

2017 ACCESSORIES AND EQUIPMENT

Bumpers and Fascias - Bolt EV

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

Application	Specification
	Metric (English)
NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Front Bumper Energy Absorber Bolt	58 N.m (43 lb ft)
Front Bumper Fascia Guide Bolt	2.5 N.m (22 lb in)
Front Bumper Fascia Lower Bolt	2.5 N.m (22 lb in)
Front Bumper Fascia Lower Screw	2.5 N.m (22 lb in)
Front Bumper Fascia Lower Stiffener Bolt	17 N.m (13 lb ft)
Front Bumper Fascia Upper Bolt	6 N.m (53 lb in)
Front Bumper Fascia Wheel Opening Bolt	2.5 N.m (22 lb in)
Front Bumper Impact Bar Bolt	22 N.m (16 lb ft)
Front Bumper Lower Fascia Bolt	2.5 N.m (22 lb in)
Front Bumper Shutter Bolt	2.5 N.m (22 lb in)
Headlamp Bolt	2.5 N.m (22 lb in)
Radiator Air Lower Baffle Bolt	9 N.m (80 lb in)
Rear Bumper Fascia Bolt	2.5 N.m (22 lb in)
Rear Bumper Fascia Guide Bolt	2.5 N.m (22 lb in)
Rear Bumper Fascia Upper Bolt	2.5 N.m (22 lb in)
Rear Bumper Impact Bar Nut	58 N.m (43 lb ft)
Underbody Brace Reinforcement Bolt	58 N.m (43 lb ft)

SCHEMATIC WIRING DIAGRAMS

ACTIVE GRILLE AIR SHUTTER WIRING SCHEMATICS

Active Grille Air Shutter

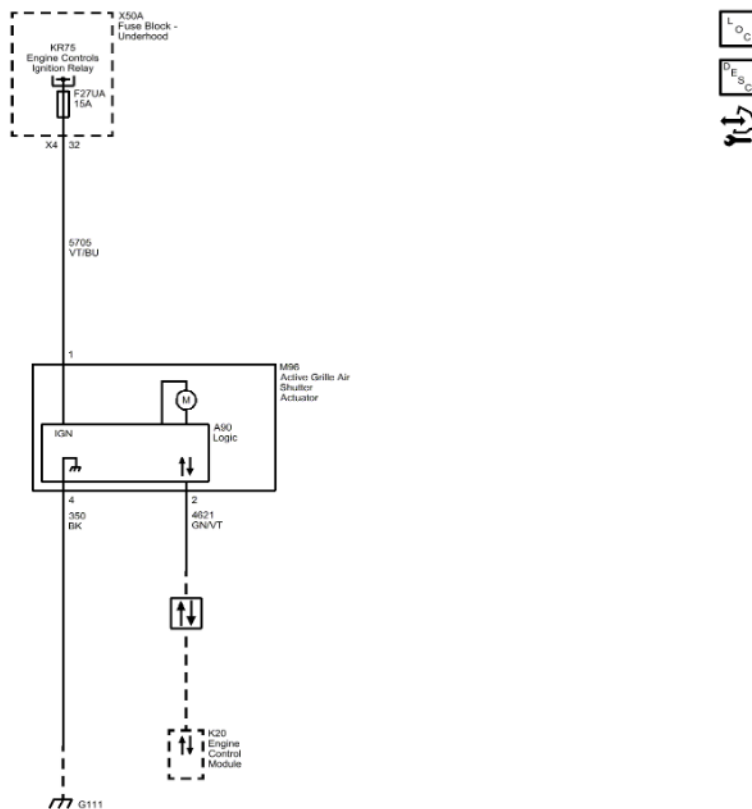


Fig. 1: Active Grille Air Shutter

Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DTC P059F OR P151E: ACTIVE GRILLE AIR SHUTTER

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 P059F

Active Grille Air Shutter 1 Performance

DTC P151E

Active Grille Air Shutter Actuator 1 Signal Message Counter Incorrect

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition	P059F, P151E	P059F, P151E	- -	- -
Local Interconnect Network Serial Data Bus	U1510	U1510	U1510	U1510
Ground	-	P059F, P151E	-	- -

Circuit/System Description

The active grille air shutter actuator closes louvers at the front bumper to enhance vehicle aerodynamics in driving situations where cooling and A/C loads are relatively low and high levels of front end airflow

are not required. If high levels of airflow are required the active grille air shutter actuator opens the louvers. The Local Interconnect Network (LIN) Serial Data Bus signal from the engine control module, ignition and ground circuits enable the active grille air shutter actuator to operate. If the conditions for opening the louvers are reached the engine control module commands the active grille air shutter actuator to open the louvers.

Conditions for Running the DTC

- Ignition On/Vehicle in Service Mode.
- The battery voltage is greater than 10 V.
- The DTC runs continuously when the above conditions are met.

Conditions for Setting the DTC

- The DTC P059F will be set during a key cycle when the commanded louver position can not be achieved after 5 attempts are made to move the louver. The DTC will be stored as current for this key cycle but the malfunction indicator lamp (MIL) will not be illuminated. The malfunction indicator lamp will illuminate in the second key cycle after a failed movement attempt is made in each of two back to back key cycles.
- The DTC P151E will set if there is a serial data communication failure.

Action Taken When the DTC Sets

DTC P059F and P151E are type B DTCs.

Conditions for Clearing the DTC

DTC P059F and P151E are type B DTCs.

Reference Information

Schematic Reference

Active Grille Air Shutter Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Active Grille Air Shutter Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition On/Vehicle in Service Mode.
2. Verify DTC U1510 is not set.
 - **If DTC U1510 is set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) for further diagnosis. cardiagn.com

- **If DTC U1510 is not set**

3. Verify the active grille air shutter position parameter changes from 0% (fully closed) to 100% (fully open) when using the scan tool ECM Active Grille Air Shutter Position control function.

- **If the louvers at the front bumper do not open and close**

Refer to Circuit/System Testing.

- **If the louvers at the front bumper open and close**

4. Verify none of the following conditions are present:

- Snow or ice packed in the front fascia which prevents the louvers from moving.
- Debris or foreign objects which prevent the louvers from moving.
- **If any of the conditions are present**

Clear any snow, ice or foreign objects from the front grille.

- **If none of the conditions are present**

5. All OK

Circuit/System Testing

1. Ignition/Vehicle Off and all vehicle systems Off, disconnect the harness connector(s) at the active grille air shutter actuator(s). It may take up to 2 minutes for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle 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/Vehicle in Service Mode.

4. Verify a test lamp illuminates between the ignition circuit and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle Off.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [**Power Mode Mismatch**](#).

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle Off.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- **If the test lamp illuminates**

5. Ignition/Vehicle Off, disconnect the harness connector at the K20 Engine Control Module.

1. Test for infinite resistance between the LIN Serial Data Bus circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance

2. Test for less than 2 Ω in the LIN Serial Data Bus circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω

3. Test for less than 1 V between the LIN Serial Data Bus circuit and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V

6. Test or replace the M60A Active Grille Air Shutter 1 Motor Module.

7. Verify DTCs P059F, P151E or U1510 are not set while operating the vehicle under the conditions for setting the DTC.

- **If the DTC is set**

Replace the K20 Engine Control Module.

- **If the DTC is not set**

8. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup.

SYMPTOMS - ACTIVE GRILLE AIR SHUTTER

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

1. Perform the [Diagnostic System Check - Vehicle](#) before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to [Active Grille Air Shutter Description and Operation](#).

Visual/Physical Inspection

- Inspect for aftermarket devices which may affect the operation of the system. Refer to [Checking Aftermarket Accessories](#).
- Inspect the easily accessible or visible system components for obvious damage or conditions which may 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

[Active Grille Air Shutter 1 Malfunction](#)

ACTIVE GRILLE AIR SHUTTER 1 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.

DTC Descriptors

DTC P059F

Active Grille Air Shutter 1 Performance

DTC P151E

Active Grille Air Shutter Actuator 1 Signal Message Counter Incorrect

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Ignition	P059F, P151E	P059F, P151E	- -	- -
Local Interconnect Network Serial Data Bus	U1510	U1510	U1510	U1510
Ground	-	P059F, P151E	-	- -

Circuit/System Description

The active grille air shutter actuator closes louvers at the front bumper to enhance vehicle aerodynamics in driving situations where cooling and A/C loads are relatively low and high levels of front end airflow are not required. If high levels of airflow are required the active grille air shutter actuator opens the louvers. The Local Interconnect Network (LIN) Serial Data Bus signal from the engine control module, ignition and ground circuits enable the active grille air shutter actuator to operate. If the conditions for opening the louvers are reached the engine control module commands the active grille air shutter actuator to open the louvers.

Conditions for Running the DTC

- Ignition On/Vehicle in Service Mode.
- The battery voltage is greater than 10 V.
- The DTC runs continuously when the above conditions are met.

Conditions for Setting the DTC

- The DTC P059F will be set during a key cycle when the commanded louver position can not be achieved after 5 attempts are made to move the louver. The DTC will be stored as current for this key cycle but the malfunction indicator lamp (MIL) will not be illuminated. The malfunction indicator lamp will illuminate in the second key cycle after a failed movement attempt is made in each of two back to back key cycles.
- The DTC P151E will set if there is a serial data communication failure.

Action Taken When the DTC Sets

DTC P059F and P151E are type B DTCs.

Conditions for Clearing the DTC

DTC P059F and P151E are type B DTCs.

Reference Information

Schematic Reference

Active Grille Air Shutter Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Active Grille Air Shutter Description and Operation

Electrical Information Reference

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

Circuit/System Verification

1. Ignition On/Vehicle in Service Mode.

2. Verify DTC U1510 is not set.

- **If DTC U1510 is set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) for further diagnosis.

- **If DTC U1510 is not set**

3. Verify the active grille air shutter position parameter changes from 0% (fully closed) to 100% (fully open) when using the scan tool ECM Active Grille Air Shutter Position control function.

- **If the louvers at the front bumper do not open and close**

Refer to Circuit/System Testing.

- **If the louvers at the front bumper open and close**

4. Verify none of the following conditions are present:

- Snow or ice packed in the front fascia which prevents the louvers from moving.
- Debris or foreign objects which prevent the louvers from moving.
- **If any of the conditions are present**

Clear any snow, ice or foreign objects from the front grille.

- **If none of the conditions are present**

5. All OK

Circuit/System Testing

1. Ignition/Vehicle Off and all vehicle systems Off, disconnect the harness connector(s) at the active grille air shutter actuator(s). It may take up to 2 minutes for all vehicle systems to power down.

2. Test for less than 10 Ω between the ground circuit and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle 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/Vehicle in Service Mode.

4. Verify a test lamp illuminates between the ignition circuit and ground.

- **If the test lamp does not illuminate and the circuit fuse is good**

1. Ignition/Vehicle Off.

2. Test for less than 2 Ω in the ignition circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , verify the fuse is not open and there is voltage at the fuse. Refer to [Power Mode Mismatch](#).

- **If the test lamp does not illuminate and the circuit fuse is open**

1. Ignition/Vehicle Off.

2. Test for infinite resistance between the ignition circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- **If the test lamp illuminates**

5. Ignition/Vehicle Off, disconnect the harness connector at the K20 Engine Control Module.

1. Test for infinite resistance between the LIN Serial Data Bus circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance
2. Test for less than 2 Ω in the LIN Serial Data Bus circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω
 3. Test for less than 1 V between the LIN Serial Data Bus circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V
6. Test or replace the M60A Active Grille Air Shutter 1 Motor Module.
 7. Verify DTCs P059F, P151E or U1510 are not set while operating the vehicle under the conditions for setting the DTC.
 - **If the DTC is set**

Replace the K20 Engine Control Module.
 - **If the DTC is not set**
 8. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup.

REPAIR INSTRUCTIONS

FRONT BUMPER ENERGY ABSORBER REPLACEMENT (NORTH AMERICA)

Removal Procedure

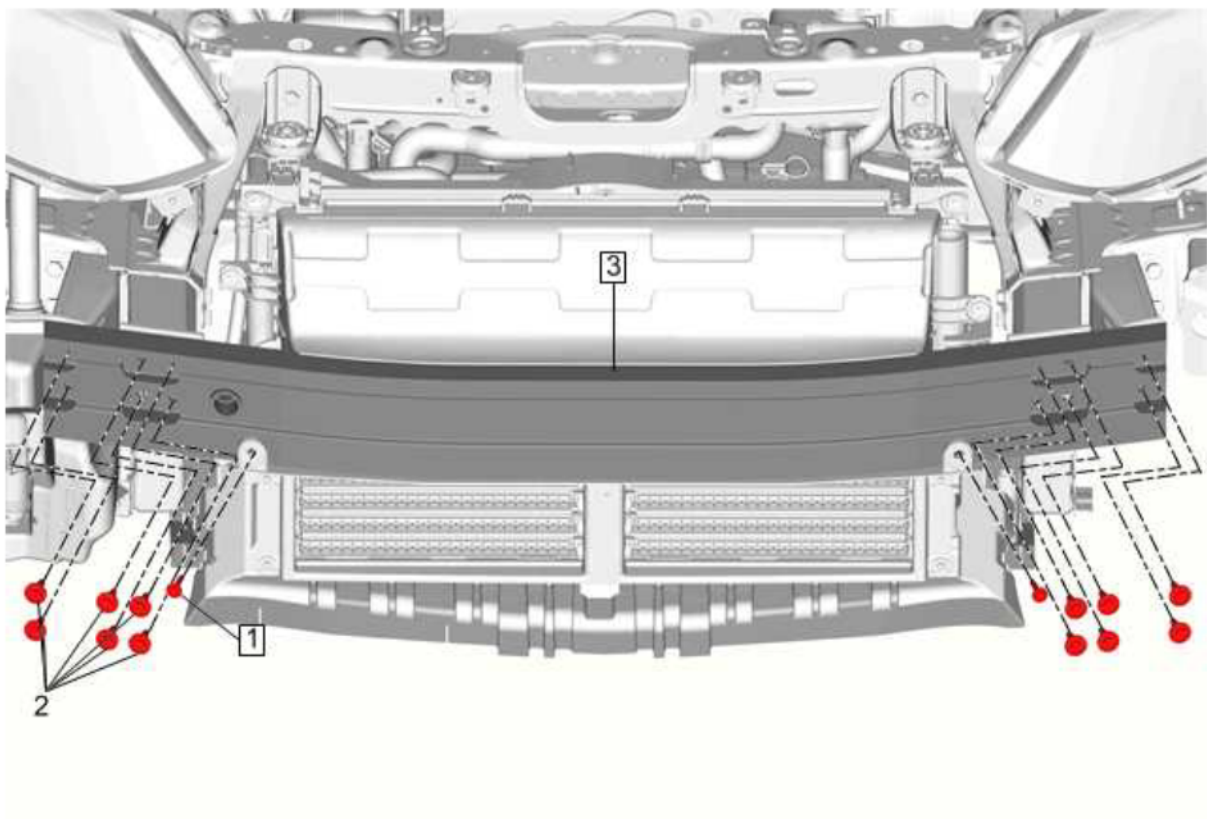


Fig. 2: Front Bumper Impact Bar (North America)

Courtesy of GENERAL MOTORS COMPANY

1. Front Bumper Impact Bar - Remove - [Front Bumper Impact Bar Replacement \(North America\)](#)

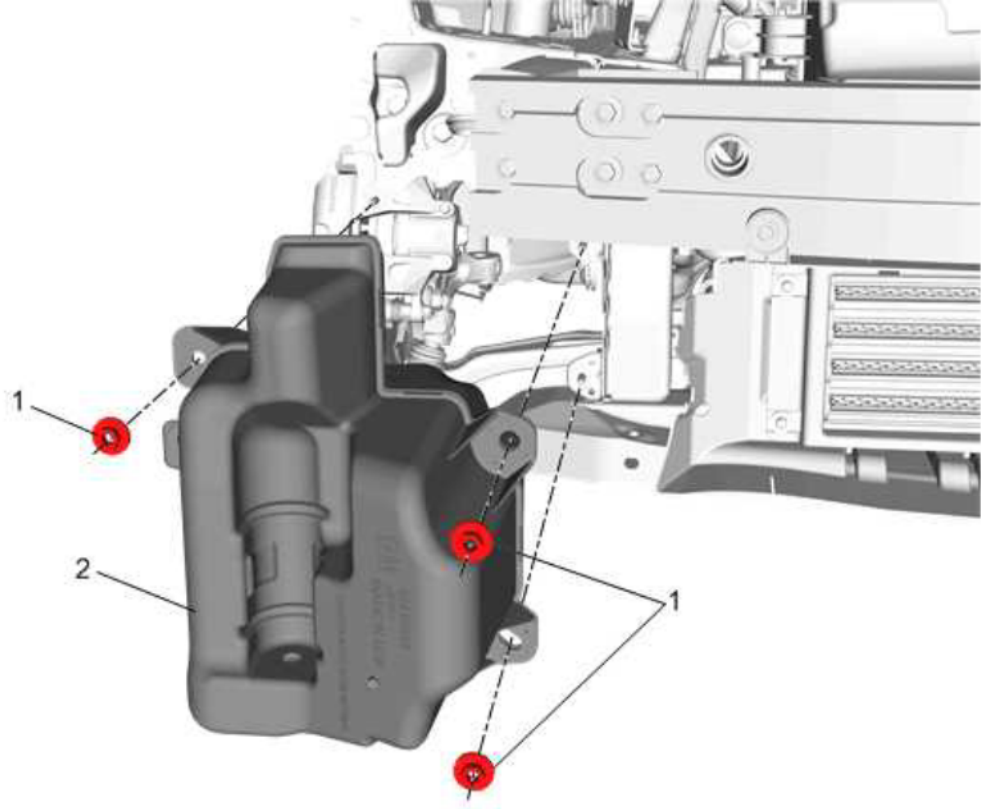


Fig. 3: Windshield Washer Solvent Container (North America)

Courtesy of GENERAL MOTORS COMPANY

2. Windshield Washer Solvent Container - Remove - **Windshield Washer Solvent Container Replacement**

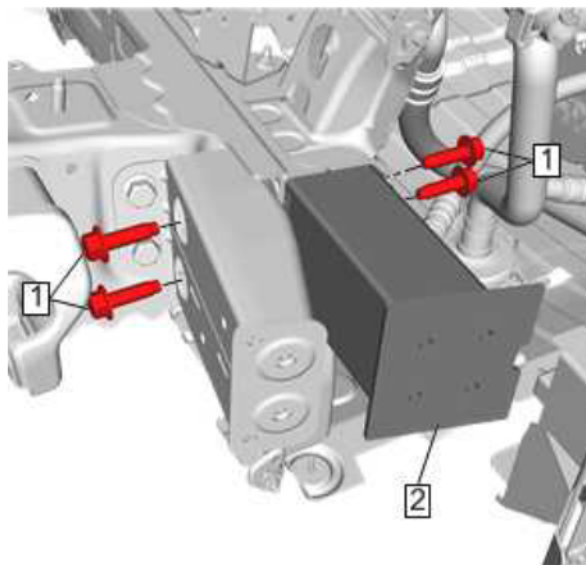


Fig. 4: Front Bumper Energy Absorber Bolt (North America)

Courtesy of GENERAL MOTORS COMPANY

3. Front Bumper Energy Absorber Bolt - Remove
4. Front Bumper Energy Absorber -Right Side - Remove

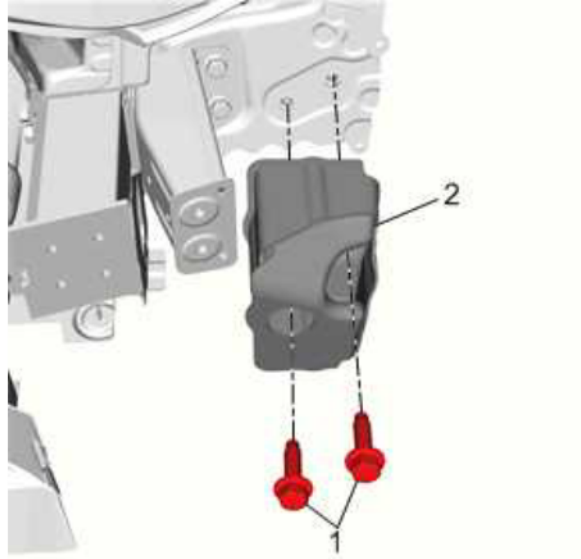


Fig. 5: Underbody Brace Reinforcement Bolt (North America)
Courtesy of GENERAL MOTORS COMPANY

- 5. Underbody Brace Reinforcement Bolt - Remove
- 6. Underbody Brace Reinforcement -Left Side - Remove

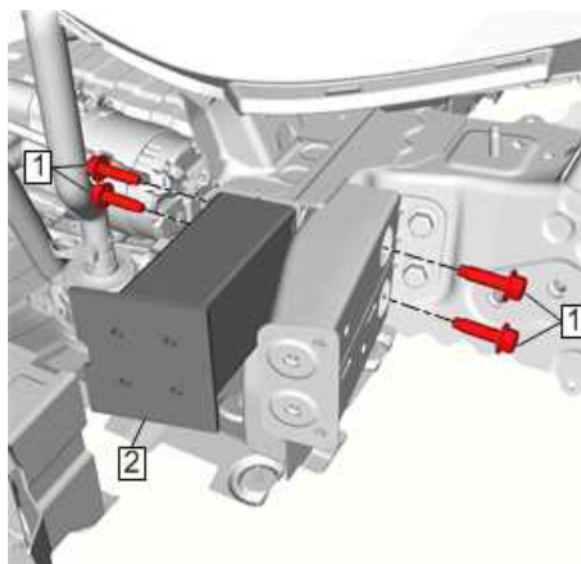


Fig. 6: Front Bumper Energy Absorber Bolt (North America)
Courtesy of GENERAL MOTORS COMPANY

- 7. Front Bumper Energy Absorber Bolt - Remove
- 8. Front Bumper Energy Absorber -Left Side - Remove

Installation Procedure

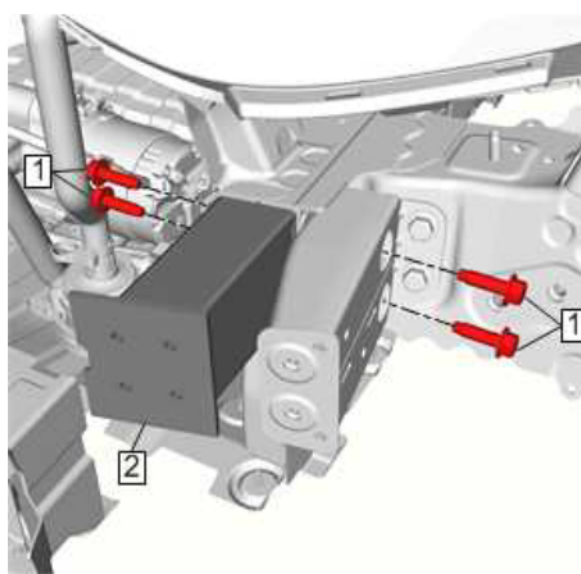


Fig. 7: Front Bumper Energy Absorber Bolt (North America)
Courtesy of GENERAL MOTORS COMPANY

1. Front Bumper Energy Absorber -Left Side - Install

CAUTION: **Fastener Caution**

2. Install the front bumper energy absorber bolt (1) and tighten to 58 N.m (43 lb ft)

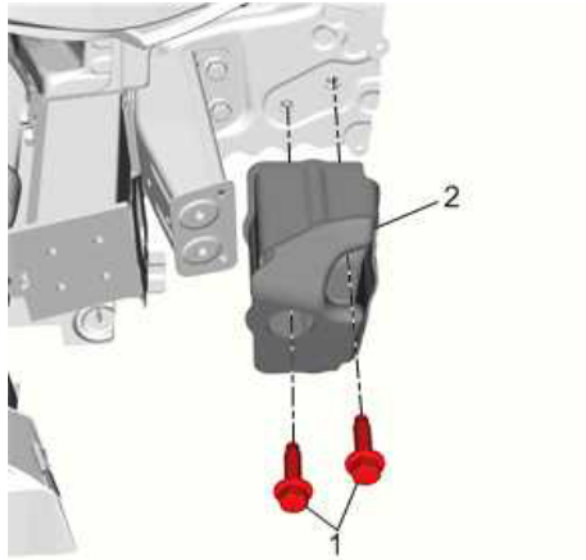


Fig. 8: Underbody Brace Reinforcement Bolt (North America)
Courtesy of GENERAL MOTORS COMPANY

3. Underbody Brace Reinforcement -Left Side - Install
4. Install the underbody brace reinforcement bolt (1) and tighten to 58 N.m (43 lb ft)

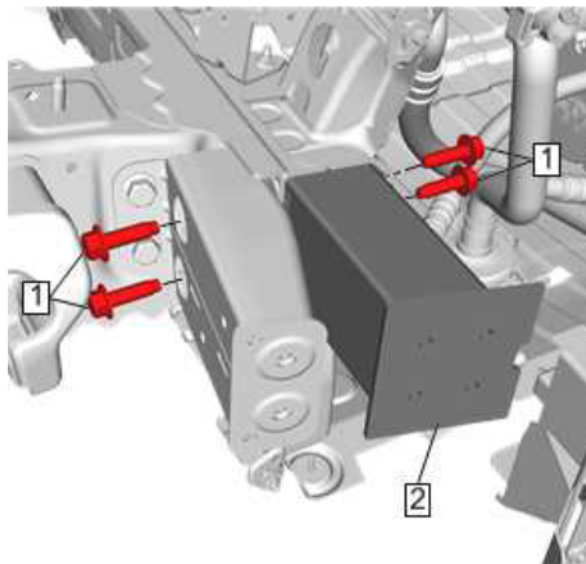


Fig. 9: Front Bumper Energy Absorber Bolt (North America)
Courtesy of GENERAL MOTORS COMPANY

5. Front Bumper Energy Absorber -Right Side - Install
6. Install the front bumper energy absorber bolt (1) and tighten to 58 N.m (43 lb ft)

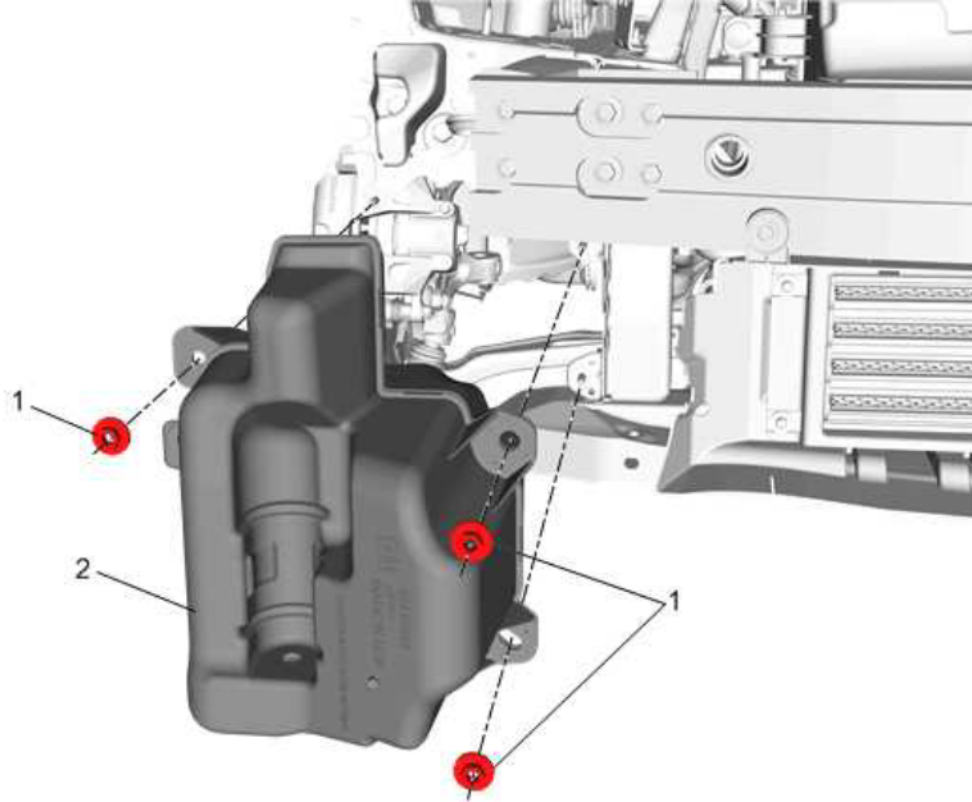


Fig. 10: Windshield Washer Solvent Container (North America)

Courtesy of GENERAL MOTORS COMPANY

7. Windshield Washer Solvent Container - Install - **Windshield Washer Solvent Container Replacement**

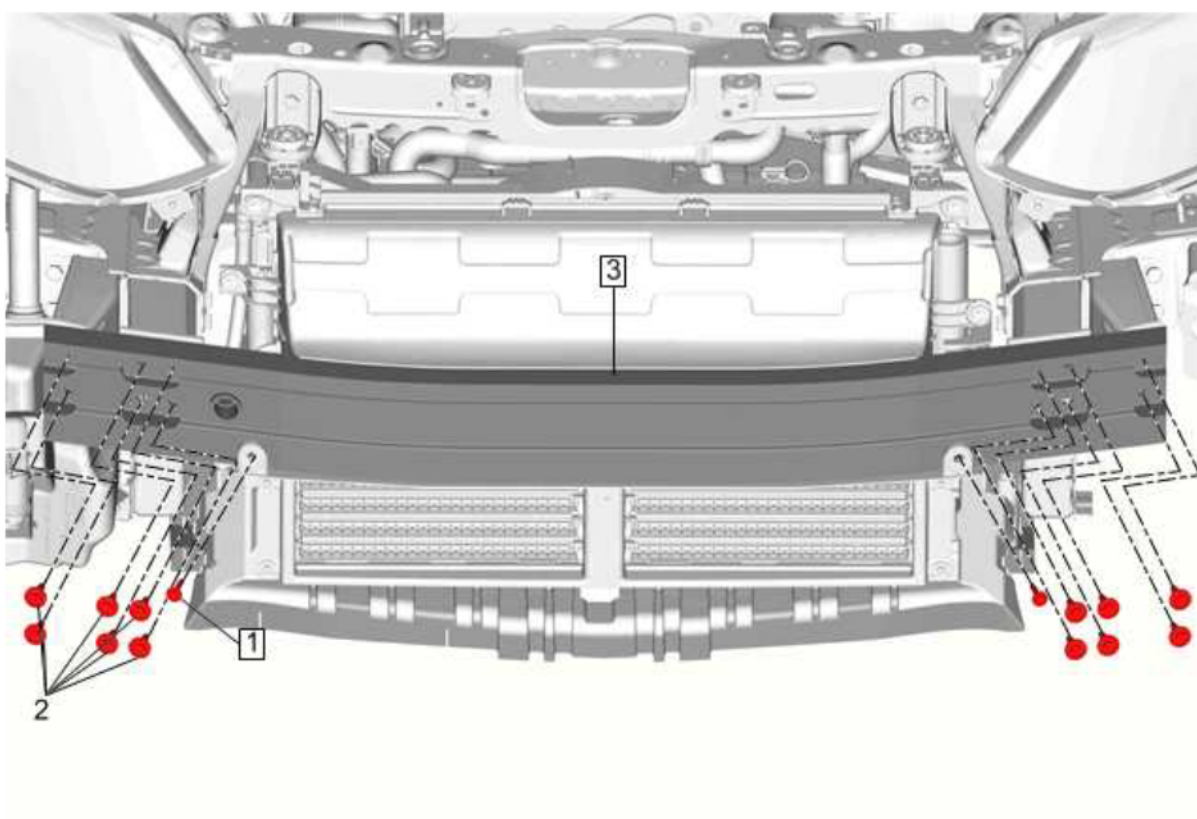


Fig. 11: Front Bumper Impact Bar (North America)

Courtesy of GENERAL MOTORS COMPANY

8. Front Bumper Impact Bar - Install - **Front Bumper Impact Bar Replacement (North America)**

FRONT BUMPER ENERGY ABSORBER REPLACEMENT (EUROPE, KOREA)

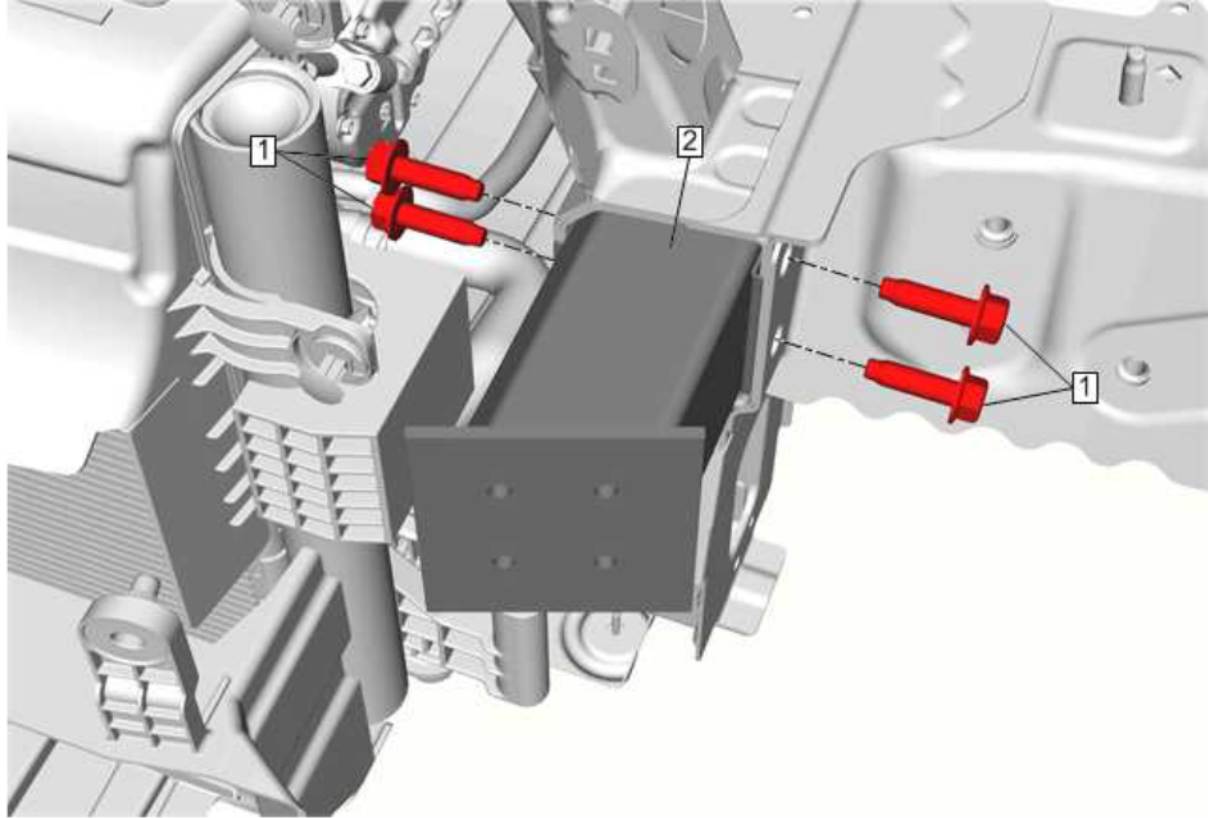


Fig. 12: Front Bumper Energy Absorber (Europe, Korea)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Front Bumper Impact Bar Replacement (Europe, Korea)</u>	
1	Front Bumper Energy Absorber Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 58 N.m (43 lb ft)
2	Front Bumper Energy Absorber

FRONT BUMPER IMPACT ABSORBER REPLACEMENT (NORTH AMERICA)

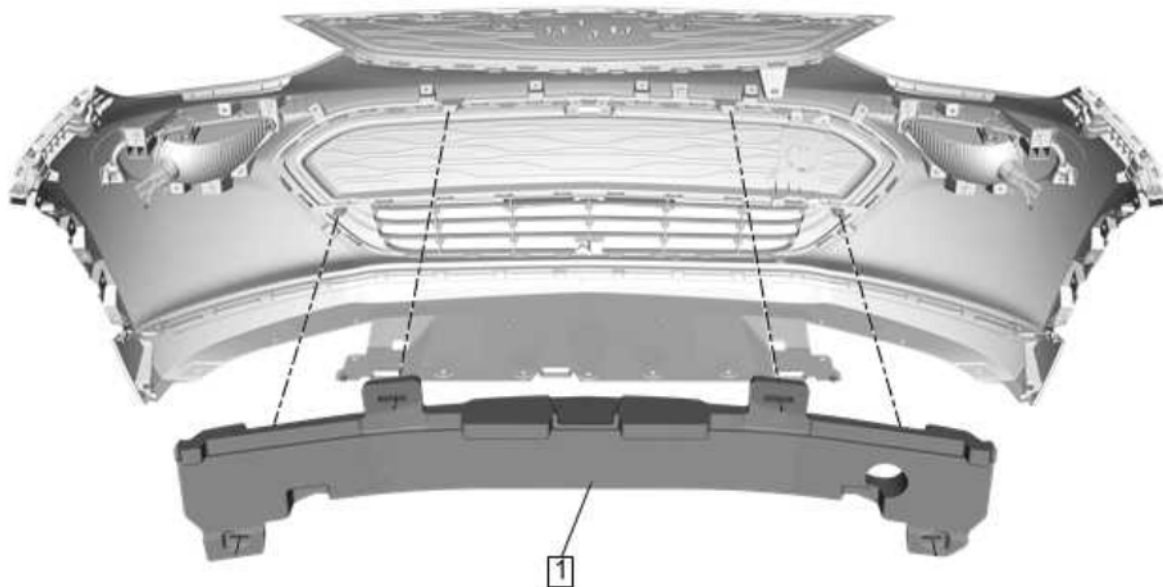


Fig. 13: Front Bumper Impact Absorber (North America)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures <u>Front Bumper Fascia Replacement (North America)</u> - Retaining clips - Remove	
1	Front Bumper Impact Absorber Procedure Release the integral retainers.

FRONT BUMPER IMPACT ABSORBER REPLACEMENT (EUROPE, KOREA)

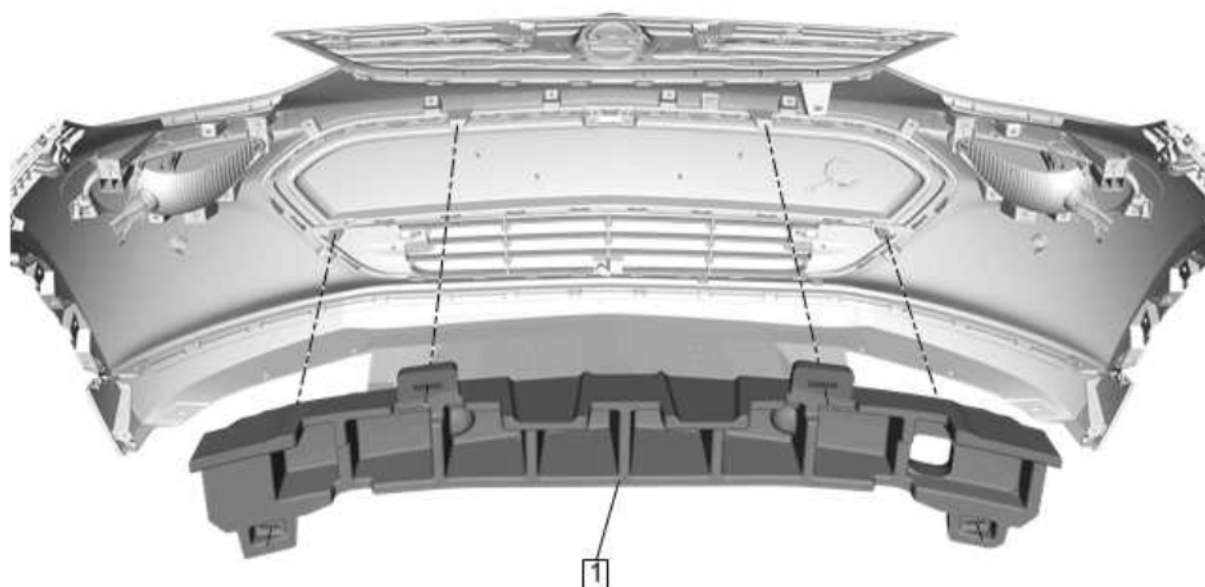


Fig. 14: Front Bumper Impact Absorber (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Bumper Fascia Replacement (Europe, Korea)</u>	
1	Front Bumper Impact Absorber

FRONT BUMPER IMPACT BAR REPLACEMENT (EUROPE, KOREA)

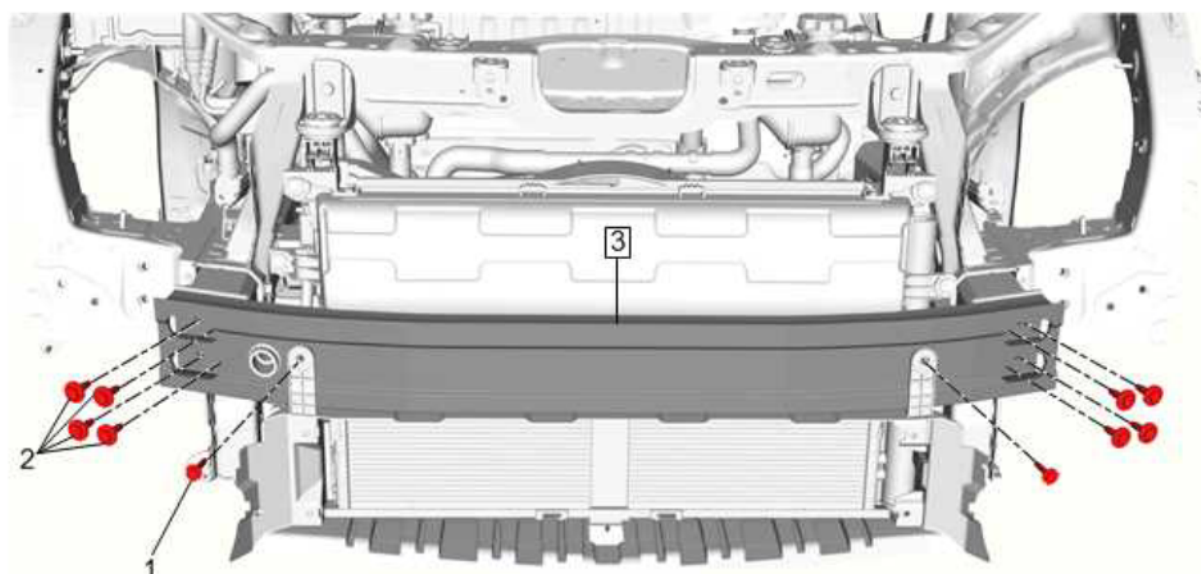


Fig. 15: Front Bumper Impact Bar (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Bumper Fascia Replacement (Europe, Korea)</u>	
1	Radiator Air Lower Baffle Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9 N.m (80 lb in)
2	Front Bumper Impact Bar Bolt Tighten 22 N.m (16 lb ft)
3	Front Bumper Impact Bar

FRONT BUMPER IMPACT BAR REPLACEMENT (NORTH AMERICA)

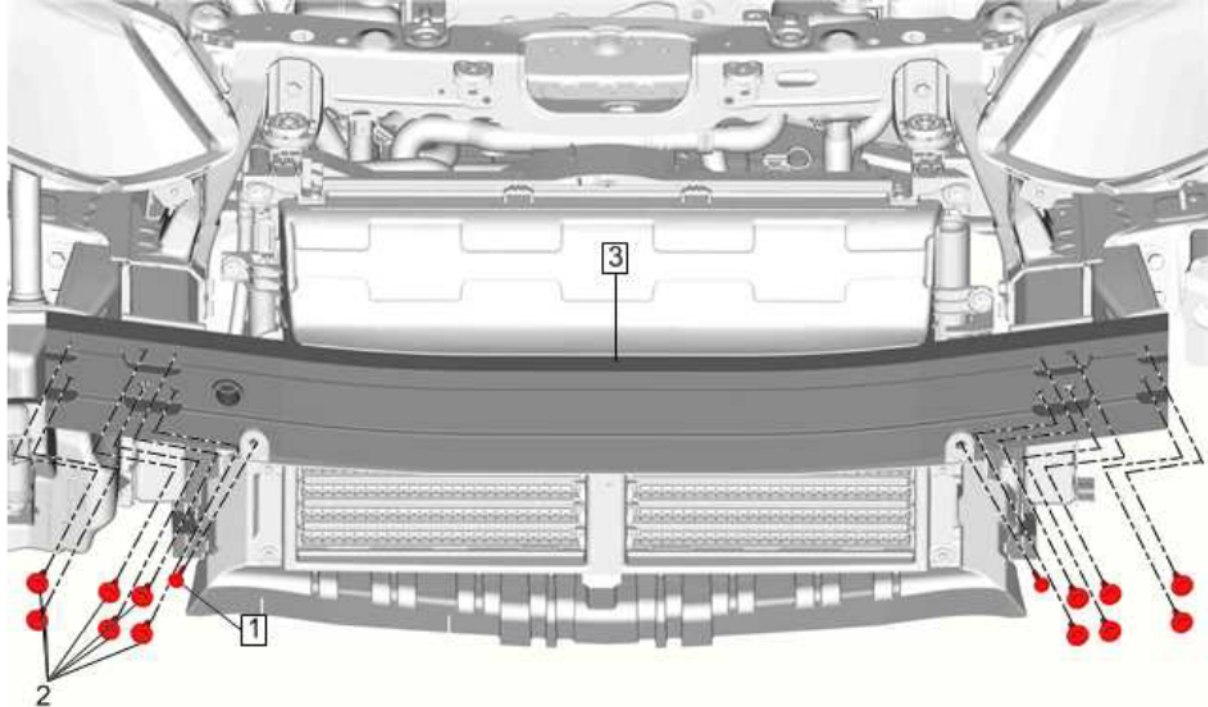


Fig. 16: Front Bumper Impact Bar (North America)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Front Bumper Fascia Replacement (North America)</u>	
1	Radiator Air Lower Baffle Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 9 N.m (80 lb in)
2	Front Bumper Impact Bar Bolt Tighten 22 N.m (16 lb ft)
3	Front Bumper Impact Bar

FRONT BUMPER FASCIA REPLACEMENT (NORTH AMERICA)

Removal Procedure

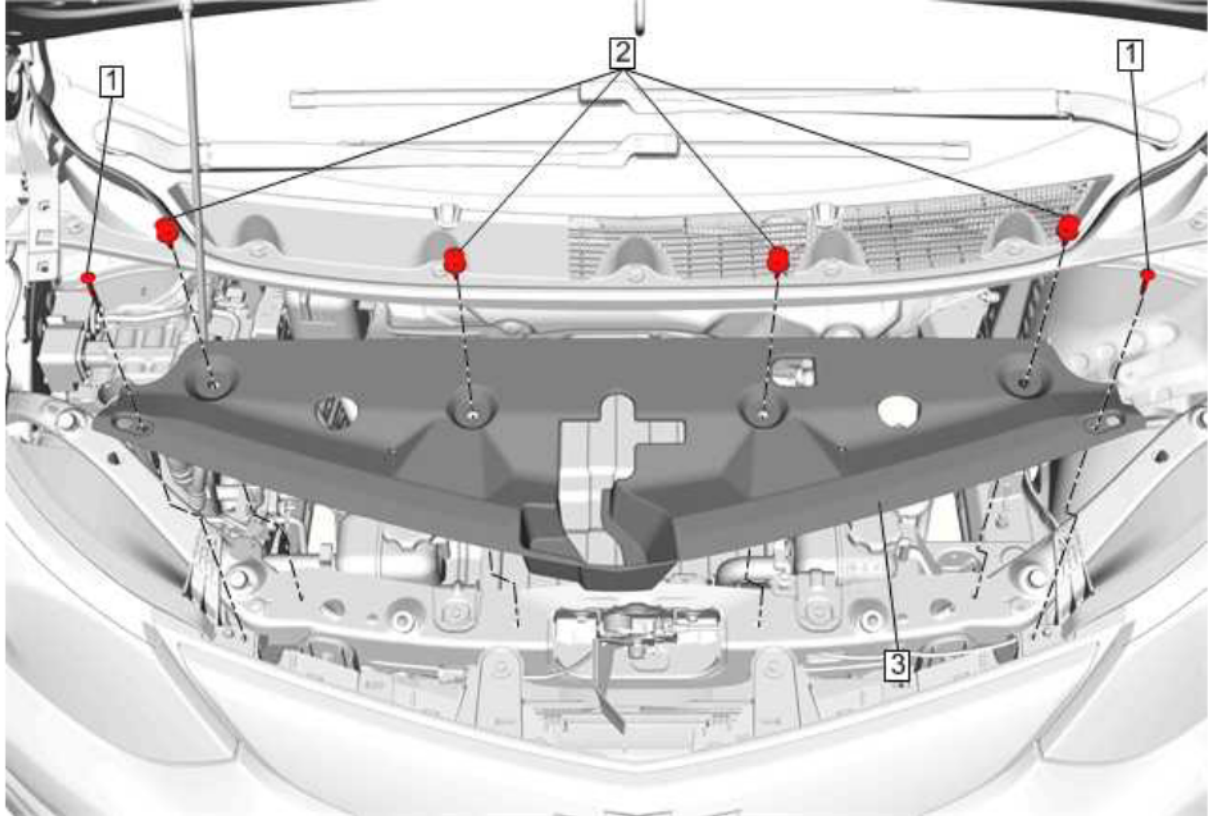


Fig. 17: Front Compartment Front Sight Shield (North America)
 Courtesy of GENERAL MOTORS COMPANY

1. Front Compartment Front Sight Shield - Remove - **Front Compartment Front Sight Shield Replacement**

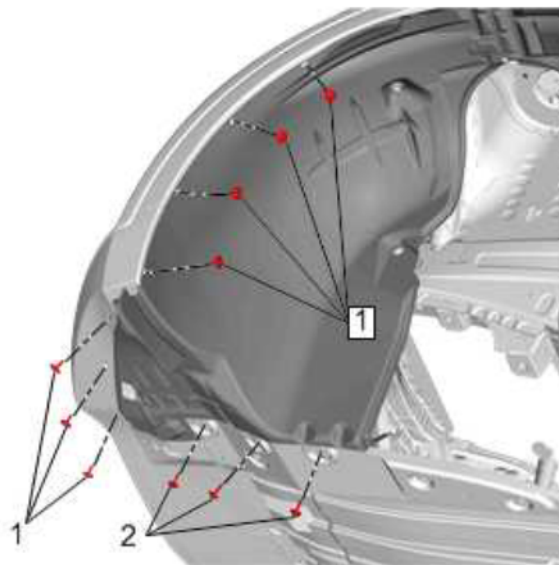


Fig. 18: Front Wheelhouse Liner Screw (North America)
 Courtesy of GENERAL MOTORS COMPANY

2. Front Wheelhouse Liner Screw - Remove
3. Front Bumper Fascia Wheel Opening Screw - Remove - **Front Wheelhouse Liner Replacement**

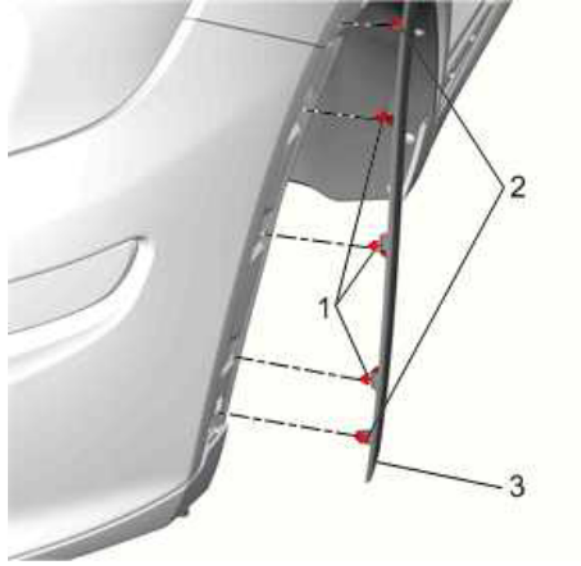


Fig. 19: Front Wheel Opening Molding Retainer (North America)
 Courtesy of GENERAL MOTORS COMPANY

4. Front Wheel Opening Molding Retainer - Remove
5. Front Wheel Opening Molding Clip - Remove
6. Partially remove the front wheel opening molding (3). **Front Wheel Opening Molding Replacement**

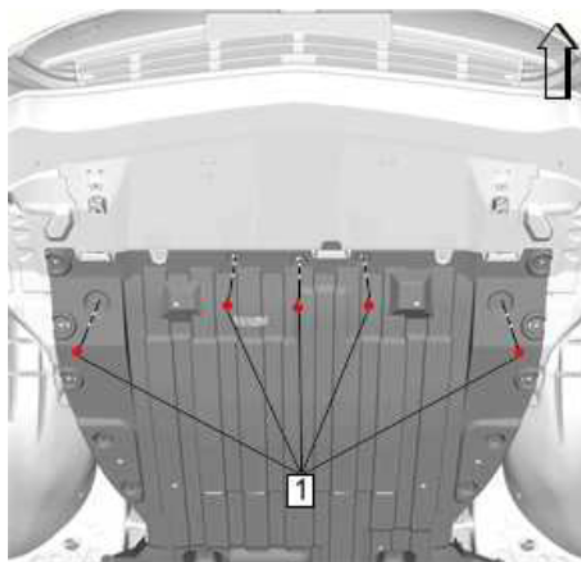


Fig. 20: Front Compartment Insulator Screw (North America)
 Courtesy of GENERAL MOTORS COMPANY

7. Front Compartment Insulator Screw - Remove - **Front Compartment Air Deflector Replacement**

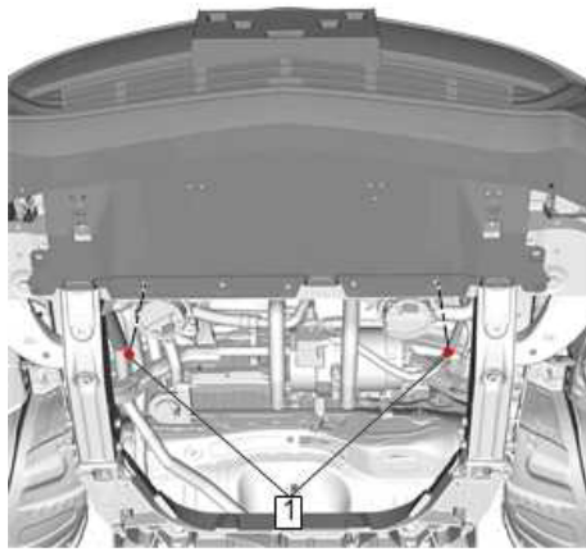


Fig. 21: Front Bumper Fascia Lower Bolt (North America)
 Courtesy of GENERAL MOTORS COMPANY

8. Front Bumper Fascia Lower Bolt - Remove

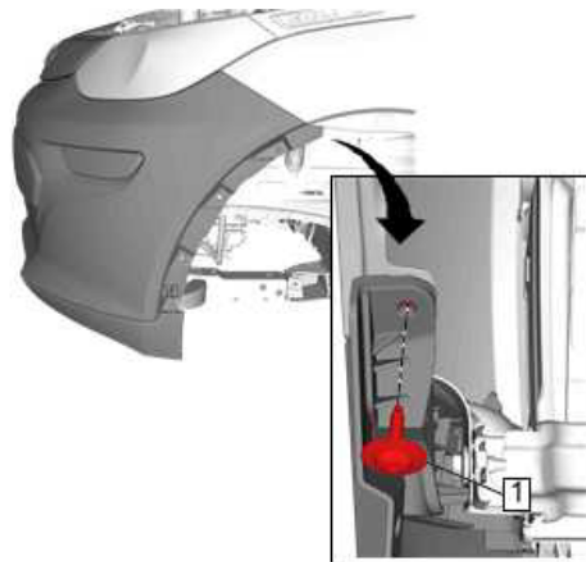


Fig. 22: Front Bumper Fascia Wheel Opening Bolt (North America)
 Courtesy of GENERAL MOTORS COMPANY

9. Front Bumper Fascia Wheel Opening Bolt - Remove

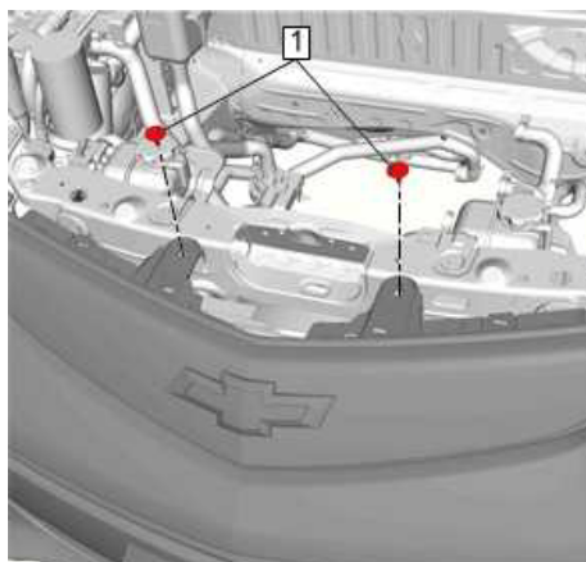


Fig. 23: Front Bumper Fascia Upper Bolt (North America)
 Courtesy of GENERAL MOTORS COMPANY

10. Front Bumper Fascia Upper Bolt - Remove
11. Release the integral retainers at both fenders and headlamps.
12. Lift fascia off of headlamp retaining tabs, then Carefully pull the front bumper fascia outward to remove.
13. Disconnect all electrical connectors.

Installation Procedure

1. Transfer components as necessary.
2. Connect all electrical connectors.
3. Front Bumper Fascia - Install
4. Carefully push in the retaining tabs of the front bumper fascia into the front bumper fascia guides.

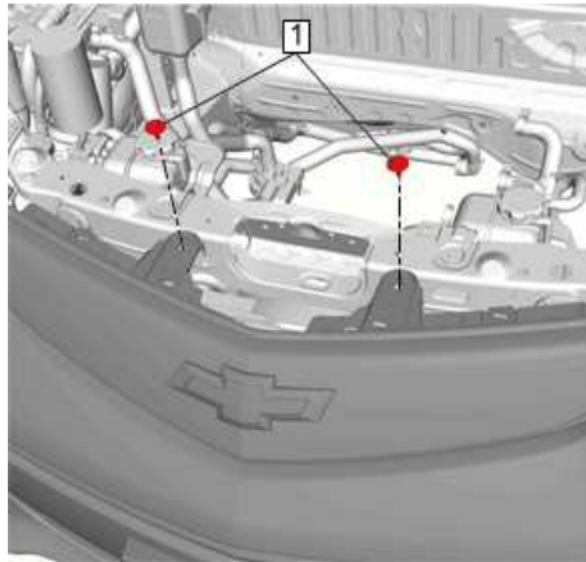


Fig. 24: Front Bumper Fascia Upper Bolt (North America)
Courtesy of GENERAL MOTORS COMPANY

5. Front Bumper Fascia Upper Bolt - Install and tighten to 6 N.m (53 lb in)

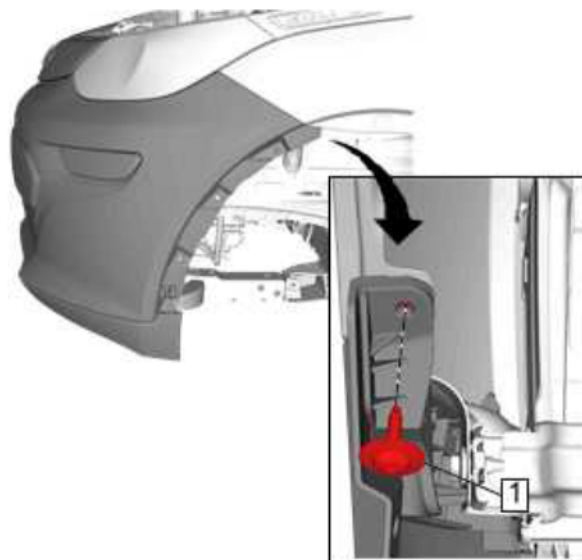


Fig. 25: Front Bumper Fascia Wheel Opening Bolt (North America)
Courtesy of GENERAL MOTORS COMPANY

6. Front Bumper Fascia Wheel Opening Bolt - Install and tighten to 2.5 N.m (22 lb in)

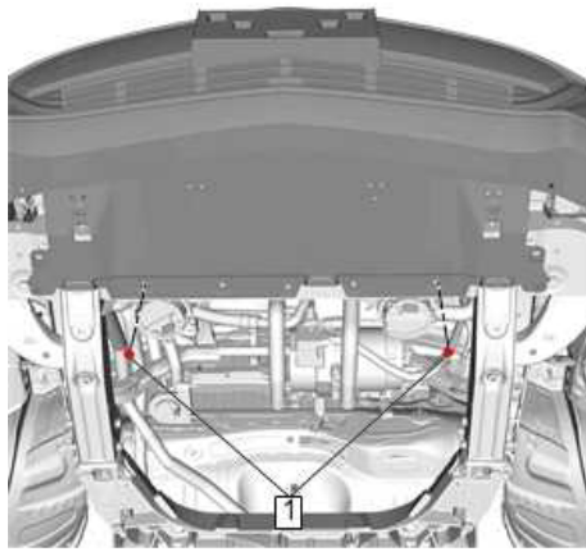


Fig. 26: Front Bumper Fascia Lower Bolt (North America)
 Courtesy of GENERAL MOTORS COMPANY

CAUTION: Fastener Caution

7. Front Bumper Fascia Lower Bolt - Install and tighten to 2.5 N.m (22 lb in)

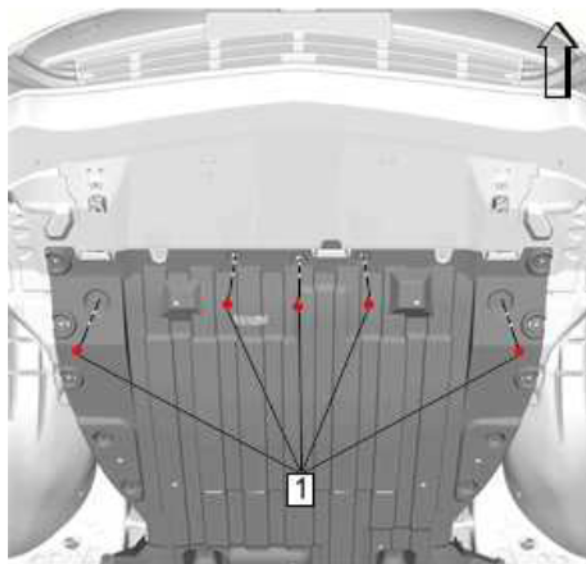


Fig. 27: Front Compartment Insulator Screw (North America)
 Courtesy of GENERAL MOTORS COMPANY

8. Front Compartment Insulator Screw - Install - Front Compartment Air Deflector Replacement

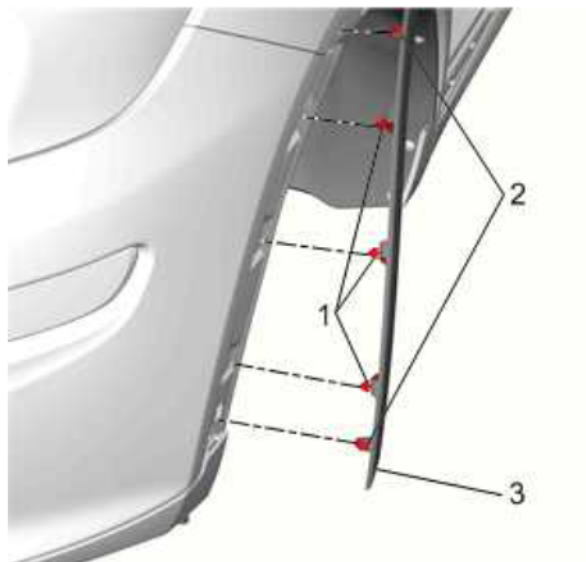


Fig. 28: Front Wheel Opening Molding Retainer (North America)
Courtesy of GENERAL MOTORS COMPANY

- 9. Front Wheel Opening Molding Retainer - Install
- 10. Front Wheel Opening Molding Clip - Install
- 11. Front Wheel Opening Molding - Install - **Front Wheel Opening Molding Replacement**

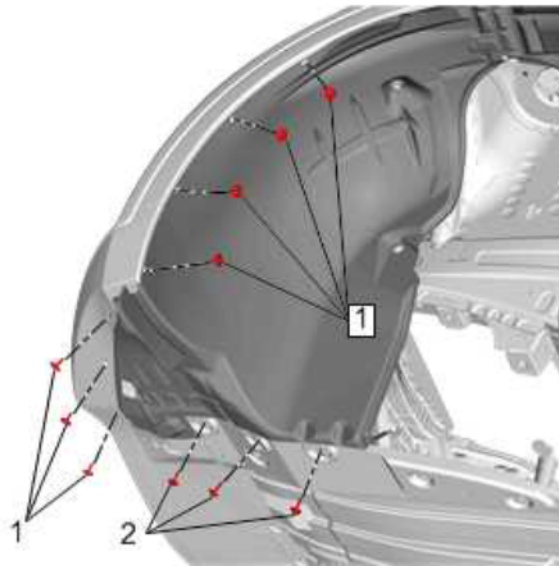


Fig. 29: Front Wheelhouse Liner Screw (North America)
Courtesy of GENERAL MOTORS COMPANY

- 12. Front Wheelhouse Liner Screw - Install
- 13. Front Bumper Fascia Wheel Opening Screw - Install - **Front Wheelhouse Liner Replacement**

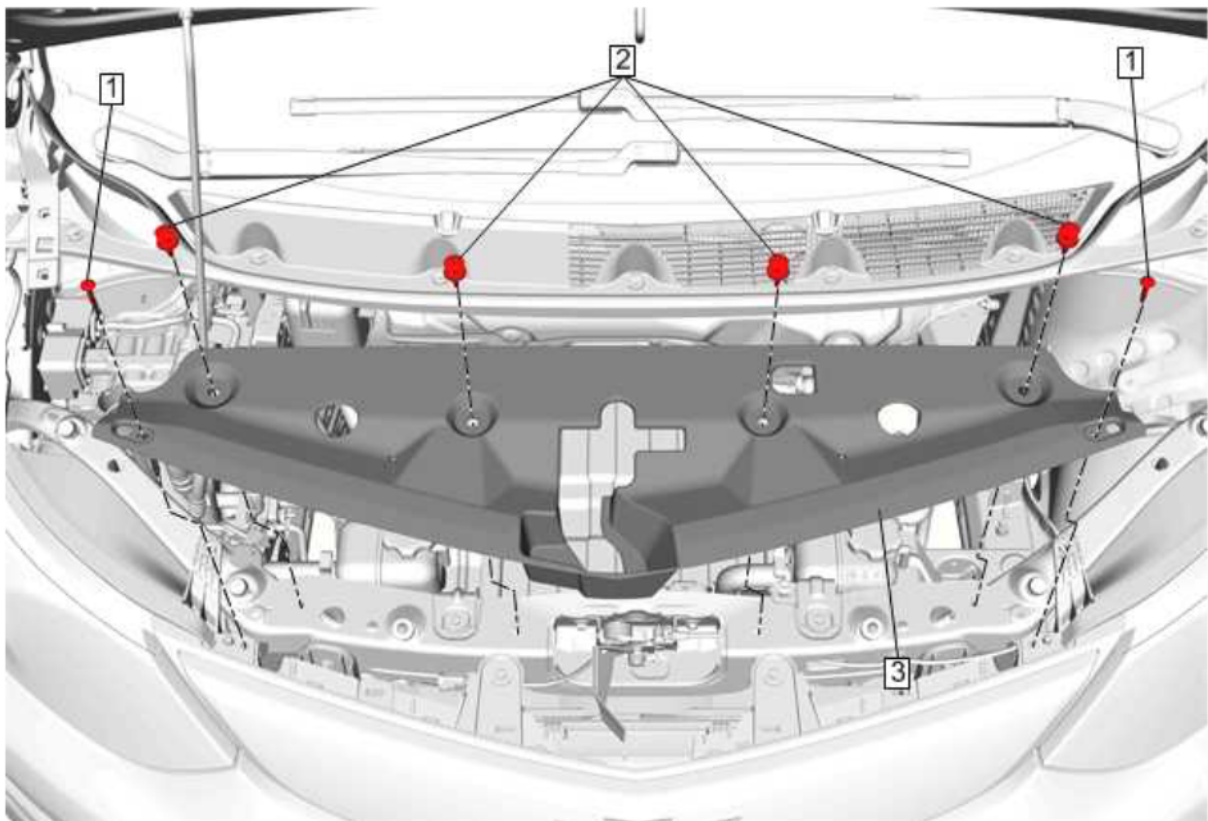


Fig. 30: Front Compartment Front Sight Shield (North America)
Courtesy of GENERAL MOTORS COMPANY

- 14. Front Compartment Front Sight Shield - Install - **Front Compartment Front Sight Shield Replacement**

FRONT BUMPER FASCIA REPLACEMENT (EUROPE, KOREA)

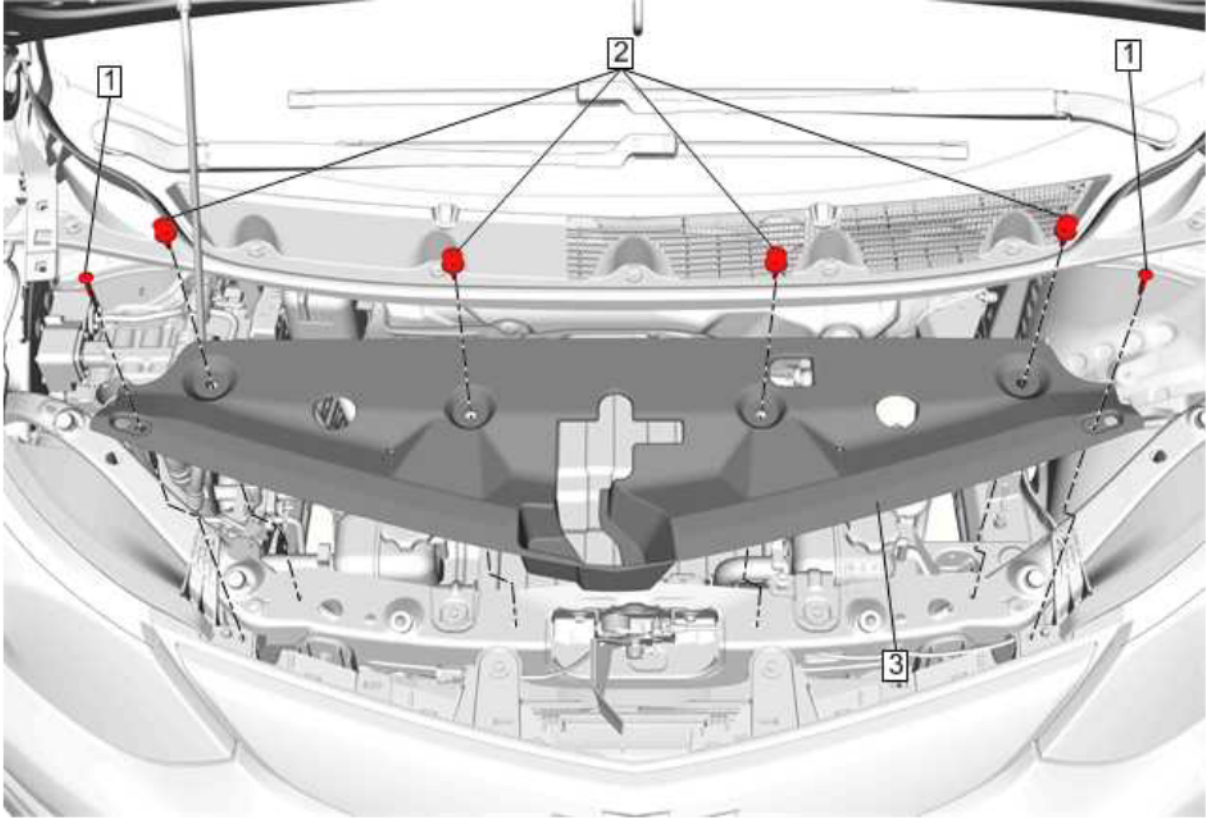


Fig. 31: Front Bumper Fascia (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

1. Front Compartment Front Sight Shield - Remove - **Front Compartment Front Sight Shield Replacement**

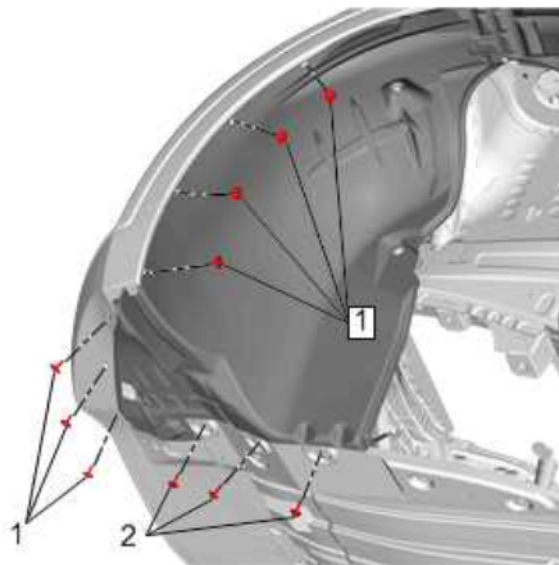


Fig. 32: Front Wheelhouse Liner Screw (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

2. Front Wheelhouse Liner Screw - Remove
3. Front Bumper Fascia Wheel Opening Screw - Remove - **Front Wheelhouse Liner Replacement**

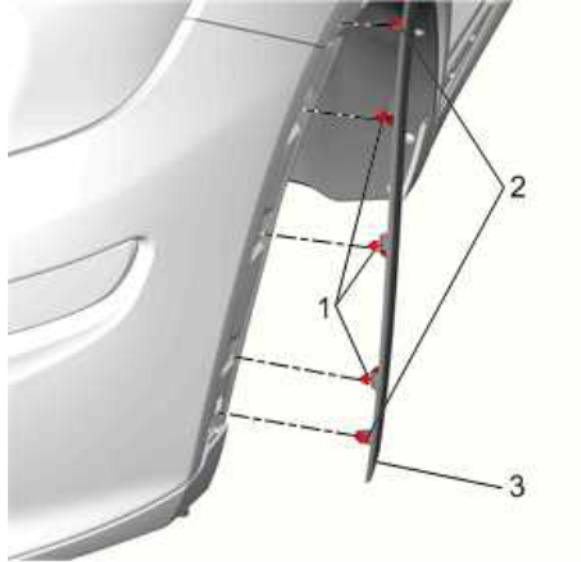


Fig. 33: Front Wheel Opening Molding Retainer (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

4. Front Wheel Opening Molding Retainer - Remove
5. Front Wheel Opening Molding Clip - Remove
6. Partially remove the front wheel opening molding (3). **Front Wheel Opening Molding Replacement**

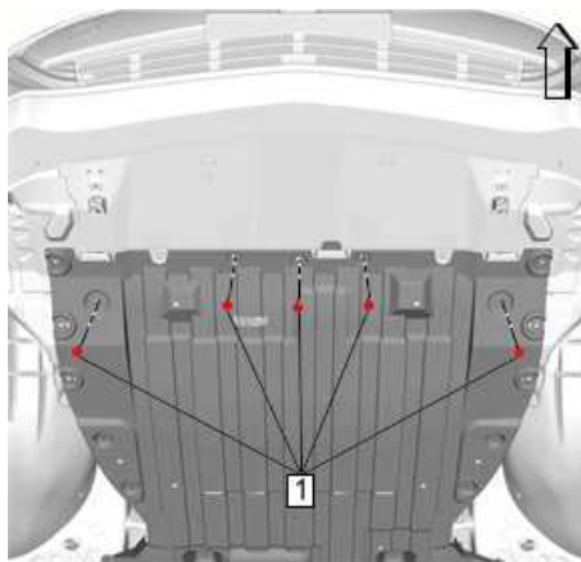


Fig. 34: Front Compartment Insulator Screw (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

7. Front Compartment Insulator Screw - Remove - **Front Compartment Air Deflector Replacement**

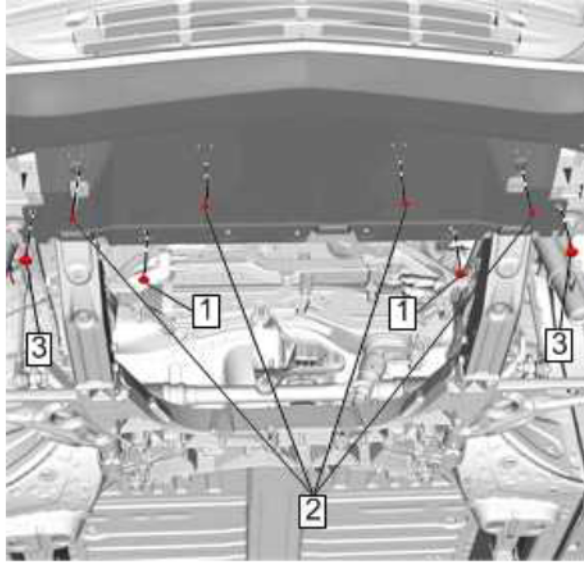


Fig. 35: Front Bumper Fascia Lower Bolt (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

- 8. Front Bumper Fascia Lower Bolt - Remove
- 9. Front Bumper Fascia Lower Screw - Remove
- 10. Front Bumper Fascia Lower Retainer - Remove

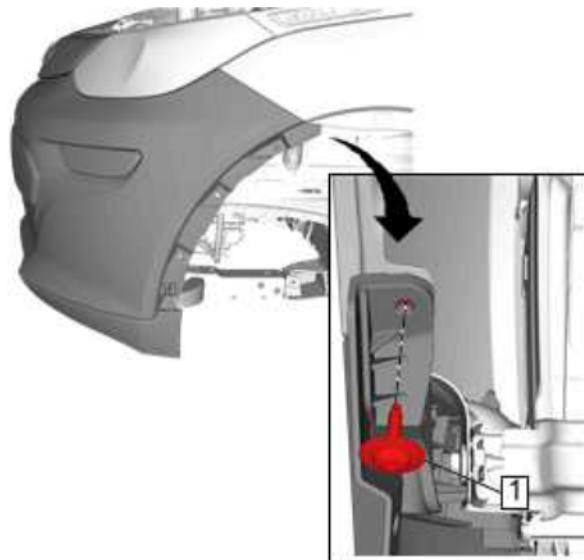


Fig. 36: Front Bumper Fascia Wheel Opening Bolt (Europe, Korea)
 Courtesy of GENERAL MOTORS COMPANY

- 11. Front Bumper Fascia Wheel Opening Bolt - Remove

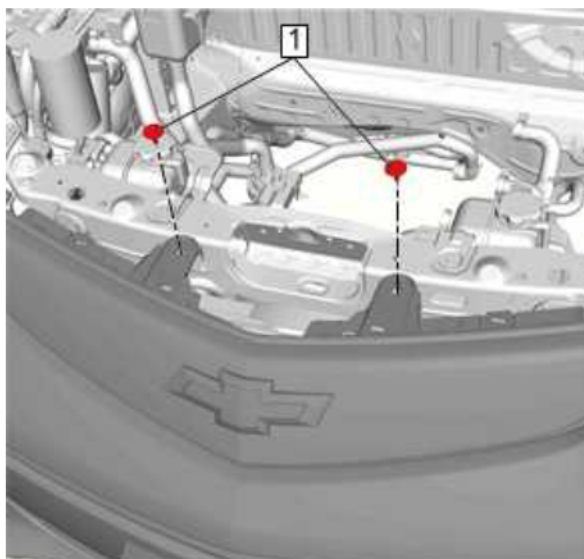


Fig. 37: Front Bumper Fascia Upper Bolt (Europe, Korea)
Courtesy of GENERAL MOTORS COMPANY

12. Front Bumper Fascia Upper Bolt - Remove
13. Release the integral retainers at both fenders and headlamps.
14. Lift fascia off of headlamp retaining tabs, then Carefully pull the front bumper fascia outward to remove.
15. Disconnect all electrical connectors.

Installation Procedure

1. Transfer components as necessary.
2. Connect all electrical connectors.
3. Front Bumper Fascia - Install
4. Carefully push in the retaining tabs of the front bumper fascia into the front bumper fascia guides.

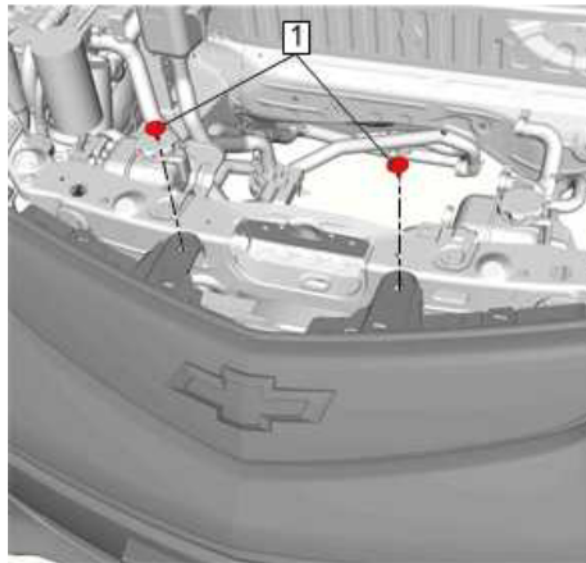


Fig. 38: Front Bumper Fascia Upper Bolt (Europe, Korea)
Courtesy of GENERAL MOTORS COMPANY

5. Front Bumper Fascia Upper Bolt - Install and tighten to 6 N.m (53 lb in)

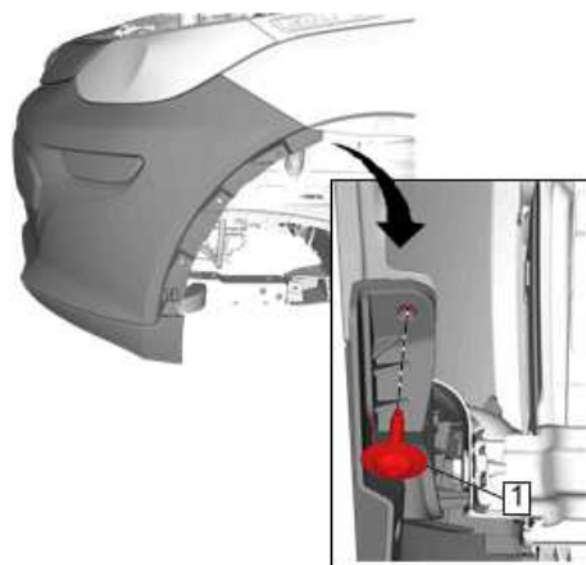


Fig. 39: Front Bumper Fascia Wheel Opening Bolt (Europe, Korea)
Courtesy of GENERAL MOTORS COMPANY

6. Front Bumper Fascia Wheel Opening Bolt - Install and tighten to 2.5 N.m (22 lb in)

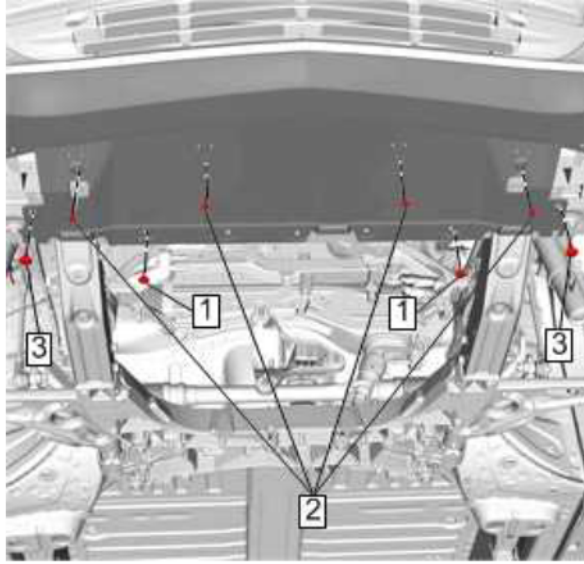


Fig. 40: Front Bumper Fascia Lower Bolt (Europe, Korea)

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Fastener Caution

7. Front Bumper Fascia Lower Bolt - Install and tighten to 2.5 N.m (22 lb in)
8. Front Bumper Fascia Lower Screw - Install and tighten to 2.5 N.m (22 lb in)
9. Front Bumper Fascia Lower Retainer - Install

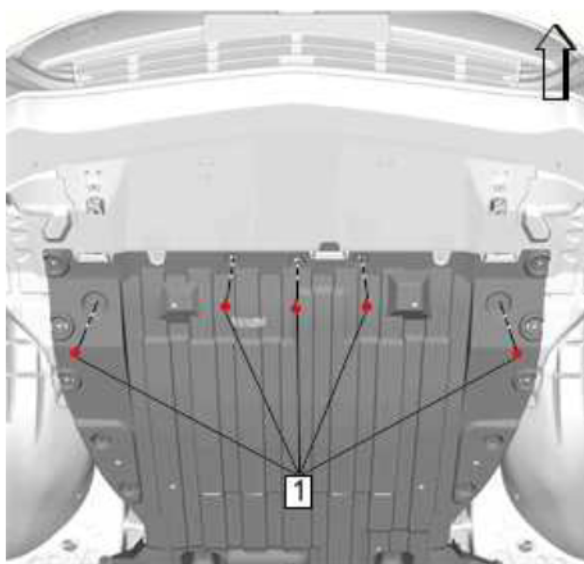


Fig. 41: Front Compartment Insulator Screw (Europe, Korea)

Courtesy of GENERAL MOTORS COMPANY

10. Front Compartment Insulator Screw - Install - Front Compartment Air Deflector Replacement

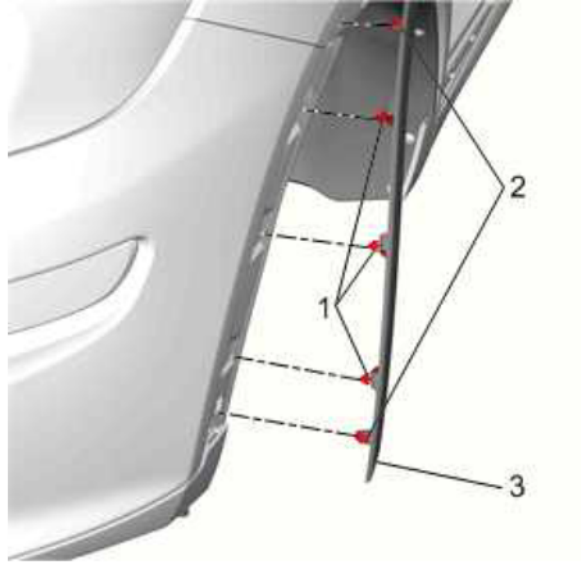


Fig. 42: Front Wheel Opening Molding Retainer (Europe, Korea)
Courtesy of GENERAL MOTORS COMPANY

- 11. Front Wheel Opening Molding Retainer - Install
- 12. Front Wheel Opening Molding Clip - Install
- 13. Front Wheel Opening Molding - Install - [Front Wheel Opening Molding Replacement](#)

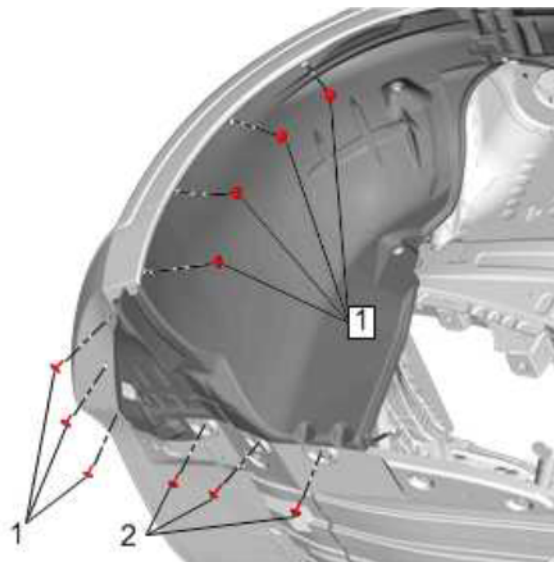


Fig. 43: Front Wheelhouse Liner Screw (Europe, Korea)
Courtesy of GENERAL MOTORS COMPANY

- 14. Front Wheelhouse Liner Screw - Install
- 15. Front Bumper Fascia Wheel Opening Screw - Install - [Front Wheelhouse Liner Replacement](#)

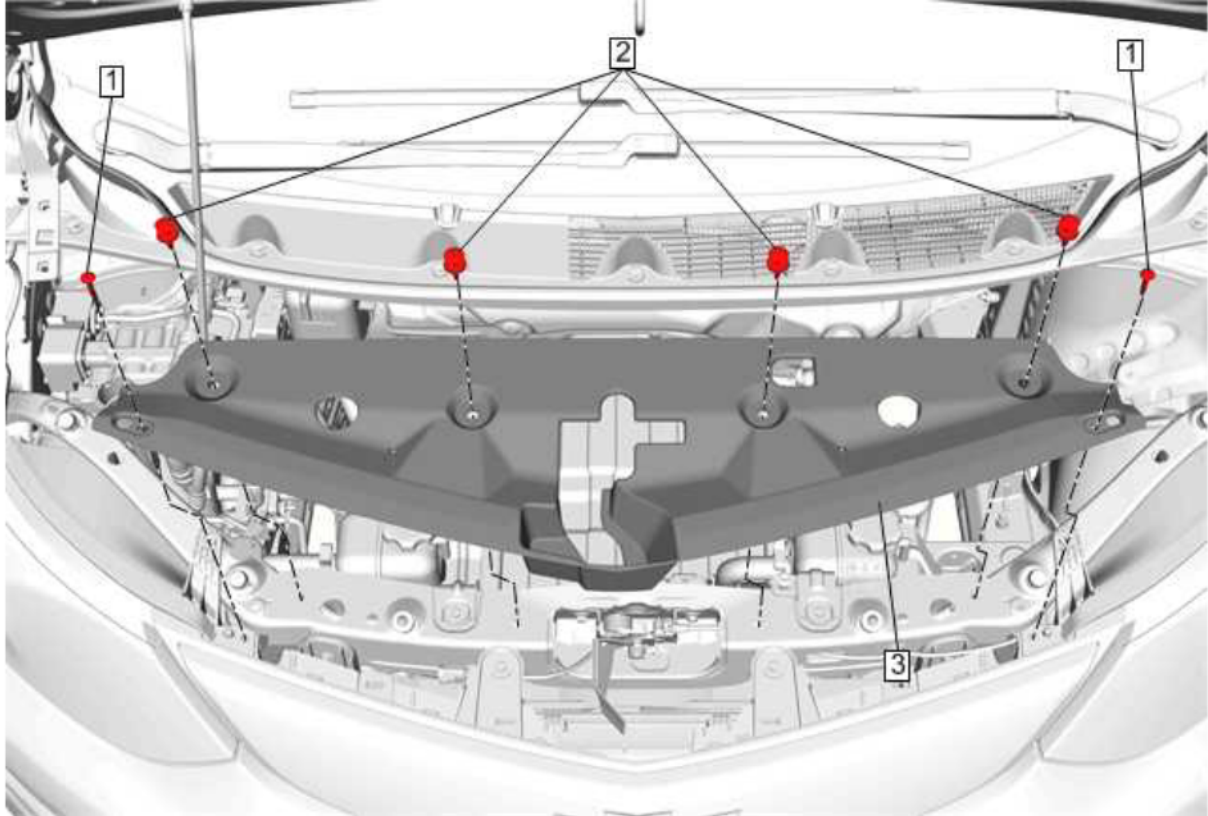


Fig. 44: Front Bumper Fascia (Europe, Korea)
Courtesy of GENERAL MOTORS COMPANY

16. Front Compartment Front Sight Shield - Install - **Front Compartment Front Sight Shield Replacement** .

FRONT BUMPER FASCIA GUIDE REPLACEMENT

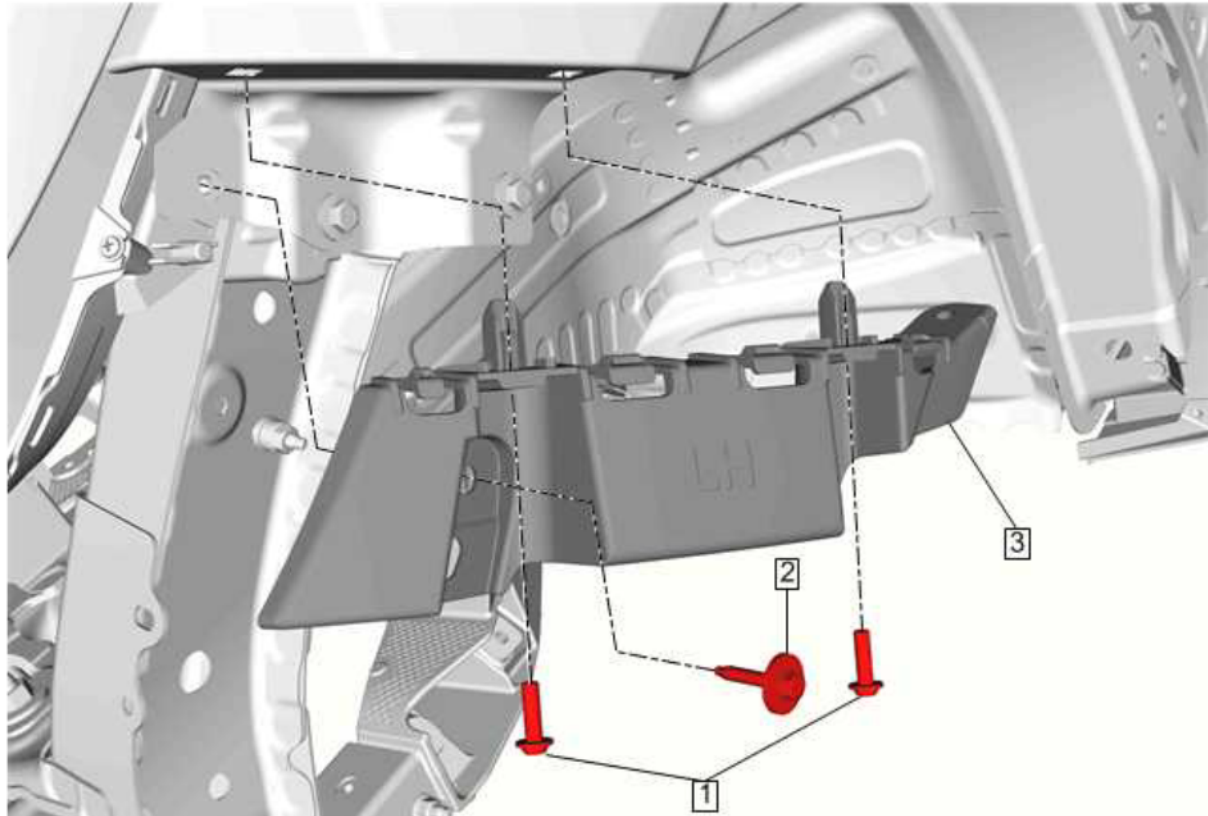


Fig. 45: Front Bumper Fascia Guide
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Front Bumper Fascia Replacement (North America)	Front Bumper Fascia Replacement
Front Bumper Fascia Replacement (Europe, Korea)	

Callout	Component Name
1	Front Bumper Fascia Guide Bolt CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Headlamp Bolt Tighten 2.5 N.m (22 lb in)
3	Front Bumper Fascia Guide

FRONT BUMPER LOWER FASCIA REPLACEMENT

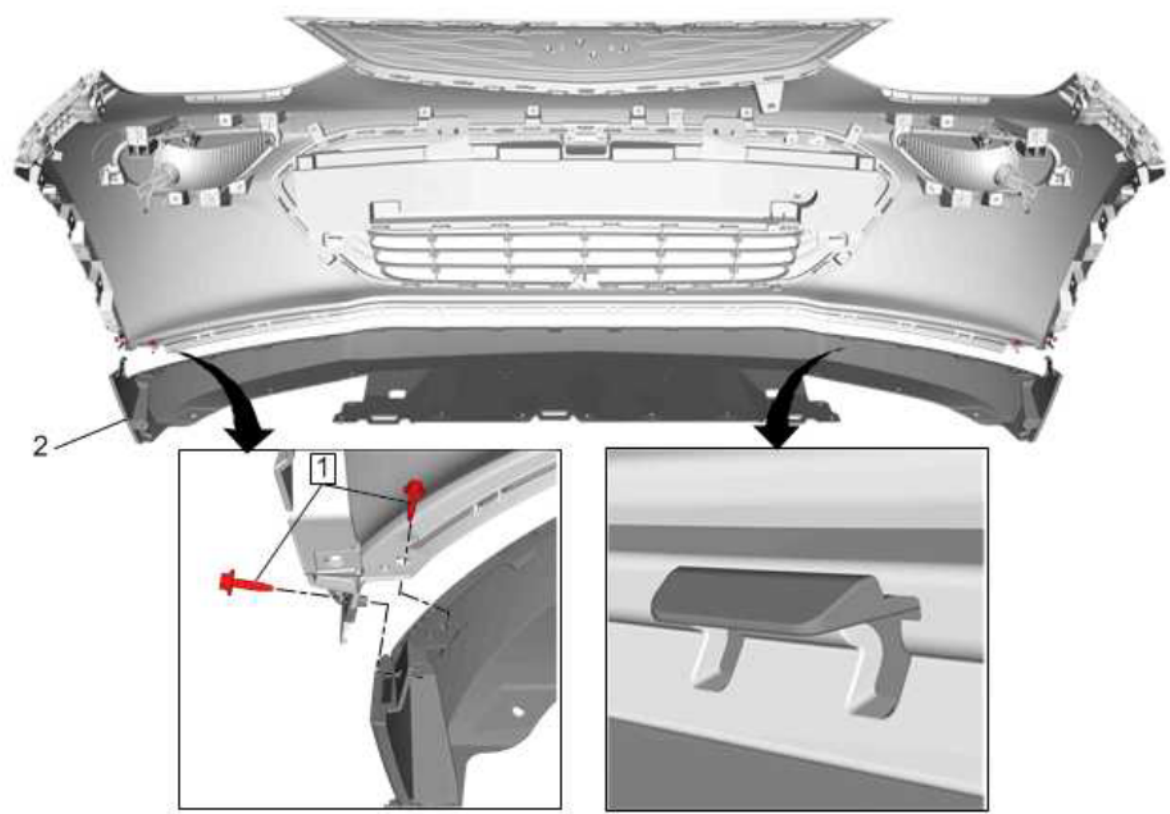


Fig. 46: Front Bumper Lower Fascia
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Bumper Fascia Replacement (North America) Front Bumper Fascia Replacement (Europe, Korea)	
1	Front Bumper Lower Fascia Bolt CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)

Callout	Component Name
2	Front Bumper Lower Fascia Procedure Using an appropriate trim tool, release the 14 Integral retainers. NOTE: Use care not to damage the front bumper lower fascia during removal.

FRONT BUMPER UPPER FASCIA REPLACEMENT

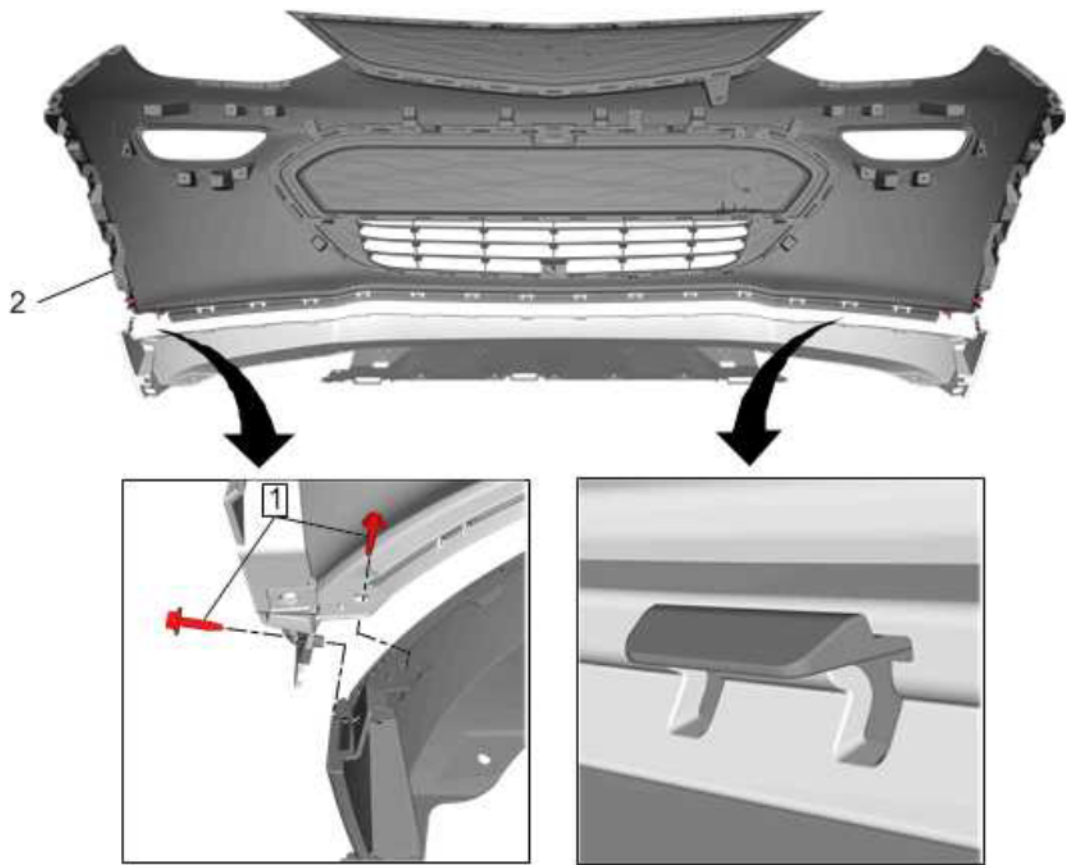


Fig. 47: Front Bumper Upper Fascia
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Bumper Fascia Replacement (North America) Front Bumper Fascia Replacement (Europe, Korea)	
1	Front Bumper Lower Fascia Bolt CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
cardiagn.com	

Callout	Component Name
2	Front Bumper Upper Fascia Procedure 1. Transfer components as necessary. 2. Using an appropriate trim tool, release the 14 integral retainers. NOTE: Use care not to damage the front bumper lower fascia during removal.

FRONT BUMPER SHUTTER REPLACEMENT

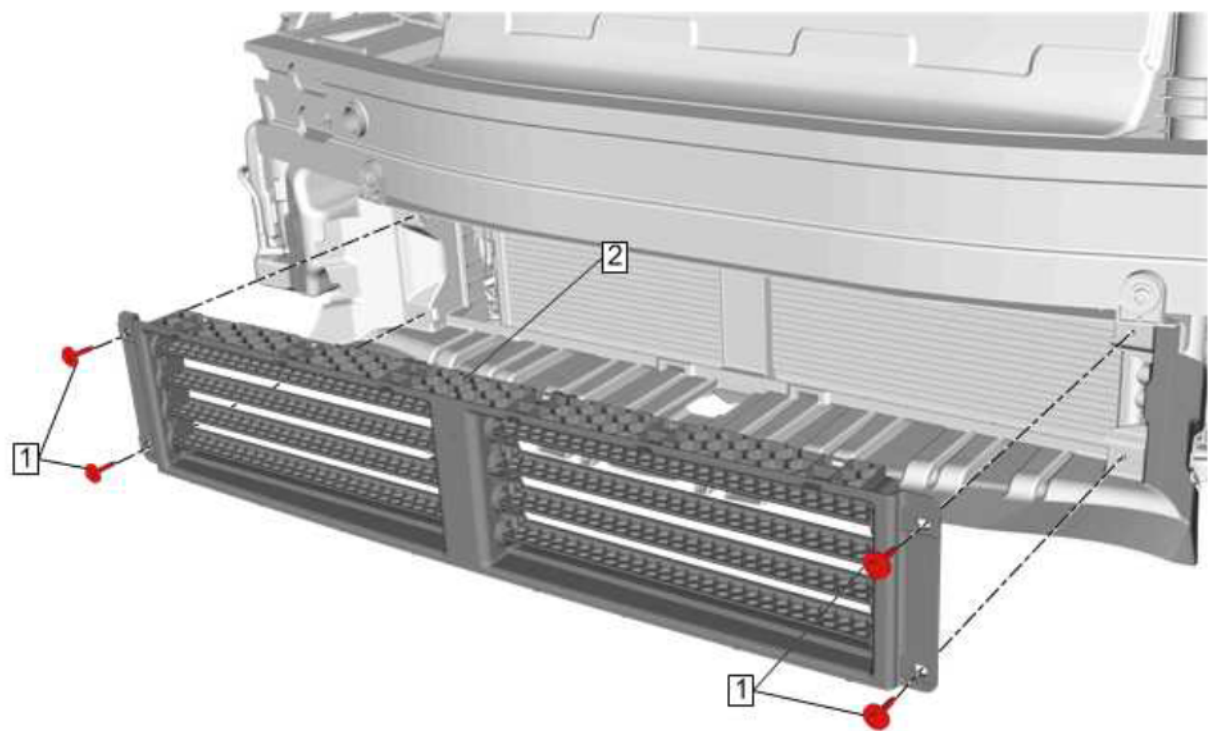


Fig. 48: Front Bumper Shutter
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Front Bumper Fascia Replacement (North America)</u> <u>Front Bumper Fascia Replacement (Europe, Korea)</u>	
1	Front Bumper Shutter Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 2.5 N.m (22 lb in)
2	Front Bumper Shutter

FRONT BUMPER FASCIA LOWER STIFFENER REPLACEMENT

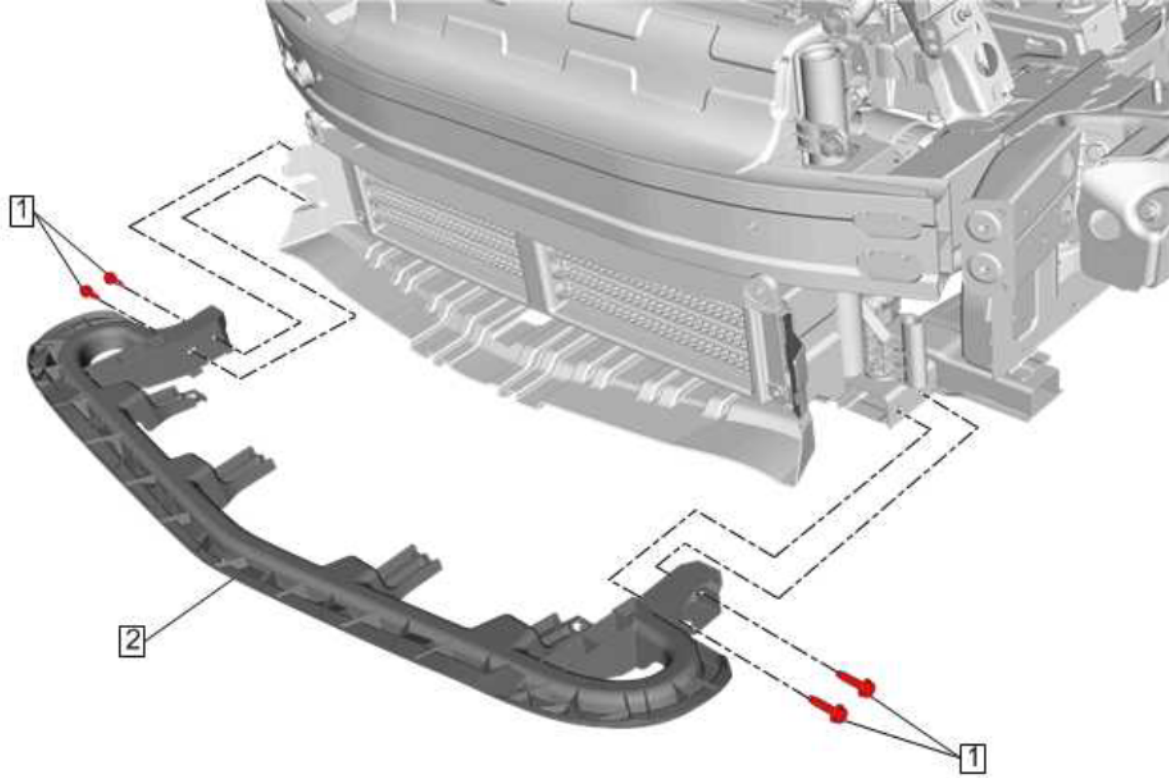


Fig. 49: Front Bumper Fascia Lower Stiffener
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Bumper Fascia Replacement (North America)Front Bumper Fascia Replacement (Europe, Korea)	
1	Front Bumper Fascia Lower Stiffener Bolt CAUTION: Refer to Fastener Caution . Tighten 17 N.m (13 lb ft)
2	Front Bumper Fascia Lower Stiffener

REAR BUMPER FASCIA MOLDING REPLACEMENT

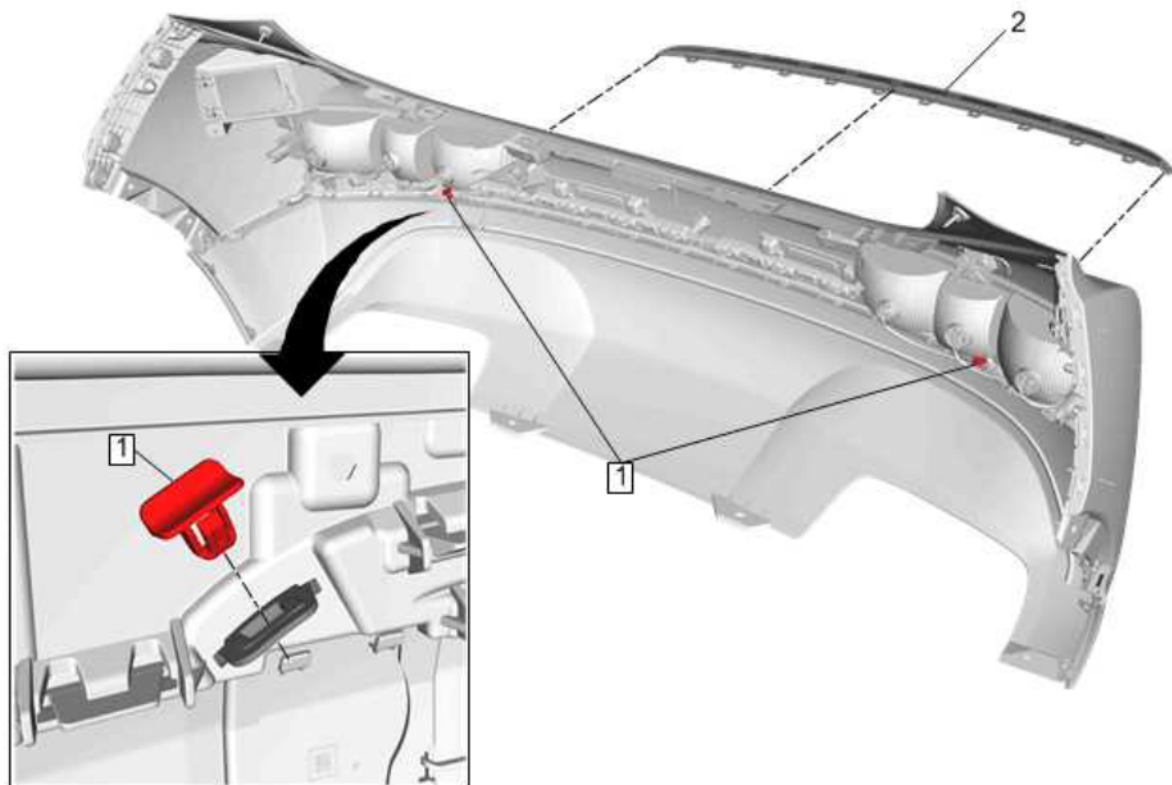


Fig. 50: Rear Bumper Fascia Molding
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Rear Bumper Fascia Replacement</u>	
1	Rear Bumper Fascia Molding Clip
2	Rear Bumper Fascia Molding
Procedure	
Carefully release the integral retainers using an appropriate flat bladed tool.	

REAR BUMPER FASCIA REPLACEMENT

Removal Procedure

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

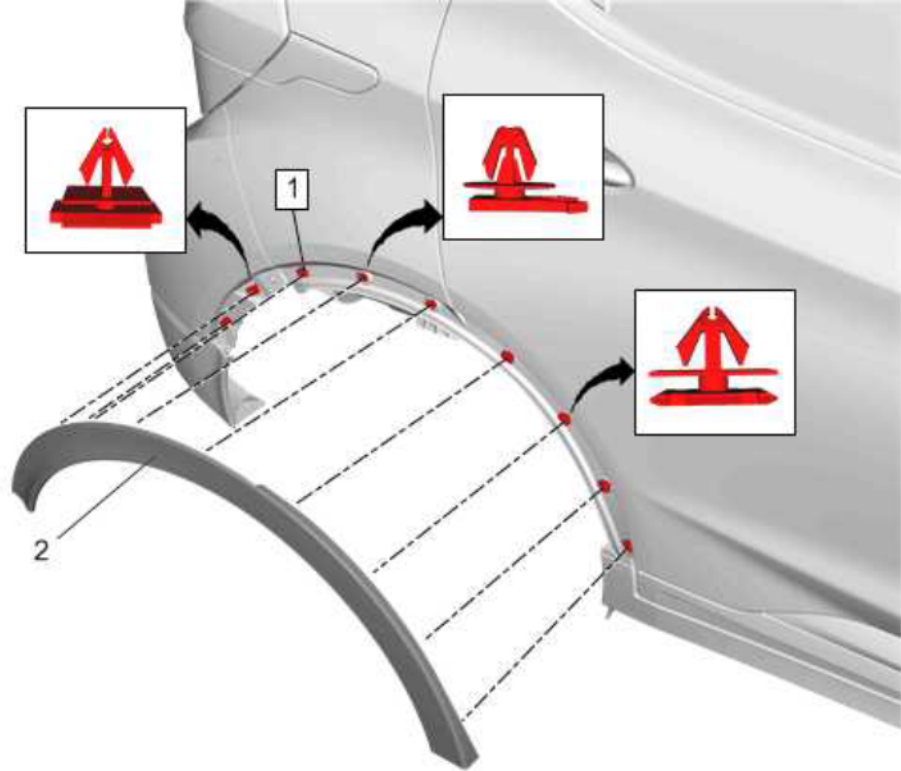


Fig. 51: Rear Wheel Opening Molding
 Courtesy of GENERAL MOTORS COMPANY

2. Rear Wheel Opening Molding - Remove - [Rear Wheel Opening Molding Replacement](#)

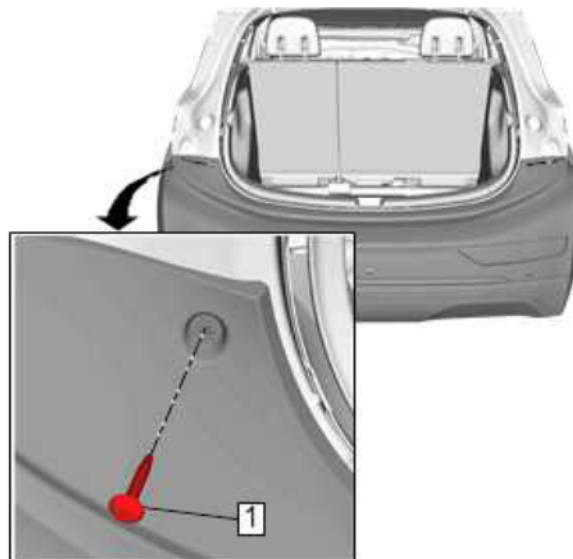


Fig. 52: Rear Bumper Fascia Upper Bolt
 Courtesy of GENERAL MOTORS COMPANY

3. Rear Bumper Fascia Upper Bolt - Remove

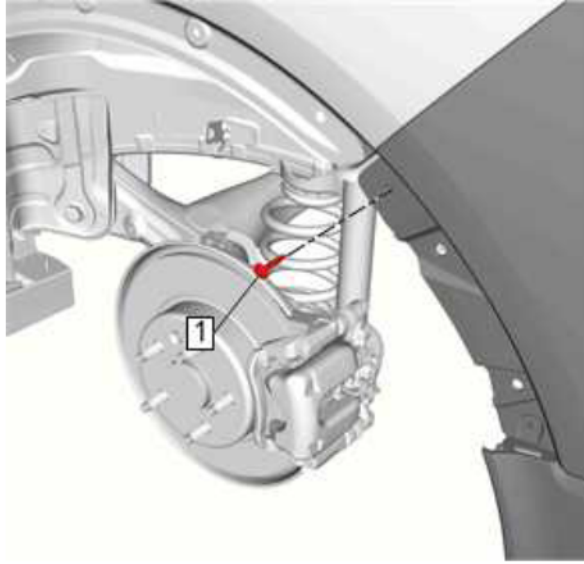


Fig. 53: Rear Bumper Fascia Guide Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Rear Bumper Fascia Guide Bolt - Remove

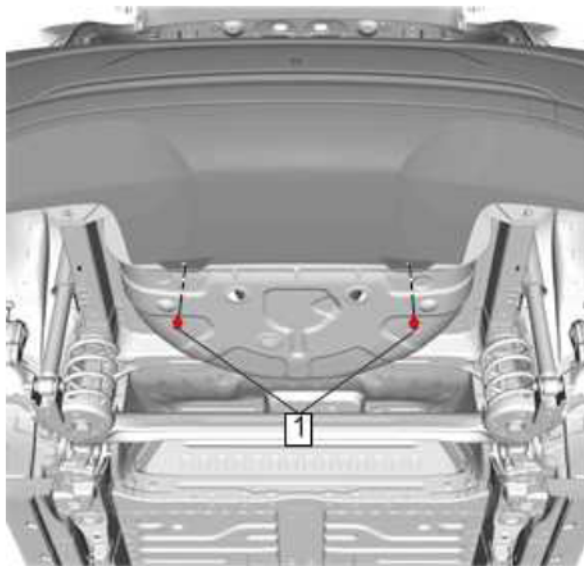


Fig. 54: Rear Bumper Fascia Lower Retainer
Courtesy of GENERAL MOTORS COMPANY

5. Rear Bumper Fascia Lower Retainer - Remove

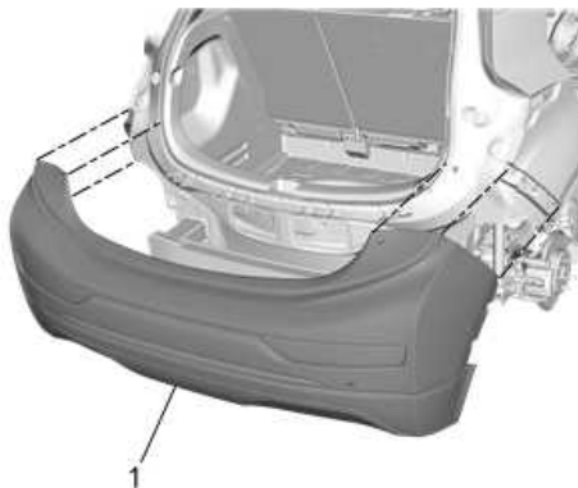


Fig. 55: Rear Fascia
Courtesy of GENERAL MOTORS COMPANY

6. Release the rear fascia from the fascia guides at the quarter panels by gently pulling the fascia outward.
7. Pull the rear bumper fascia carefully outwards.
8. Disconnect the electrical connector.

Installation Procedure

1. Transfer components as necessary.
2. Connect the electrical connector.

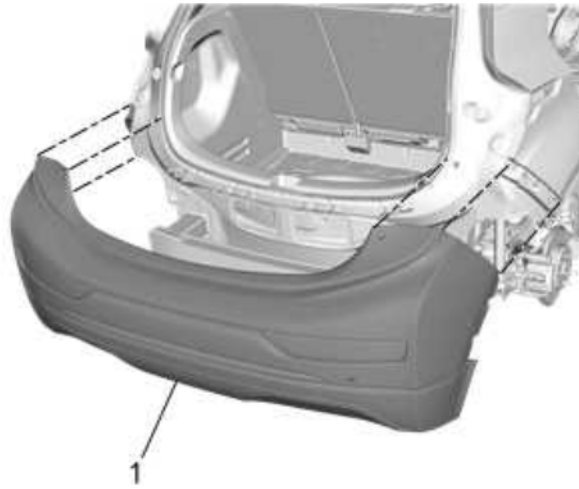


Fig. 56: Rear Fascia

Courtesy of GENERAL MOTORS COMPANY

3. Carefully push in the retaining tabs of the rear bumper fascia into the rear bumper fascia guides.

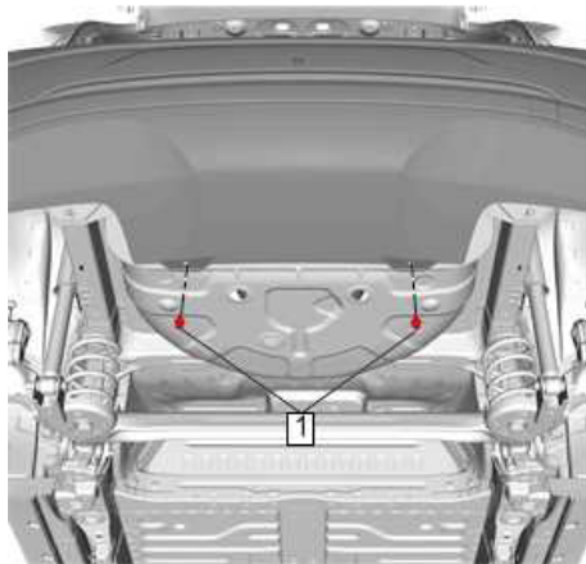


Fig. 57: Rear Bumper Fascia Lower Retainer

Courtesy of GENERAL MOTORS COMPANY

4. Rear Bumper Fascia Lower Retainer - Install

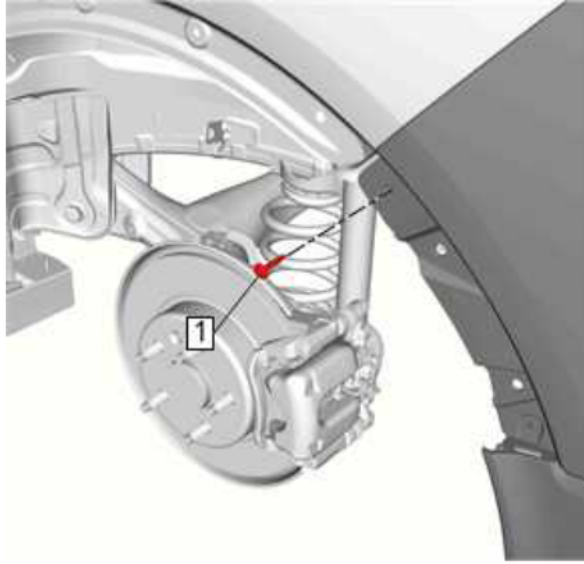


Fig. 58: Rear Bumper Fascia Guide Bolt
 Courtesy of GENERAL MOTORS COMPANY

CAUTION: Fastener Caution .

5. Rear Bumper Fascia Guide Bolt - Install and tighten to 2.5 N.m (22 lb in)

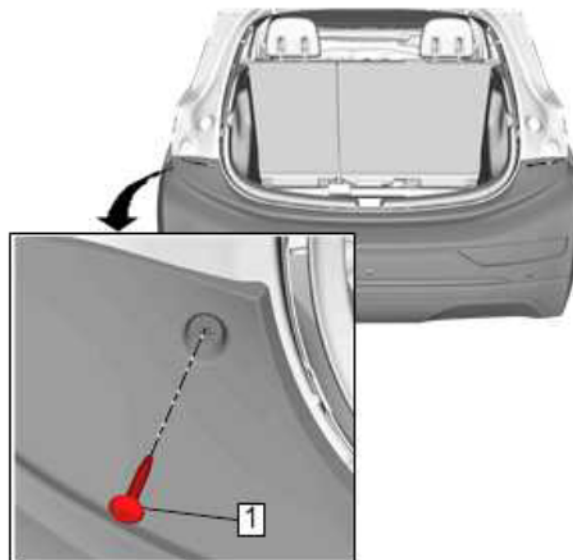


Fig. 59: Rear Bumper Fascia Upper Bolt
 Courtesy of GENERAL MOTORS COMPANY

6. Rear Bumper Fascia Upper Bolt - Install and tighten to 2.5 N.m (22 lb in)

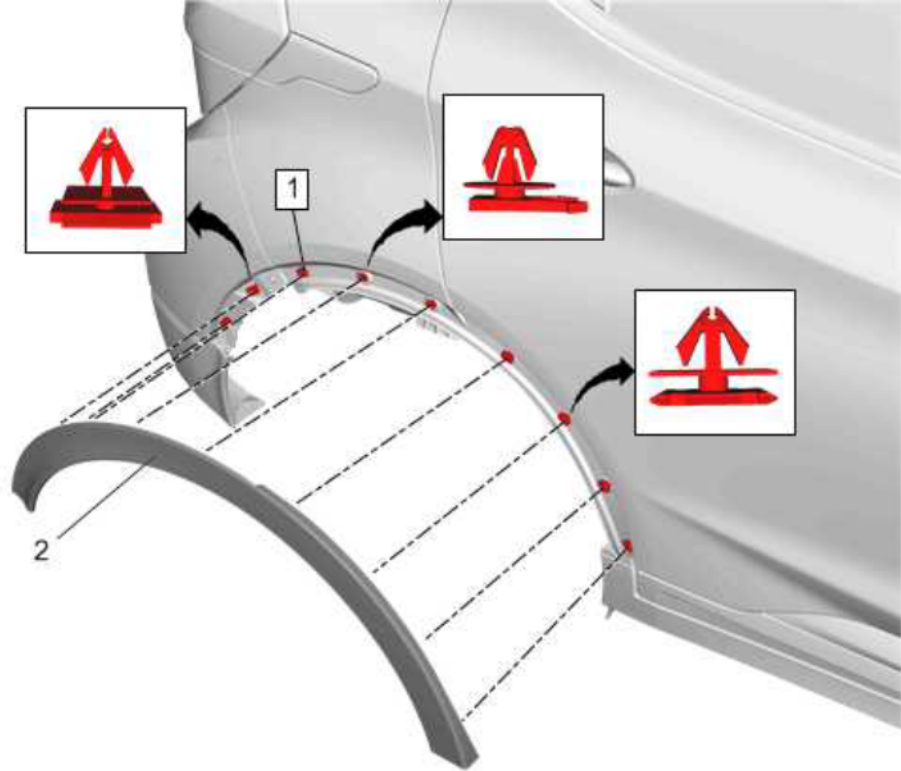


Fig. 60: Rear Wheel Opening Molding
 Courtesy of GENERAL MOTORS COMPANY

7. Rear Wheel Opening Molding - Install - [Rear Wheel Opening Molding Replacement](#)
8. Remove the support and lower the vehicle. [Lifting and Jacking the Vehicle](#)

REAR BUMPER FASCIA GUIDE REPLACEMENT

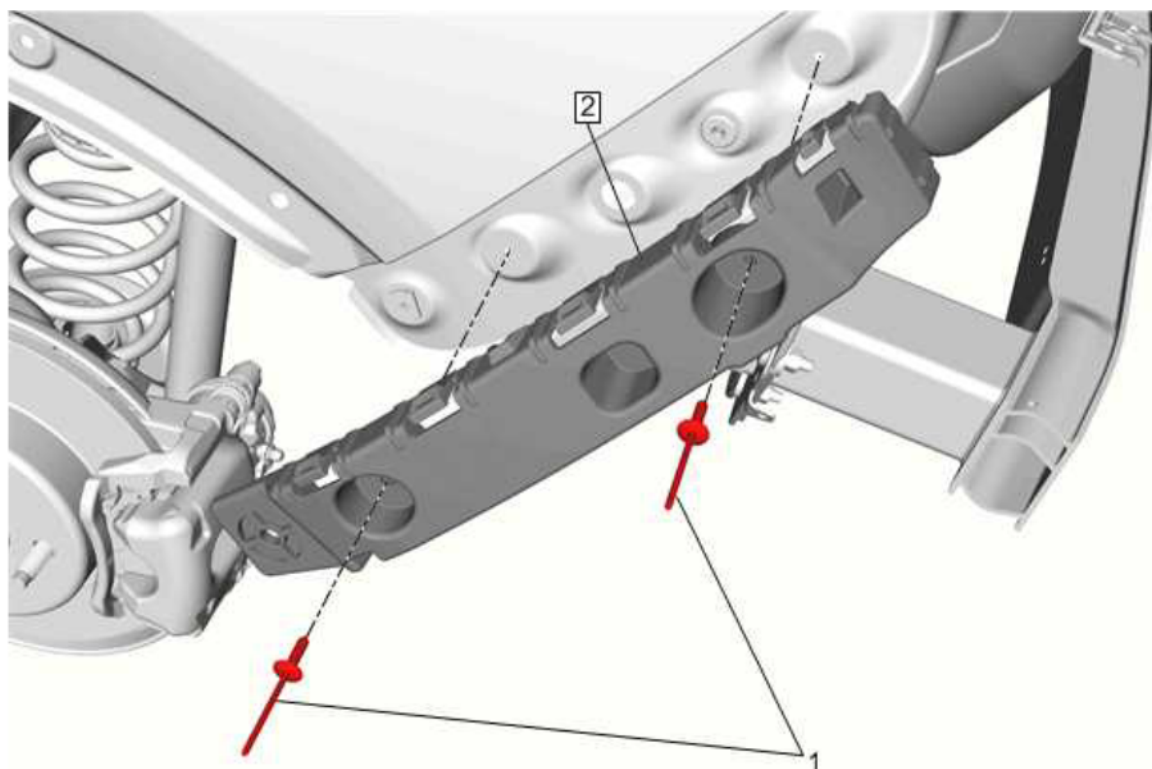


Fig. 61: Rear Bumper Fascia Guide
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Callout	Component Name
WARNING: Eye Protection Warning	
Preliminary Procedure Rear Bumper Fascia Replacement	
1	Rear Bumper Fascia Guide Rivet
2	Rear Bumper Fascia Guide

REAR BUMPER UPPER FASCIA REPLACEMENT

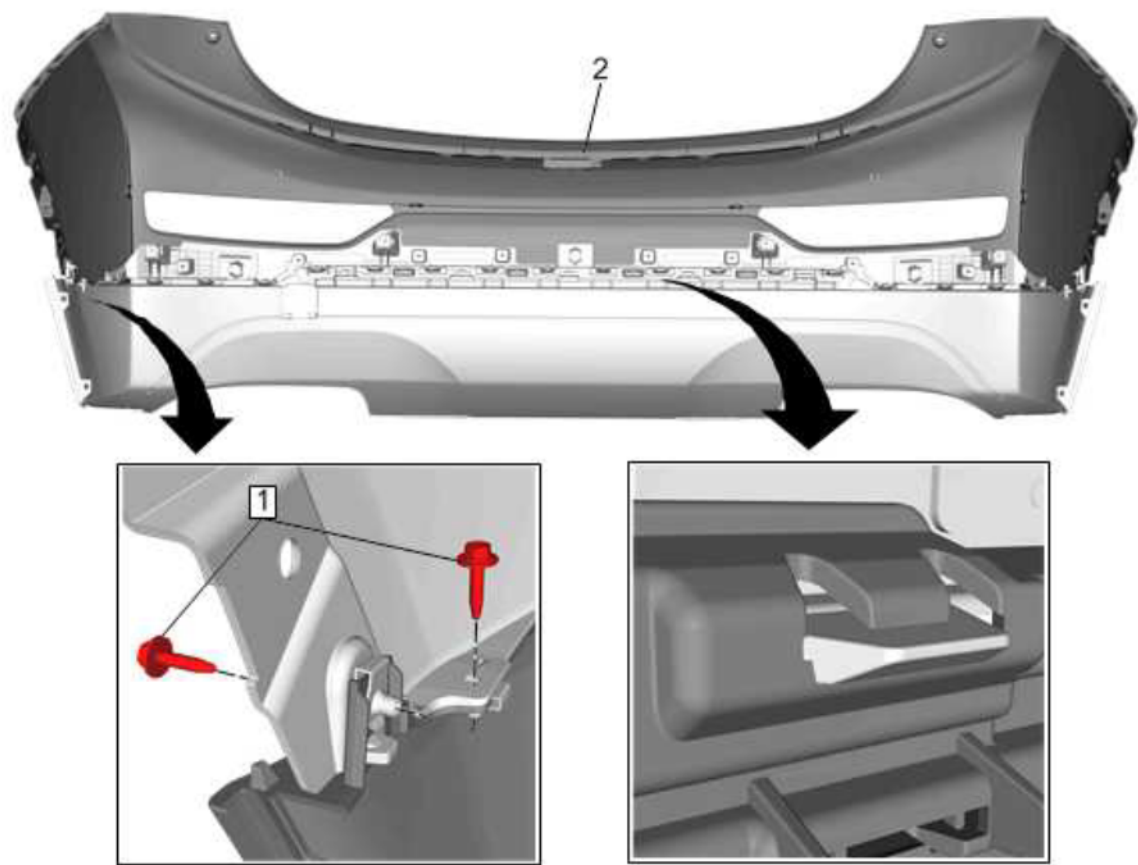


Fig. 62: Rear Bumper Upper Fascia
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Rear Bumper Fascia Replacement Rear Fascia Lower Signal Lamp Replacement Rear Bumper Fascia Molding Replacement Rear Parking Assist Alarm Sensor Replacement	
1	Rear Bumper Fascia Bolt CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)

Callout	Component Name
2	Rear Bumper Upper Fascia Procedure 1. Disconnect and unclip the electrical harness as required. 2. Carefully release the integral retainers. 3. Transfer components as necessary. NOTE: Use care not to damage the front bumper lower fascia during removal.

REAR BUMPER LOWER FASCIA REPLACEMENT

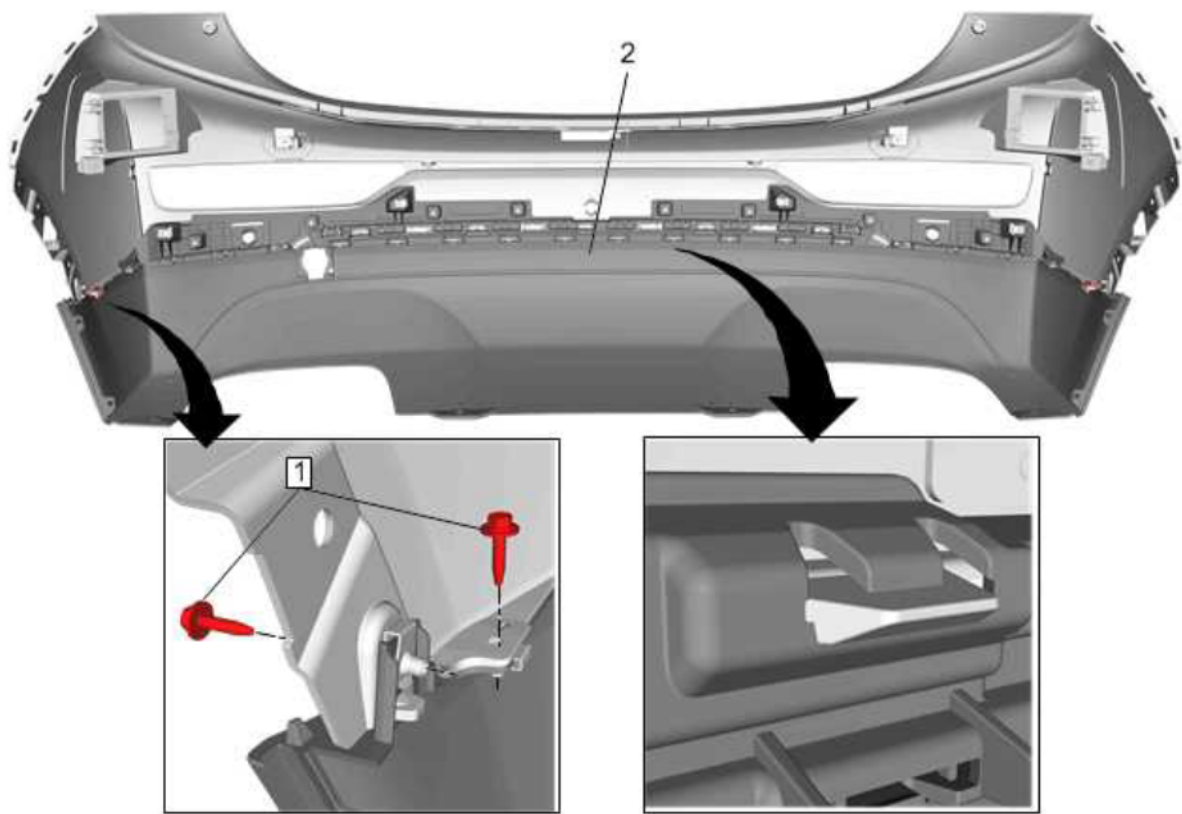


Fig. 63: Rear Bumper Lower Fascia
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Rear Bumper Fascia Replacement 2. Rear Fascia Lower Signal Lamp Replacement 3. Rear Bumper Fascia Molding Replacement 4. Rear Parking Assist Alarm Sensor Replacement	
1	Rear Bumper Fascia Bolt CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)

Callout	Component Name
2	Rear Bumper Lower Fascia Procedure 1. Disconnect and unclip the electrical harness as required. 2. Carefully release the integral retainers. 3. Transfer components as necessary. NOTE: Use care not to damage the front bumper lower fascia during removal.

REAR BUMPER IMPACT BAR REPLACEMENT

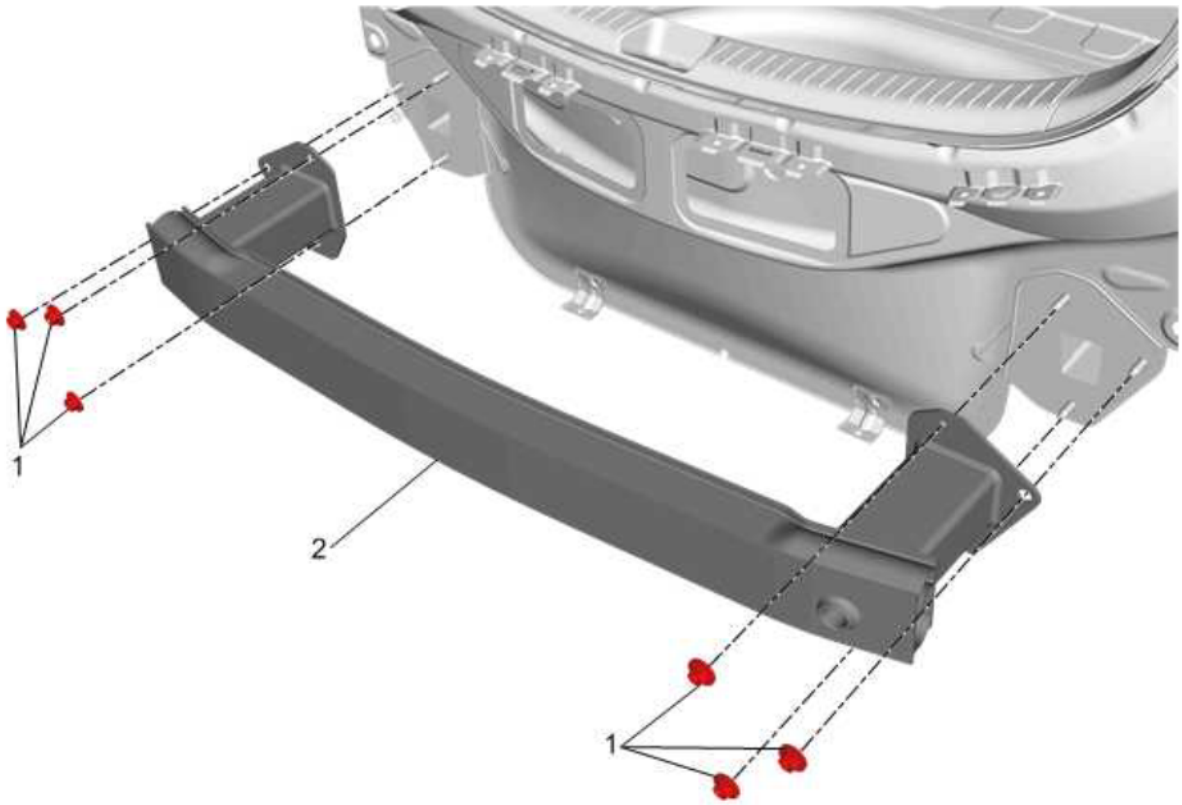


Fig. 64: Rear Bumper Impact Bar
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear Bumper Fascia Replacement	
1	Rear Bumper Impact Bar Nut CAUTION: Refer to Fastener Caution . Tighten 58 N.m (43 lb ft)
2	Rear Bumper Impact Bar

DESCRIPTION AND OPERATION

ACTIVE GRILLE AIR SHUTTER DESCRIPTION AND OPERATION

The active grille air shutter system closes shutters in the front grille to enhance vehicle aerodynamics in driving situations where cooling and A/C loads are relatively low and high levels of front end airflow are not required. If high levels of airflow are required the active grille air shutter system will open one or both shutters. The control signal from the engine control module, ignition and ground circuits enable the active grille air shutter actuators to operate. If the conditions for opening the shutters are reached the engine control module commands the active grille air shutter actuators to open one or both shutters.

The dual active grille air shutter system consists of two aero shutter mechanisms located in the front grille for controlling the amount of air flowing through the grille. It includes three wires; ground, power and a Local Interconnect Network (LIN) Bus serial data circuit from the engine control module to the shutter actuator. The engine control module determines shutter state based on various vehicle conditions such as vehicle speed, coolant temperature, fan state, refrigerant system pressure, A/C compressor state and ambient temperature. The engine control module has the ability to command each shutter individually to the open or closed positions through communications on the LIN Bus.

The actuators are powered by an ignition circuit that is active when the key is in the RUN position. The vehicle may have to be driven for up to 13 minutes at speeds greater than 41 km/h (25 mph) before a shutter begins to move. If low ambient temperature is detected, the shutters will remain in the closed position.
