS COMPANY

5. Remove the nuts (1), securing the trailer hitch platform (2), to the right frame rail.

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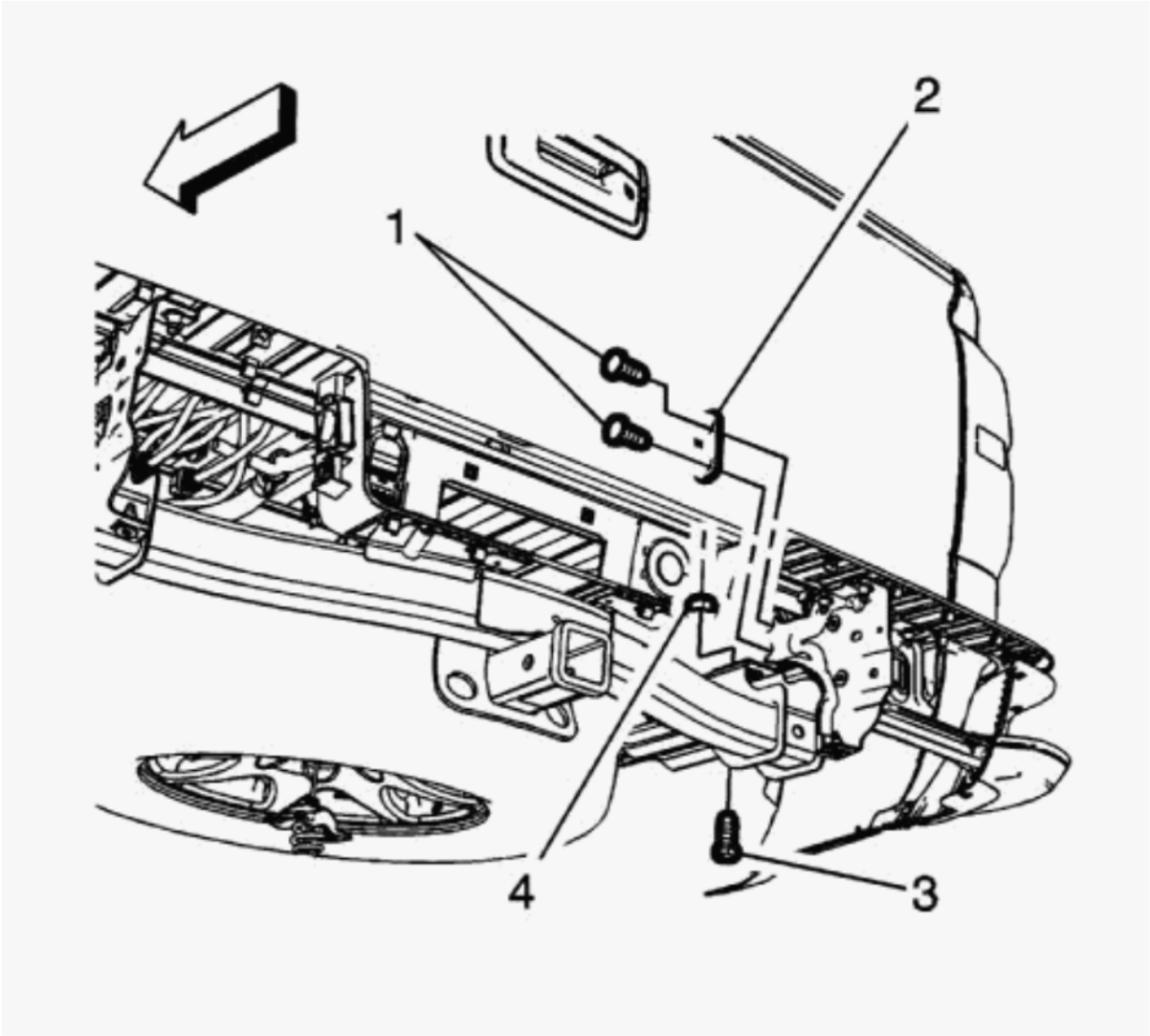


Fig. 92: Through Bolts And Retainer Plate
Courtesy of GENERAL MOTORS COMPANY

6. Remove the through bolts (1) along with the retainer plate (2).
7. Remove the trailer hitch mounting bolt (3) and nut (4), from the right frame rail.

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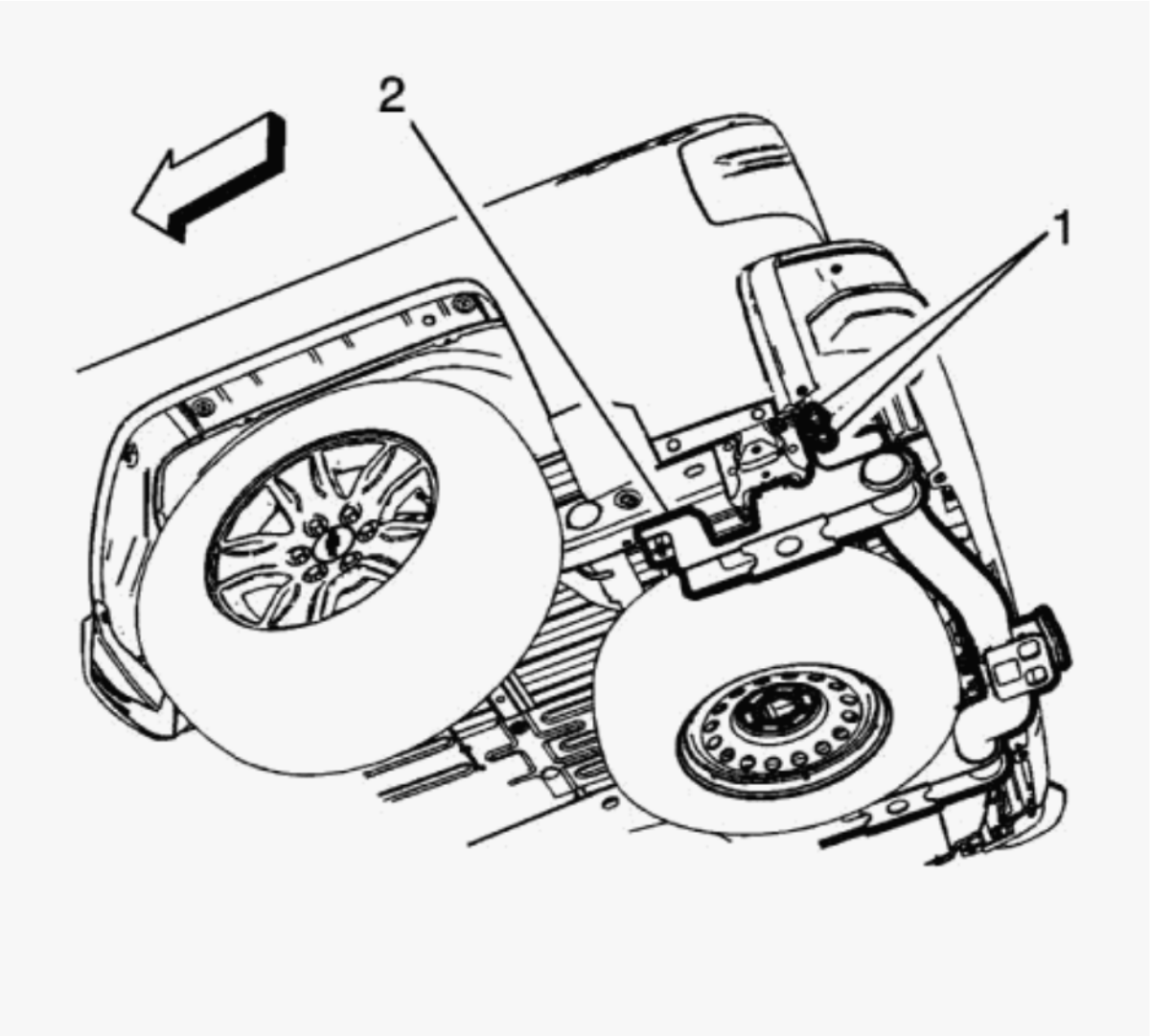


Fig. 93: Securing Trailer Hitch Platform
Courtesy of GENERAL MOTORS COMPANY

8. Remove the nuts (1) securing the trailer hitch platform (2) to the left frame rail.

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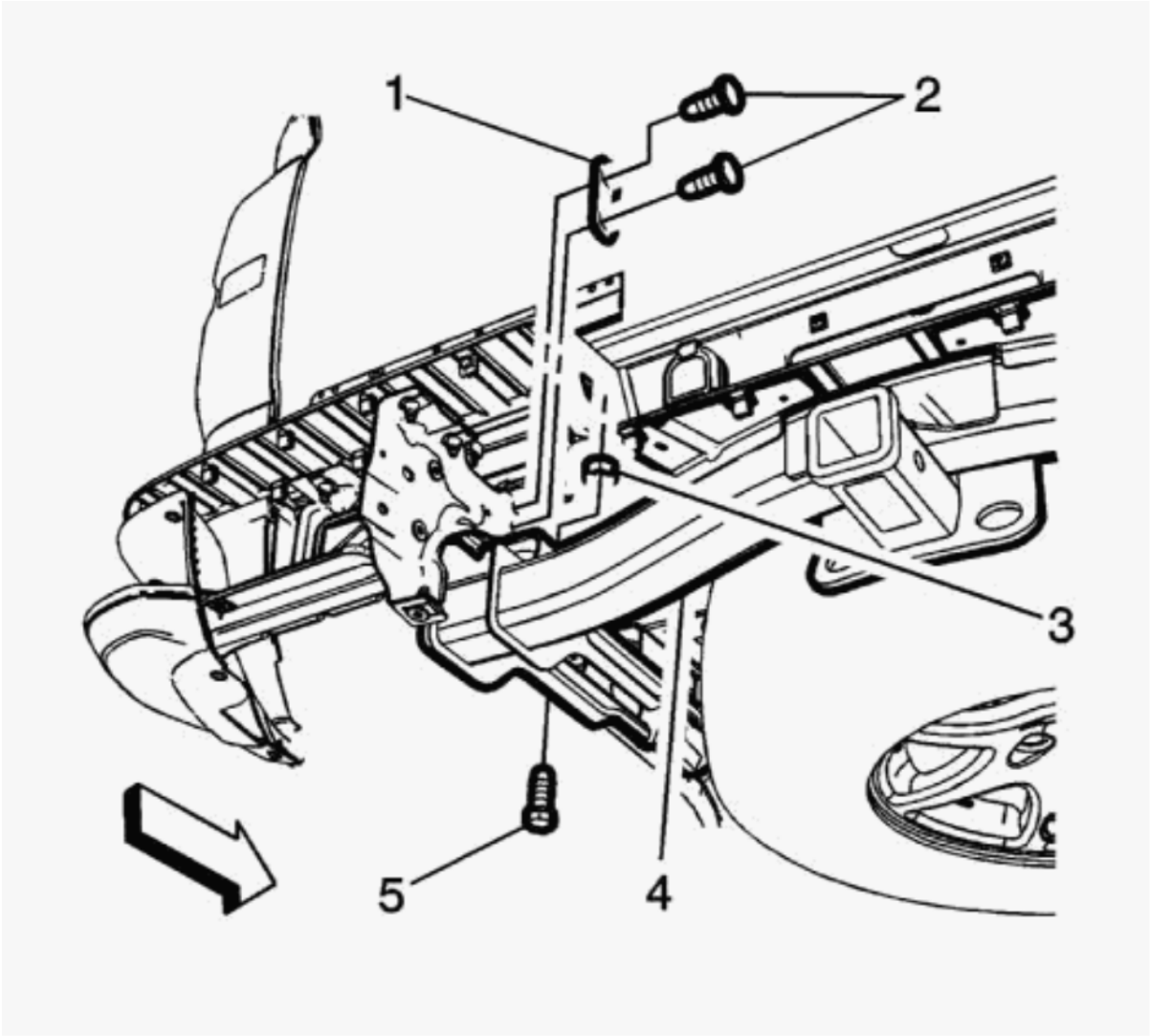


Fig. 94: Through Bolts And Retaining Plate
Courtesy of GENERAL MOTORS COMPANY

9. Remove the through bolts (2) and the retaining plate (1) from the left frame rail.
10. Remove the trailer hitch (4) mounting bolt (5) and nut (3) from the left frame rail.

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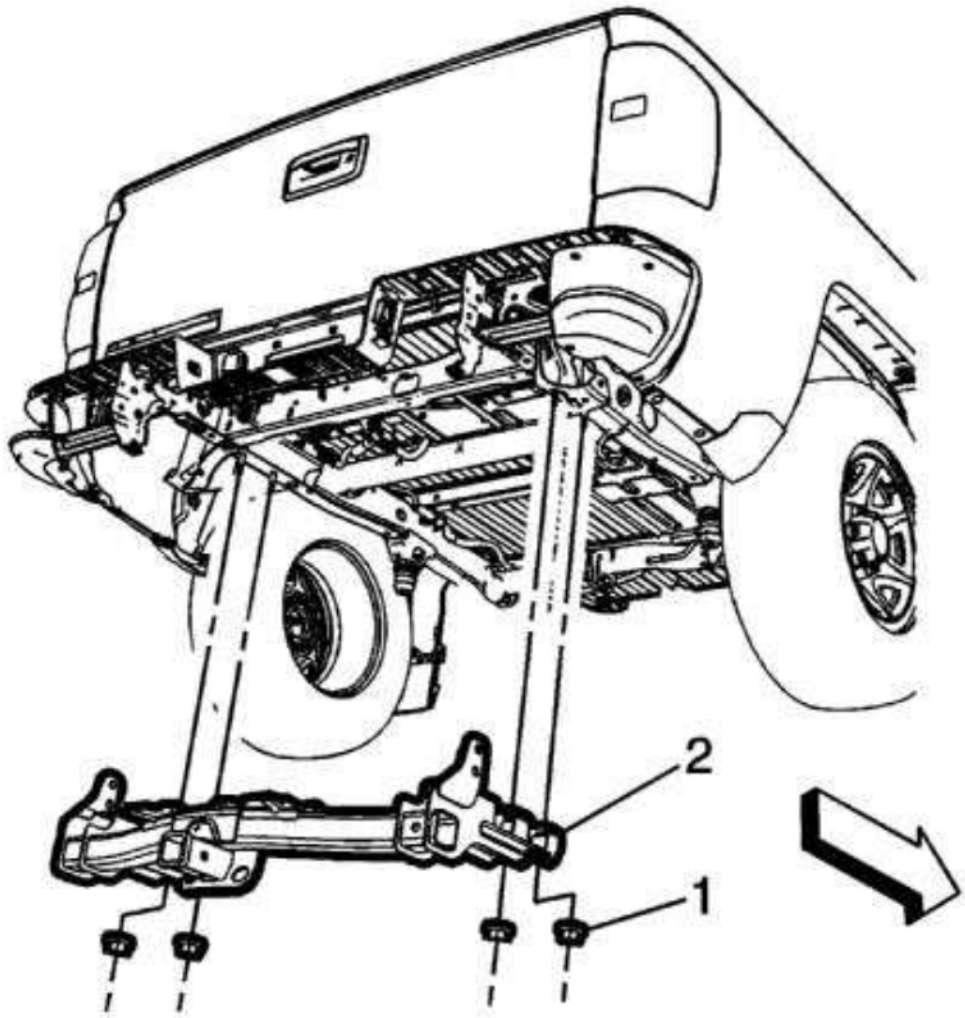


Fig. 95: Remaining Mounting Nuts And Lower Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

11. Remove the 4 remaining mounting nuts (1) and lower the trailer hitch (2).

Installation Procedure

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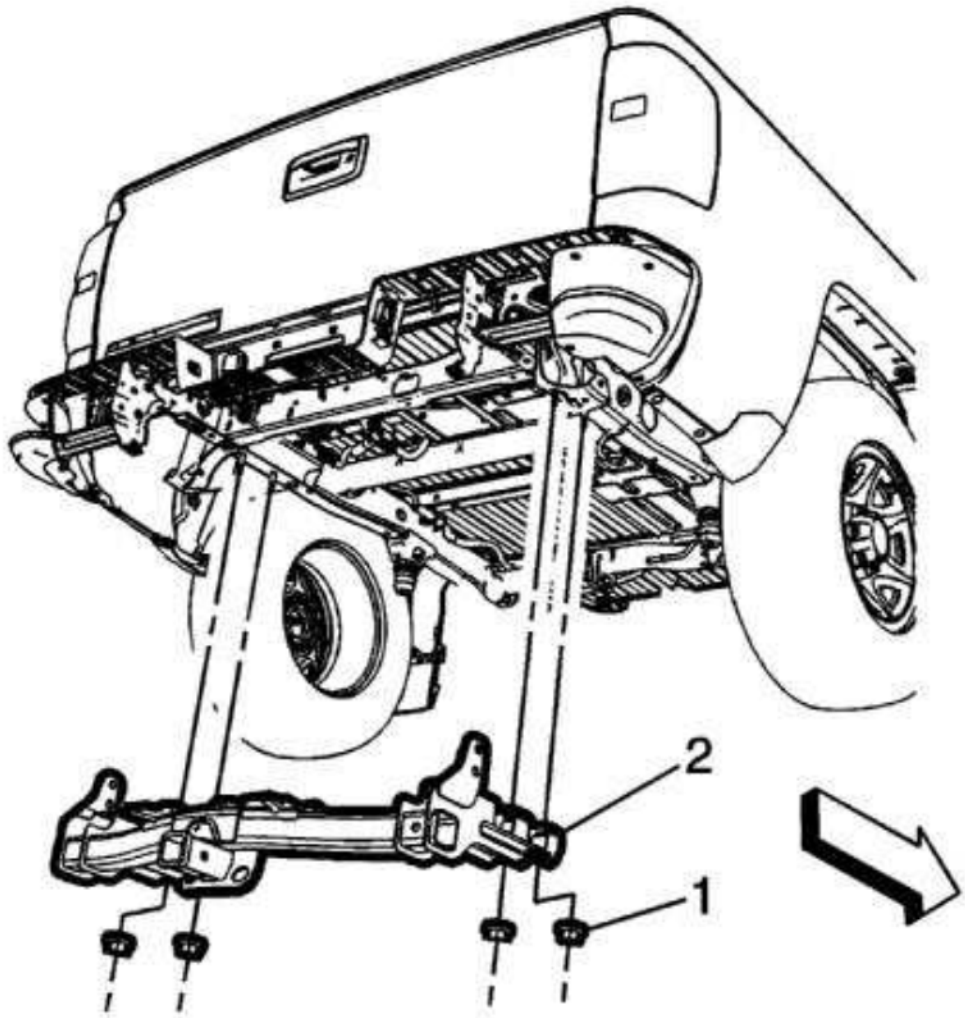


Fig. 96: Remaining Mounting Nuts And Lower Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

1. Position the trailer hitch platform (2) to the vehicle.

CAUTION: **Refer to Fastener Caution .**

2. Install the trailer hitch platform mounting nuts (1) and tighten to 112 N.m (83 lb ft).

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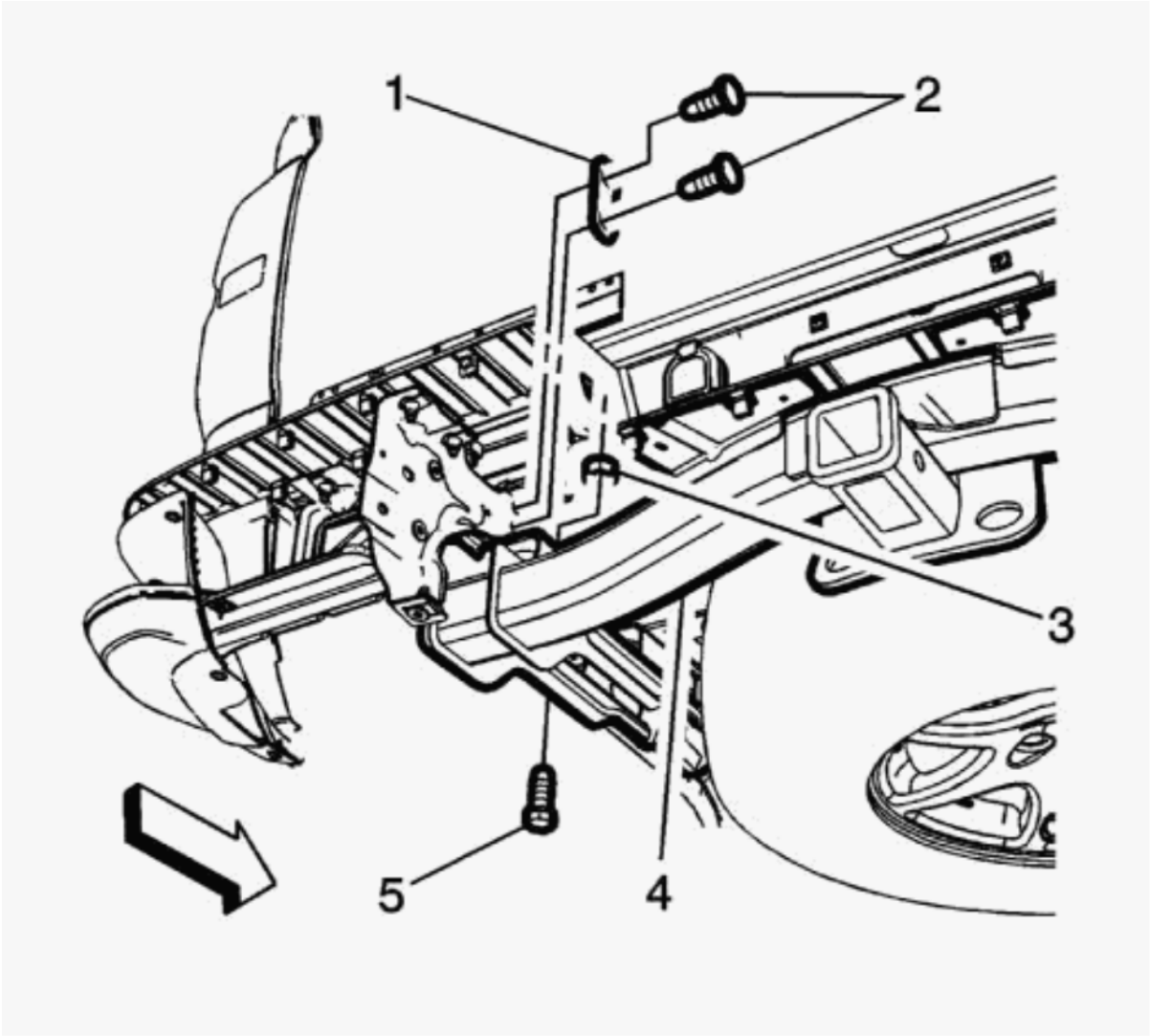


Fig. 97: Through Bolts And Retaining Plate
Courtesy of GENERAL MOTORS COMPANY

3. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry. 4
4. Apply thread locking adhesive to the bolt.4 - **Adhesives, Fluids, Lubricants, and Sealers**
5. Install the trailer hitch mounting bolt (5) and nut (3) to the left side frame rail and tighten to 140 N.m (103 lb ft).
6. Install the retaining plate (1) and bolts (2) through the frame rail.

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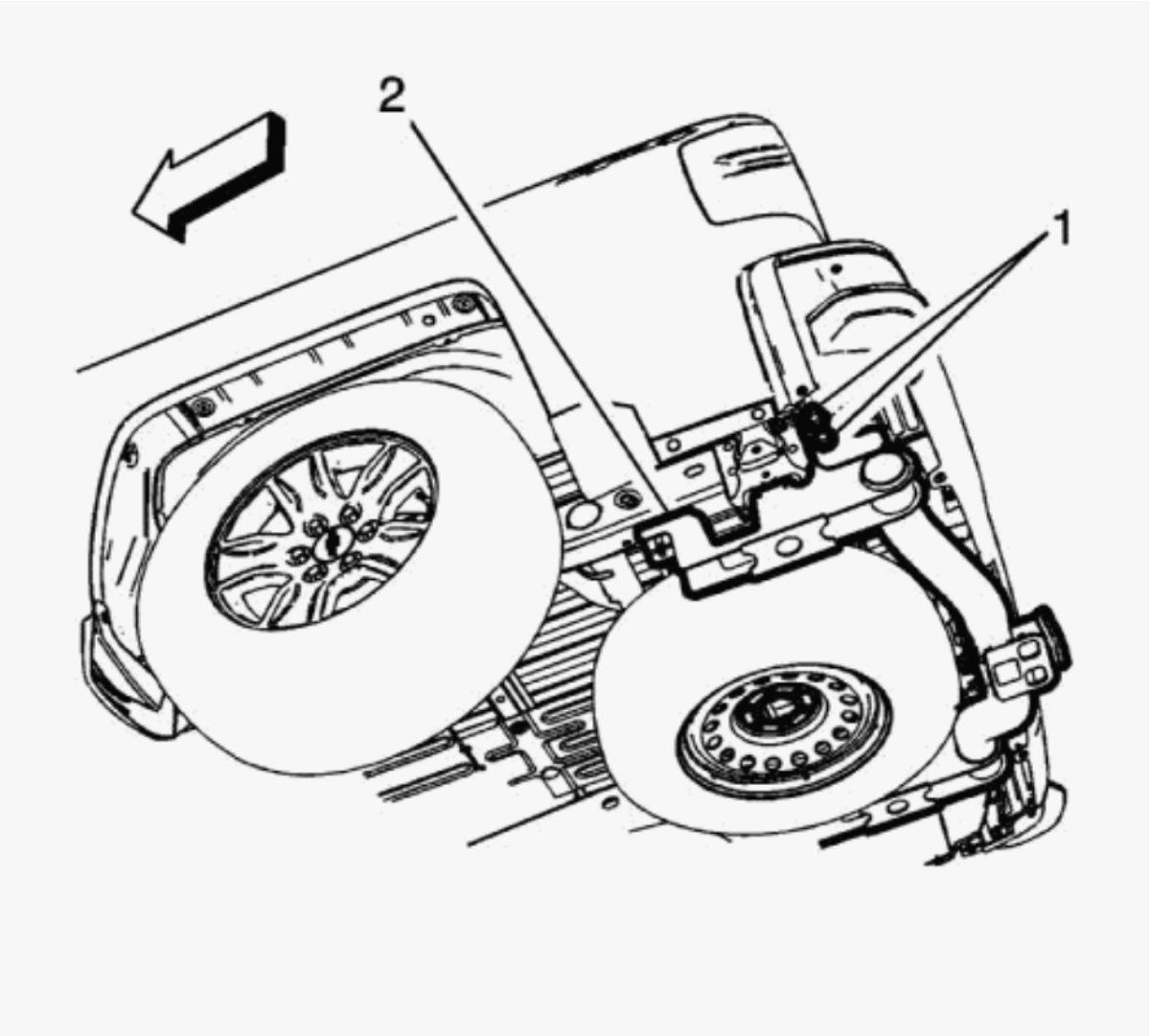


Fig. 98: Securing Trailer Hitch Platform
Courtesy of GENERAL MOTORS COMPANY

7. Install the nuts (1) to the through bolts and tighten to 70 N.m (52 lb ft).

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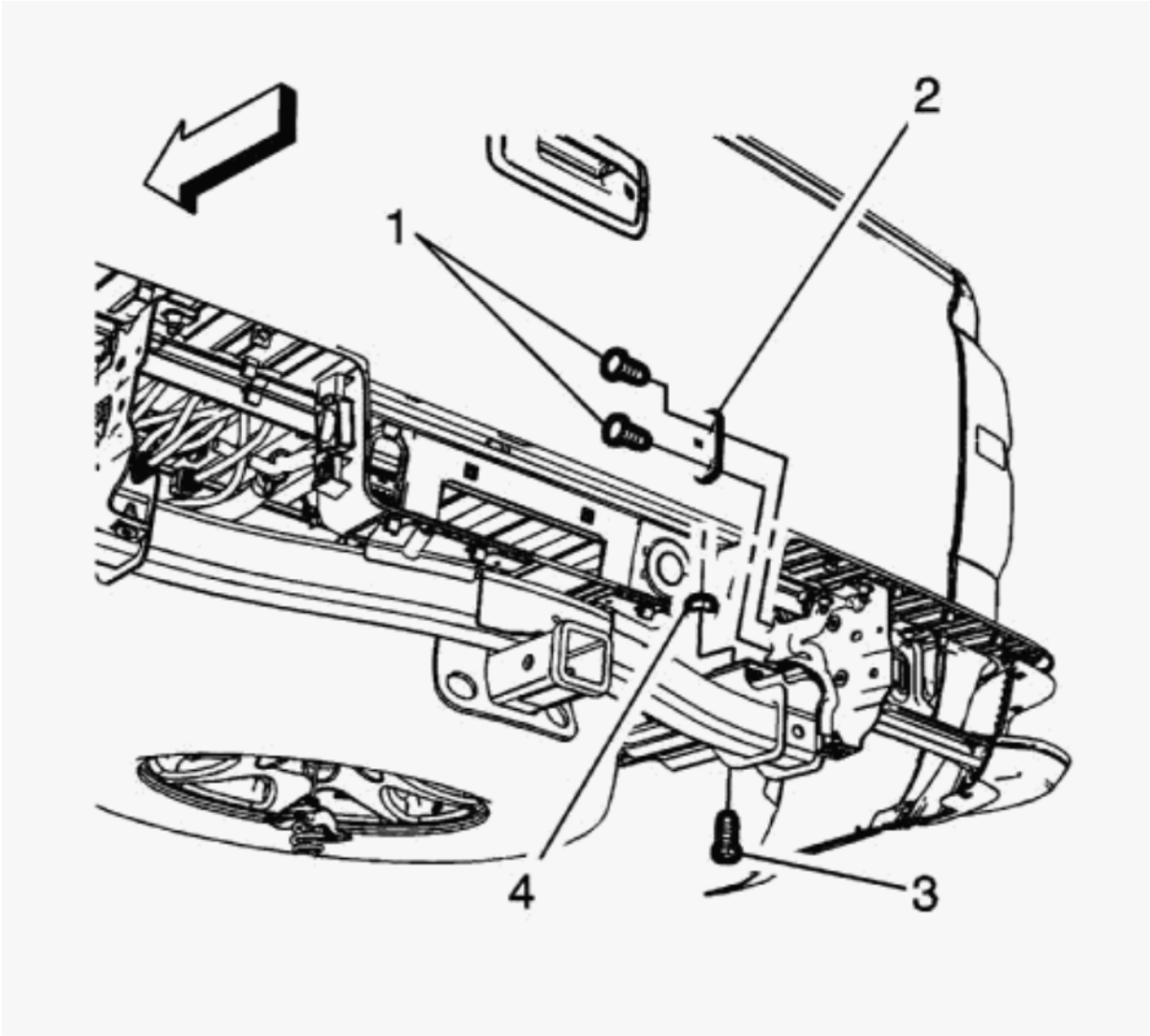


Fig. 99: Through Bolts And Retainer Plate
Courtesy of GENERAL MOTORS COMPANY

8. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry.3
9. Apply thread locking adhesive to the bolt.3 - **Adhesives, Fluids, Lubricants, and Sealers**
10. Install the trailer hitch mounting bolt (3) and nut (4) and tighten to 140 N.m (103 lb ft).
11. Install the retaining plate (2) and install the bolts through the right frame rail.

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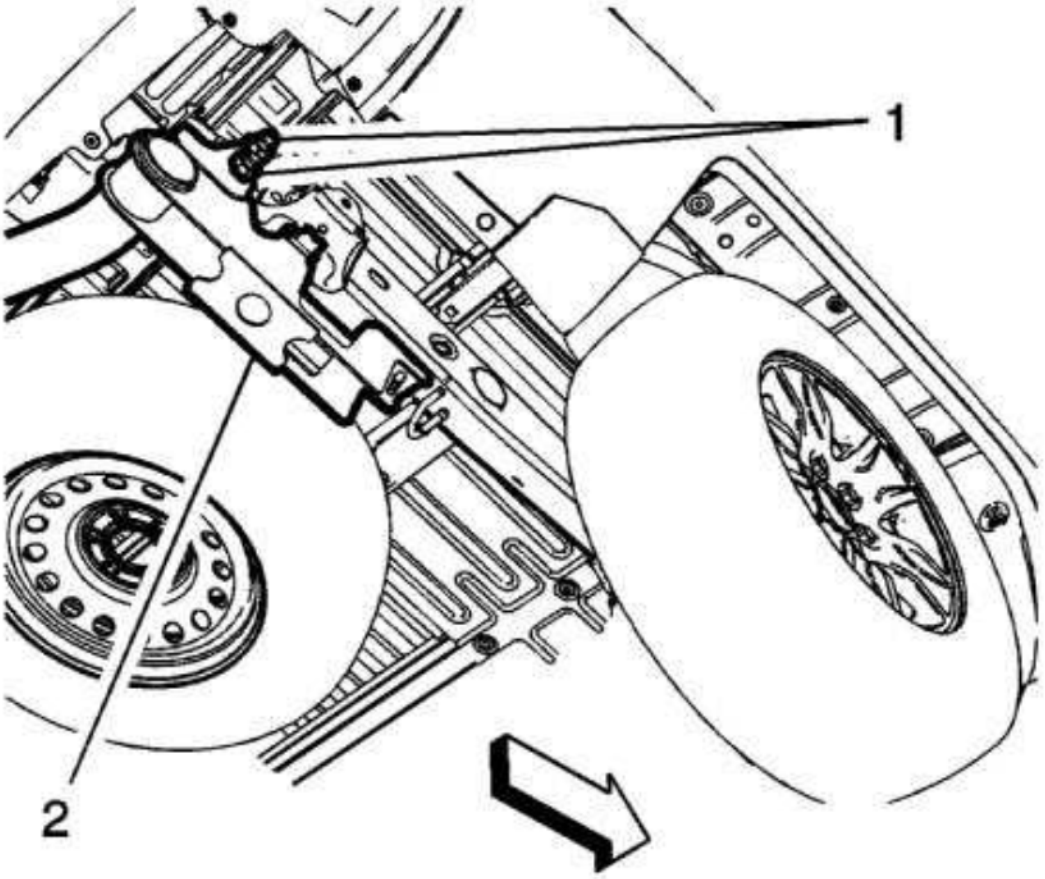


Fig. 100: Securing Trailer Hitch Platform To Right Frame Rail
Courtesy of GENERAL MOTORS COMPANY

12. Install the nuts (1) to the through bolts and tighten to 70 N.m (52 lb ft).

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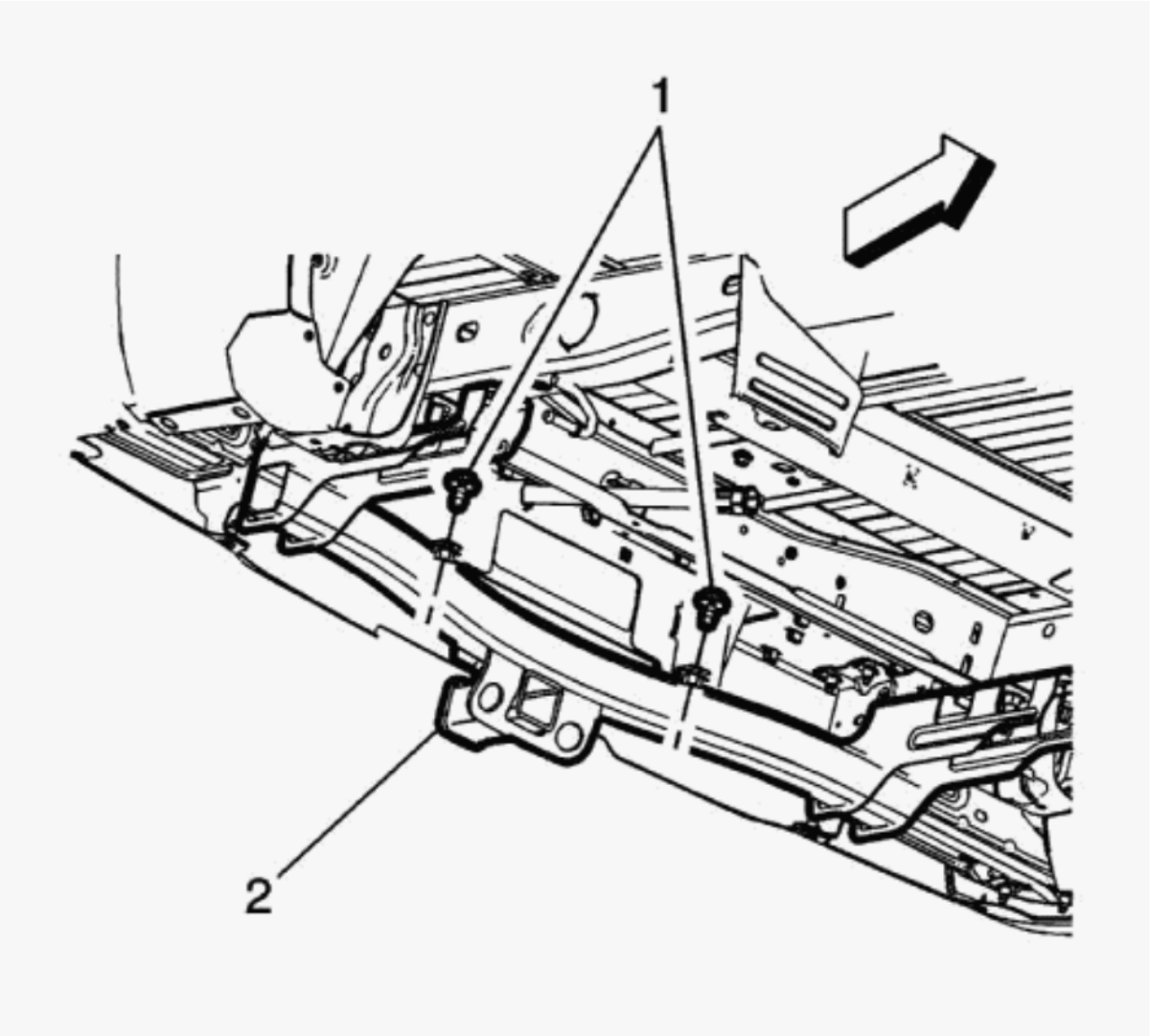


Fig. 101: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

13. Install the rear bumper bar fasteners (1) to the trailer hitch and tighten to 22 N.m (16 lb ft).
14. Lower the vehicle.
15. Install the spare tire. Refer to **Spare Wheel Hoist Replacement** .

TRAILER HITCH PLATFORM REPLACEMENT (LIGHT DUTY - WITHOUT Z82)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Support the trailer hitch with a suitable jack.

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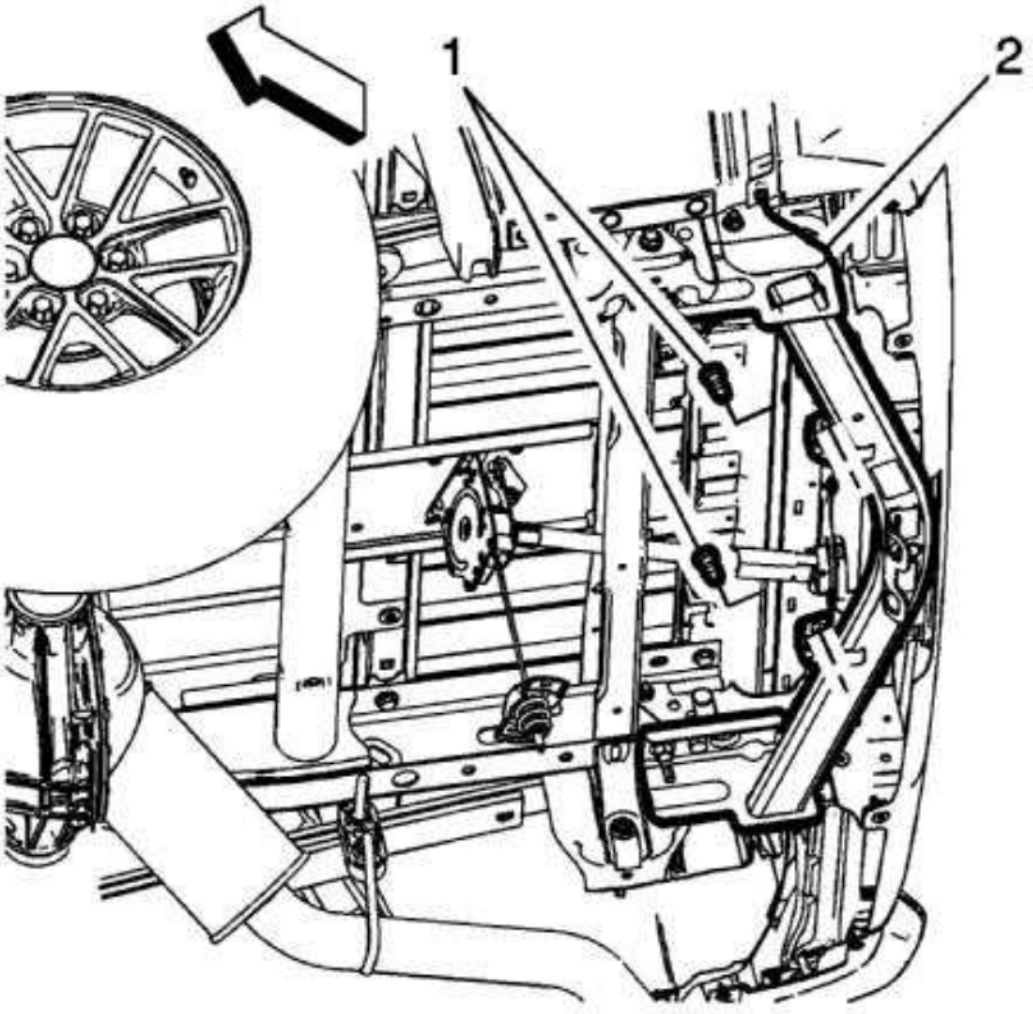


Fig. 102: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

3. Remove the rear bumper bar fasteners (1) to the trailer hitch (2).

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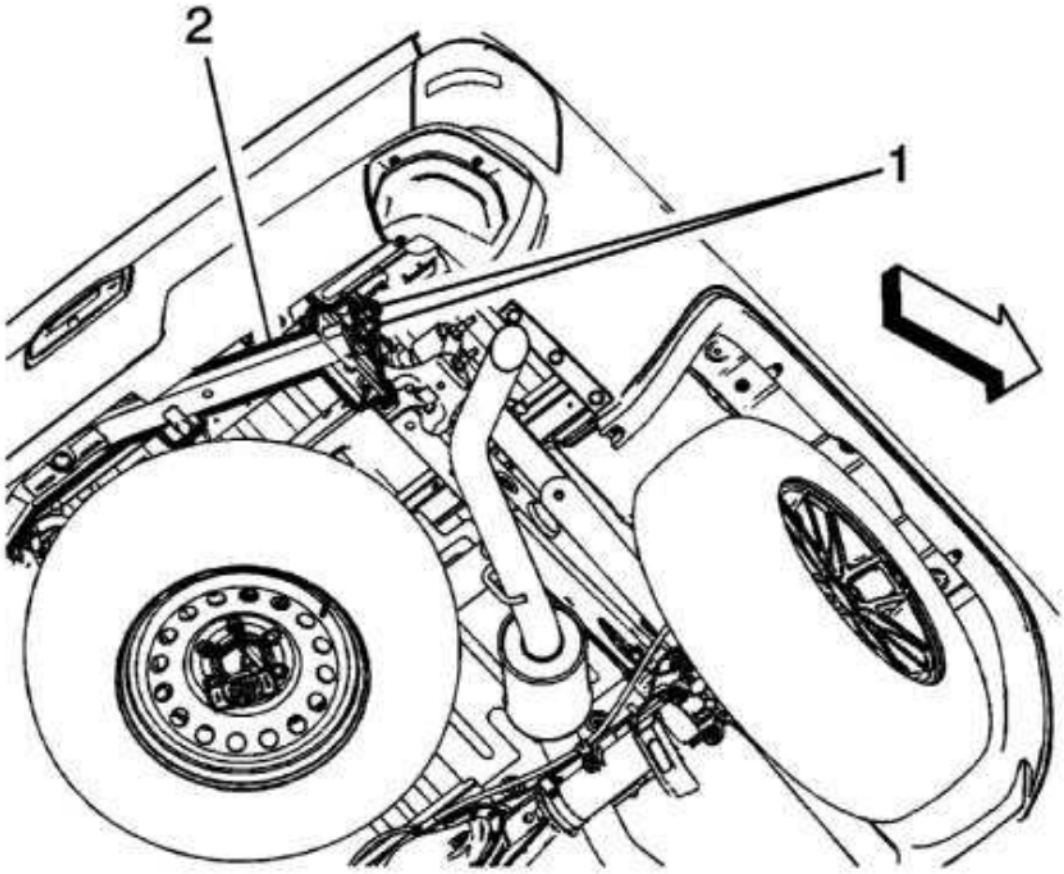


Fig. 103: Nuts And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

4. Remove the nuts (1) securing the trailer hitch (2) to the right frame rail.

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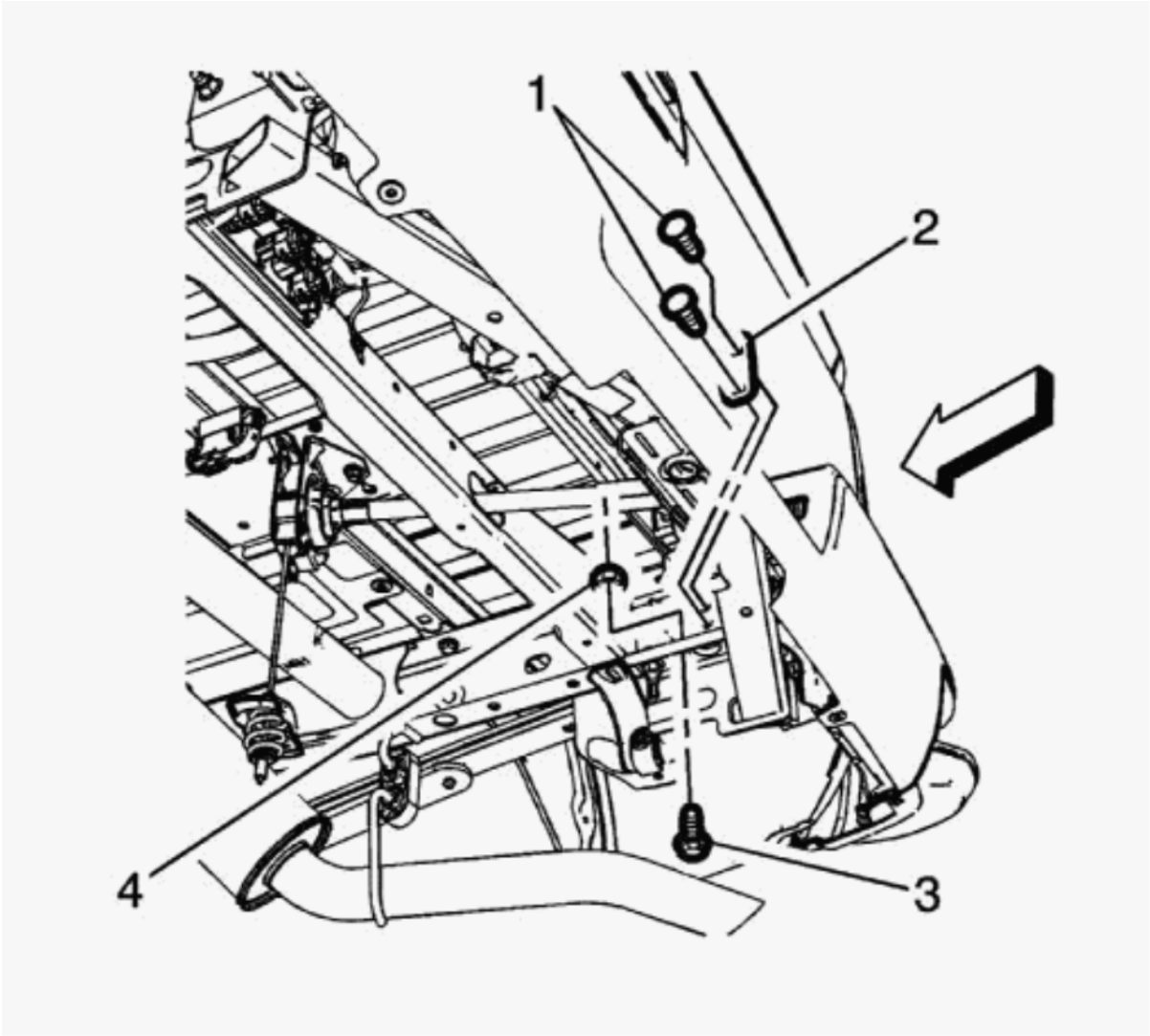


Fig. 104: Frame Through Bolts And Retaining Plate
Courtesy of GENERAL MOTORS COMPANY

5. Remove the frame through bolts (1) and the retaining plate (2).
6. Remove the trailer hitch mounting bolt (3) and nut (4).

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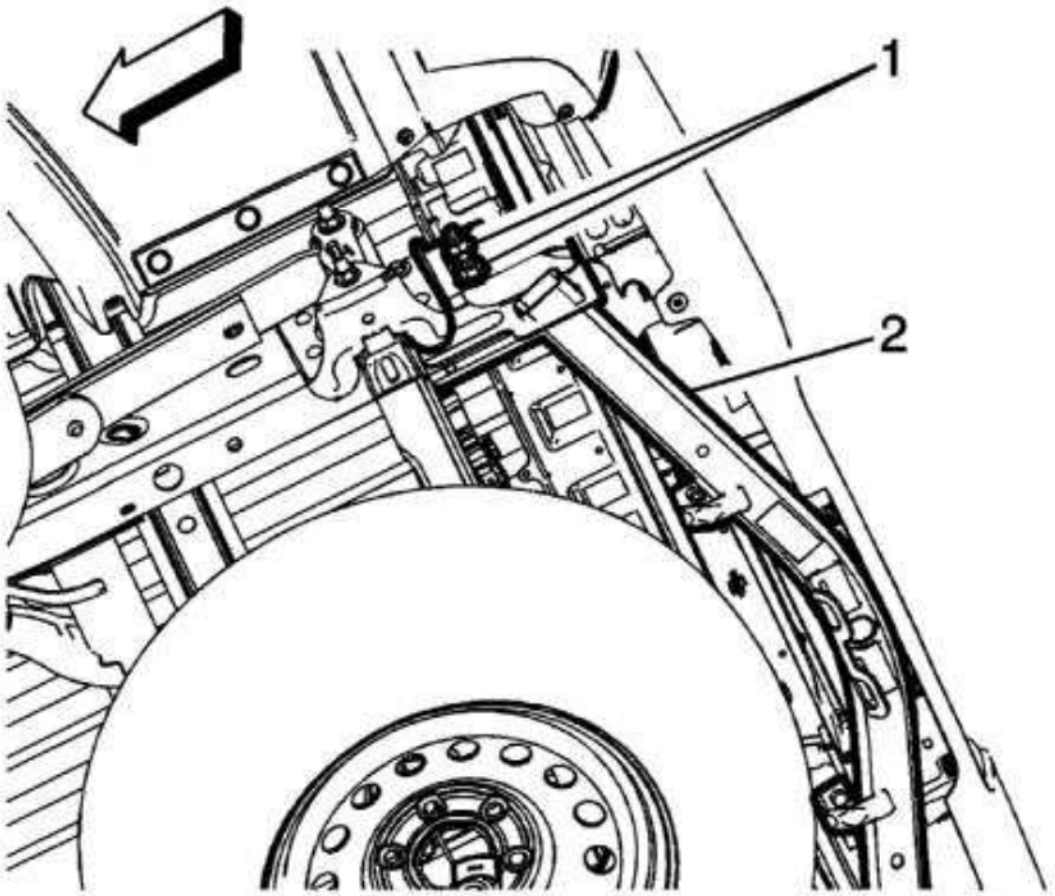


Fig. 105: Nuts And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

7. Remove the nuts (1) securing the trailer hitch (2) to the left frame rail.

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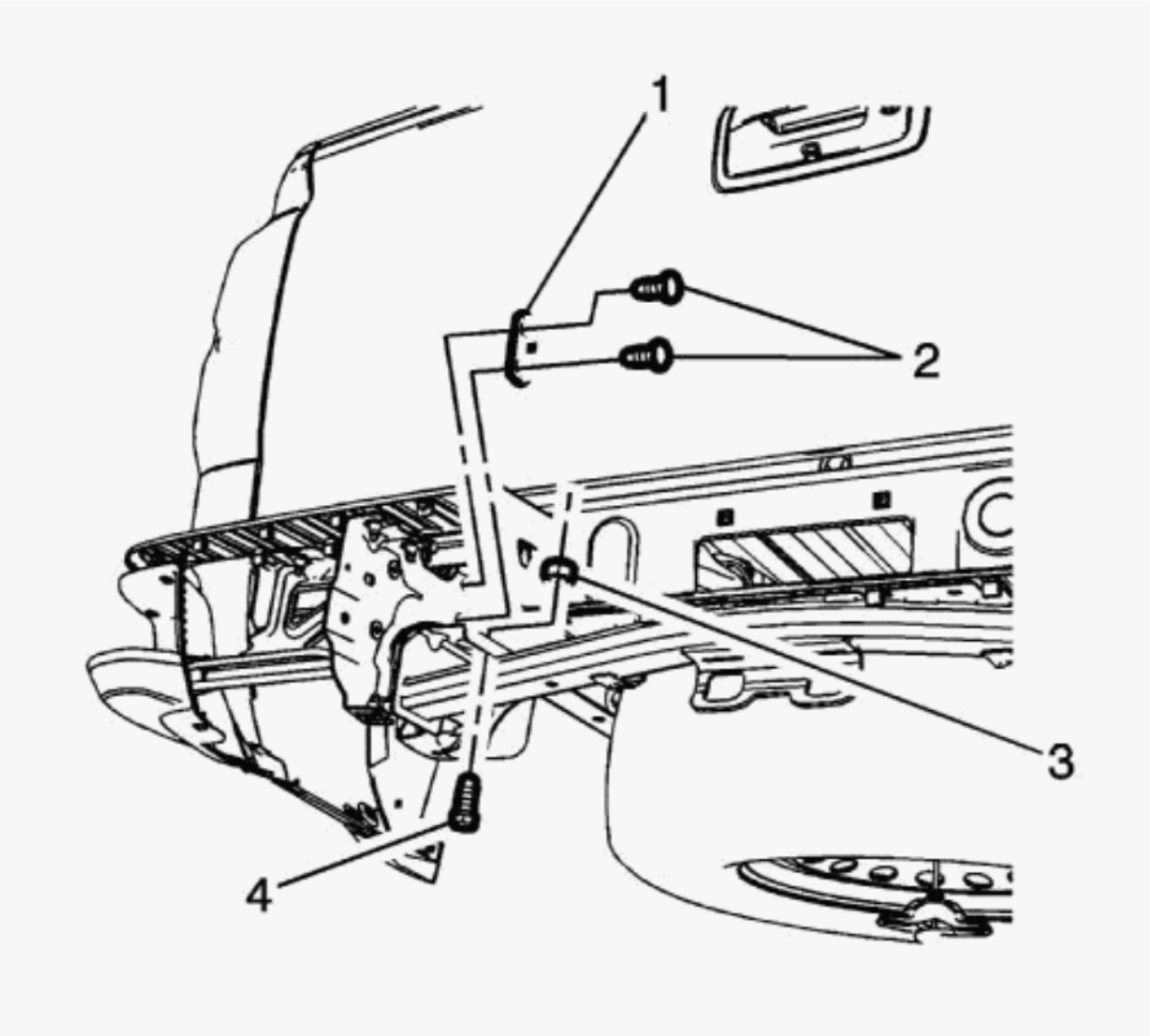


Fig. 106: Frame Through Bolts And Retaining Plate
Courtesy of GENERAL MOTORS COMPANY

8. Remove the frame through bolts (2) and the retaining plate (1).
9. Remove the trailer hitch mounting bolt (4) and nut (3).

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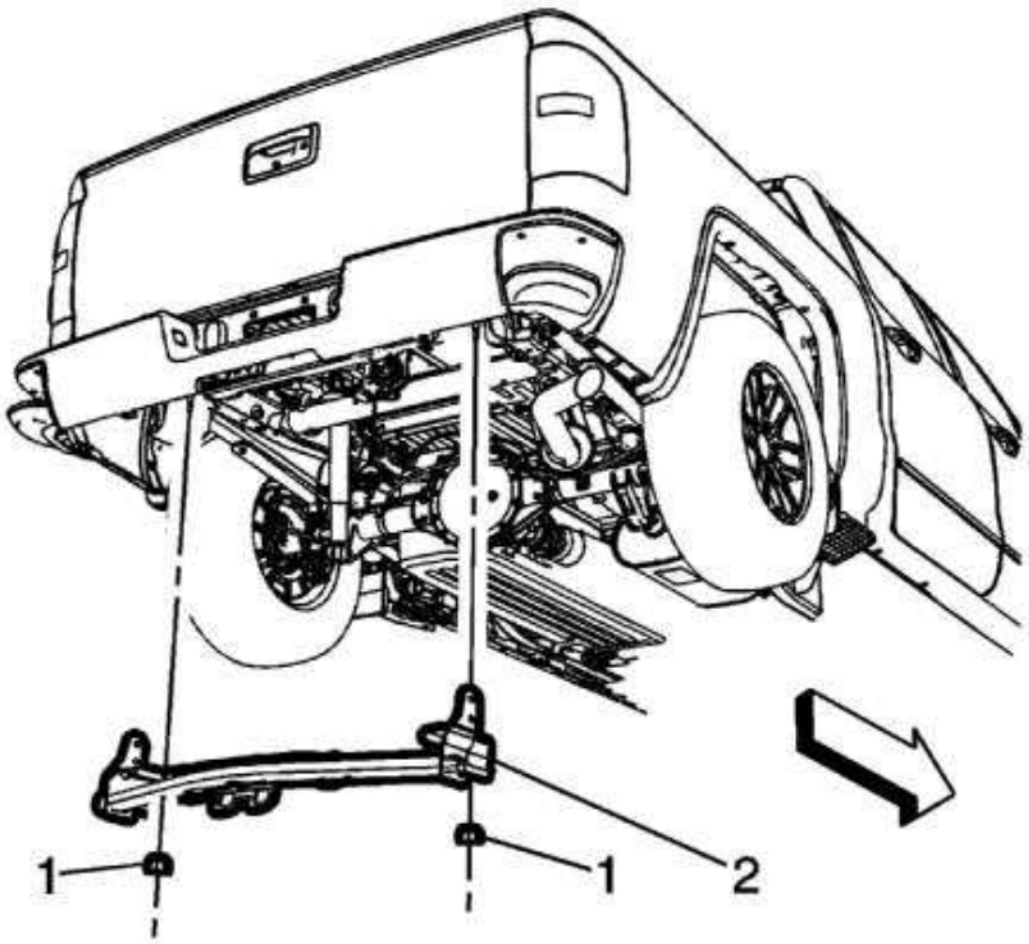


Fig. 107: Trailer Hitch Mounting Nuts And Trailer Hitch Platform
Courtesy of GENERAL MOTORS COMPANY

10. Remove the 2 remaining trailer hitch mounting nuts (1) and lower the trailer hitch platform (2) to the floor.

Installation Procedure

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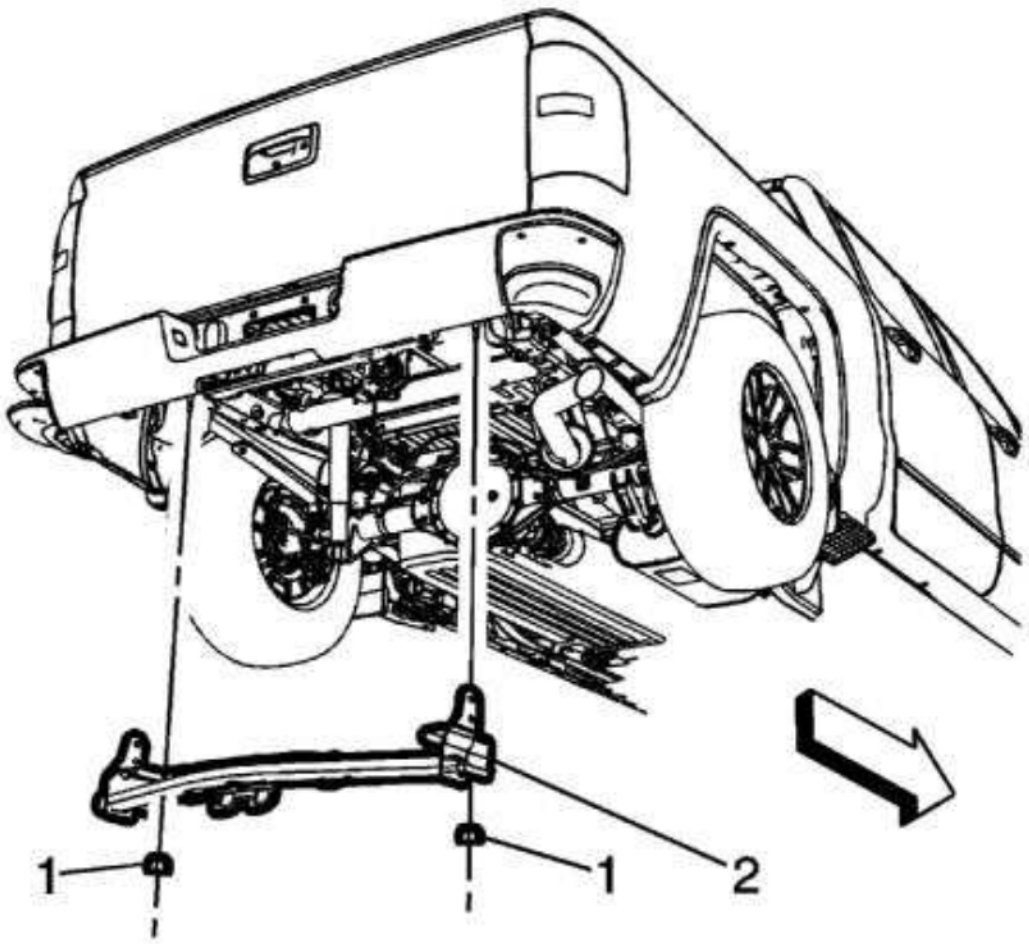


Fig. 108: Trailer Hitch Mounting Nuts And Trailer Hitch Platform
Courtesy of GENERAL MOTORS COMPANY

1. Position the trailer hitch platform (2) to the vehicle.

CAUTION: **Refer to Fastener Caution .**

2. Install the trailer hitch mounting fasteners (1) and tighten to 112 N.m (83 lb ft).

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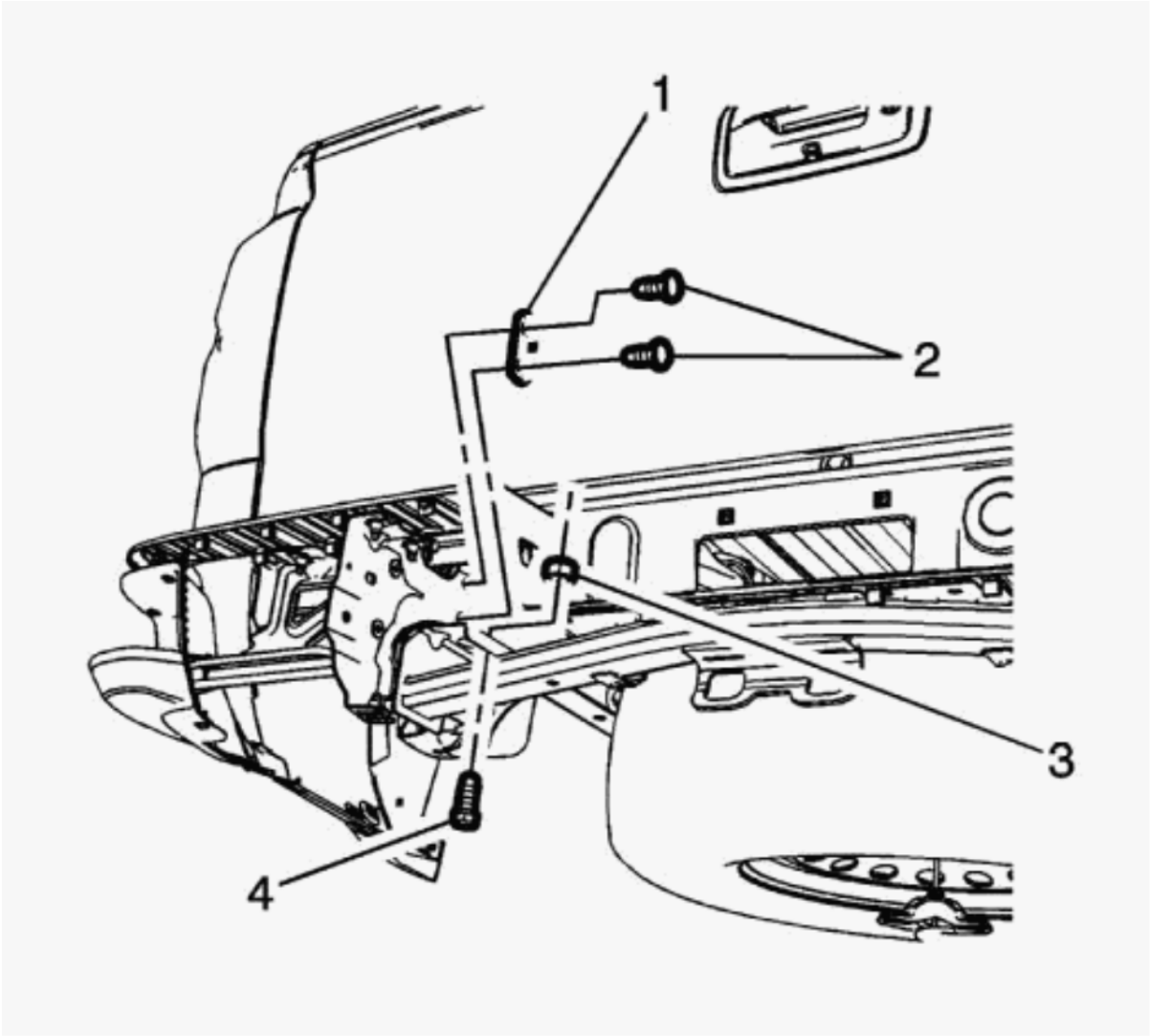


Fig. 109: Frame Through Bolts And Retaining Plate
Courtesy of GENERAL MOTORS COMPANY

3. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry. 5
4. Apply thread locking adhesive to the bolt.5 - **Adhesives, Fluids, Lubricants, and Sealers**
5. Install the trailer hitch mounting bolt (4) and nut (3) to the left side frame rail and tighten to 140 N.m (103 lb ft).
6. Install the retaining plate (1) and the frame through bolts (2).

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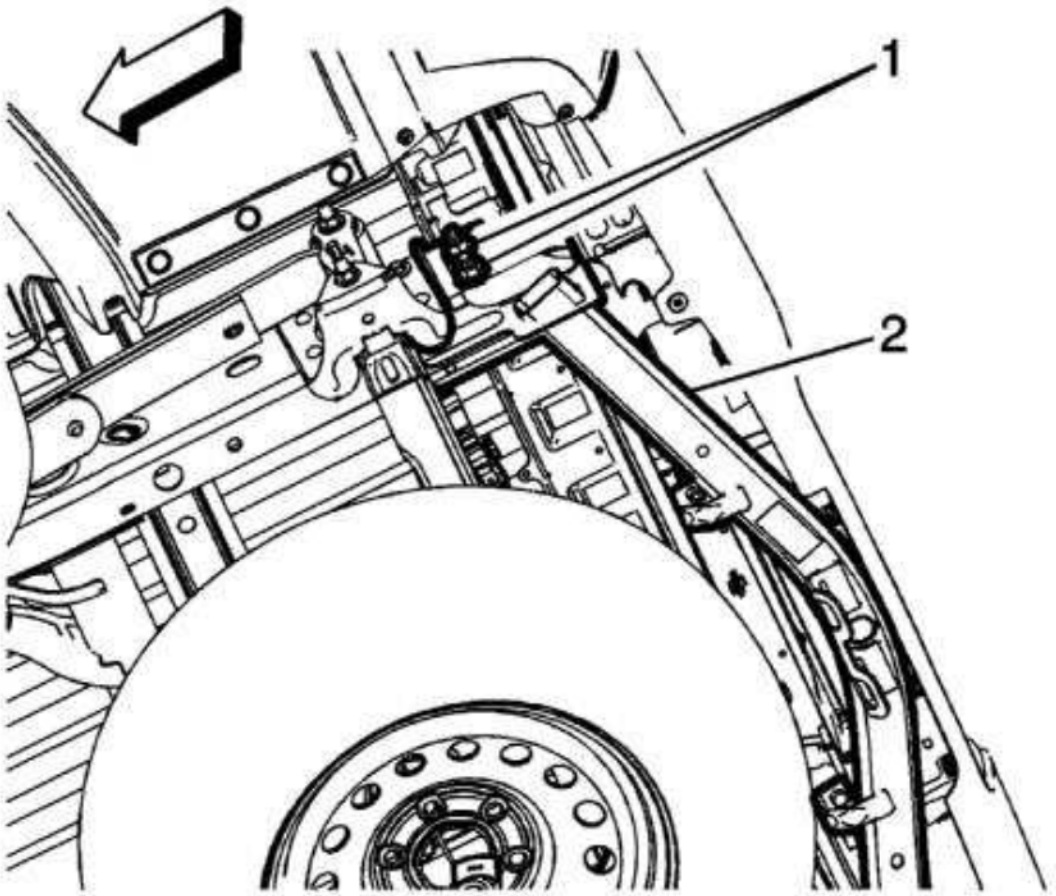


Fig. 110: Nuts And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

7. Install the nuts (1) to the through bolts and tighten to 70 N.m (52 lb ft).

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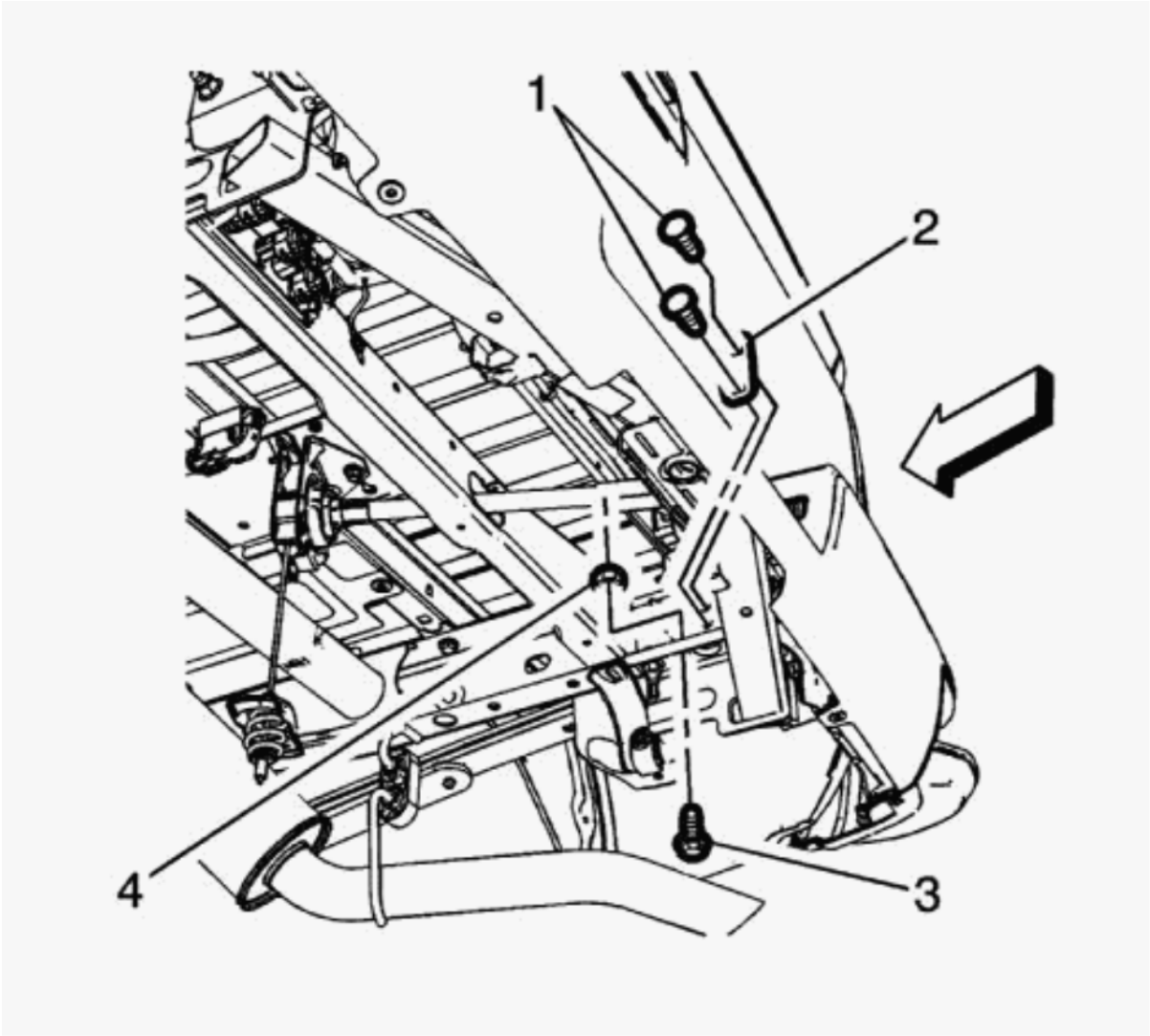


Fig. 111: Frame Through Bolts And Retaining Plate
Courtesy of GENERAL MOTORS COMPANY

8. Clean the threads of the bolt with denatured alcohol or equivalent and allow to dry. 3
9. Apply thread locking adhesive to the bolt.3 - **Adhesives, Fluids, Lubricants, and Sealers**
10. Install the trailer hitch mounting bolt (3) and nut (4) to the right frame rail. Tighten to 140 N.m (103 lb ft).
11. Install the retaining plate (2) and the bolts (1) through the right frame rail.

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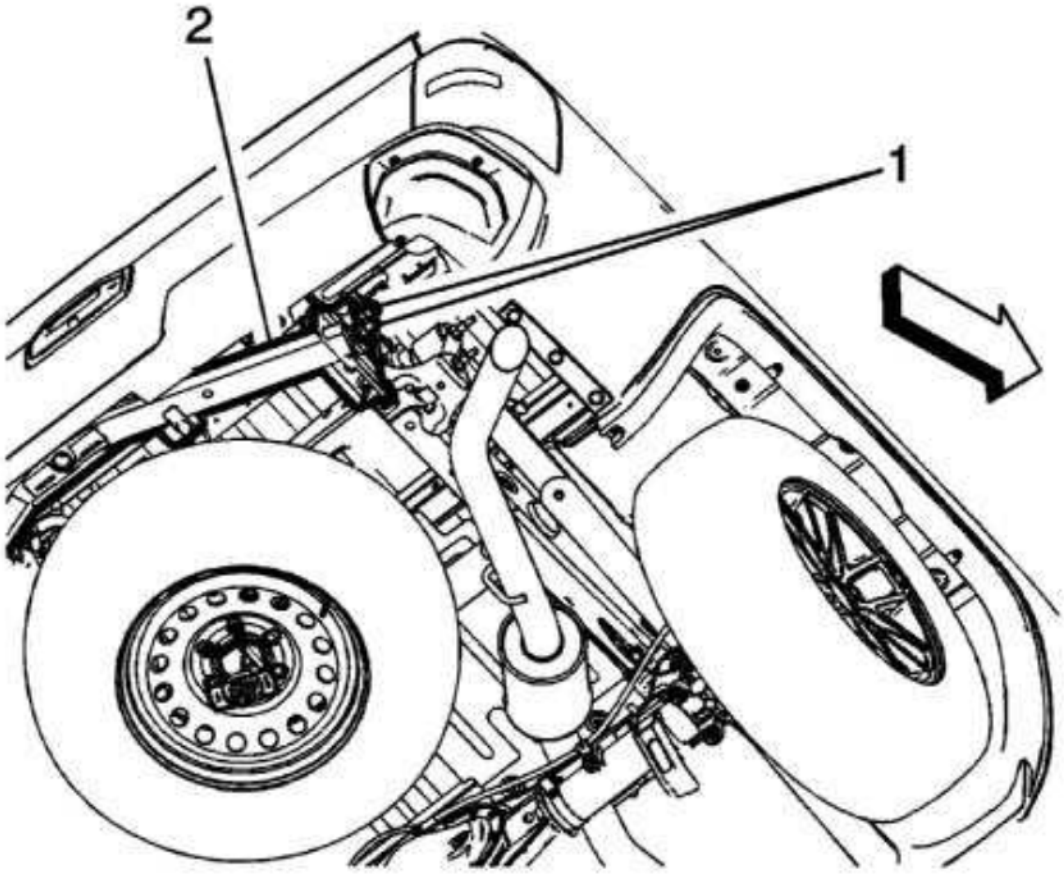


Fig. 112: Nuts And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

12. Install the nuts (1) to the through bolts and tighten to 70 N.m (52 lb ft).

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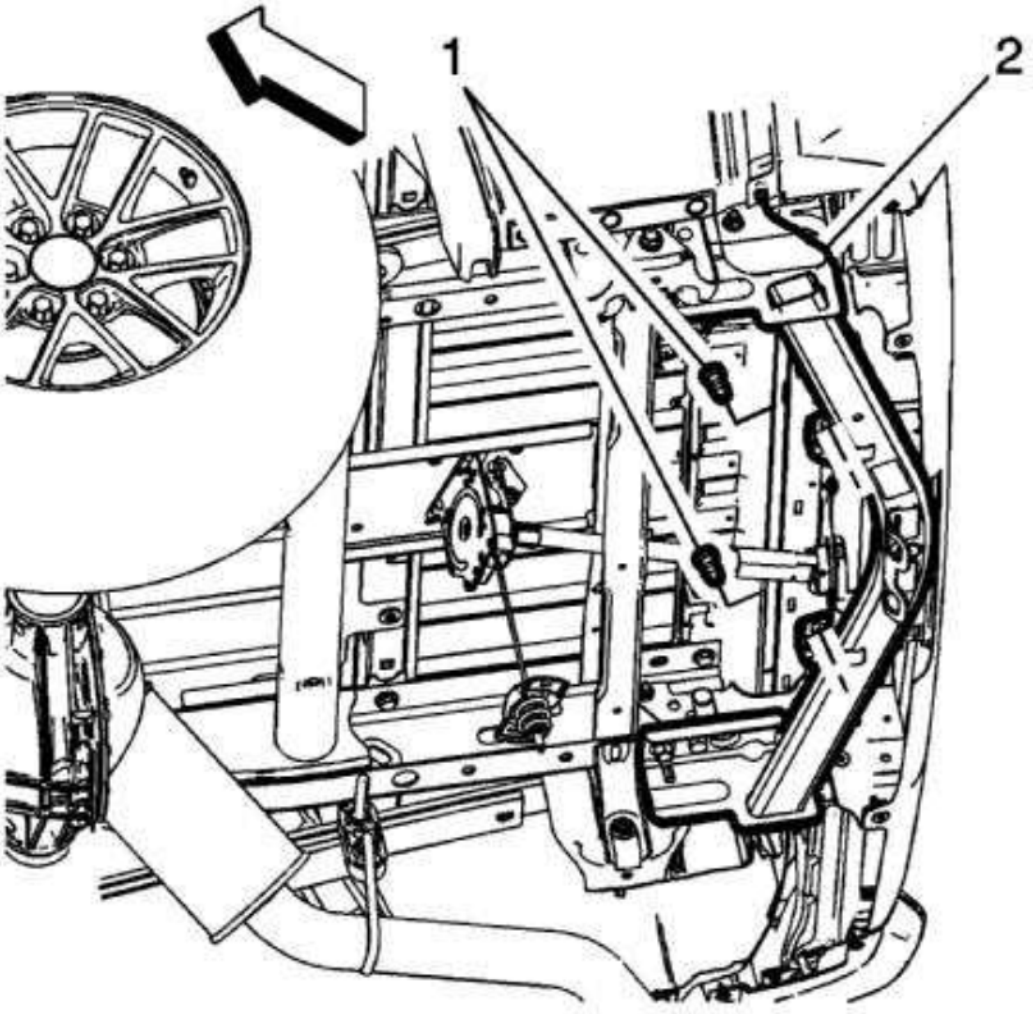


Fig. 113: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

13. Install the rear bumper bar fasteners (1) to the trailer hitch (2) and tighten to 22 N.m (16 lb ft).

TRAILER HITCH PLATFORM REPLACEMENT (HEAVY DUTY - WITH Z82)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the spare tire. Refer to **Spare Wheel Hoist Replacement** .
3. Support the trailer hitch with a suitable jack.

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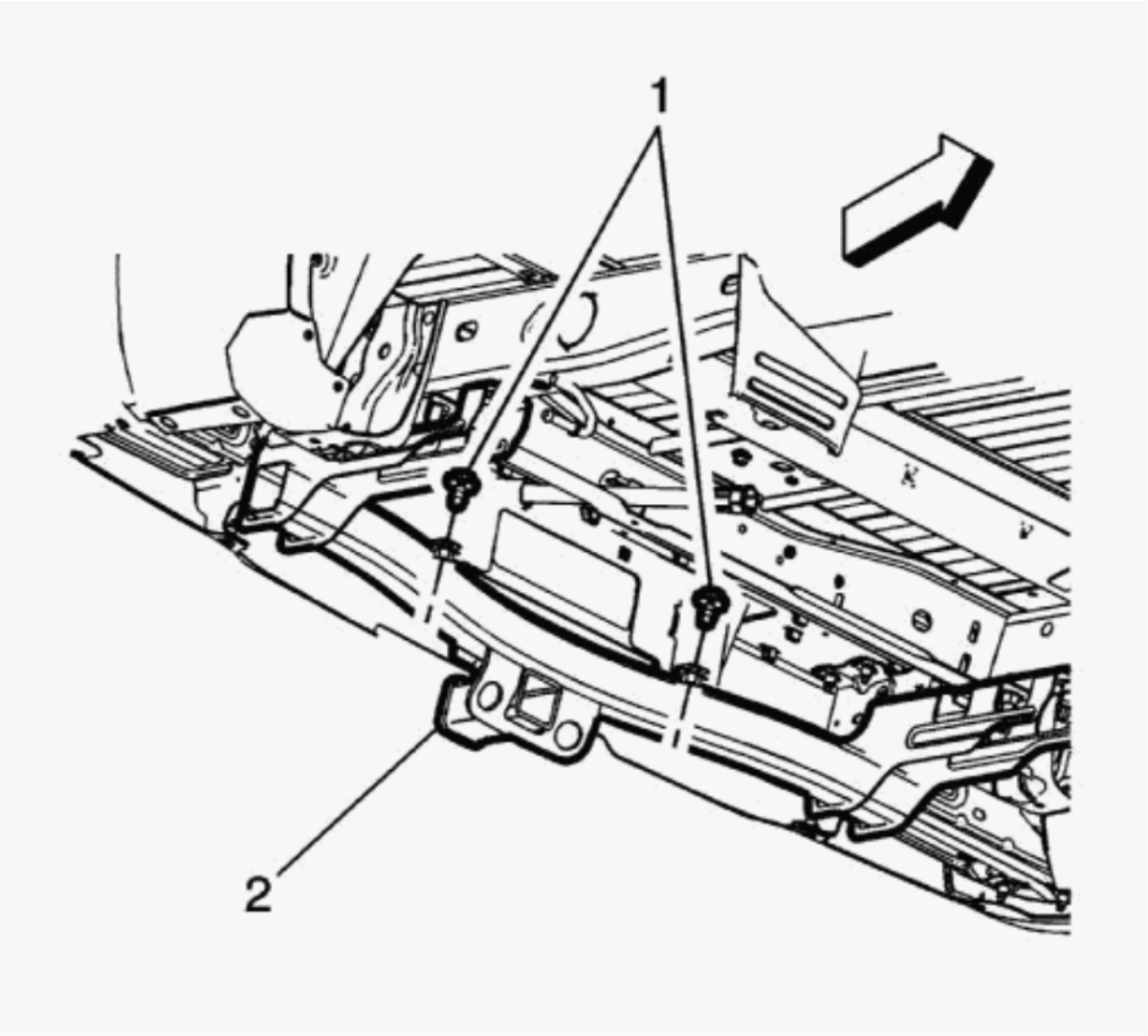


Fig. 114: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

4. Remove the rear bumper bar fasteners (1) to the trailer hitch (2).

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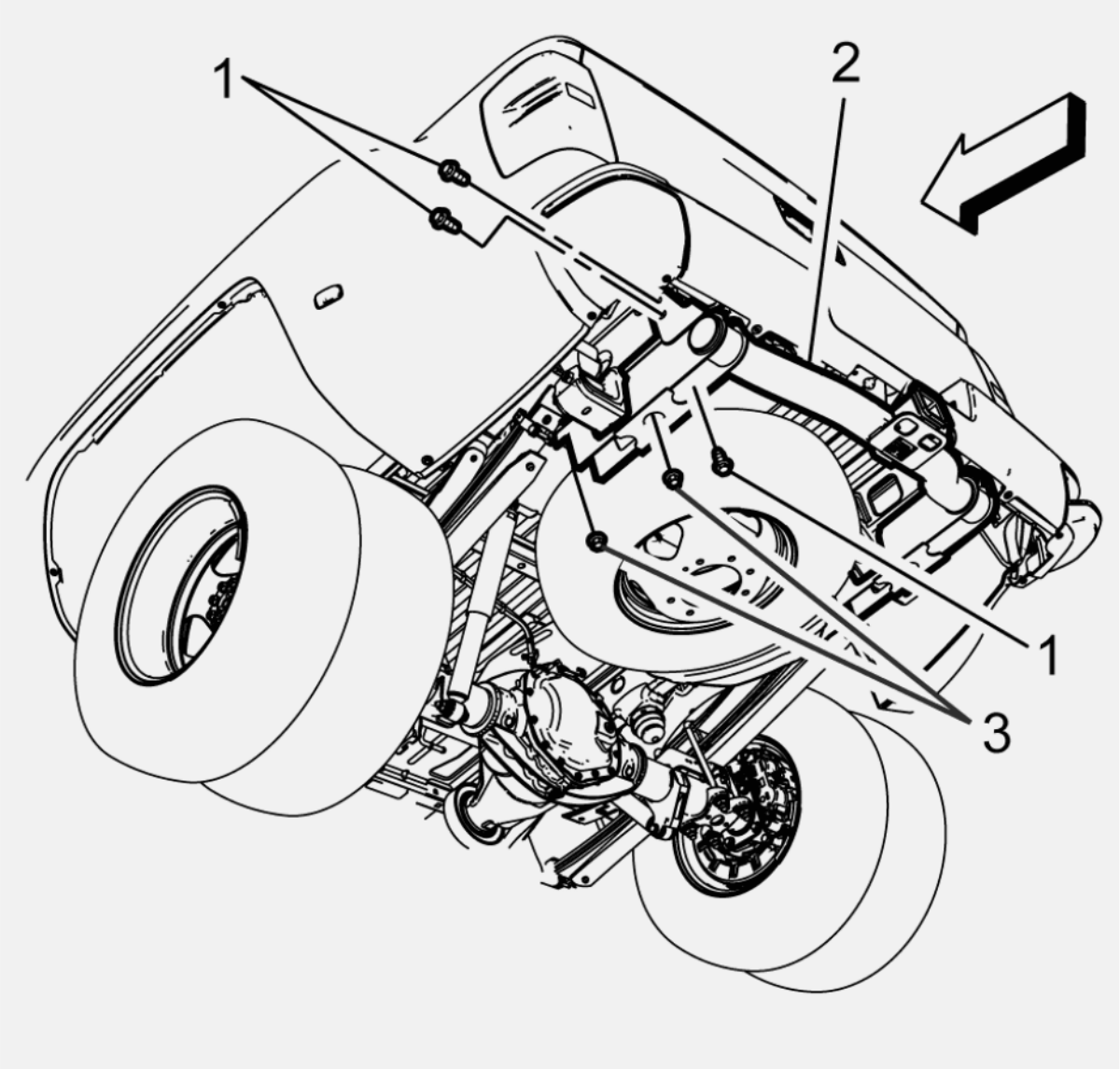


Fig. 115: Trailer Hitch Platform At Left Frame Rail
Courtesy of GENERAL MOTORS COMPANY

5. Remove the nuts (3), securing the trailer hitch platform (2), to the left frame rail.
6. Remove the bolts (1), securing the trailer hitch platform (2), to the left frame rail.

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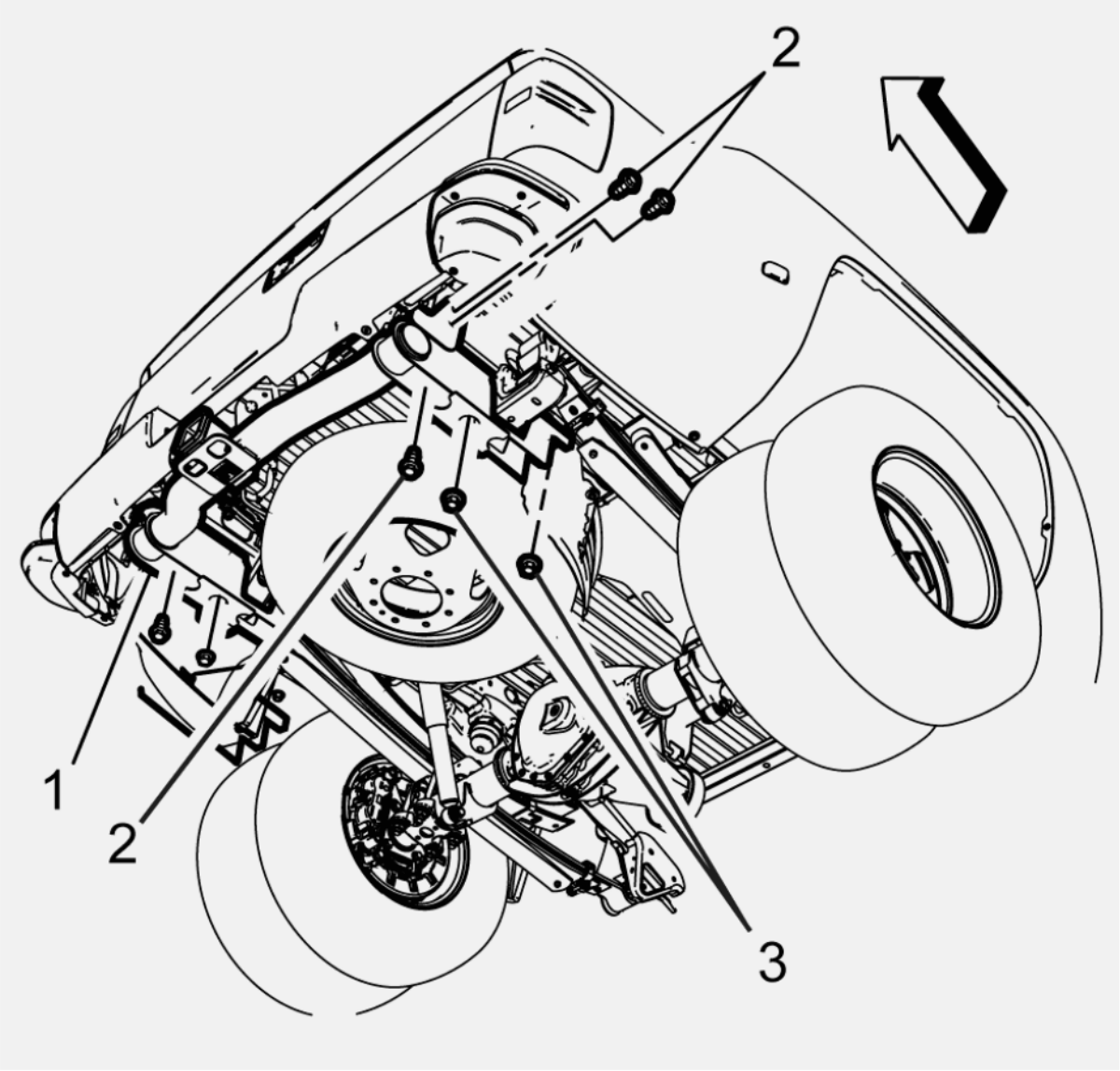


Fig. 116: Trailer Hitch Platform At Left Frame Rail
Courtesy of GENERAL MOTORS COMPANY

7. Remove the nuts (3), securing the trailer hitch platform (1), to the right frame rail.
8. Remove the bolts (2), securing the trailer hitch platform (1), to the right frame rail.
9. With the aide of second technician, lower the trailer hitch platform (1) to the floor.

Installation Procedure

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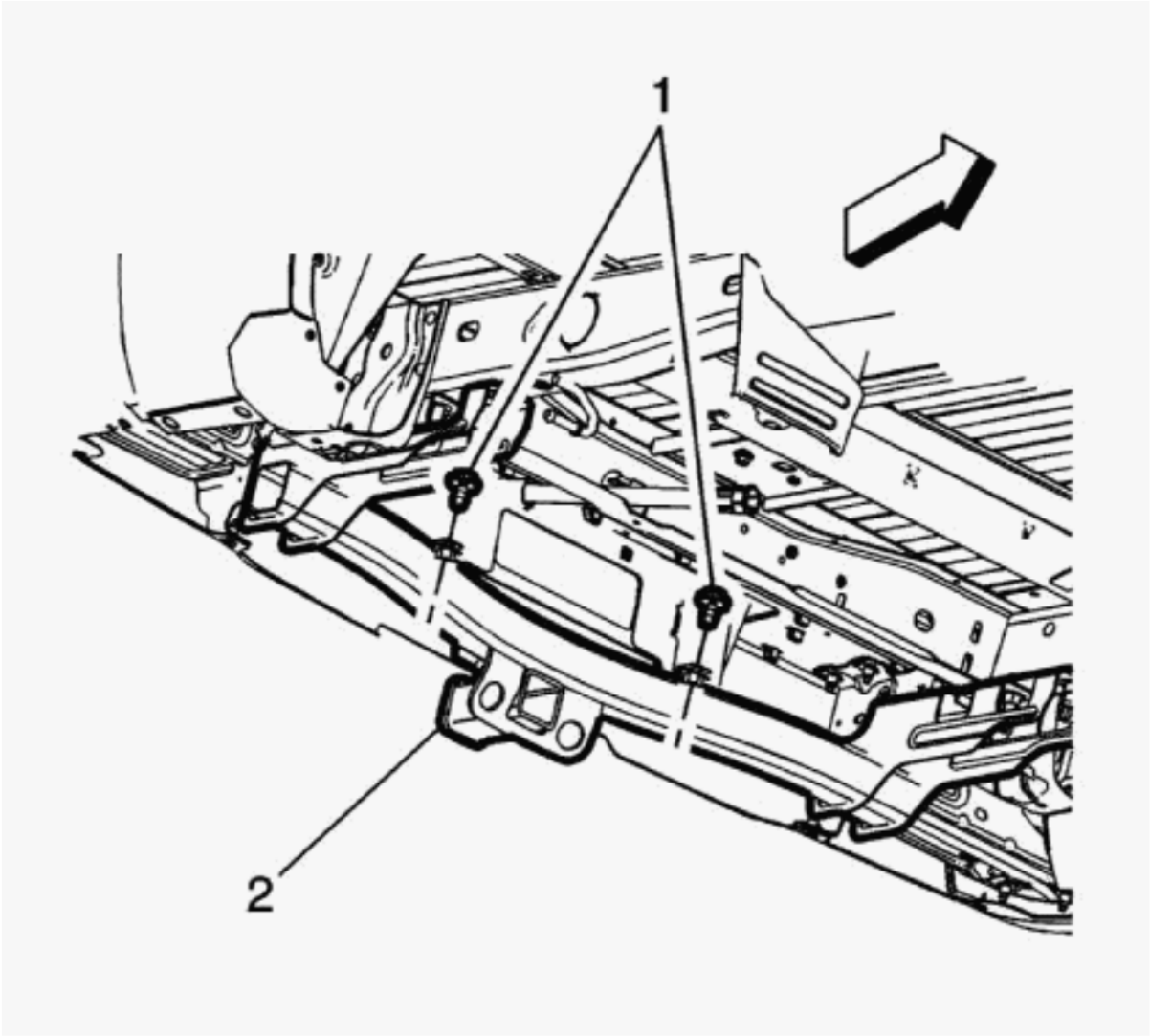


Fig. 117: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

1. With the aide of second technician, position the trailer hitch platform (2) to the vehicle.

CAUTION: **Refer to Fastener Caution .**

2. Install the rear bumper bar fasteners (1) to the trailer hitch and tighten to 22 N.m (16 lb ft).

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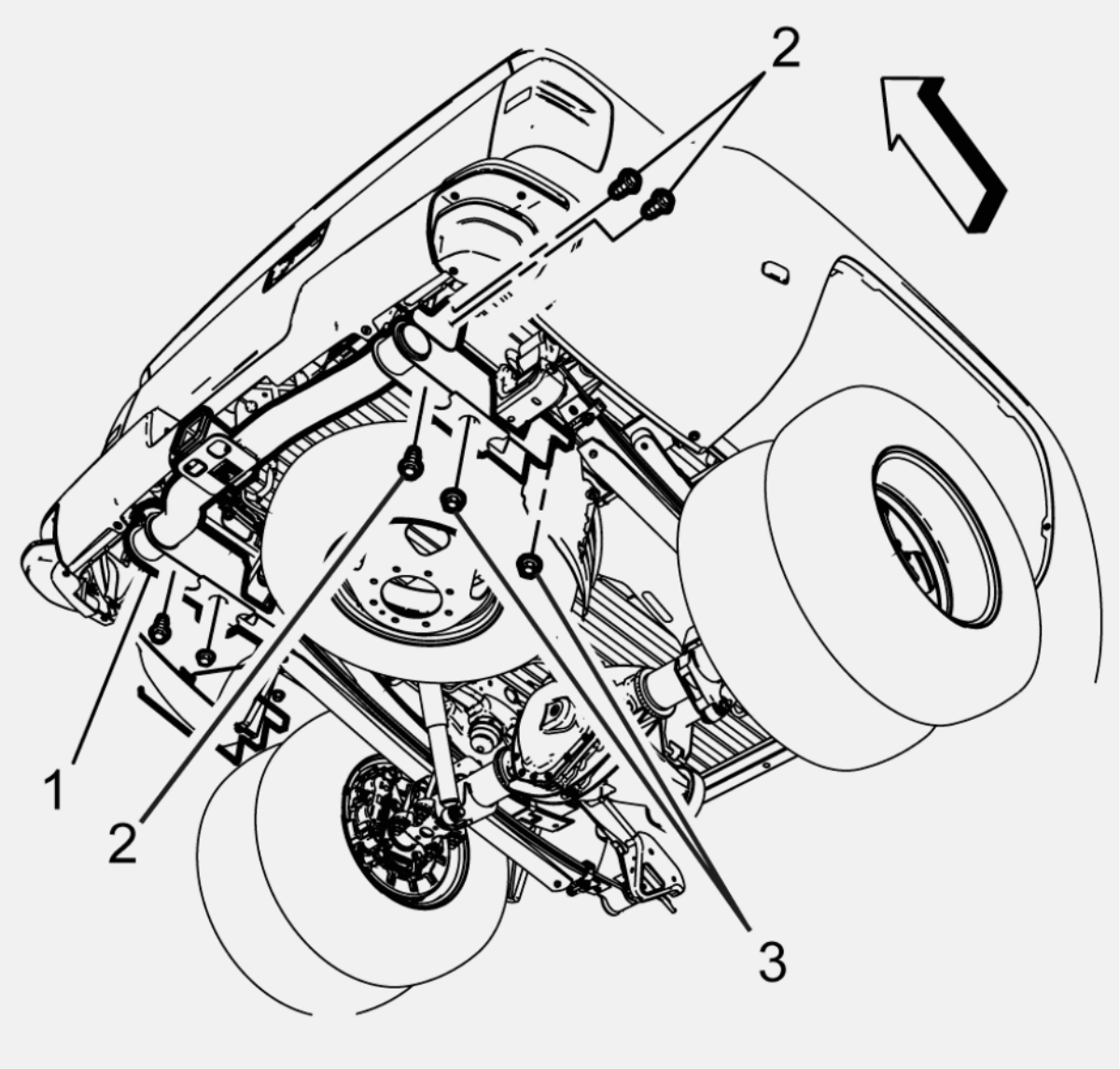


Fig. 118: Trailer Hitch Platform At Left Frame Rail
Courtesy of GENERAL MOTORS COMPANY

3. Install the trailer hitch mounting bolts (2) and tighten to 140 (103 lb ft).
4. Install the trailer hitch platform mounting nuts (3) and tighten to 112 N.m (83 lb ft).

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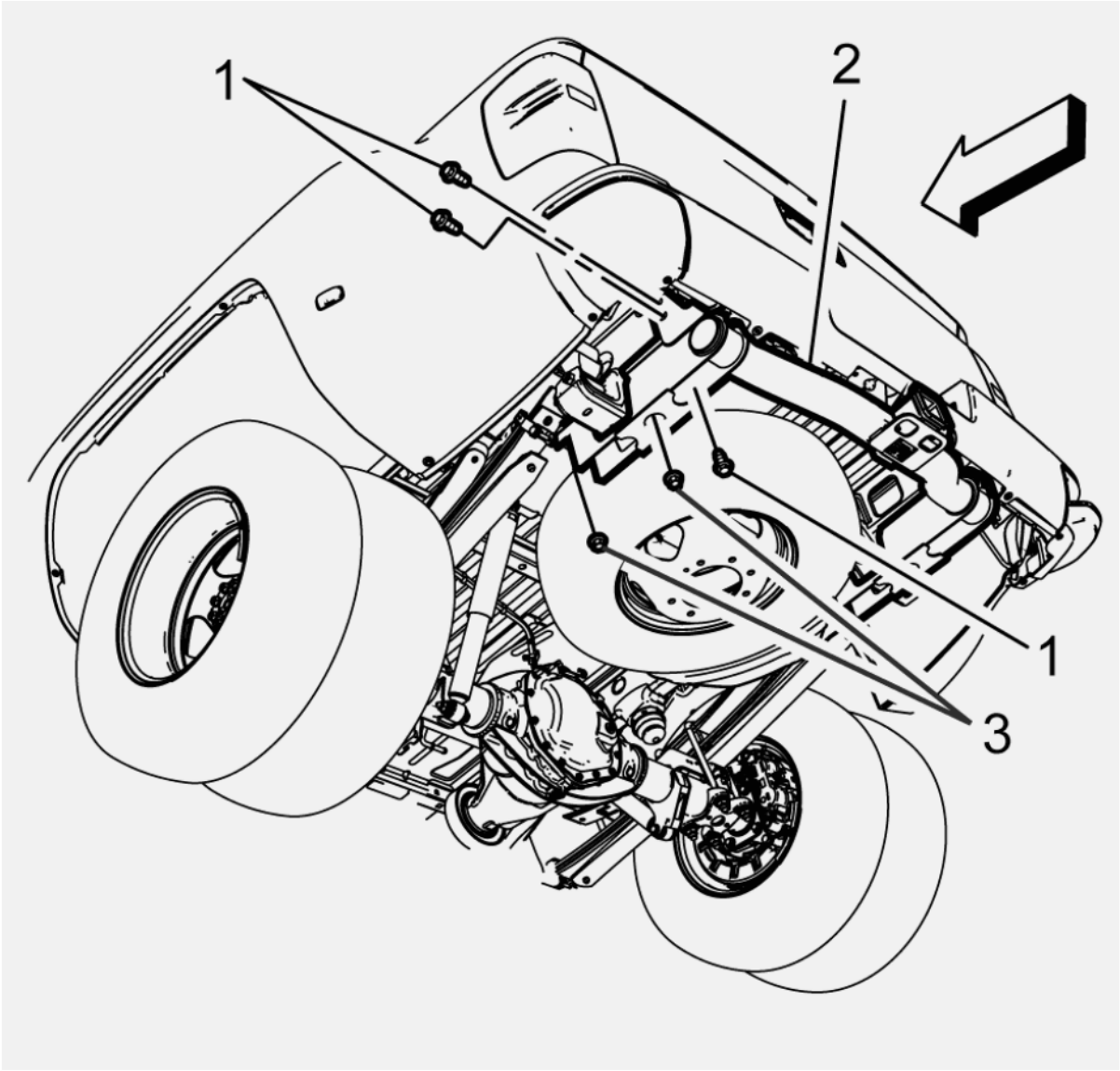


Fig. 119: Trailer Hitch Platform At Left Frame Rail
Courtesy of GENERAL MOTORS COMPANY

5. Install the trailer hitch mounting bolts (1) and tighten to 140 N.m (103 lb ft).
6. Install the trailer hitch mounting nuts (3) and tighten to 112 N.m (83 lb ft).
7. Lower the vehicle.
8. Install the spare tire. Refer to **Spare Wheel Hoist Replacement** .

TRAILER HITCH PLATFORM REPLACEMENT (HEAVY DUTY - WITHOUT Z82)

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Support the trailer hitch with a suitable jack.

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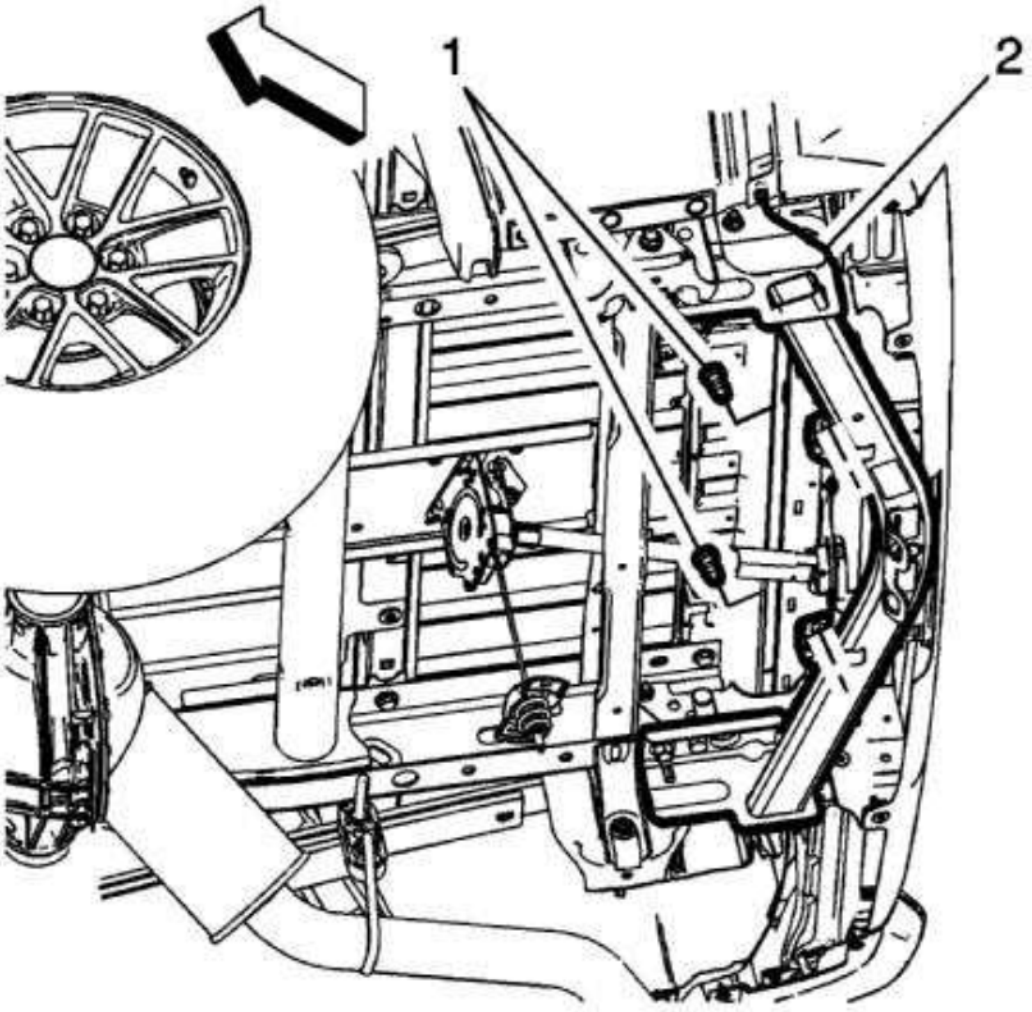


Fig. 120: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

3. Remove the rear bumper bar fasteners (1) to the trailer hitch (2).

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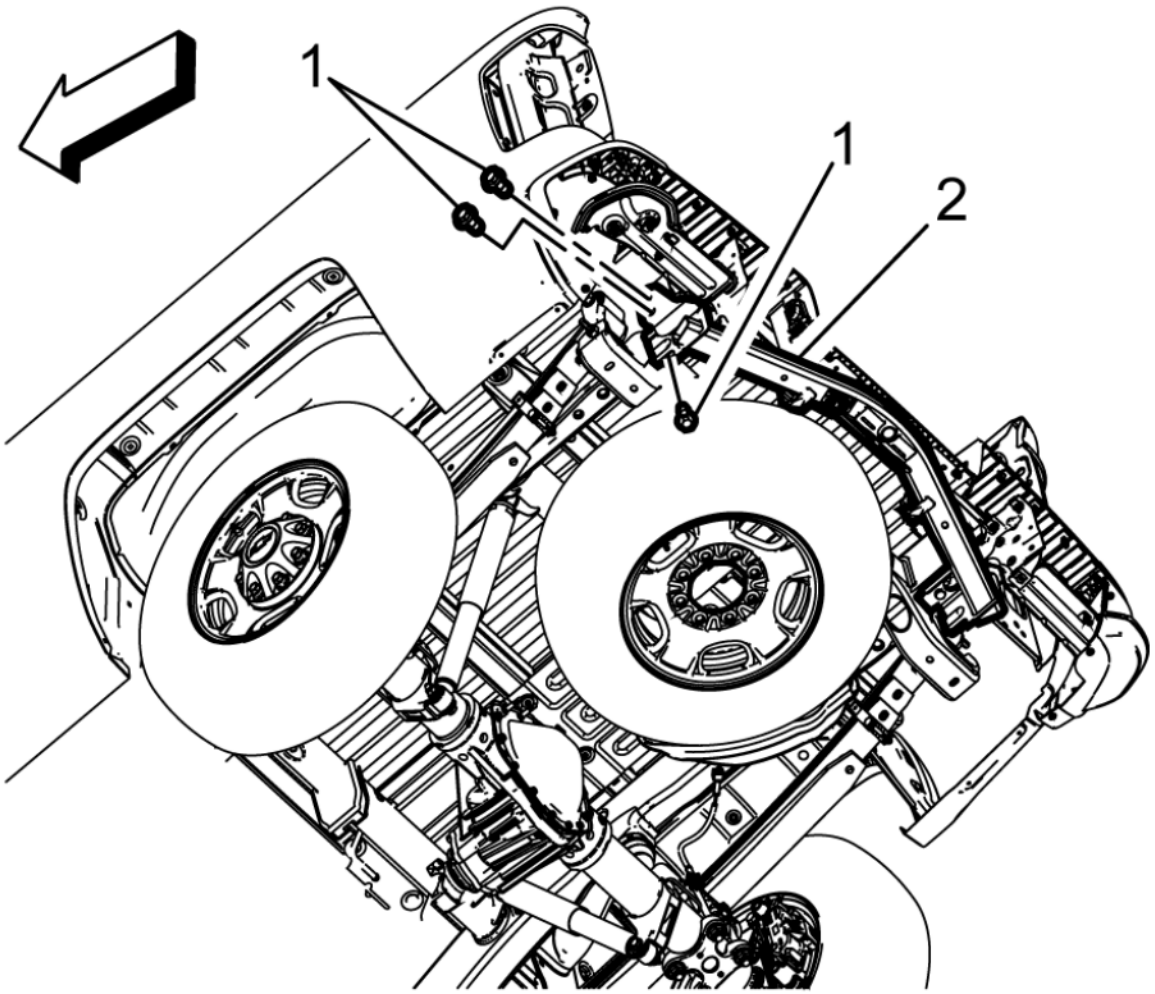


Fig. 121: Trailer Hitch At Left Frame Rail
Courtesy of GENERAL MOTORS COMPANY

4. Remove the bolts (1), securing the trailer hitch (1), to the left frame rail.

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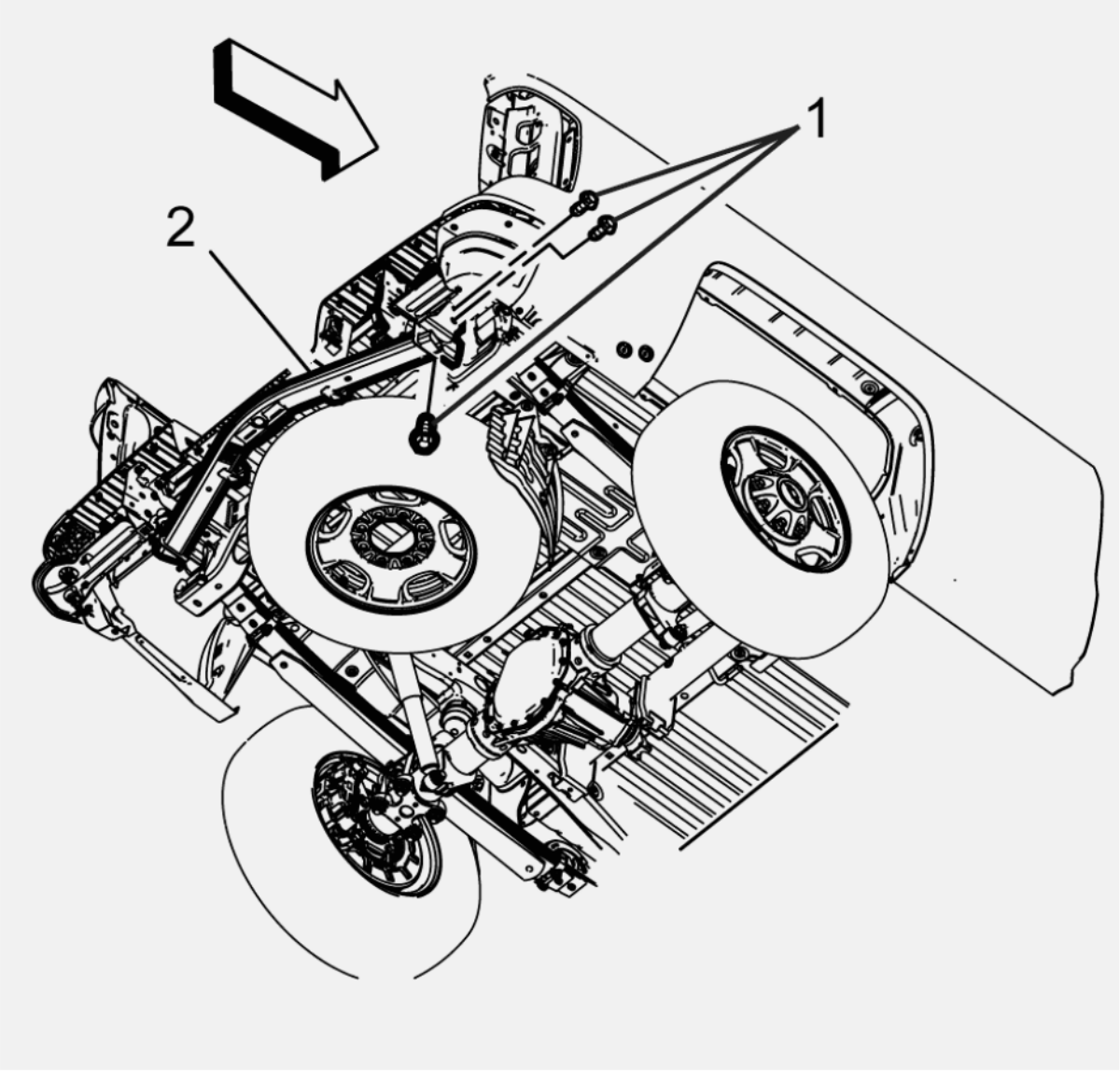


Fig. 122: Trailer Hitch At Right Frame Rail
Courtesy of GENERAL MOTORS COMPANY

5. Remove the bolts (1), securing the trailer hitch (2), to the right frame rail.
6. Remove the trailer hitch (2) from the vehicle.

Installation Procedure

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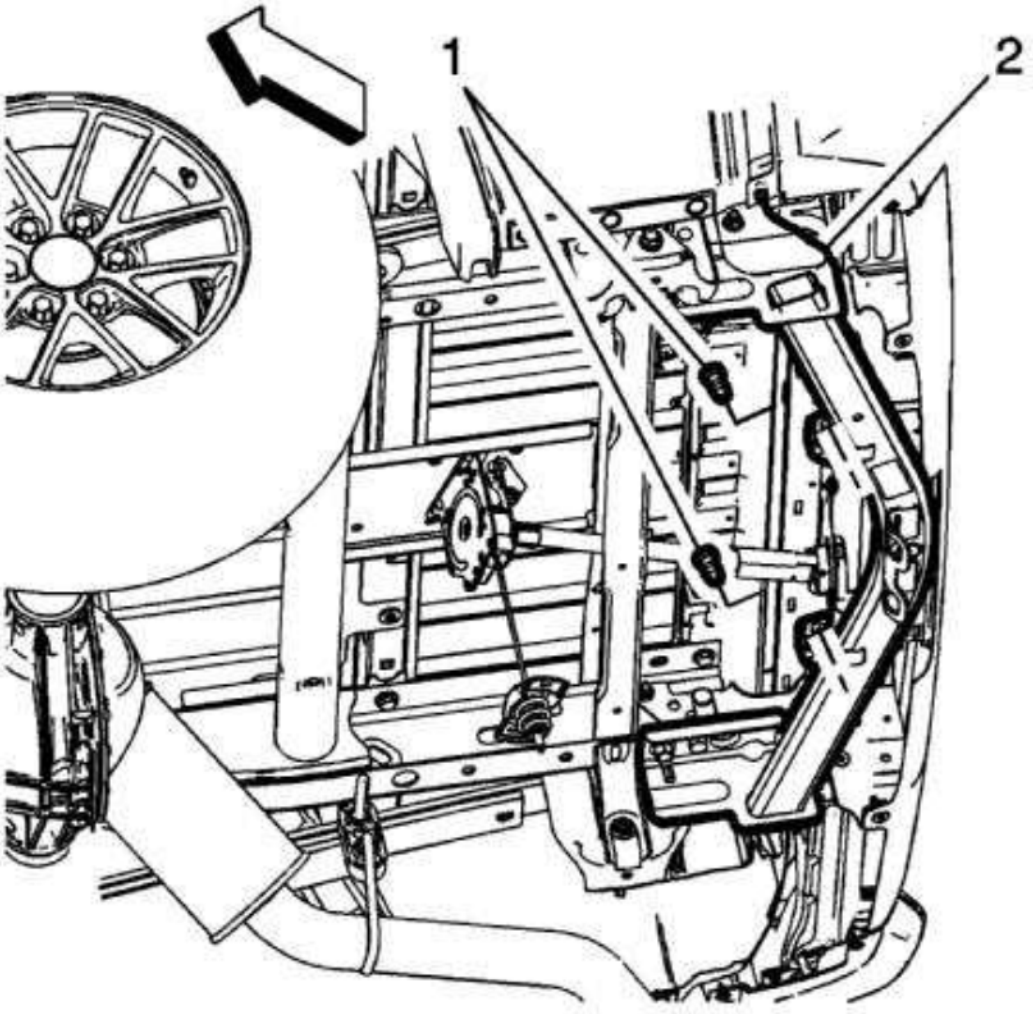


Fig. 123: Rear Bumper Bar Fasteners And Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

1. Position the trailer hitch (2) to the vehicle.

CAUTION: **Refer to Fastener Caution .**

2. Install the rear bumper bar fasteners (1), to the trailer hitch (2), and tighten to 22 N.m (16 lb ft).

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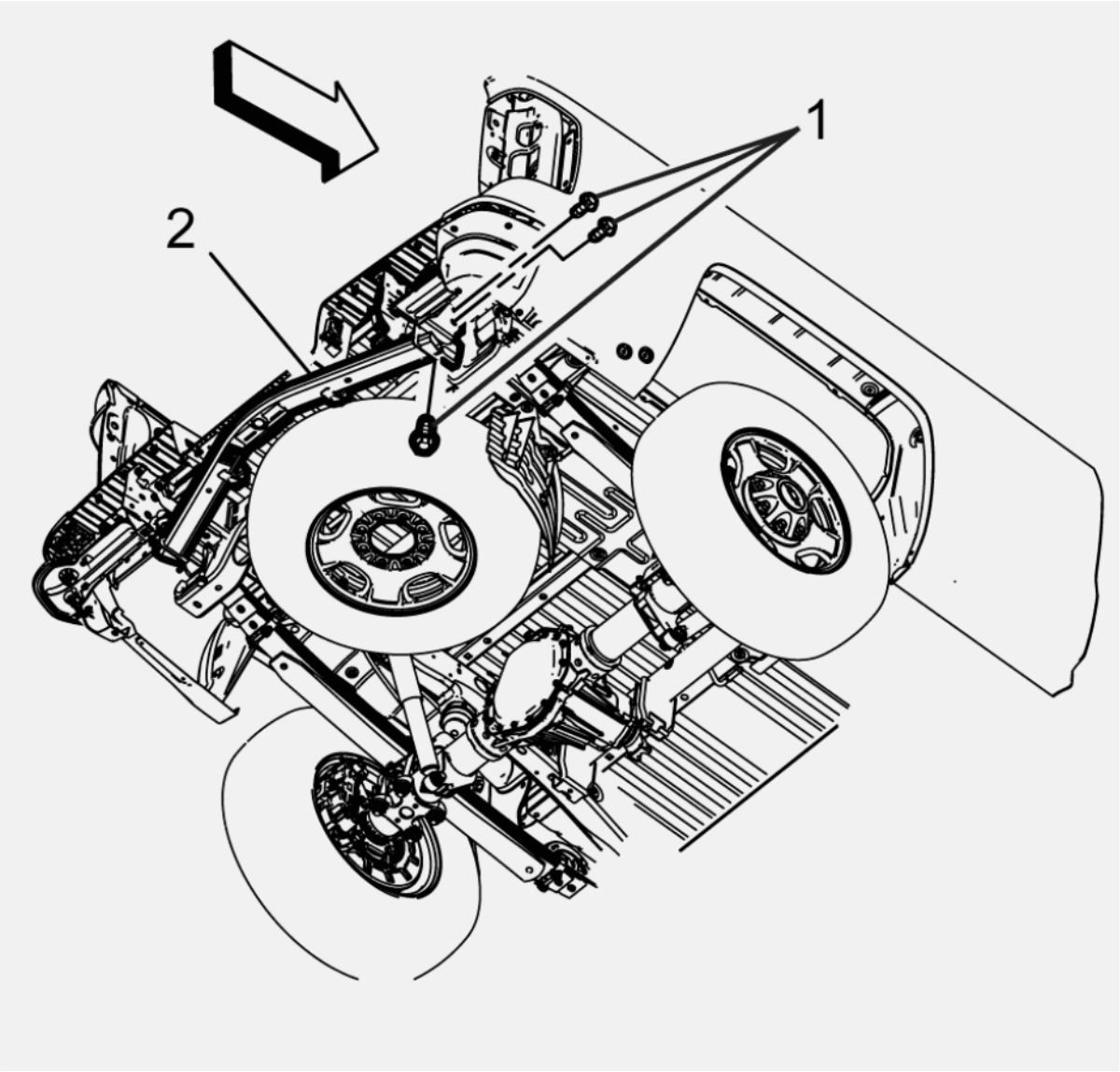


Fig. 124: Trailer Hitch At Right Frame Rail
Courtesy of GENERAL MOTORS COMPANY

3. Install the trailer hitch mounting bolts (1) and tighten to 140 N.m (103 lb ft).

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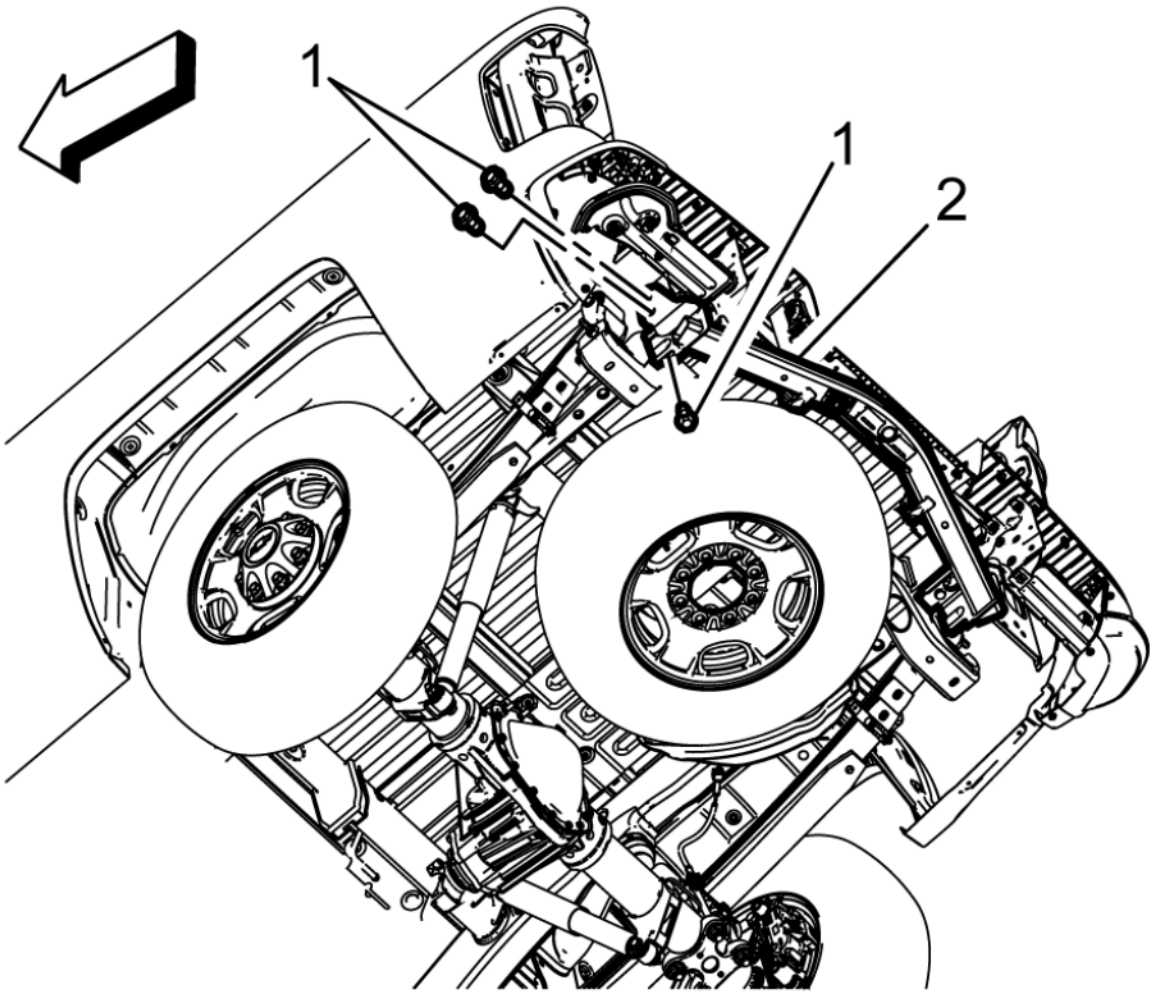


Fig. 125: Trailer Hitch At Left Frame Rail
Courtesy of GENERAL MOTORS COMPANY

4. Install the trailer hitch mounting bolts (1) and tighten to 140 N.m (103 lb ft).
5. Lower the vehicle.

BOX MOUNTED TRAILER HITCH REPLACEMENT

Removal Procedure

1. Remove the pickup box. **Pickup Box Replacement (Long Box)** **Pickup Box Replacement (Standard Box)**

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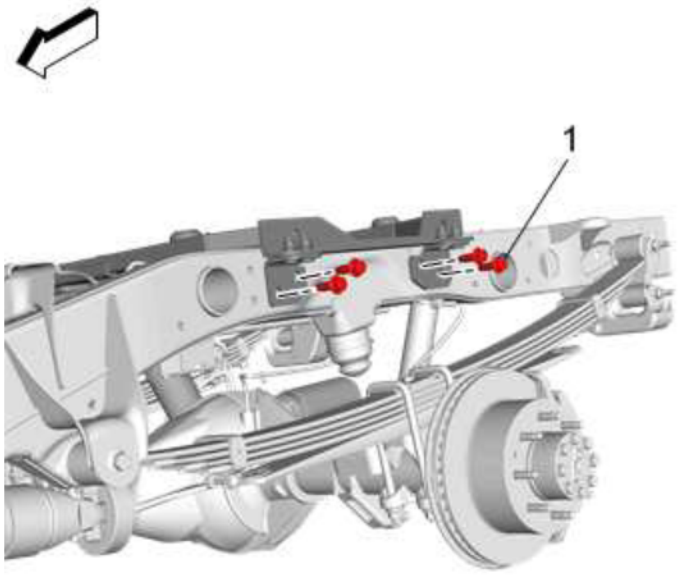


Fig. 126: Box Mounted Trailer Hitch Mounting Bolt
Courtesy of GENERAL MOTORS COMPANY

2. Box Mounted Trailer Hitch Mounting Bolt 1 - Remove

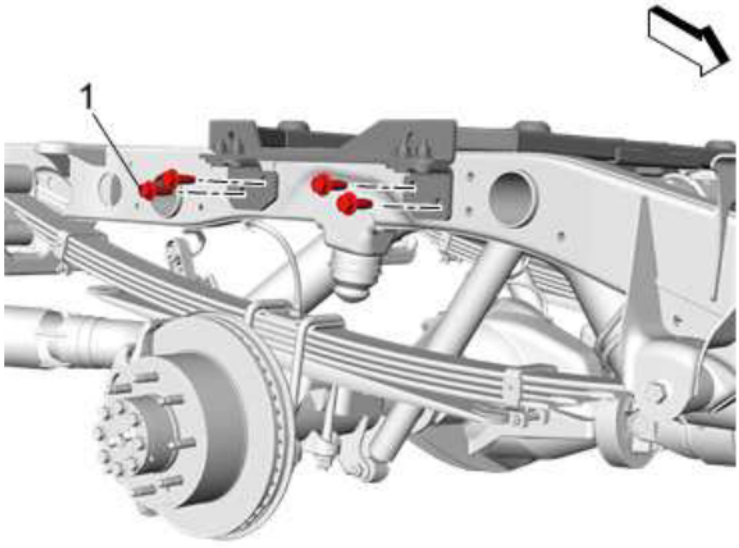


Fig. 127: Box Mounted Trailer Hitch Mounting Bolt
Courtesy of GENERAL MOTORS COMPANY

3. Box Mounted Trailer Hitch Mounting Bolt 1 - Remove

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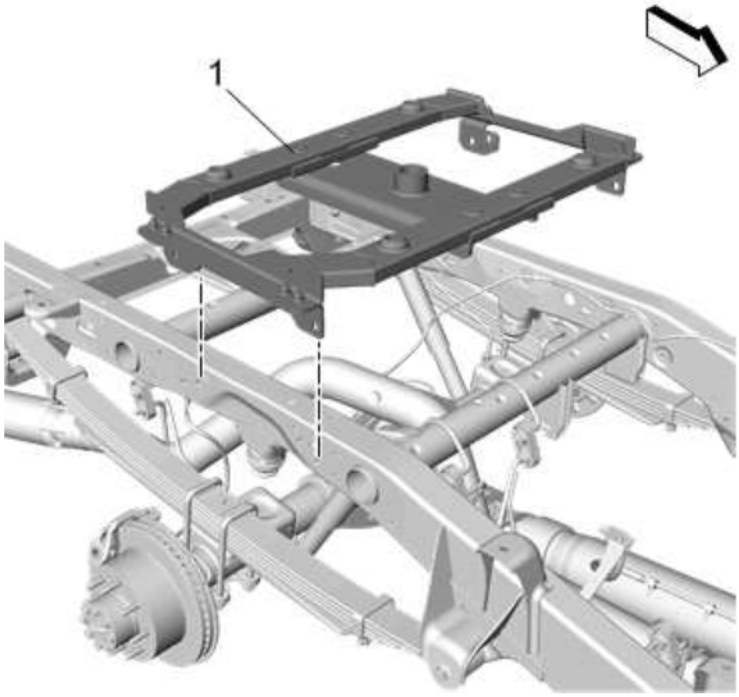


Fig. 128: Box Mounted Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

4. Box Mounted Trailer Hitch 1 - Remove

Installation Procedure

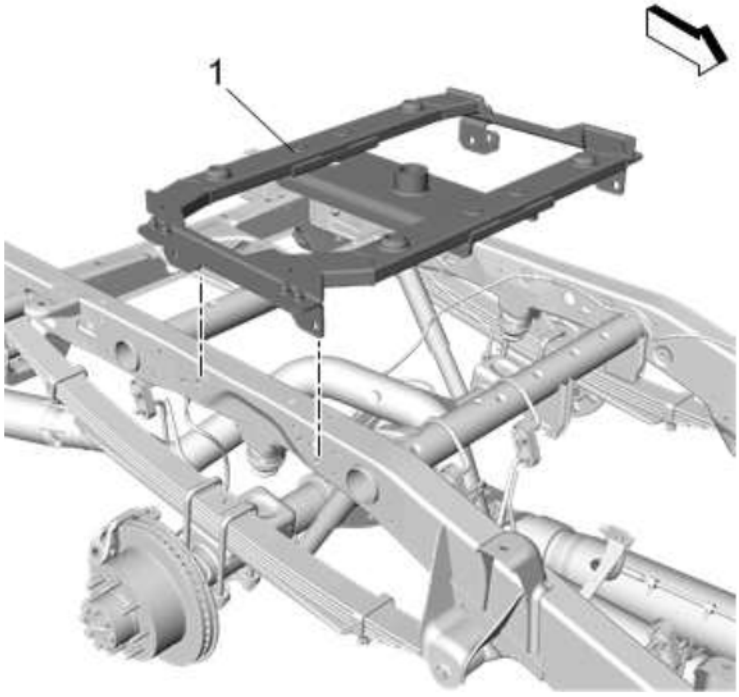


Fig. 129: Box Mounted Trailer Hitch
Courtesy of GENERAL MOTORS COMPANY

1. Box Mounted Trailer Hitch 1 - Install

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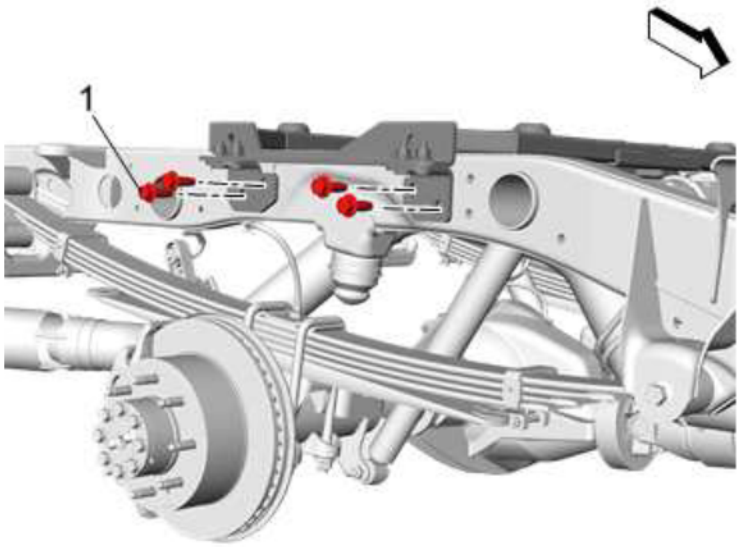


Fig. 130: Box Mounted Trailer Hitch Mounting Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution**

2. Box Mounted Trailer Hitch Mounting Bolt 1 - Install and tighten 240 N.m (177 lb ft)

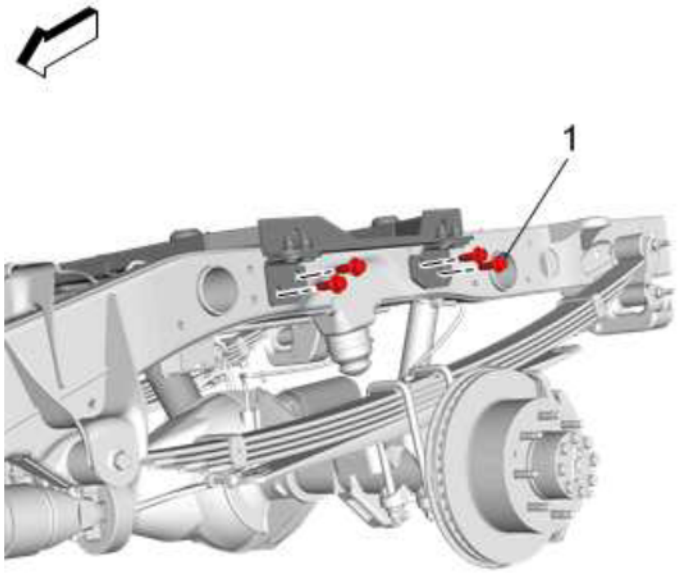


Fig. 131: Box Mounted Trailer Hitch Mounting Bolt
Courtesy of GENERAL MOTORS COMPANY

3. Box Mounted Trailer Hitch Mounting Bolt 1 - Install and tighten 240 N.m (177 lb ft)
4. Install the pickup box. **Pickup Box Replacement (Long Box)** **Pickup Box Replacement (Standard**

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Box)

DESCRIPTION AND OPERATION

RUNNING BOARD DESCRIPTION

Assist Step Controller System Components

The assist step controller system consists of the following components:

- Assist step switch (disable switch)
- Assist step kick switch - Left
- Assist step kick switch - Right
- Running Board Step - Left
- Running Board Step - Right
- K4 Assist Step Control Module

Operation

Each assist step has a bi-directional motor and a hall-effect sensor to detect the position of the assist step. The hall-effect sensors are included with the motor assembly. The polarity on each motor is switched to reverse the direction of assist step travel.

In normal mode, a power extend operation will occur with the opening of either the front or rear doors on the assist step on that side of the vehicle. A power retract operation will occur with the closing of both doors on the assist step on that side of the vehicle. A door ajar status input is received by the assist step control module through the serial data line from the body control module. The gear position and vehicle speed inputs are is also received by the assist step controller through the serial data line.

The assist steps will be extended when the assist step switch is pushed once if the transmission is in park or neutral. Pressing the assist step switch again will extend the assist steps to the rear tires. The assist steps will be retracted with a third push of the disable switch. The assist steps will also retract if the transmission is switched out of park or neutral and the vehicle speed exceeds 8 kph (5 mph).

Object Detection

Each assist step will reverse direction of travel when an object is detected in the travel path. If an assist step is moving in the retract direction, the assist step will move to the full extend position if an object is detected. If a door on the same side as the extended assist step is opened and then closed, the assist step will move to the retract position. The assist steps will stop and hold if an object is detected.

Assist Step Switch (Disable Switch)

The switch input is normally pulled to B+ through a resistor in the assist step controller. The switch grounds the signal with a switch closure. The switch is used to enable and disable the assist steps. The switch can also be used to manually deploy both assist steps. To Enable or disable the assist steps, press and hold the switch for 4 seconds. The driver information center will display a message noting the status of the assist steps. The Assist Step must first be in the Enabled mode before it can be manually deployed. With the vehicle in Park or Neutral press and release the Assist Step Controller Switch to extend the assist steps to the entry position. Pressing the assist step switch a second time will extend the assist steps to the rear tires for aide in accessing the truck bed. To retract the assist steps, returning it to the Enabled mode, press and release the switch a third time.

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Assist Step Kick Switches

The switch inputs are normally pulled to B+ through a resistor in the assist step controller. The switches ground the signal with a switch closure. The switches are used to extend the assist steps to aide in accessing the truck bed. The assist steps must be Enabled before it can be deployed using the kick switches. The kick switches can be used with the ignition in the OFF position if the vehicle is in Park and unlocked. The assist step control module must see a message over serial data for an unlock request from the door lock switch or the keyless entry transmitter. The kick switch inputs will be ignored if the vehicle is unlocked manually using the door handle or if the assist steps have been extended using the assist step switch.

Learn Procedure

When the assist step controller is replaced, or loses battery power, the assist step controller must learn the position of both assist steps. At least one door must be opened and closed on each side of the vehicle for both assist steps to go to a learn procedure. Each assist step will extend and then retract after a door is opened and closed on that assist steps side of the vehicle. Each assist step will learn its own position with the learn procedure

Shipping Mode Unlock Procedure

Vehicles equipped with the power running boards are shipped from the assembly plant in a disabled mode. The boards are disabled in a retracted position during shipping. To enable the boards for normal operation, perform the following steps:

1. Ignition ON, all doors closed.
2. Press and hold the assist step switch for 4 seconds. After releasing the switch the driver information center should display "Running Boards Enabled".
3. Open and close a driver and passenger door to verify running boards extend and retract.

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