

2017 ACCESSORIES & EQUIPMENT

Frame and Underbody - CT6

SPECIFICATIONS

FASTENER SPECIFICATIONS

Single Use Threaded Fastener/Component Tightening Specifications

NOTE: <i>All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.</i>	
Application	Specification
	Metric (English)
Drivetrain and Front Suspension Cradle to Rail Bolt (Qty 6)	
• First Pass:	100 N.m (74 lb ft)
• Final Pass:	plus 30 to 40 Degrees
Drivetrain and Front Suspension Cradle Rear Extension Bolt (Qty 2)	100 N.m (74 lb ft)
Rear Suspension Cradle Bolt (Long)	100 N.m (74 lb ft)
Rear Cradle Mount Bolt Bracket Bolt (Long)	100 N.m (74 lb ft)

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Accessory DC Power Control Module Bracket Nut (HP9)	22 N.m (16 lb ft)
Drivetrain and Front Suspension Cradle Plate Fastener	22 N.m (16 lb ft)
Engine Front Splash Shield Bolt	2.5 N.m (22 lb in)
Engine Front Splash Shield Screw	2.5 N.m (22 lb in)
Engine Mount Nut	70 N.m (52 lb ft)
Floor Panel Number 2 Cross Bar Reinforcement Bolt	22 N.m (16 lb ft)
Floor Panel Number 3 Cross Bar Reinforcement Bolt	22 N.m (16 lb ft)
Floor Panel Number 4 Cross Bar Reinforcement Bolt	22 N.m (16 lb ft)
Front Tire Front Air Deflector Fastener	2.5 N.m (22 lb in)
Front Wheelhouse Liner Screw	2.5 N.m (22 lb in)
Front Wheelhouse Panel Brace Fastener (Front)	22 N.m (16 lb ft)
Front Wheelhouse Panel Brace Fastener (Rear)	9 N.m (80 lb in)
Rear Cradle Mount Bolt Bracket Bolt (Short)	58 N.m (43 lb ft)
Rear Suspension Cradle Brace Bolt	58 N.m (43 lb ft)
Rear Tire Front Air Deflector Fastener	2.5 N.m (22 lb in)
Rear Wheelhouse Liner Screw	2.5 N.m (22 lb in)
Transmission Support Crossmember Bolt (LTG)	58 N.m (43 lb ft)
Underbody Front Air Deflector Fastener	2.5 N.m (22 lb in)

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Underbody Rear Air Deflector Nut	3 N.m (27 lb in)
Underbody Rear Air Outer Deflector Fastener	2.5 N.m (22 lb in)
Underbody Rear Air Rear Deflector Fastener	2.5 N.m (22 lb in)
Underbody Rear Air Rear Deflector Nut	6 N.m (53 lb in)

REPAIR INSTRUCTIONS

ENGINE FRONT SPLASH SHIELD REPLACEMENT - LEFT SIDE (REAR)

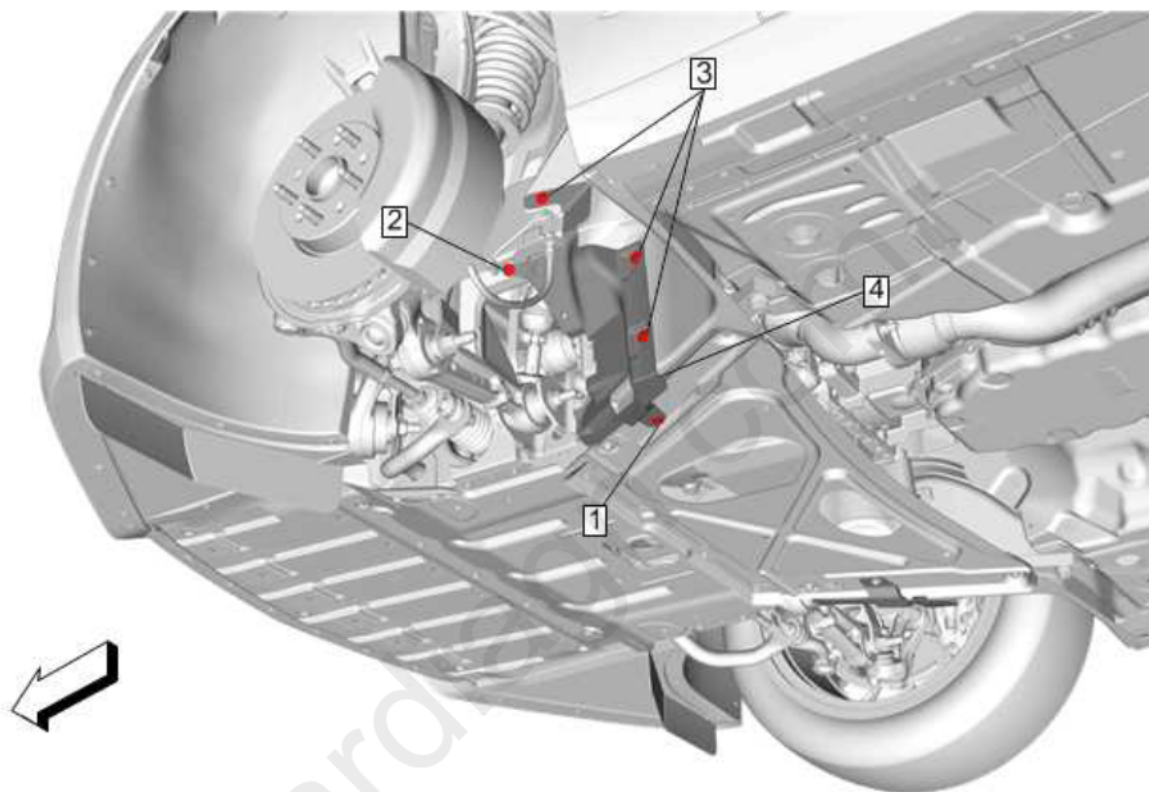


Fig. 1: Engine Front Splash Shield - Left Side (Rear)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
2. Remove the left front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Engine Front Splash Shield Bolt CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
2	Retainer

Callout	Component Name
3	Engine Front Splash Shield Screw [3x] Tighten 2.5 N.m (22 lb in)
4	Engine Front Splash Shield - Left Side

ENGINE FRONT SPLASH SHIELD REPLACEMENT - LEFT SIDE (FRONT)

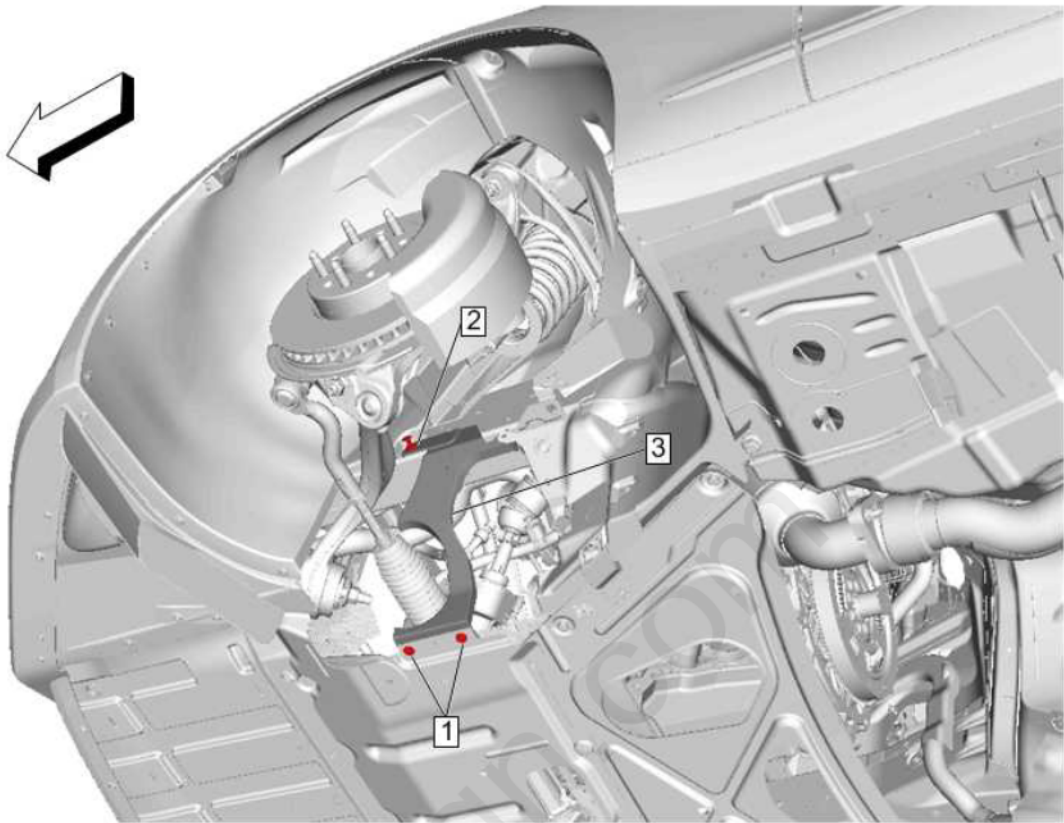


Fig. 2: Engine Front Splash Shield - Left Side (Front)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Remove the left front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Engine Front Splash Shield Bolt [2x] CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
2	Retainer
3	Engine Front Splash Shield - Left Side

ENGINE FRONT SPLASH SHIELD REPLACEMENT - RIGHT SIDE (REAR)

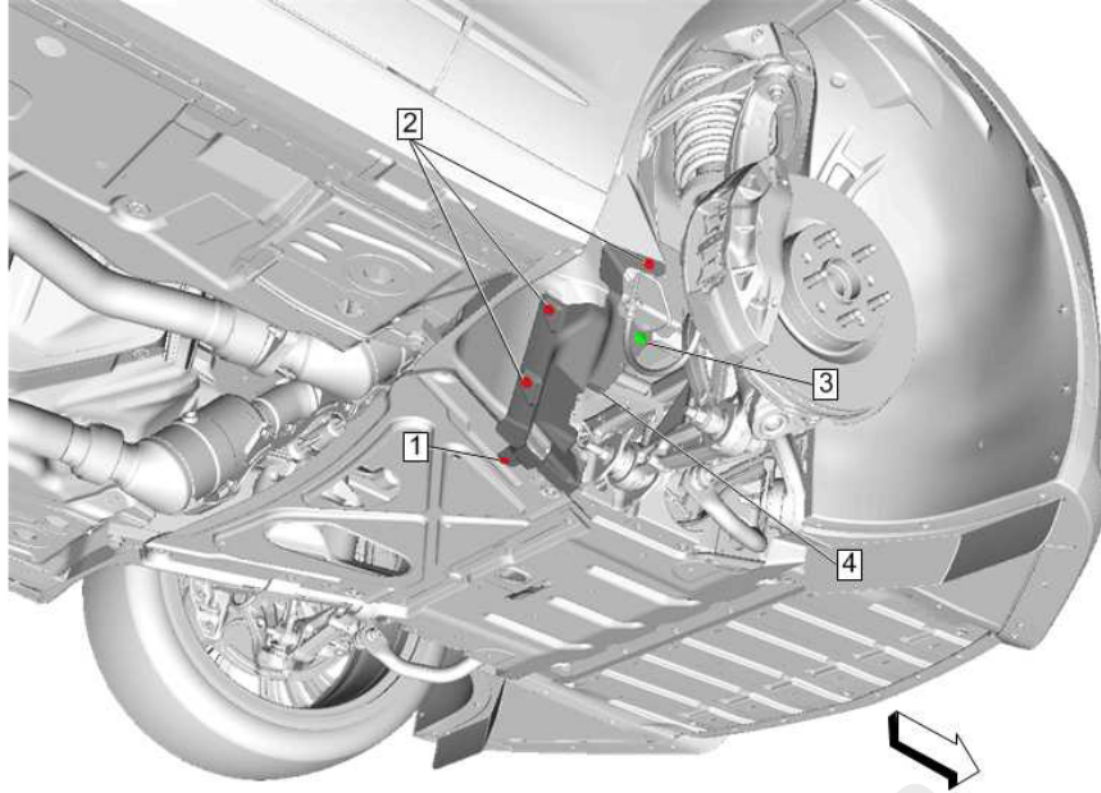


Fig. 3: Engine Front Splash Shield - Right Side (Rear)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Remove the right front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation 3. Engine Lower Front Splash Shield Replacement (LTG) » Remove	
1	Engine Front Splash Shield Bolt CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
2	Engine Front Splash Shield Screw [3x] Tighten 2.5 N.m (22 lb in)
3	Retainer
4	Engine Front Splash Shield - Right Side

ENGINE FRONT SPLASH SHIELD REPLACEMENT - RIGHT SIDE (FRONT)

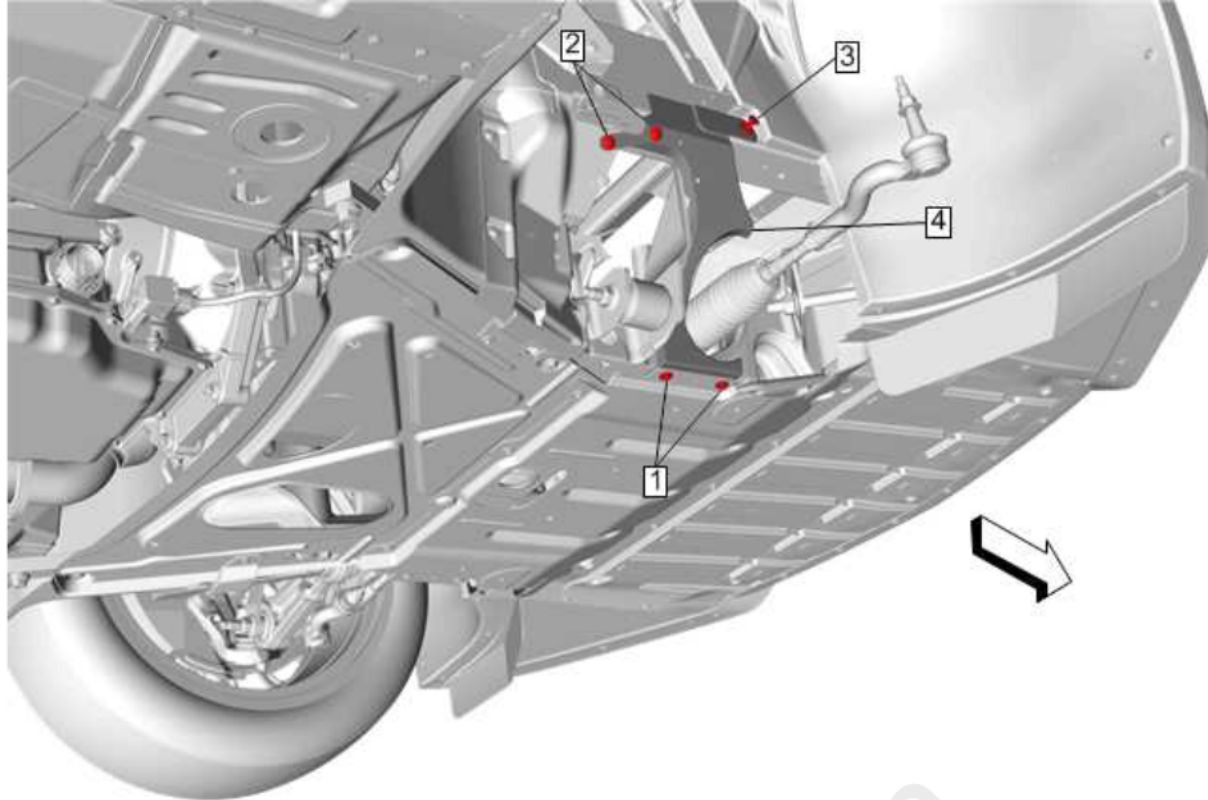


Fig. 4: Engine Front Splash Shield - Right Side (Front)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Remove the right front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Engine Front Splash Shield Bolt [2x] CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
2	Retainer [2x]
3	Retainer
4	Engine Front Splash Shield - Right Side

ENGINE LOWER FRONT SPLASH SHIELD REPLACEMENT (LTG)

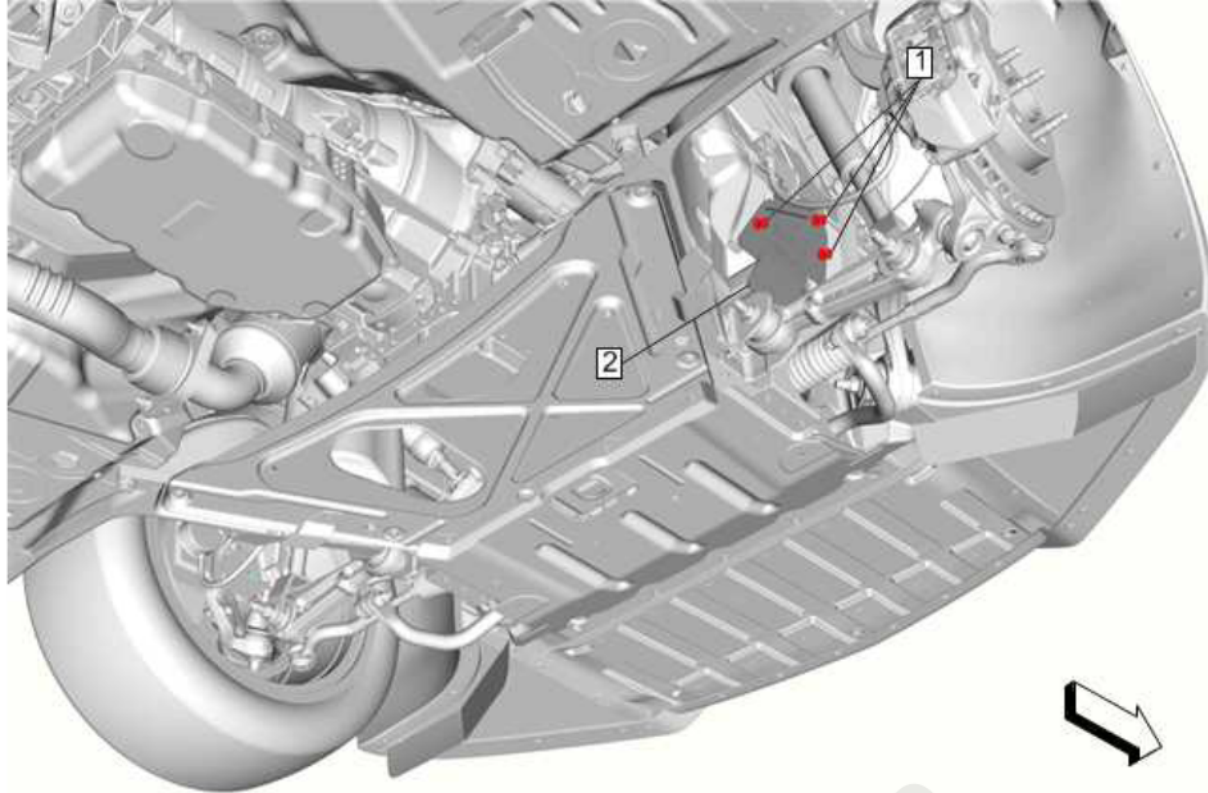


Fig. 5: Engine Lower Front Splash Shield (LTG)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Remove the right front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Retainer [3x]
2	Engine Lower Front Splash Shield

DRIVETRAIN AND FRONT SUSPENSION CRADLE PLATE REPLACEMENT

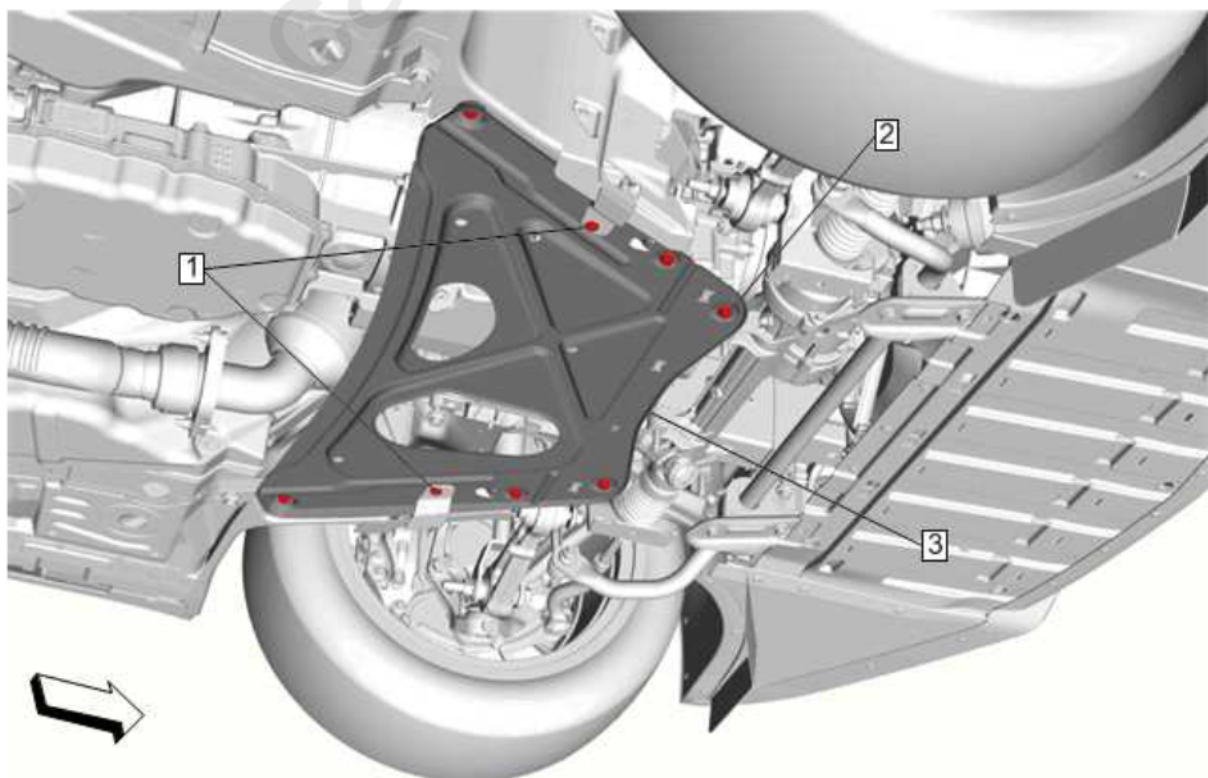


Fig. 6: Drivetrain and Front Suspension Cradle Plate
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Underbody Front Air Deflector Replacement</u> » Remove	
1	Engine Front Splash Shield Bolt [2x] CAUTION: Refer to <u>Fastener Caution</u> Tighten 2.5 N.m (22 lb in)
2	Drivetrain and Front Suspension Cradle Plate Fastener [6x] Tighten 22 N.m (16 lb ft)
3	Drivetrain and Front Suspension Cradle Plate

UNDERBODY FRONT AIR DEFLECTOR REPLACEMENT

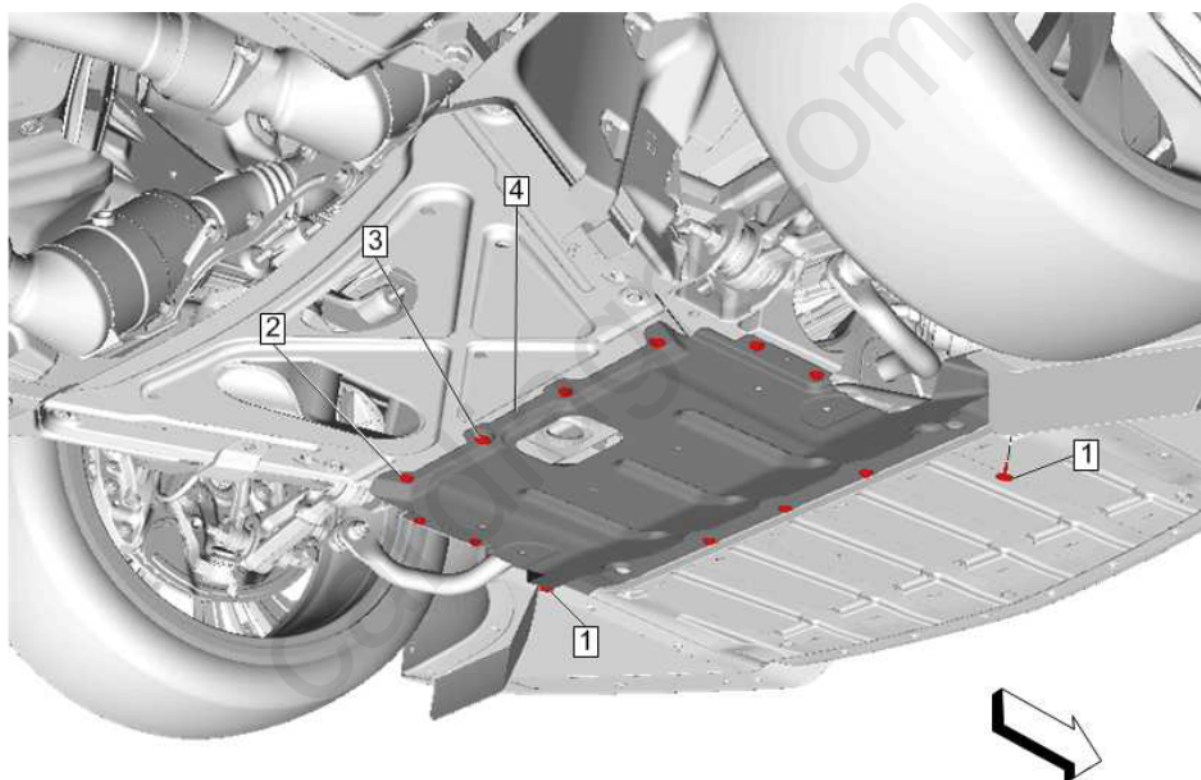


Fig. 7: Underbody Front Air Deflector
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u>	
1	Front Tire Front Air Deflector Fastener [2x] CAUTION: Refer to <u>Fastener Caution</u> Tighten 2.5 N.m (22 lb in)

Callout	Component Name
2	Underbody Front Air Deflector Bolt [11x] Tighten 2.5 N.m (22 lb in)
3	Retainer
4	Underbody Front Air Deflector

UNDERBODY REAR AIR DEFLECTOR REPLACEMENT - LEFT SIDE

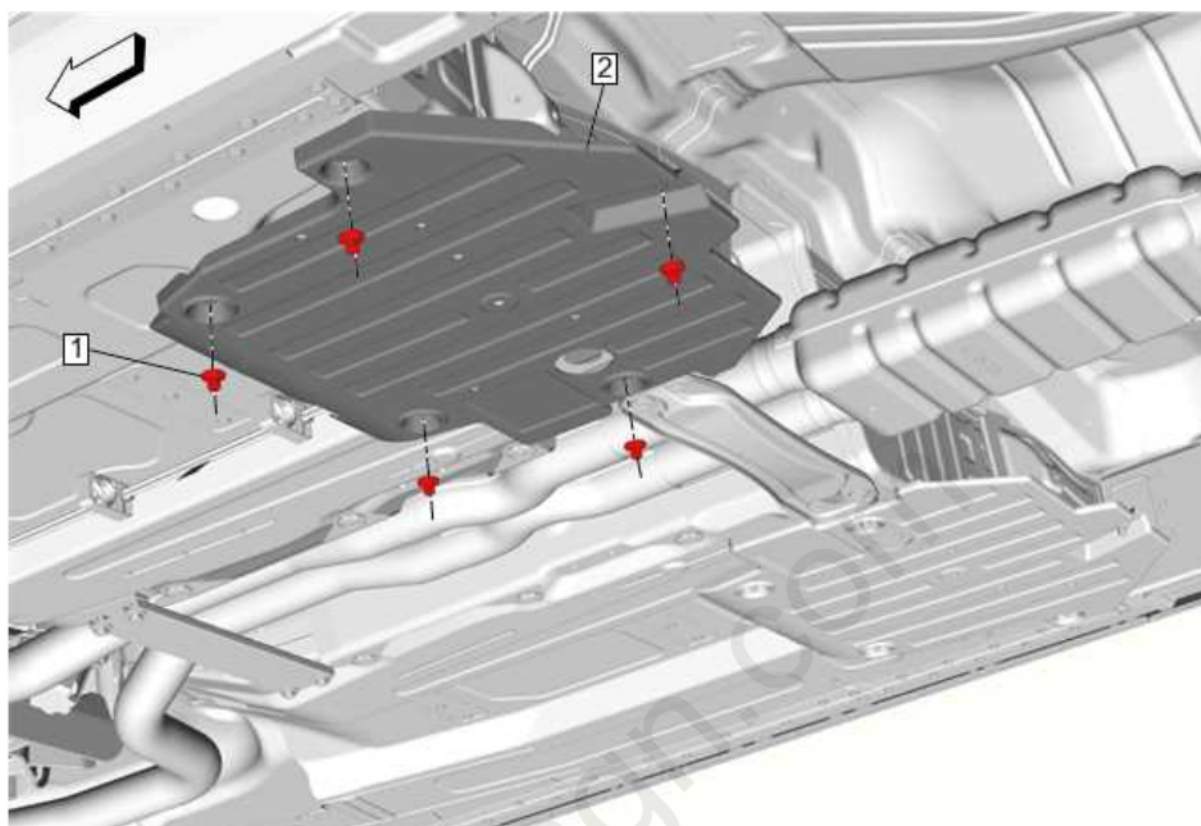


Fig. 8: Underbody Rear Air Deflector - Left Side

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Underbody Rear Air Deflector Nut [5x] CAUTION: Refer to Fastener Caution Tighten 3 N.m (27 lb in)
2	Underbody Rear Air Deflector

UNDERBODY REAR AIR DEFLECTOR REPLACEMENT - RIGHT SIDE

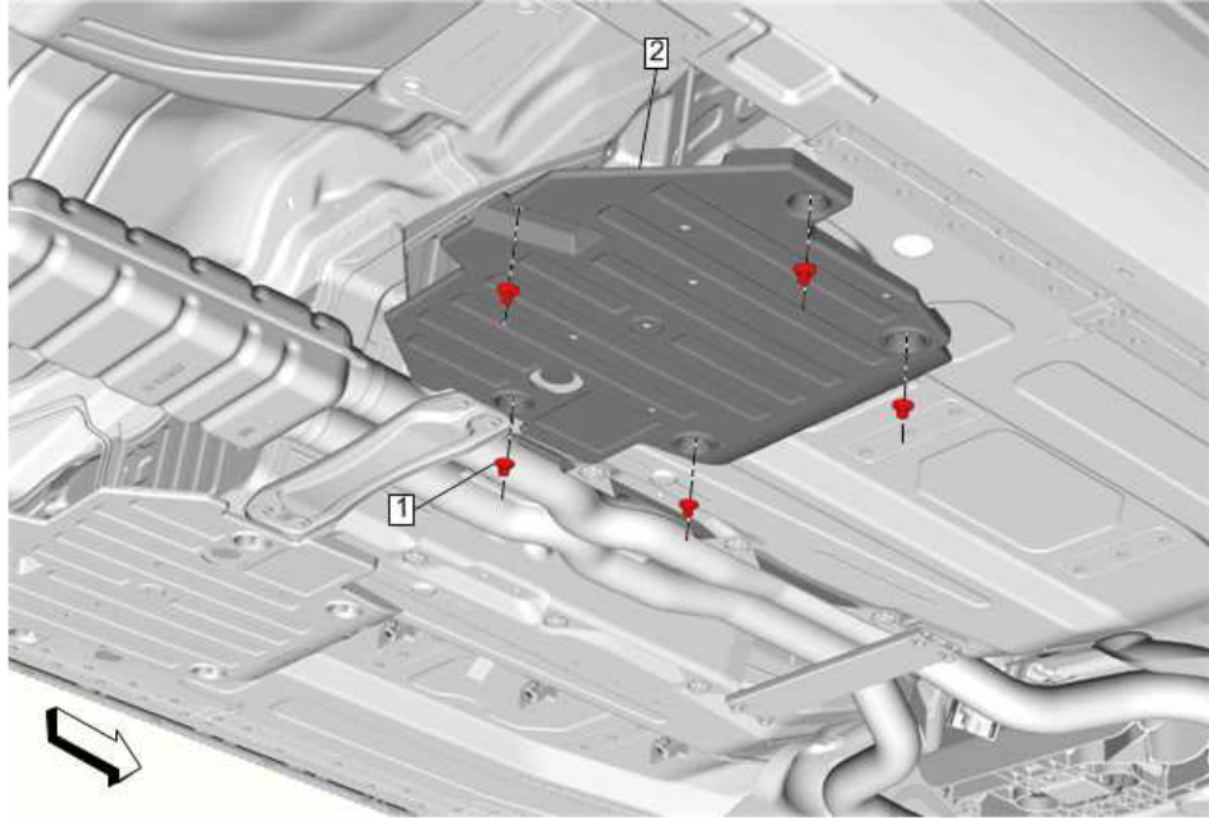


Fig. 9: Underbody Rear Air Deflector - Right Side

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Underbody Rear Air Deflector Nut [5x] CAUTION: Refer to Fastener Caution Tighten 3 N.m (27 lb in)
2	Underbody Rear Air Deflector

UNDERBODY REAR AIR REAR DEFLECTOR REPLACEMENT (WITHOUT HP9)

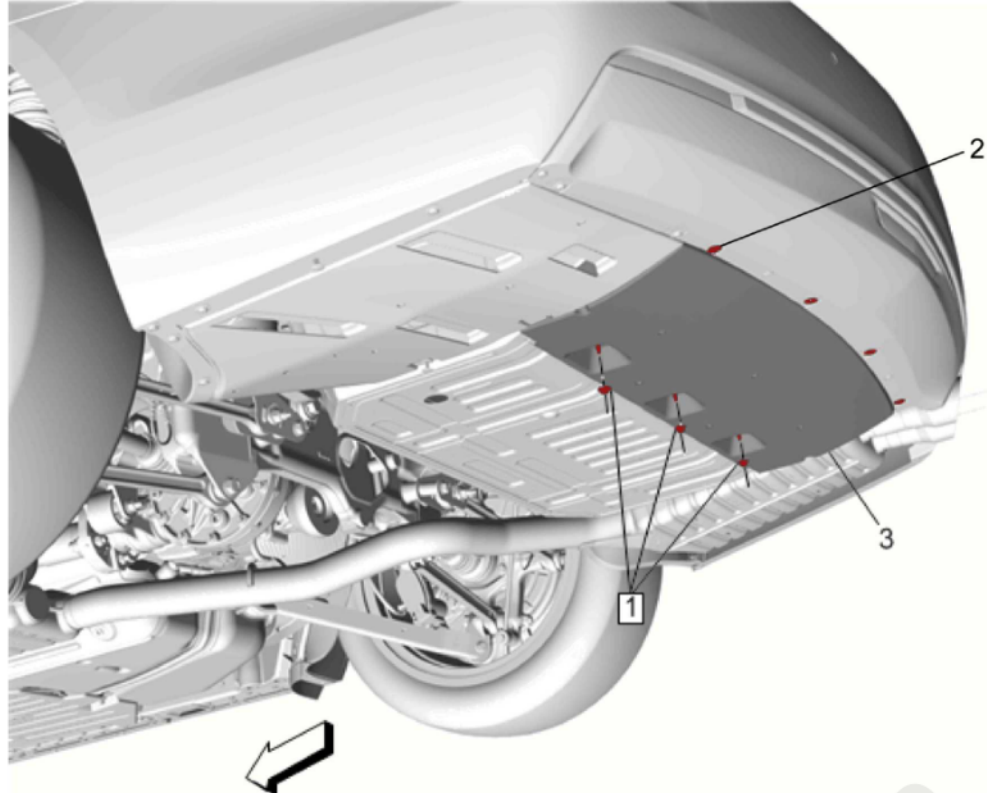


Fig. 10: Underbody Rear Air Rear Deflector (Without HP9)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Underbody Rear Air Rear Deflector Nut [3x] CAUTION: Refer to Fastener Caution Tighten 6 N.m (53 lb in)
2	Underbody Rear Air Rear Deflector Fastener [4x] Tighten 2.5 N.m (22 lb in)
3	Underbody Rear Air Rear Deflector

UNDERBODY REAR AIR REAR DEFLECTOR REPLACEMENT (WITH HP9)

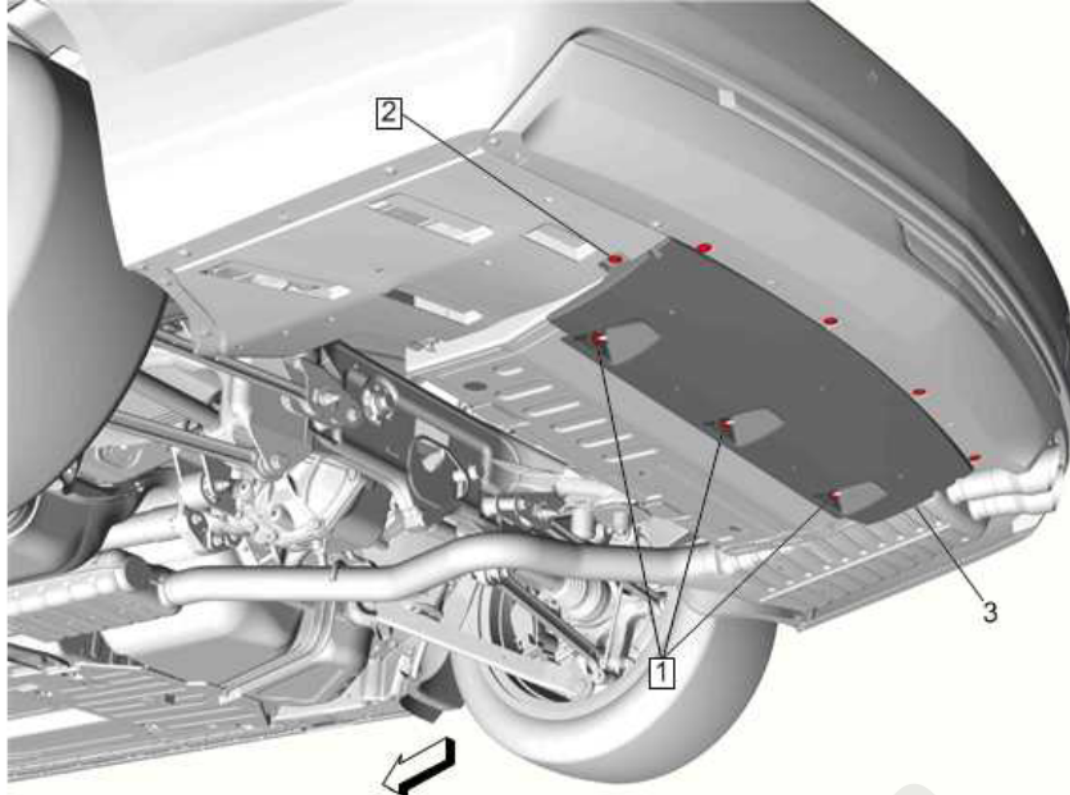


Fig. 11: Underbody Rear Air Rear Deflector (With HP9)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Underbody Rear Air Rear Deflector Nut [3x] CAUTION: Refer to Fastener Caution Tighten 6 N.m (53 lb in)
2	Underbody Rear Air Rear Deflector Fastener [5x] Tighten 2.5 N.m (22 lb in)
3	Underbody Rear Air Rear Deflector

UNDERBODY REAR AIR OUTER DEFLECTOR REPLACEMENT (WITHOUT HP9)

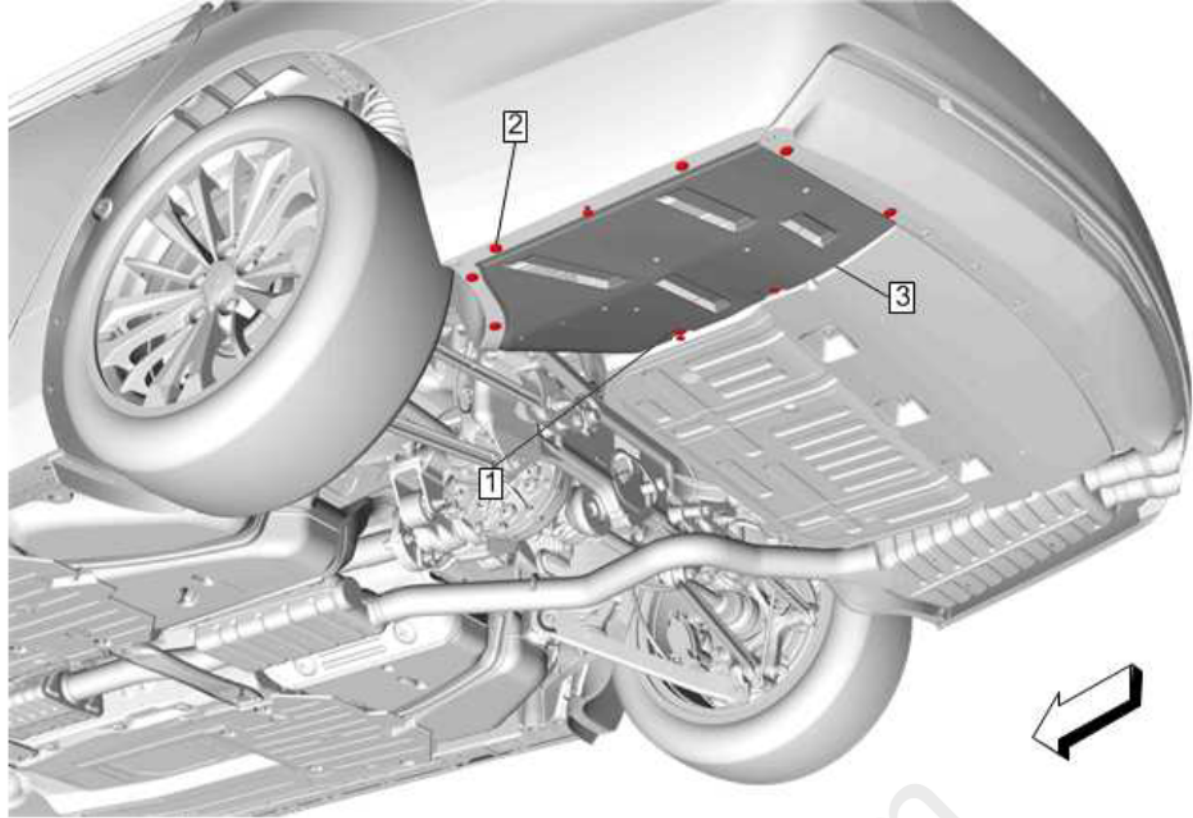


Fig. 12: Underbody Rear Air Outer Deflector (without HP9)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Retainer
2	Underbody Rear Air Outer Deflector Fastener [8x] CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
3	Underbody Rear Air Outer Deflector

UNDERBODY REAR AIR OUTER DEFLECTOR REPLACEMENT (WITH HP9)

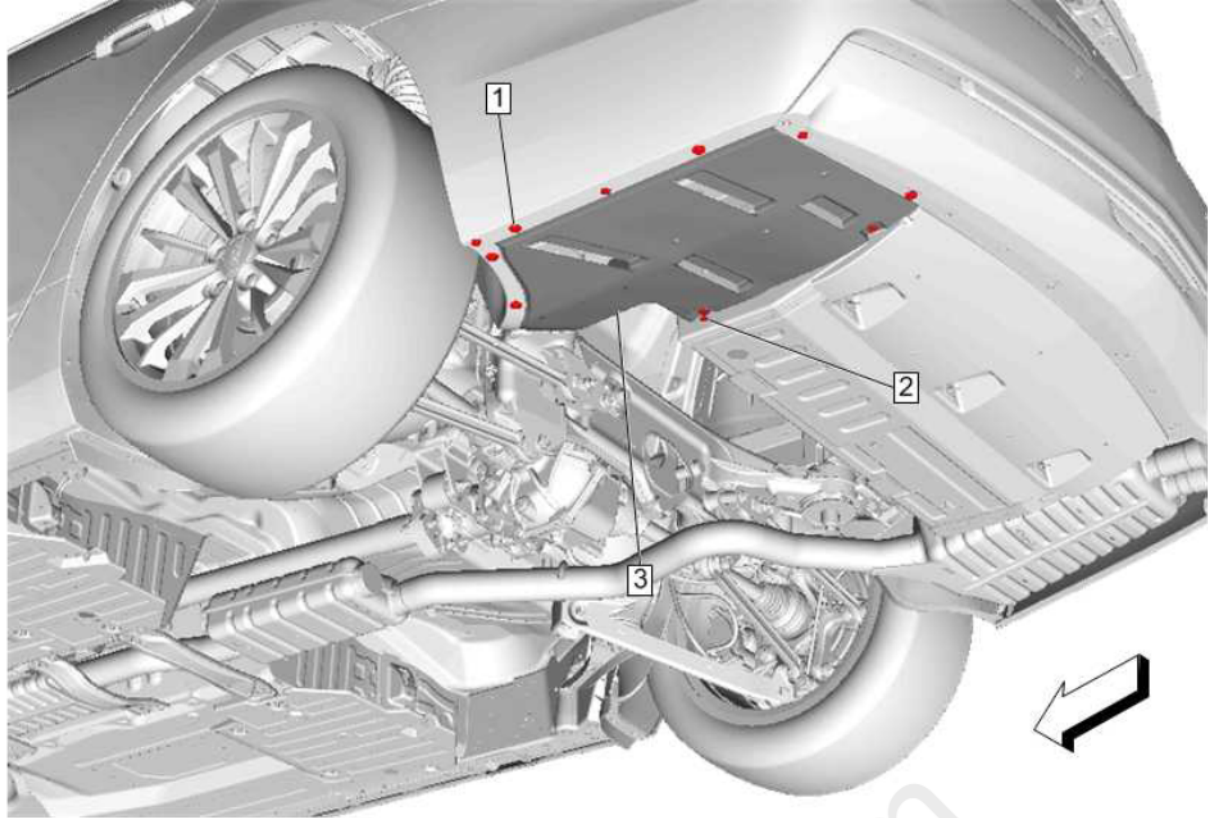


Fig. 13: Underbody Rear Air Outer Deflector (with HP9)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Retainer
2	Underbody Rear Air Outer Deflector Fastener [9x] CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
3	Underbody Rear Air Outer Deflector

DRIVETRAIN AND FRONT SUSPENSION CRADLE REPLACEMENT

Special Tools

EN-39580 Support Stand

Equivalent regional tools: [Special Tools](#).

Removal Procedure

NOTE: Suspension components attached to the frame use Torque-to-Yield fasteners and must be **DISCARDED** and replaced with **NEW** Torque Angle Yield (TAY) fasteners. The frame to body fasteners are not TAY fasteners.

NOTE: Vehicle alignment is not required if the cradle is being lowered or dropped to perform another procedure. This vehicle is equipped with a cradle to body aligning feature: cradle to body through holes or self-aligning pins that are part of the cradle or body. Only align if replacing the cradle with a **NEW** part and transferring components.

1. Install the engine support fixture. Refer to [Engine Support Fixture \(LGW\)](#) , [Engine Support Fixture \(LGX\)](#) , 3.0L or [Engine Support Fixture](#) 2.0L

2. Front Wheelhouse Liner (2)» Remove - [Front Wheelhouse Liner Replacement](#)

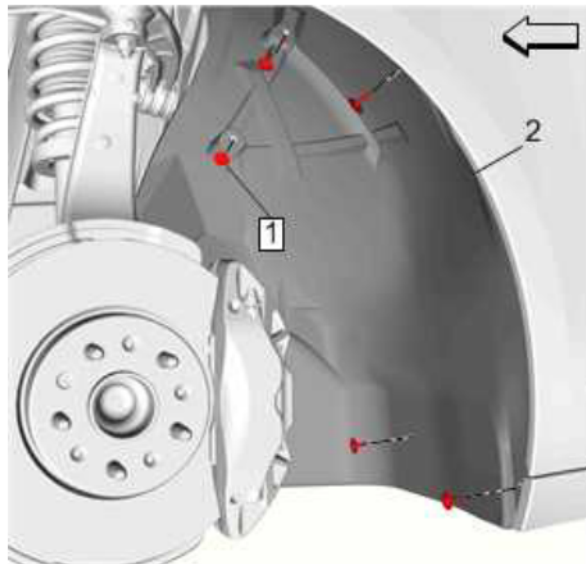


Fig. 14: Front Wheelhouse Liner

Courtesy of GENERAL MOTORS COMPANY

3. Front Tire Front Air Deflector (2)» Remove - [Front Tire Front Air Deflector Replacement](#)

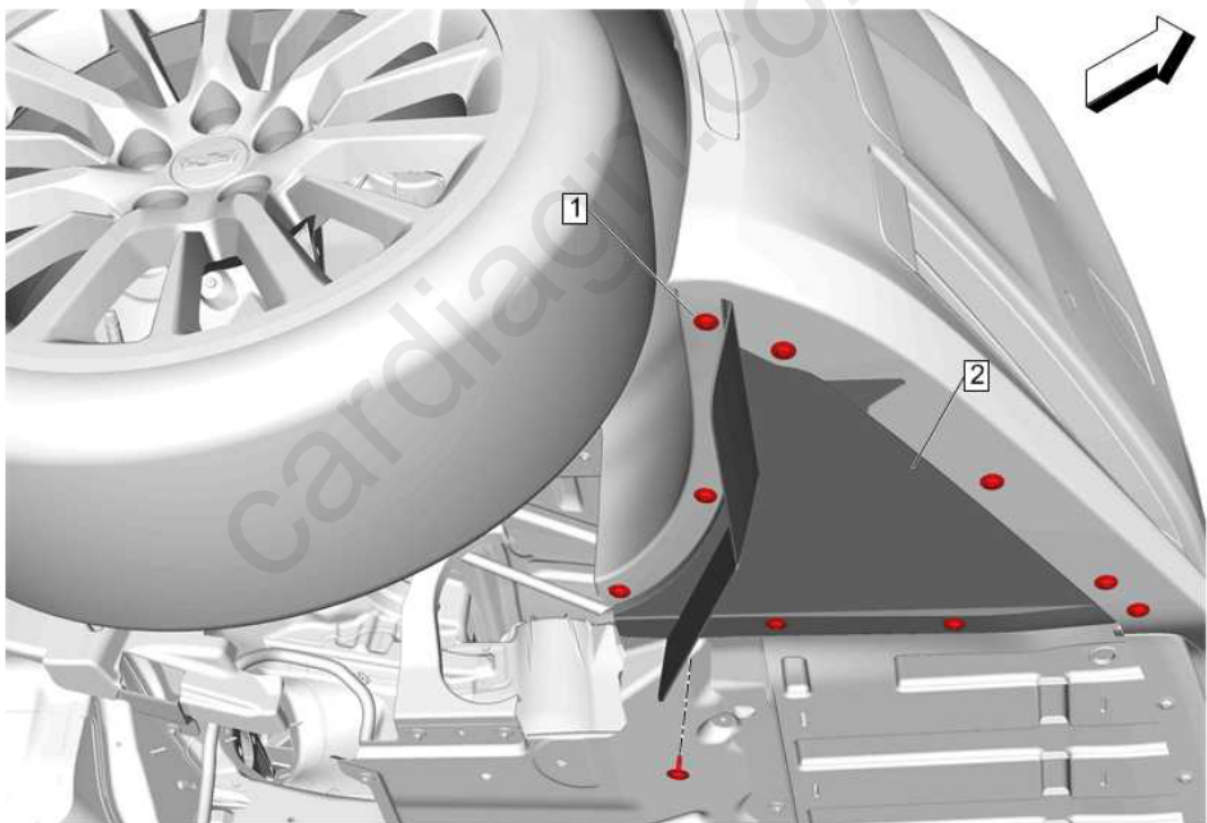


Fig. 15: Front Tire Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

4. Underbody Front Air Deflector (3)» Remove - [Underbody Front Air Deflector Replacement](#)

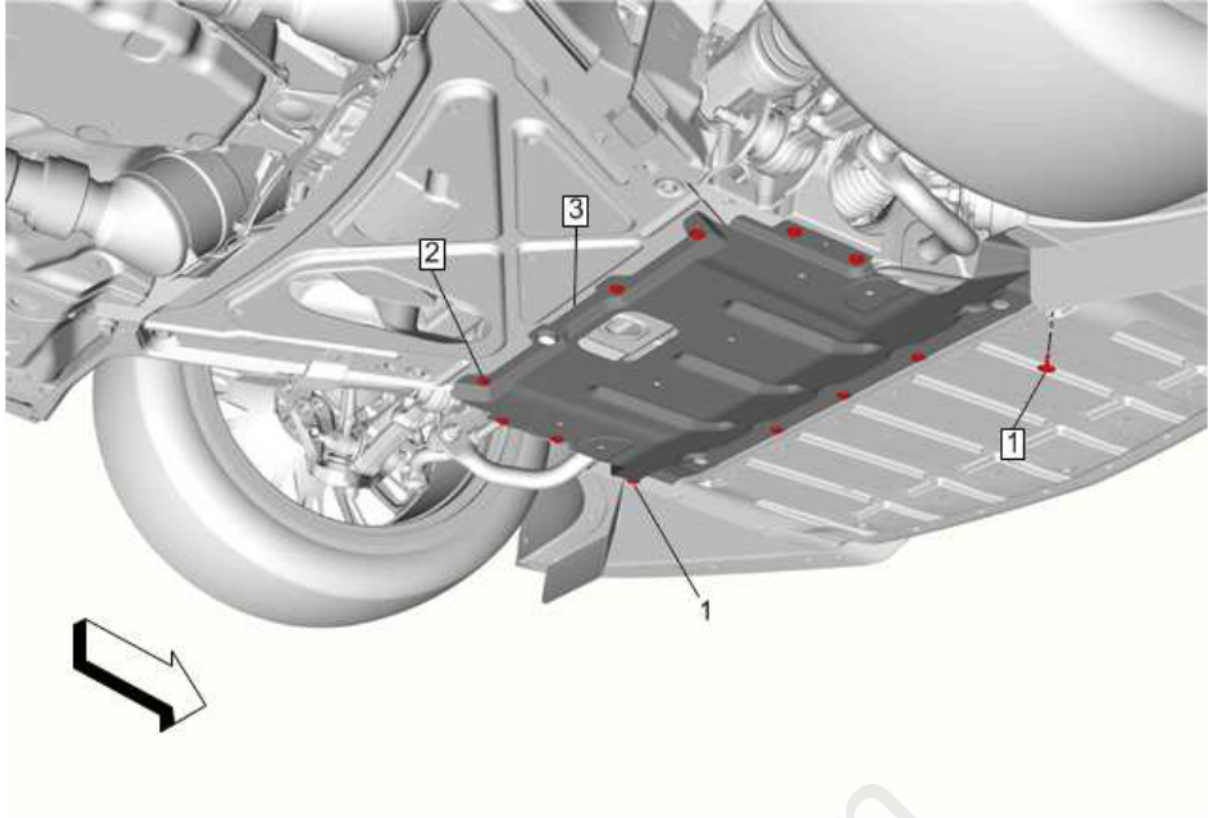


Fig. 16: Underbody Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

5. Front Bumper Fascia Lower Stiffener (1)» Remove - **Front Bumper Fascia Lower Stiffener Replacement**

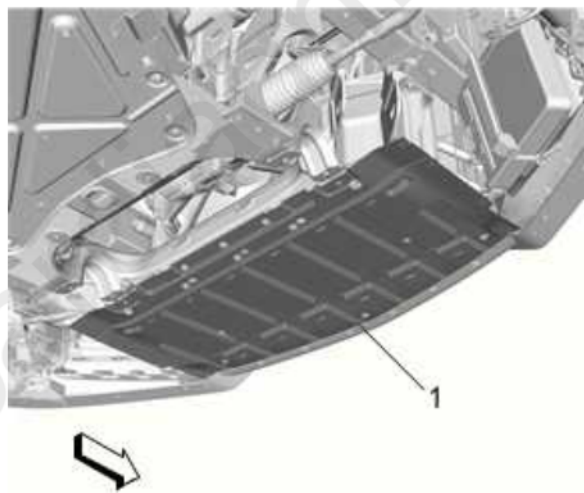


Fig. 17: Front Bumper Fascia Lower Stiffener

Courtesy of GENERAL MOTORS COMPANY

6. Support the radiator.
7. Drivetrain and Front Suspension Cradle Plate (3)» Remove - **Drivetrain and Front Suspension Cradle Plate Replacement**

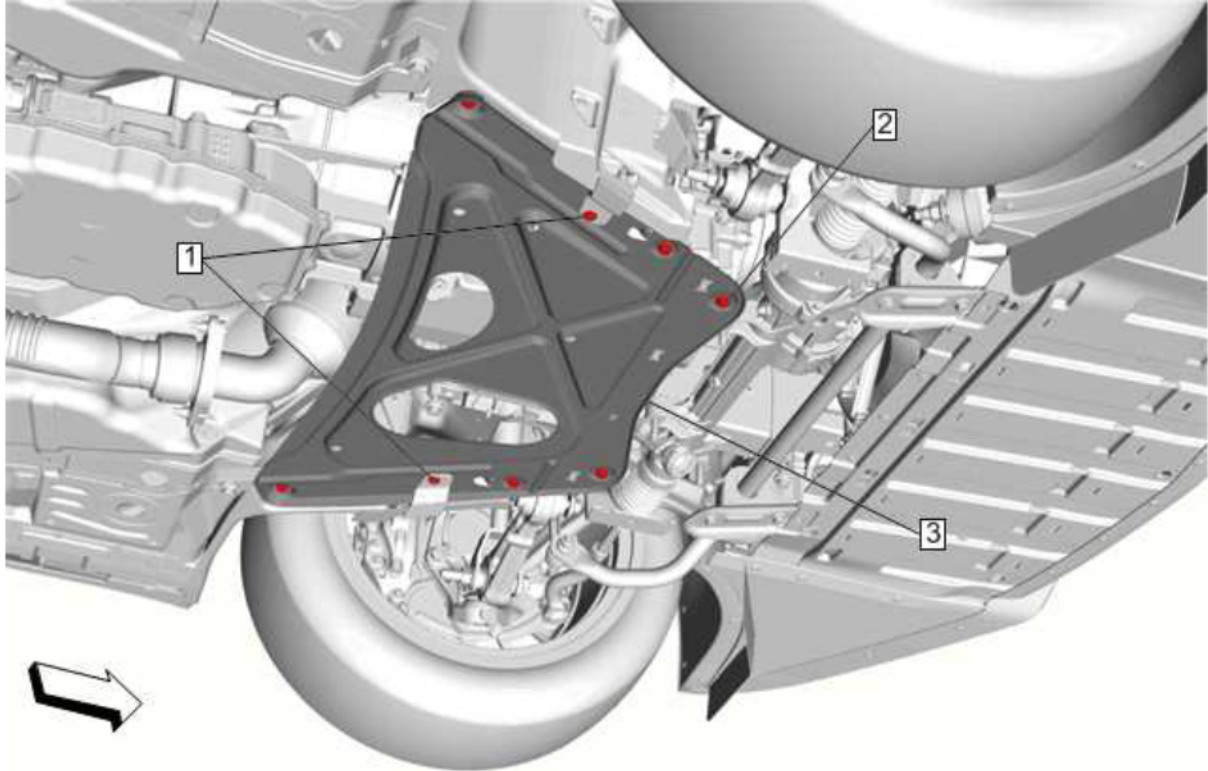


Fig. 18: Drivetrain and Front Suspension Cradle Plate
 Courtesy of GENERAL MOTORS COMPANY

8. {If equipped} Electrical Connector (1) » Disconnect

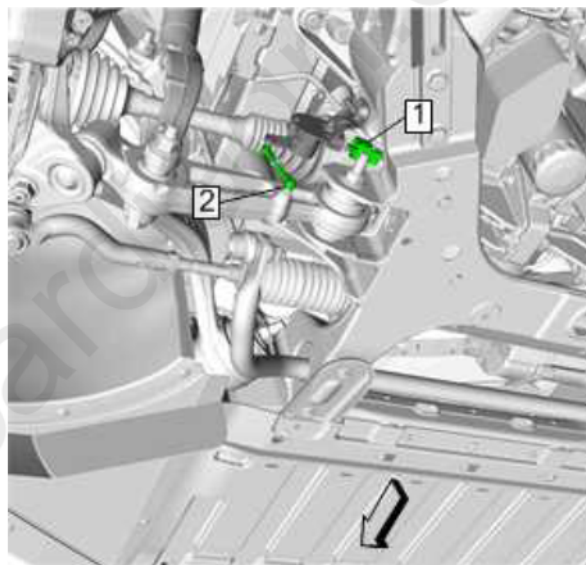


Fig. 19: Electrical Connector
 Courtesy of GENERAL MOTORS COMPANY

9. {If equipped} Electronic Suspension Front Position Sensor (2) » Disconnect
10. Steering Linkage Outer Tie Rod (3) @ Steering Knuckle » Remove - **Steering Linkage Outer Tie Rod Replacement**

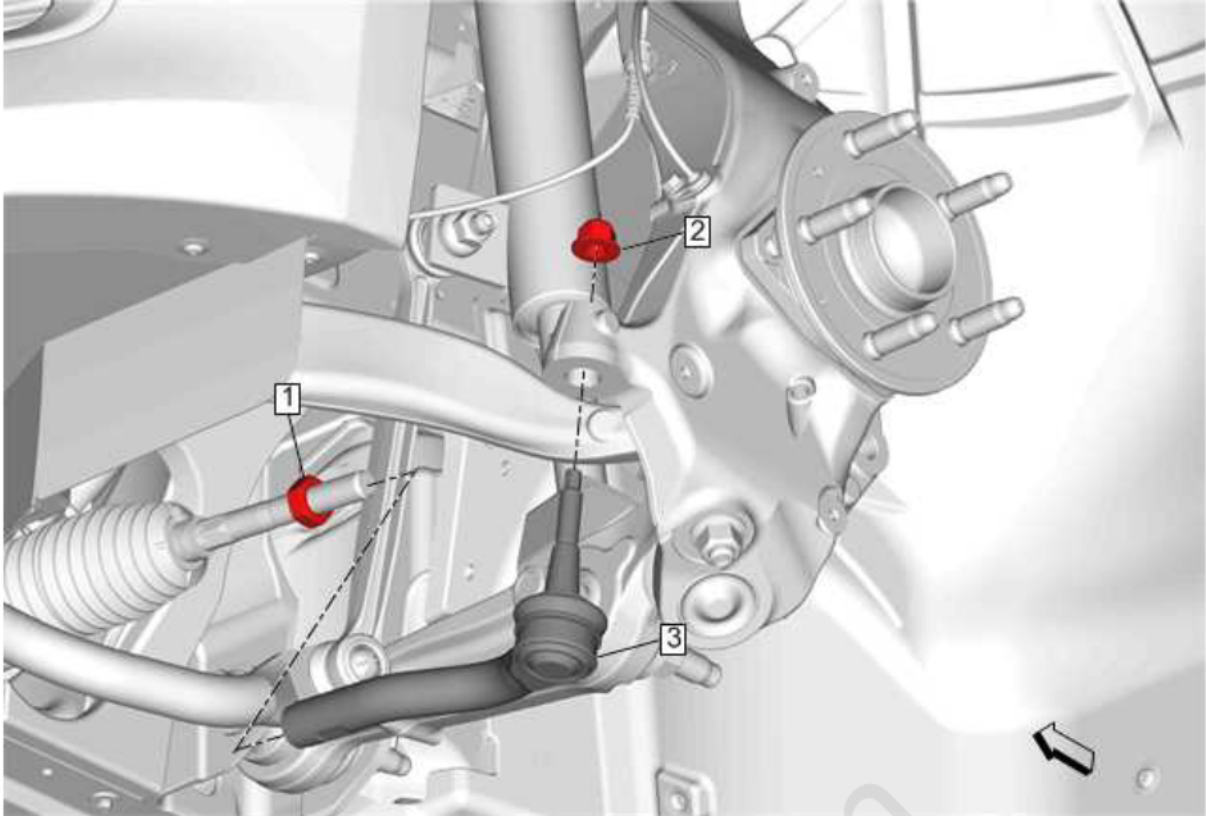


Fig. 20: Steering Linkage Outer Tie Rod

Courtesy of GENERAL MOTORS COMPANY

11. Stabilizer Shaft Link (2) @ Stabilizer Shaft» Remove - [Stabilizer Shaft Link Replacement \(RWD\)](#) and/or [Stabilizer Shaft Link Replacement \(AWD\)](#)

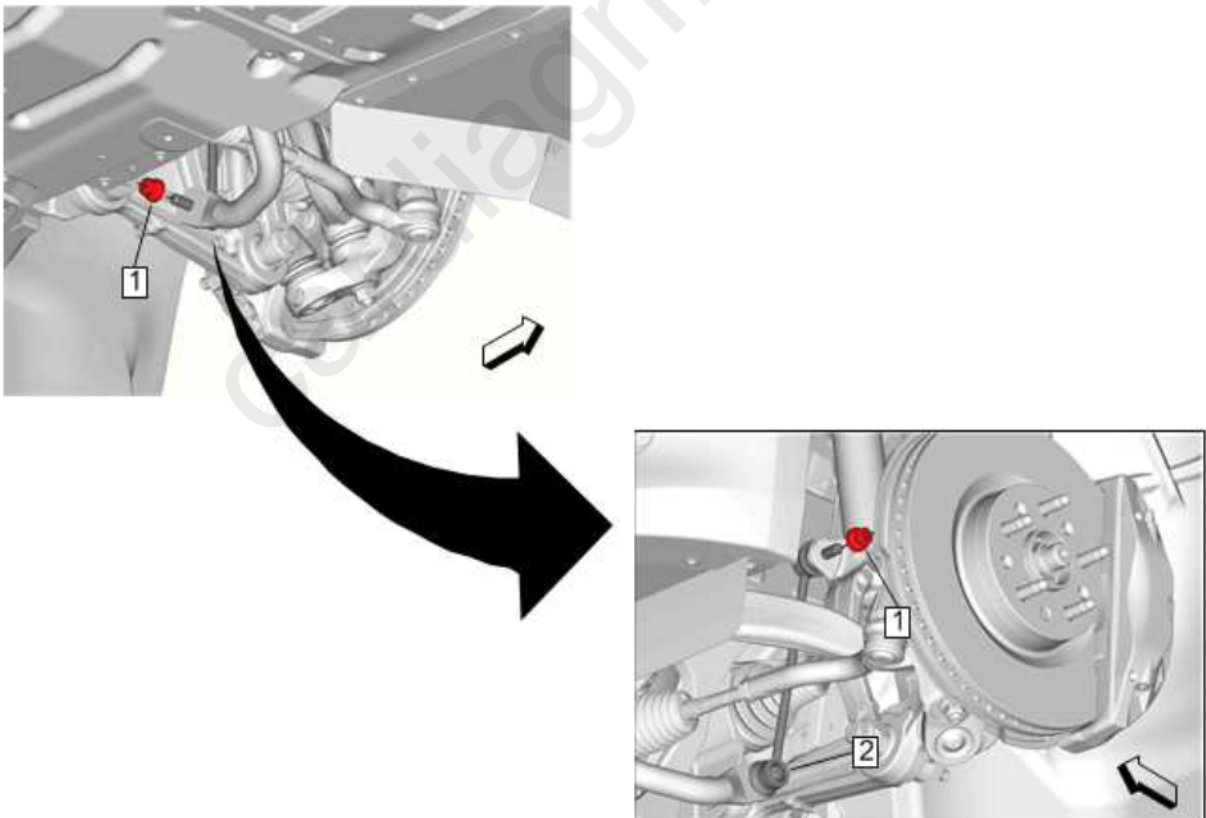


Fig. 21: Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

12. Shock Absorber and Spring (1) @ Front Lower Control Rear Link» Remove - [Shock Absorber and Spring Removal and Installation \(RWD Without F55\)](#) , [Shock Absorber and Spring Removal and Installation \(AWD Without F55\)](#) , [Shock Absorber and Spring Removal and Installation \(RWD With F55\)](#) and/or [Shock Absorber and Spring Removal and Installation \(AWD With F55\)](#)

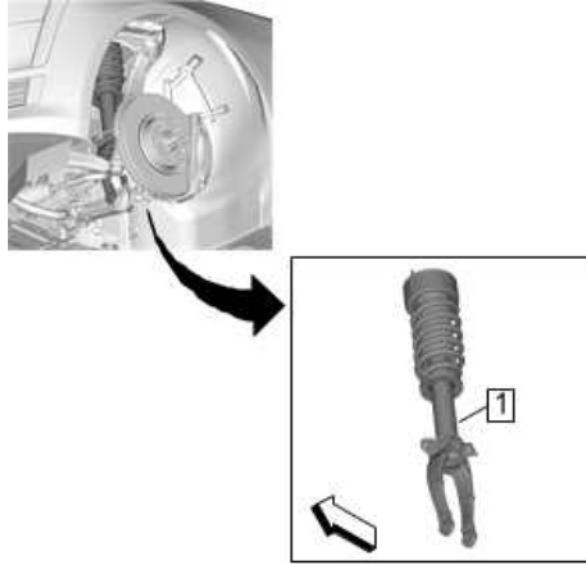


Fig. 22: Shock Absorber and Spring

Courtesy of GENERAL MOTORS COMPANY

13. Front Lower Control Front Link (1) @ Steering Knuckle» Remove - **Front Lower Control Front Link Replacement (RWD)** and/or **Front Lower Control Front Link Replacement (AWD)**

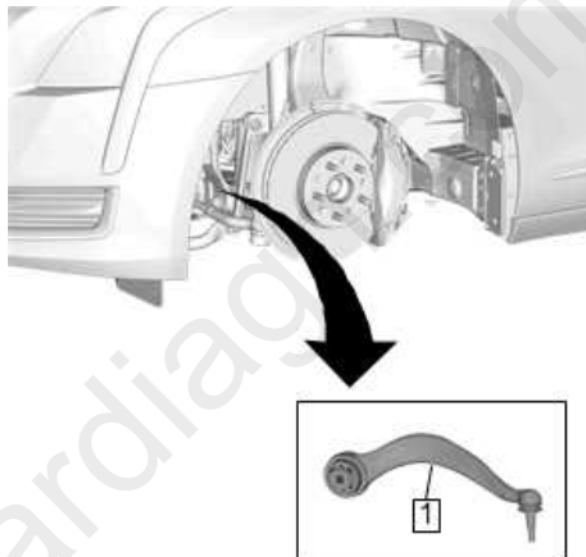
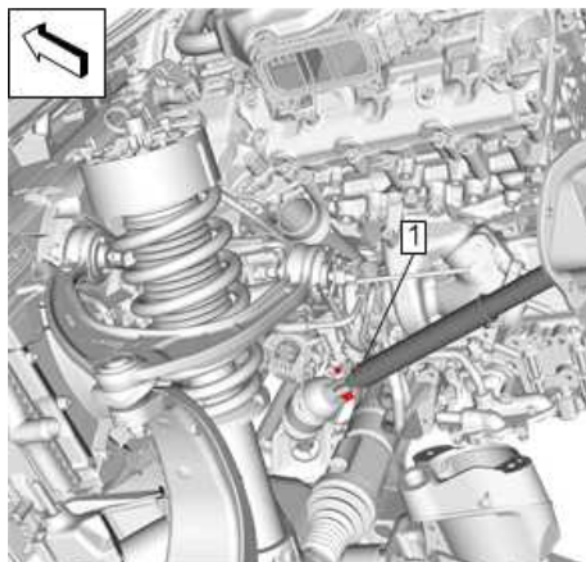


Fig. 23: Front Lower Control Front Link

Courtesy of GENERAL MOTORS COMPANY

14. Intermediate Steering Shaft (1) @ Steering Gear» Remove - **Intermediate Steering Shaft Replacement (RWD)** and/or **Intermediate Steering Shaft Replacement (AWD)**



15. Disconnect the steering gear electrical connectors. (1)

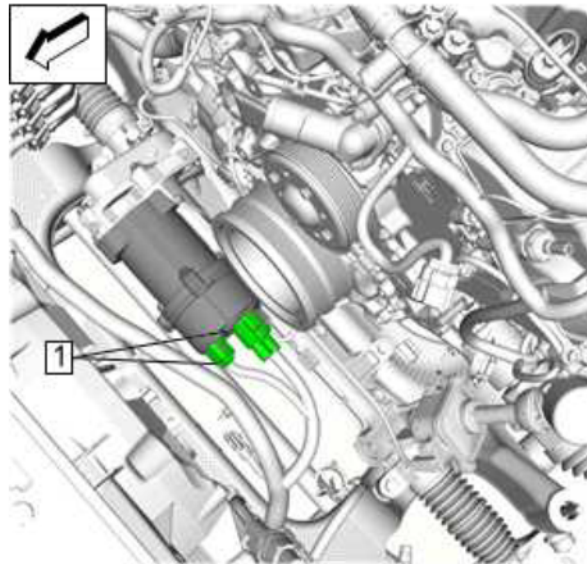


Fig. 25: Steering Gear Electrical Connectors
Courtesy of GENERAL MOTORS COMPANY

16. {If equipped} Accessory DC Power Control Module Bracket Nut (1) @ Accessory DC Power Control Module Bracket (2)» Remove [2x]

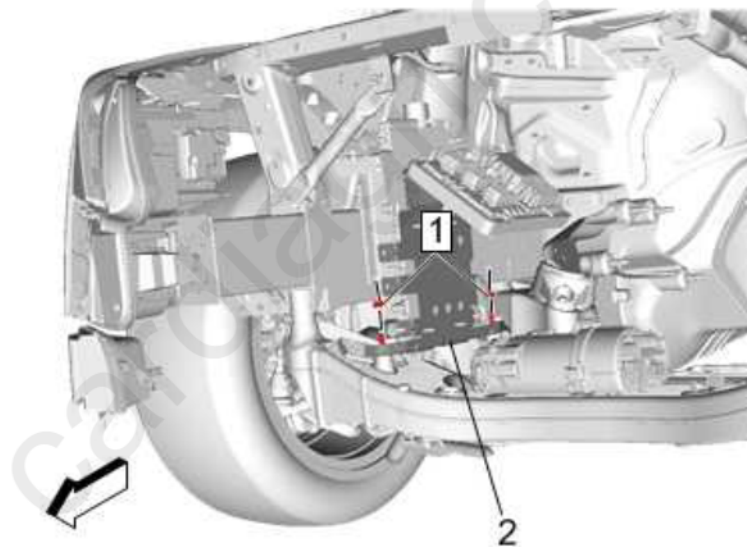


Fig. 26: Accessory DC Power Control Module Bracket Nut
Courtesy of GENERAL MOTORS COMPANY

17. Wiring Harness Retainer (1)» Disengage [6x]

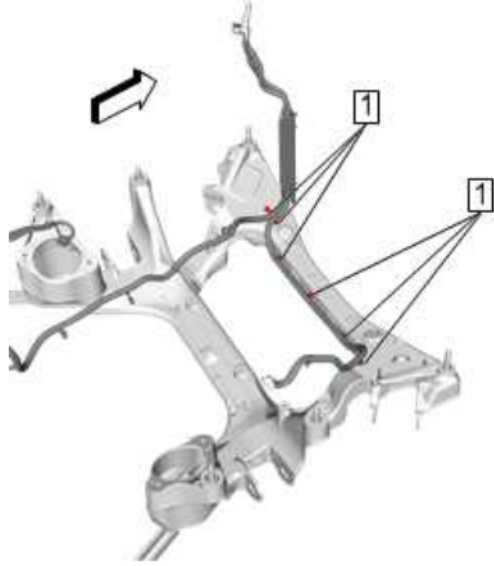


Fig. 27: Wiring Harness Retainers And Frame
 Courtesy of GENERAL MOTORS COMPANY

18. Engine Mount Nut - Left Side (1)» Remove

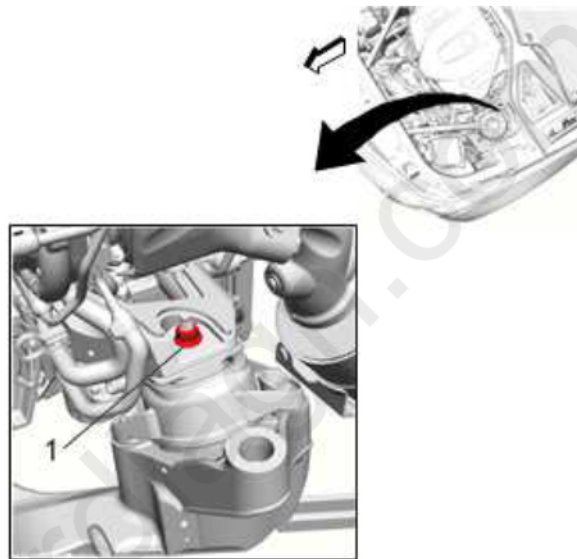


Fig. 28: Engine Mount Nut
 Courtesy of GENERAL MOTORS COMPANY

19. Engine Mount Nut - Right Side (1)» Remove

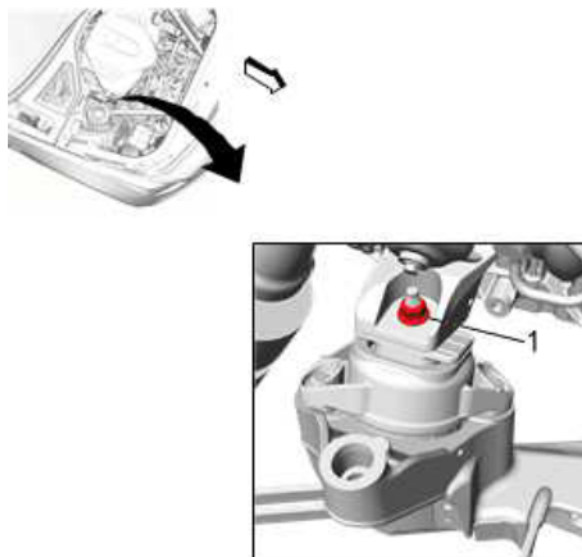


Fig. 29: Engine Mount Nut
 Courtesy of GENERAL MOTORS COMPANY

20. Install **EN-39580** engine support stand under the drivetrain and front suspension cradle.

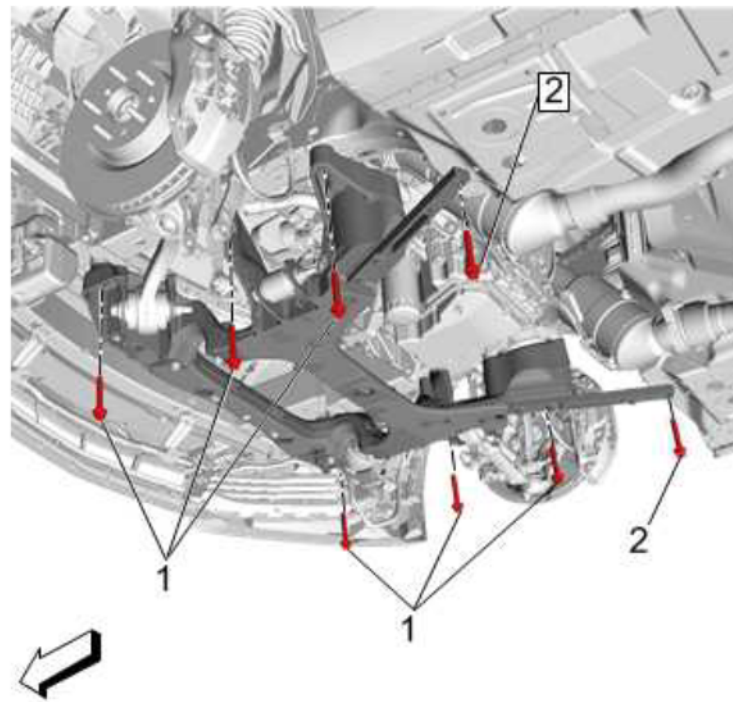


Fig. 30: Drivetrain and Front Suspension Cradle Mounting Bolts

Courtesy of GENERAL MOTORS COMPANY

21. Lower the vehicle until the drivetrain and front suspension frame is resting lightly on the jackstands.
22. Drivetrain and Front Suspension Cradle Mounting Bolts (1) » Remove and DISCARD the bolts. [6x]
23. Drivetrain and Front Suspension Cradle Mounting Bolts (2) » Remove and DISCARD the bolts. [2x]
24. With the aid of an assistant, carefully raise the body from the frame.
25. Ensure when raising the body the following items are clear from the frame:
 - Vacuum lines
 - Steering knuckles
 - Electrical wiring harnesses
 - Oil coolers lines
26. Drivetrain and Front Suspension Cradle (1) » Remove

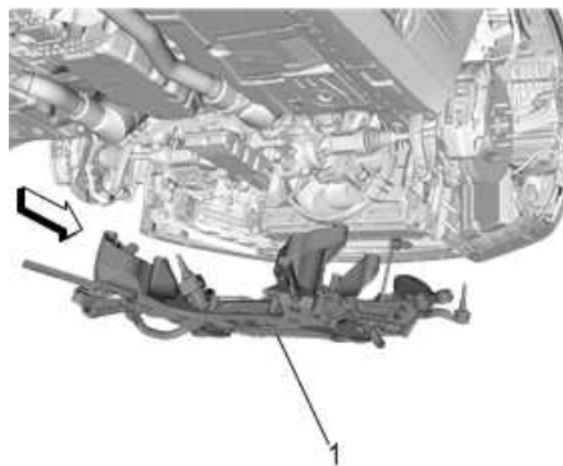


Fig. 31: Lowering Body To Frame

Courtesy of GENERAL MOTORS COMPANY

27. Transfer components as necessary.

1. Inspect the engine mount to ensure the phenolic spacer (1) is in place and not damaged.

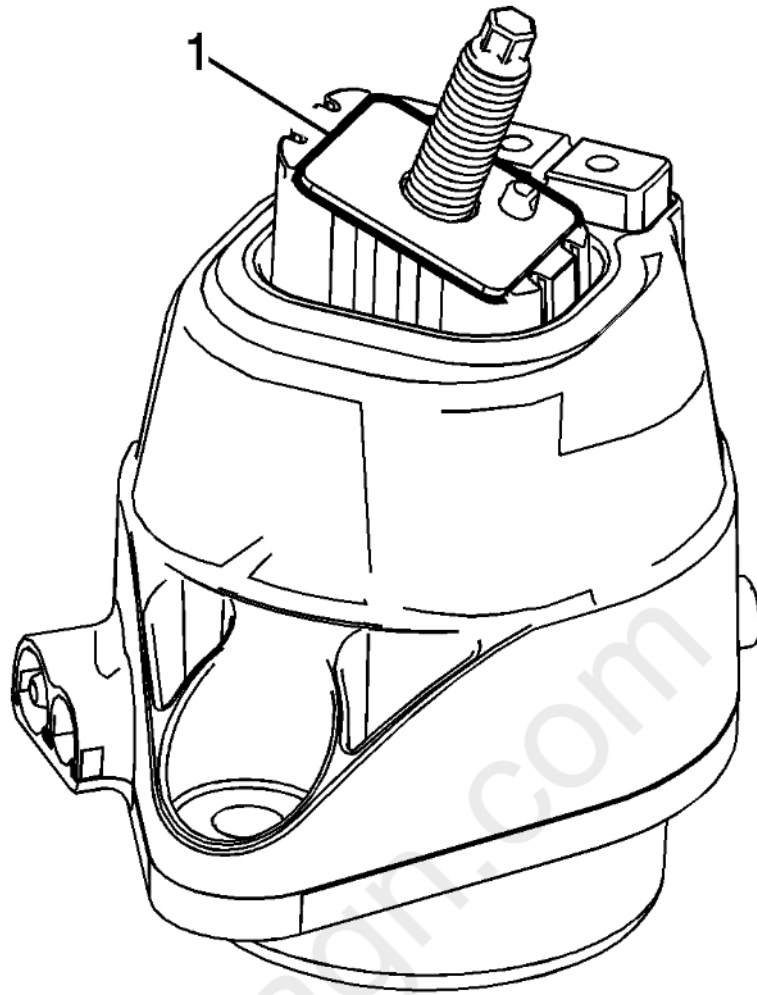
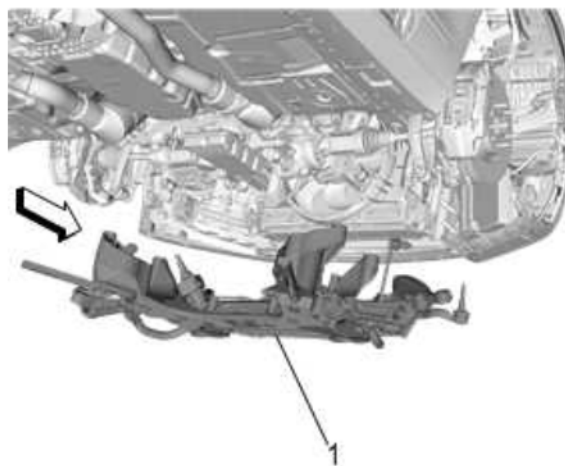


Fig. 32: Phenolic Spacer

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Phenolic spacer must be present to prevent galvanic/corrosive reaction and/or excessive temperature conduction between engine mount bracket and engine mount. Replace mount if phenolic spacer is missing or damaged. Failure to ensure phenolic spacer is intact and not damaged can lead to premature failure of engine mount and/or engine mount bracket.

2. With the aid of an assistant, carefully lower the body to the frame. (1)



3. Ensure the following components are clear from the frame:
 - Vacuum lines
 - Steering knuckles
 - Electrical wiring harnesses
 - Oil cooler lines
4. Drivetrain and Front Suspension Cradle Bolts (1) and Front Cradle Mount Bolt Bracket Bolt (2)» Install and hand tighten the NEW Bolts [8x]

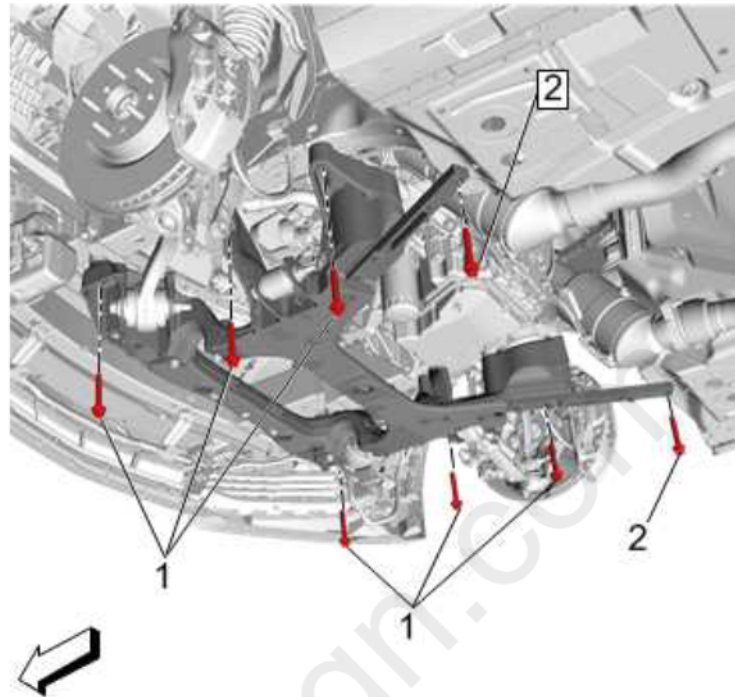


Fig. 34: Drivetrain and Front Suspension Cradle Mounting Bolts
Courtesy of GENERAL MOTORS COMPANY

5. Drivetrain and Front Suspension Cradle Bolt» Install and tighten the NEW bolt. (1) 100 N.m (74 lb ft) plus 30 to 45 degrees (6x)
- CAUTION:** This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.
6. Front Cradle Mount Bolt Bracket Bolt» Install and tighten the NEW bolt. (2) 100 N.m (74 lb ft) (2x)
 7. Remove the **EN-39580** engine support stand from under the vehicle.
 8. Engine Mount Nut-Left Side (1)» Install and tighten 70 N.m (52 lb ft)

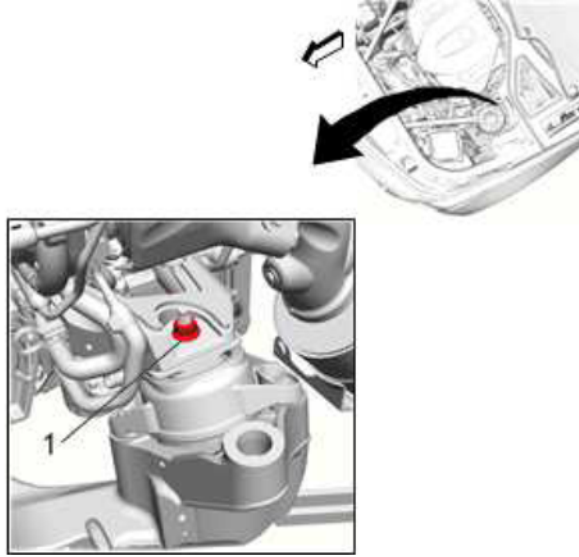


Fig. 35: Engine Mount Nut

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution**

9. Engine Mount Nut - Right Side (1) » Install and tighten 70 N.m (52 lb ft)

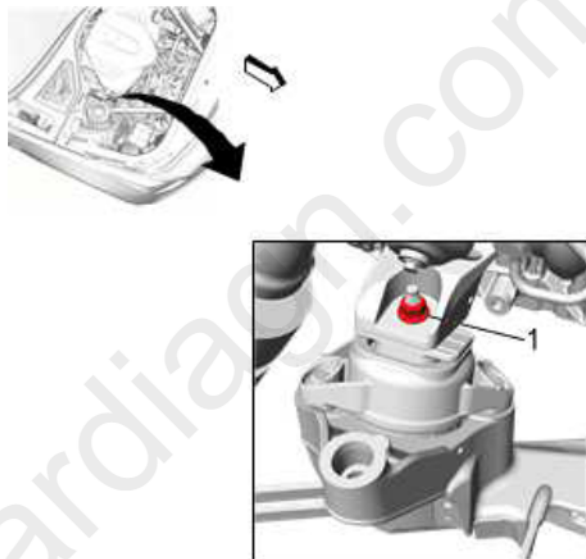


Fig. 36: Engine Mount Nut

Courtesy of GENERAL MOTORS COMPANY

10. Intermediate Steering Shaft (1) @ Steering Gear » Install - **Intermediate Steering Shaft Replacement (RWD)** **Intermediate Steering Shaft Replacement (AWD)**

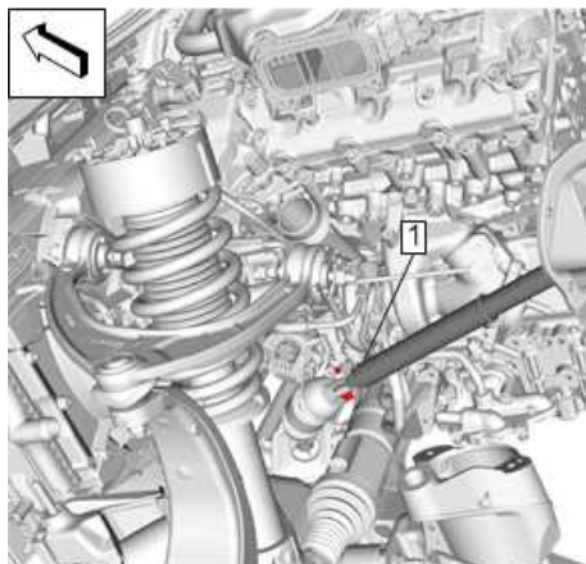


Fig. 37: Intermediate Steering Shaft
Courtesy of GENERAL MOTORS COMPANY

11. Install the wiring harness retainers to the frame. (1)

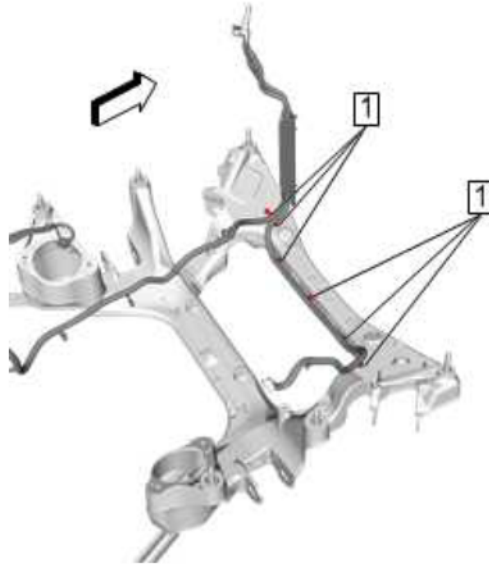


Fig. 38: Wiring Harness Retainers And Frame
Courtesy of GENERAL MOTORS COMPANY

12. Connect the steering gear electrical connectors. (1)

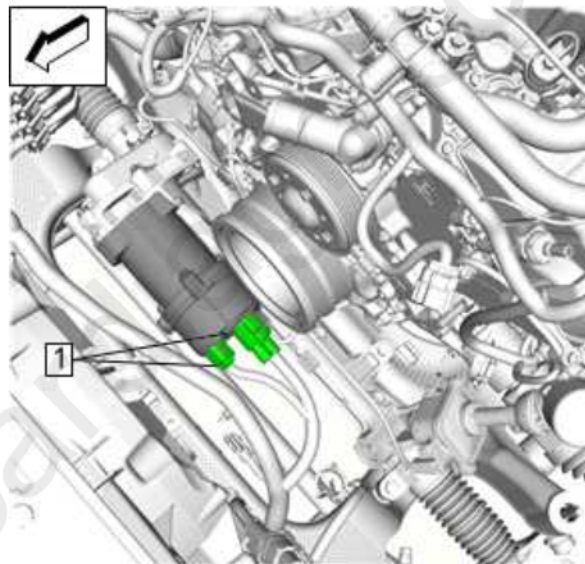


Fig. 39: Steering Gear Electrical Connectors
Courtesy of GENERAL MOTORS COMPANY

13. {If equipped} Accessory DC Power Control Module Bracket Nut (1) @ Accessory DC Power Control Module Bracket (2)» Install and tighten [2x] 22 N.m (16 lb ft)

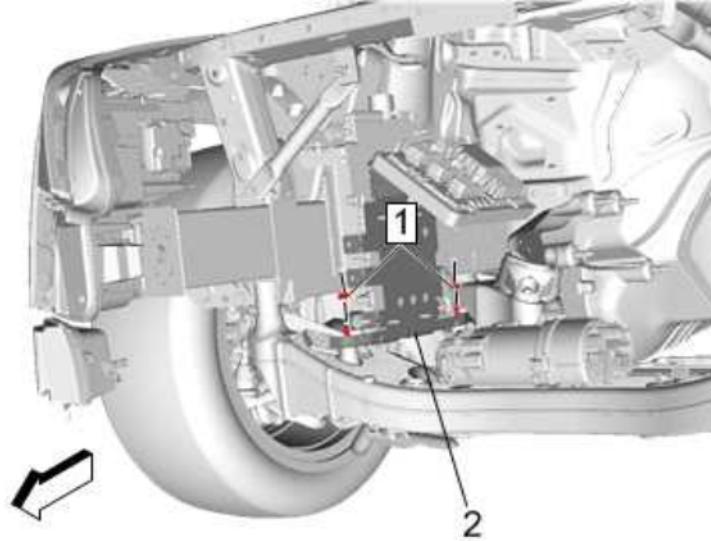


Fig. 40: Accessory DC Power Control Module Bracket Nut
 Courtesy of GENERAL MOTORS COMPANY

14. Front Lower Control Front Link (1) @ Steering Knuckle» Install - **Front Lower Control Front Link Replacement (RWD)** and/or **Front Lower Control Front Link Replacement (AWD)**

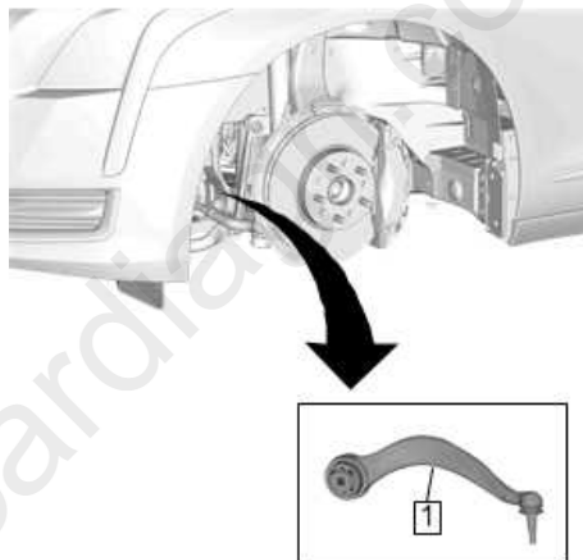


Fig. 41: Front Lower Control Front Link
 Courtesy of GENERAL MOTORS COMPANY

15. Shock Absorber and Spring (1) @ Front Lower Control Rear Link» Install - **Shock Absorber and Spring Removal and Installation (RWD Without F55)** **Shock Absorber and Spring Removal and Installation (AWD Without F55)** **Shock Absorber and Spring Removal and Installation (RWD With F55)** **Shock Absorber and Spring Removal and Installation (AWD With F55)**

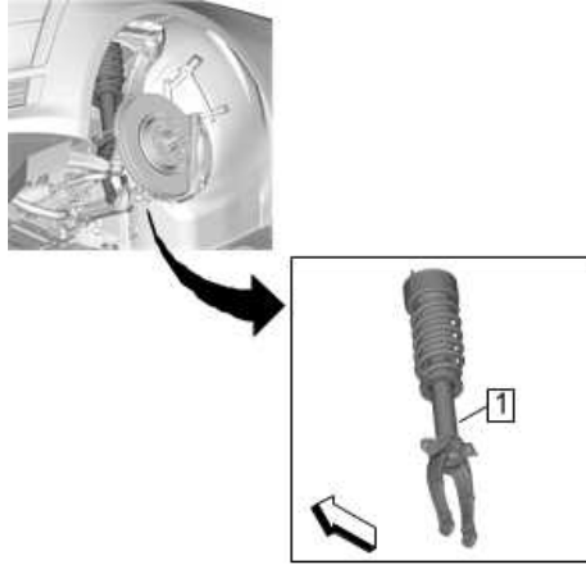


Fig. 42: Shock Absorber and Spring

Courtesy of GENERAL MOTORS COMPANY

16. Stabilizer Shaft Link (2) @ Stabilizer Shaft» Install - [Stabilizer Shaft Link Replacement \(RWD\)](#) [Stabilizer Shaft Link Replacement \(AWD\)](#)

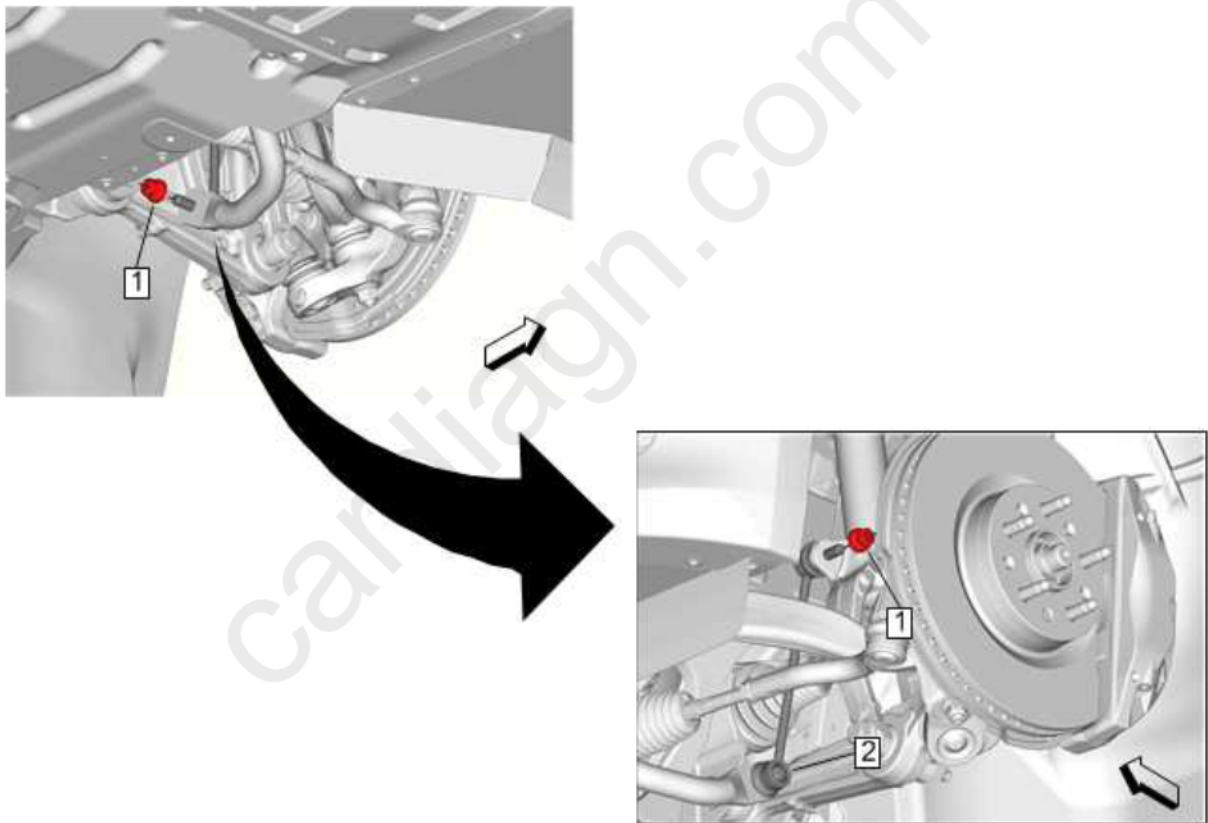


Fig. 43: Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

17. Steering Linkage Outer Tie Rod (3) @ Steering Knuckle» Install - [Steering Linkage Outer Tie Rod Replacement](#)

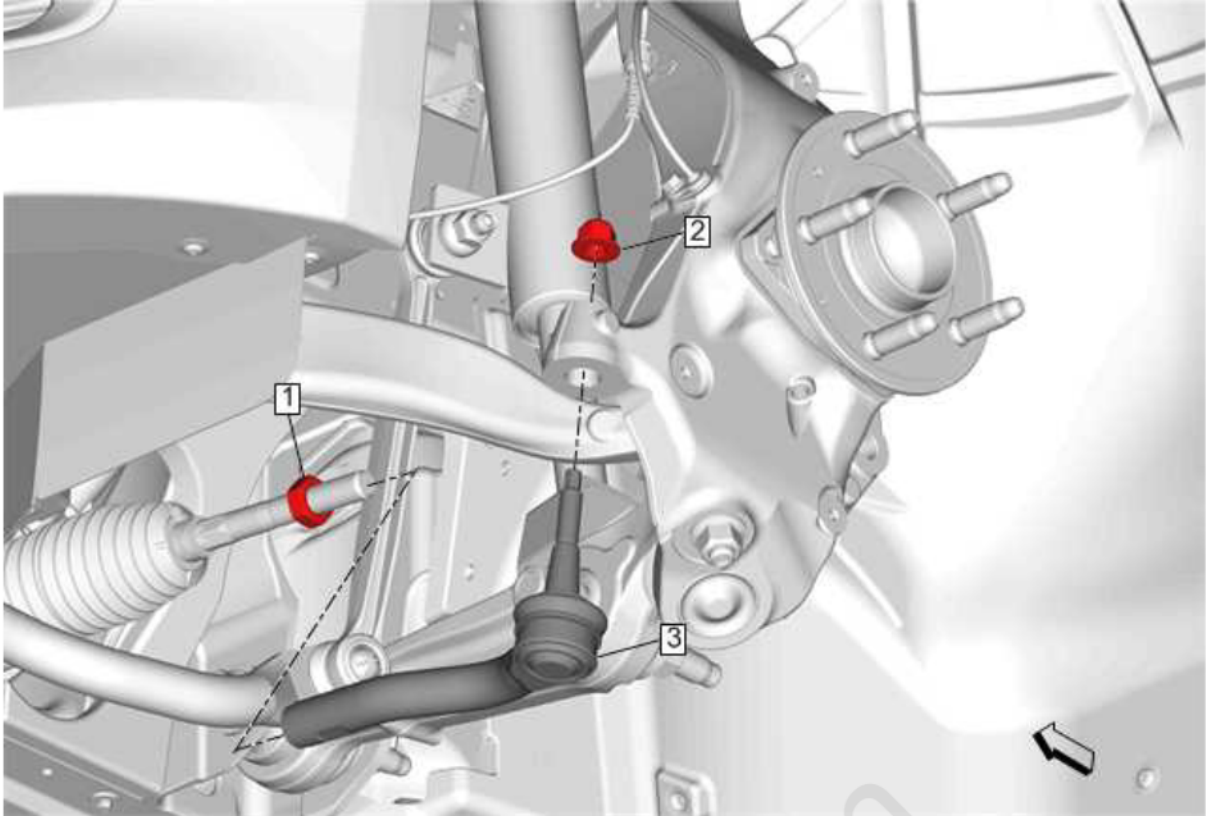


Fig. 44: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

18. {If equipped} Electrical Connector (1)» Connect

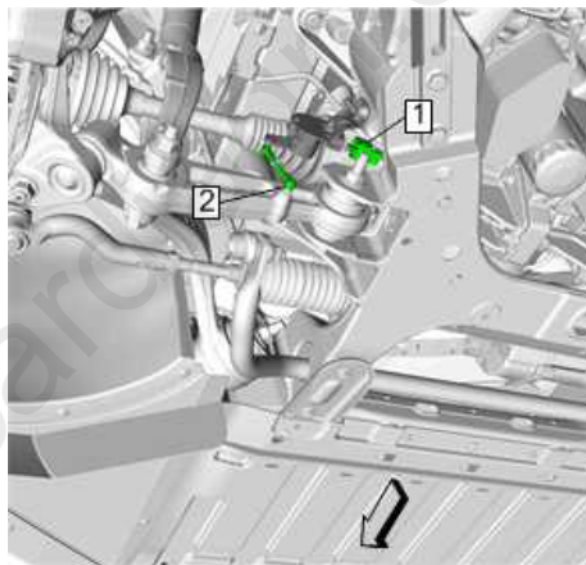


Fig. 45: Electrical Connector
 Courtesy of GENERAL MOTORS COMPANY

19. {If equipped} Electronic Suspension Front Position Sensor (2)» Connect
20. Drivetrain and Front Suspension Cradle Plate (3)» Install - **Drivetrain and Front Suspension Cradle Plate Replacement**

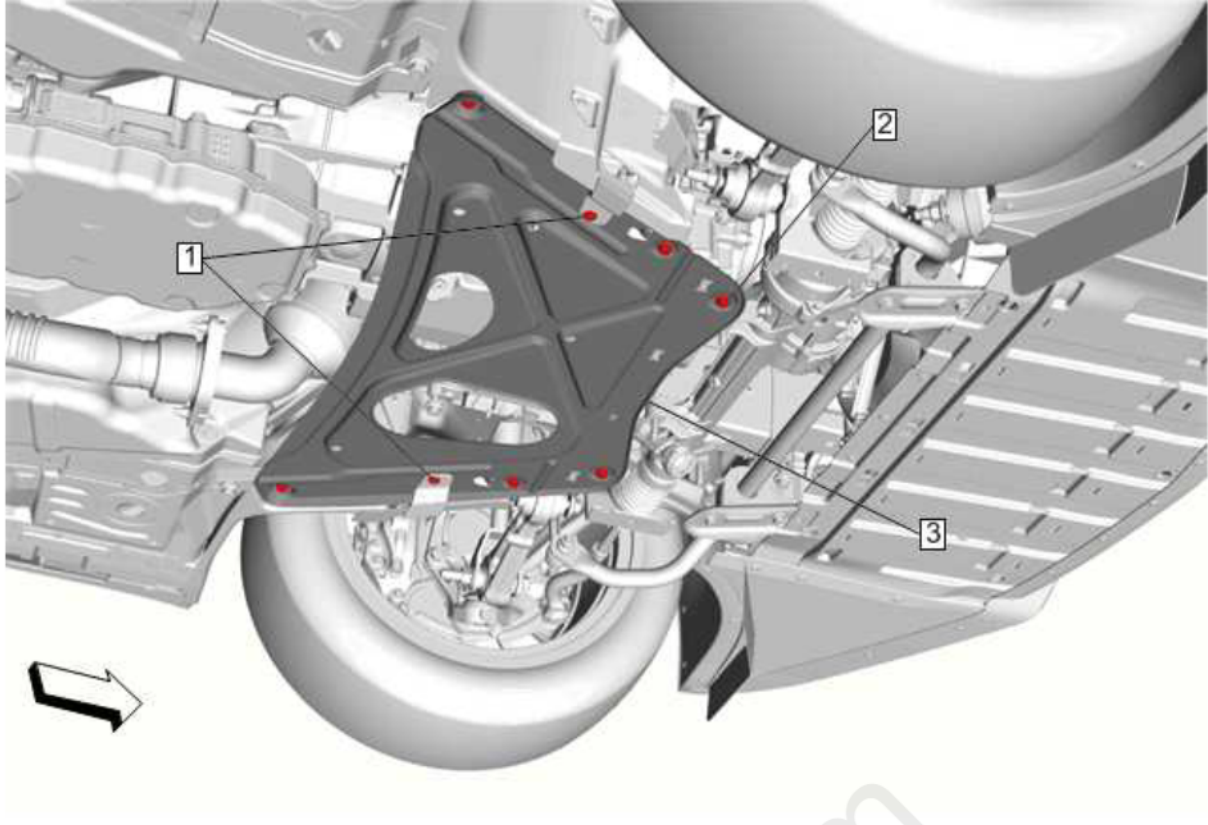


Fig. 46: Drivetrain and Front Suspension Cradle Plate

Courtesy of GENERAL MOTORS COMPANY

21. Front Bumper Fascia Lower Stiffener (1)» Install - **Front Bumper Fascia Lower Stiffener Replacement**

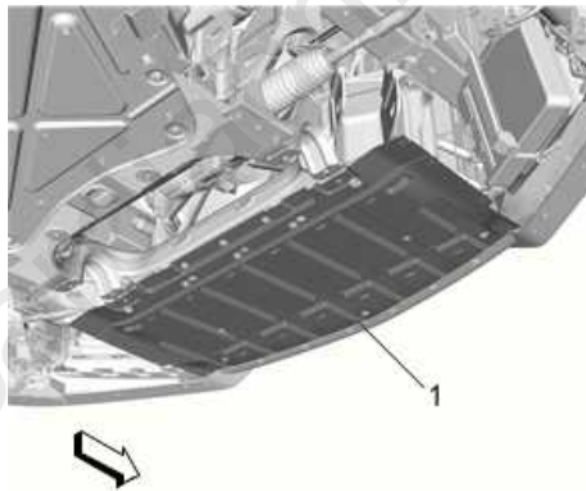


Fig. 47: Front Bumper Fascia Lower Stiffener

Courtesy of GENERAL MOTORS COMPANY

22. Underbody Front Air Deflector (3)» Install - **Underbody Front Air Deflector Replacement**

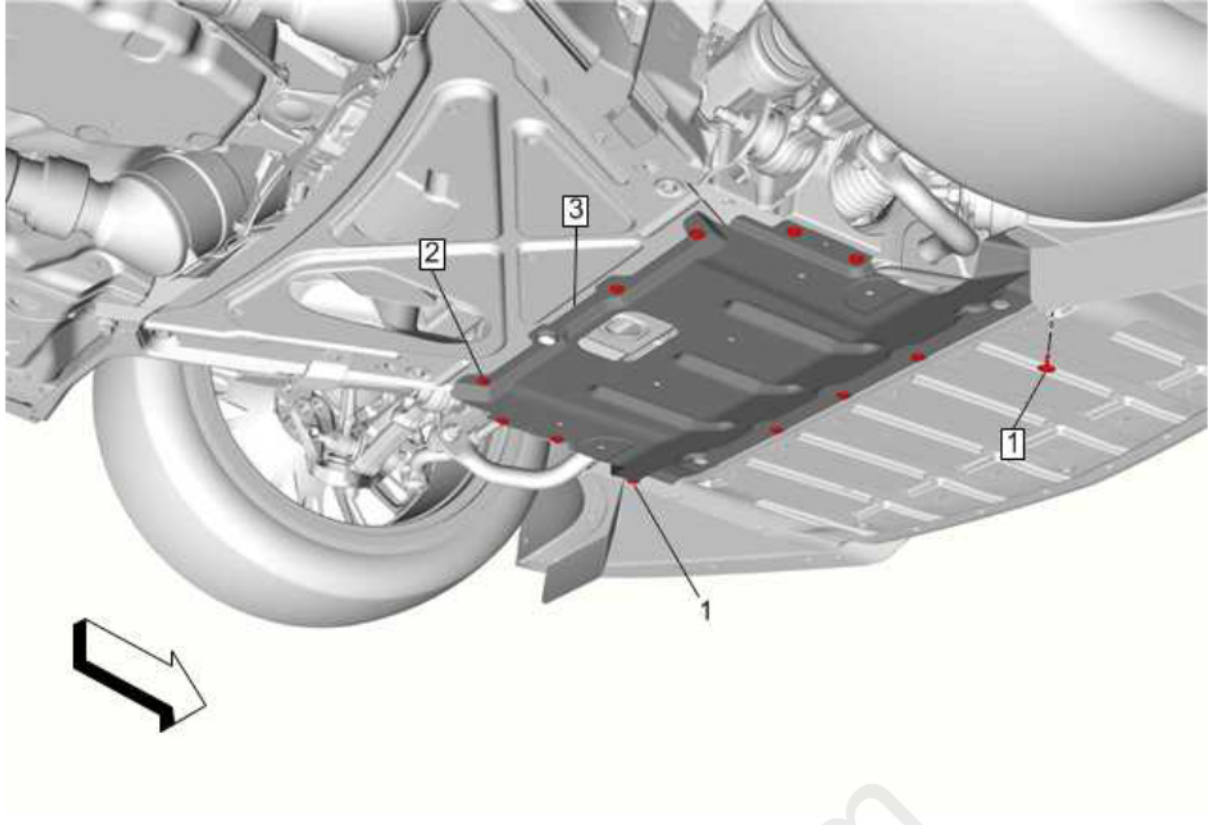


Fig. 48: Underbody Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

23. Front Tire Front Air Deflector (2)» Install - [Front Tire Front Air Deflector Replacement](#)

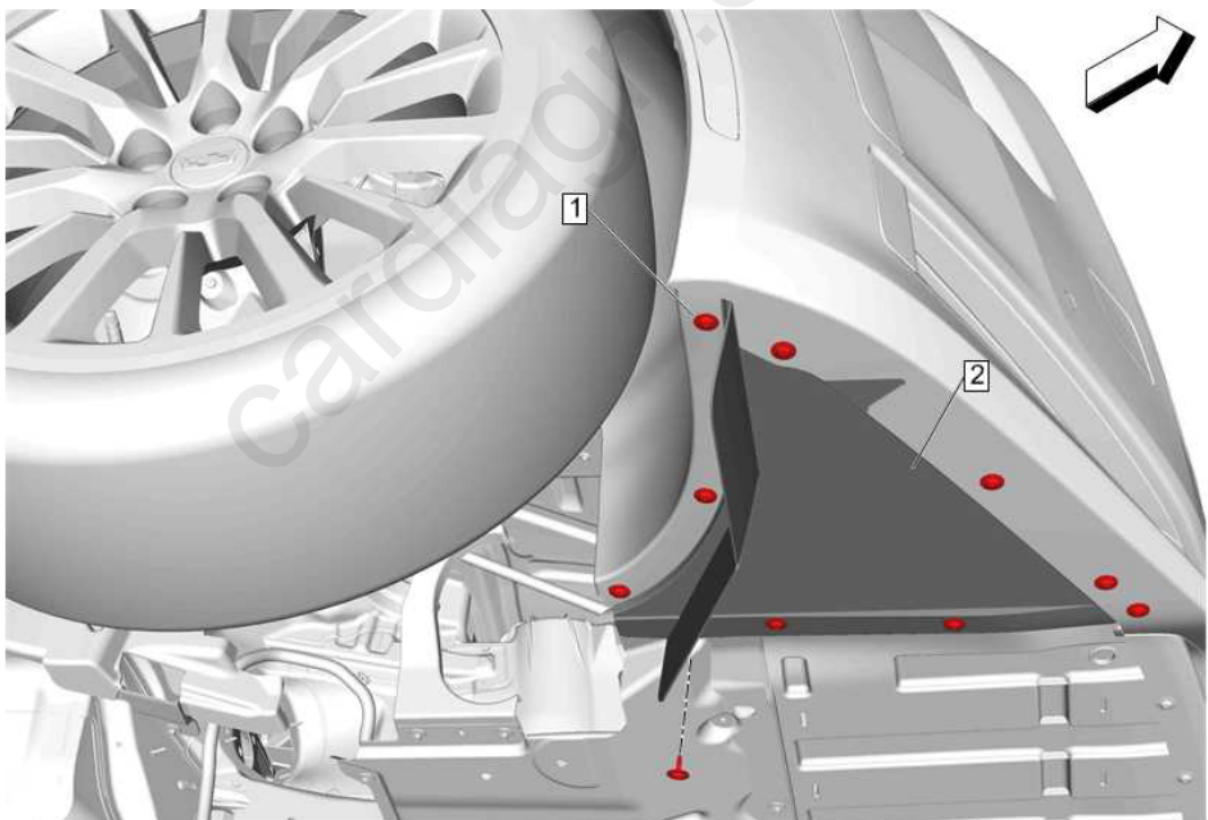


Fig. 49: Front Tire Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

24. Front Wheelhouse Liner (2)» Install - [Front Wheelhouse Liner Replacement](#)

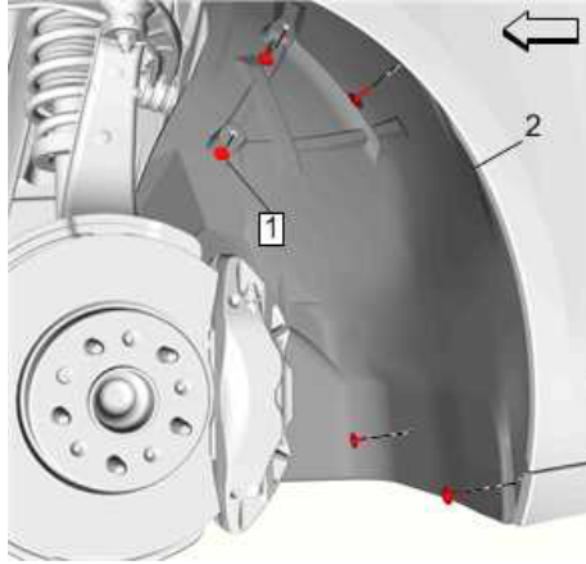


Fig. 50: Front Wheelhouse Liner

Courtesy of GENERAL MOTORS COMPANY

25. Lower the vehicle.
26. Remove the engine support fixture.
27. Align the vehicle only if replacing the drivetrain and front suspension frame. Refer to **Wheel Alignment Measurement**

DRIVETRAIN AND FRONT SUSPENSION CRADLE REMOVAL AND INSTALLATION

Special Tools

EN-39580 Support Stand

Equivalent regional tools: **Special Tools**.

Removal Procedure

- NOTE:** Suspension components attached to the frame use Torque-to-Yield fasteners and must be DISCARDED and replaced with NEW Torque Angle Yield (TAY) fasteners.
- NOTE:** Vehicle alignment is not required if the cradle is being lowered or dropped to perform another procedure. This vehicle is equipped with a cradle to body aligning feature: cradle to body through holes or self-aligning pins that are part of the cradle or body. Only align if replacing the cradle with a NEW part and transferring components.

1. Support the radiator.
2. Install the engine support fixture. Refer to **Engine Support Fixture (LGW)** , **Engine Support Fixture (LGX)** , 3.0L or **Engine Support Fixture** 2.0L
3. Front Wheelhouse Liner (2)» Remove - **Front Wheelhouse Liner Replacement**

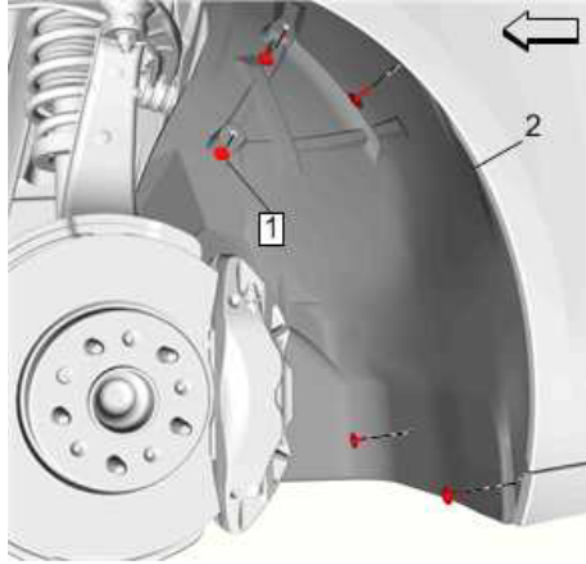


Fig. 51: Front Wheelhouse Liner

Courtesy of GENERAL MOTORS COMPANY

4. Front Tire Front Air Deflector (2) » Remove - [**Front Tire Front Air Deflector Replacement**](#)

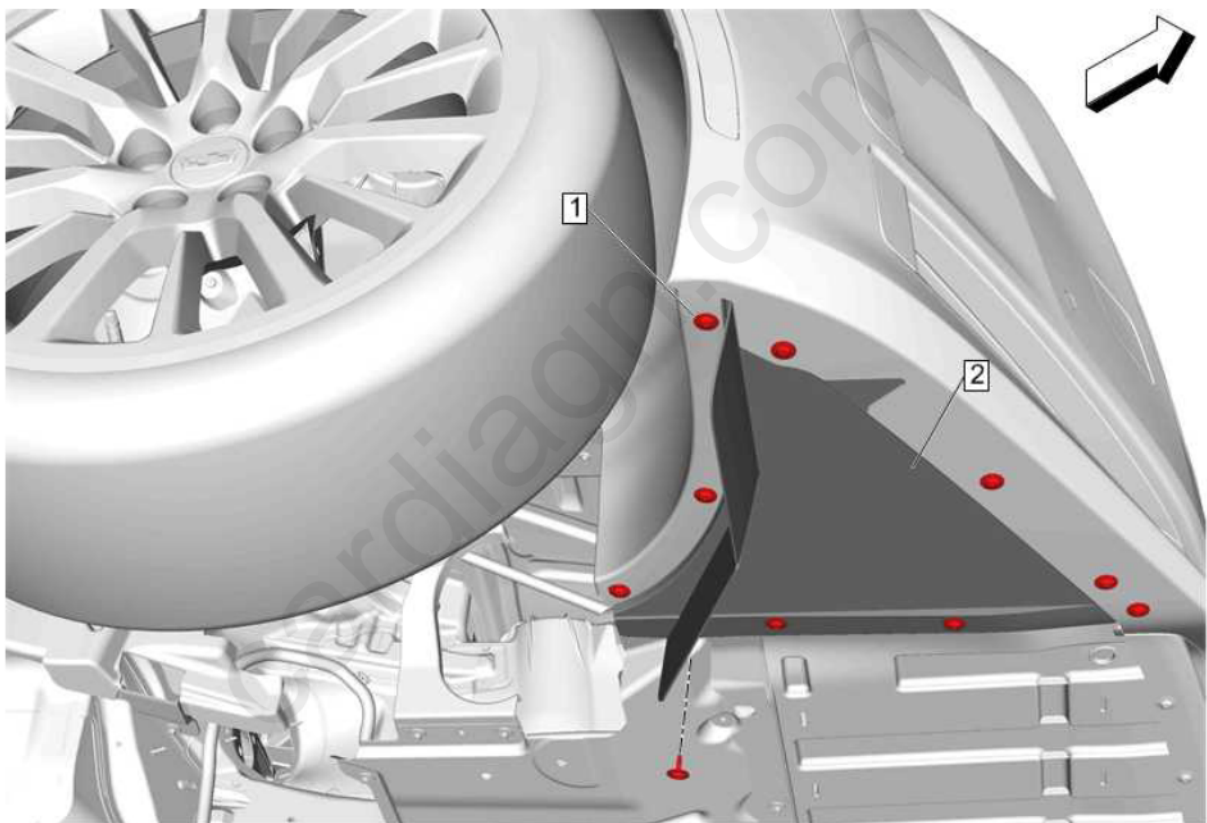


Fig. 52: Front Tire Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

5. Underbody Front Air Deflector (3) » Remove - [**Underbody Front Air Deflector Replacement**](#)

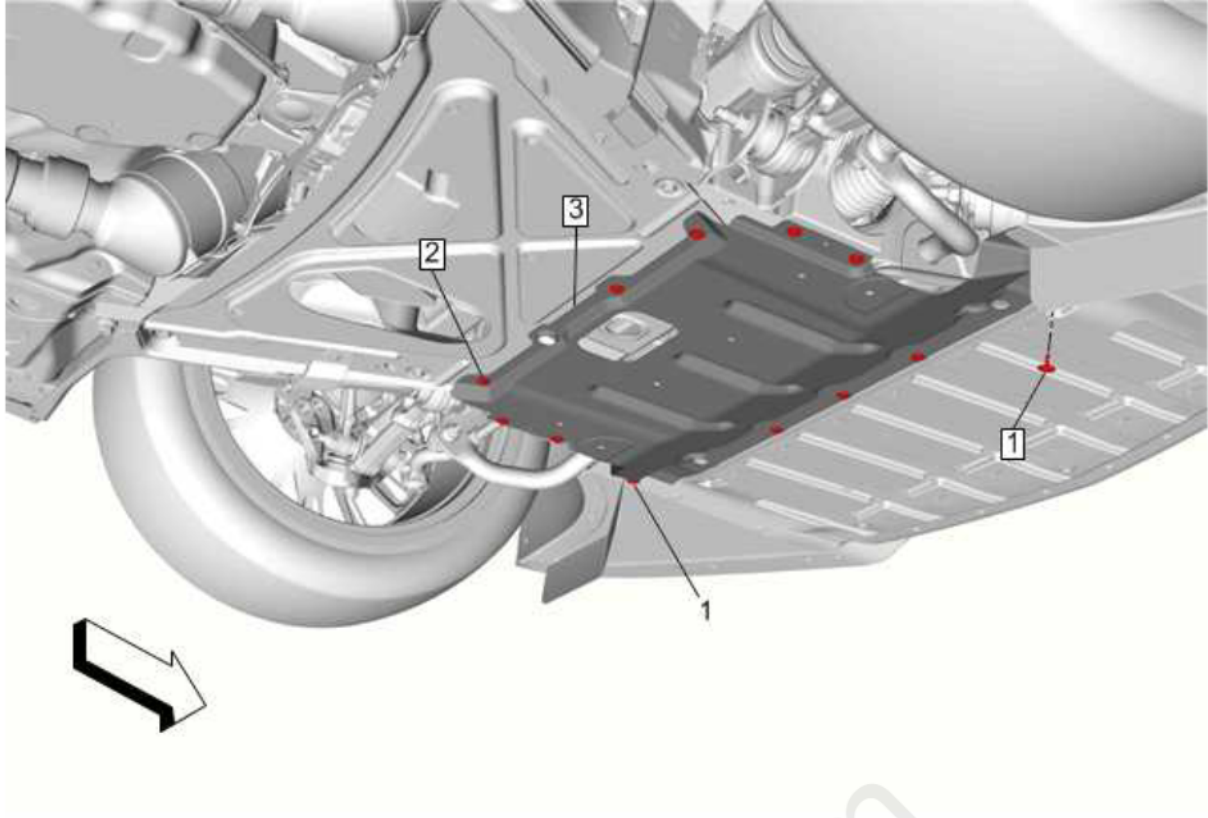


Fig. 53: Underbody Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

6. Front Bumper Fascia Lower Stiffener (1)» Remove - **Front Bumper Fascia Lower Stiffener Replacement**

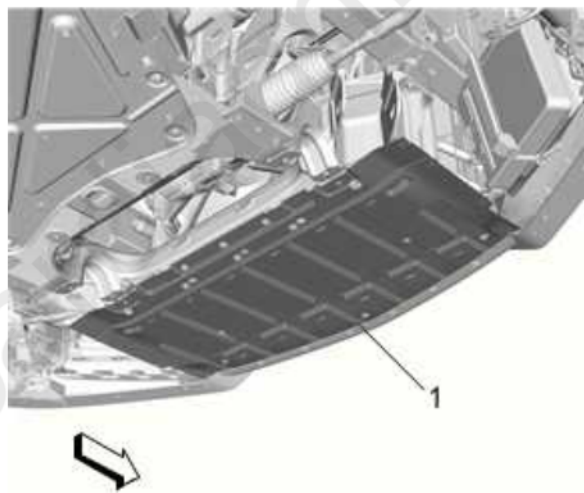


Fig. 54: Front Bumper Fascia Lower Stiffener

Courtesy of GENERAL MOTORS COMPANY

7. Drivetrain and Front Suspension Cradle Plate (3)» Remove - **Drivetrain and Front Suspension Cradle Plate Replacement**

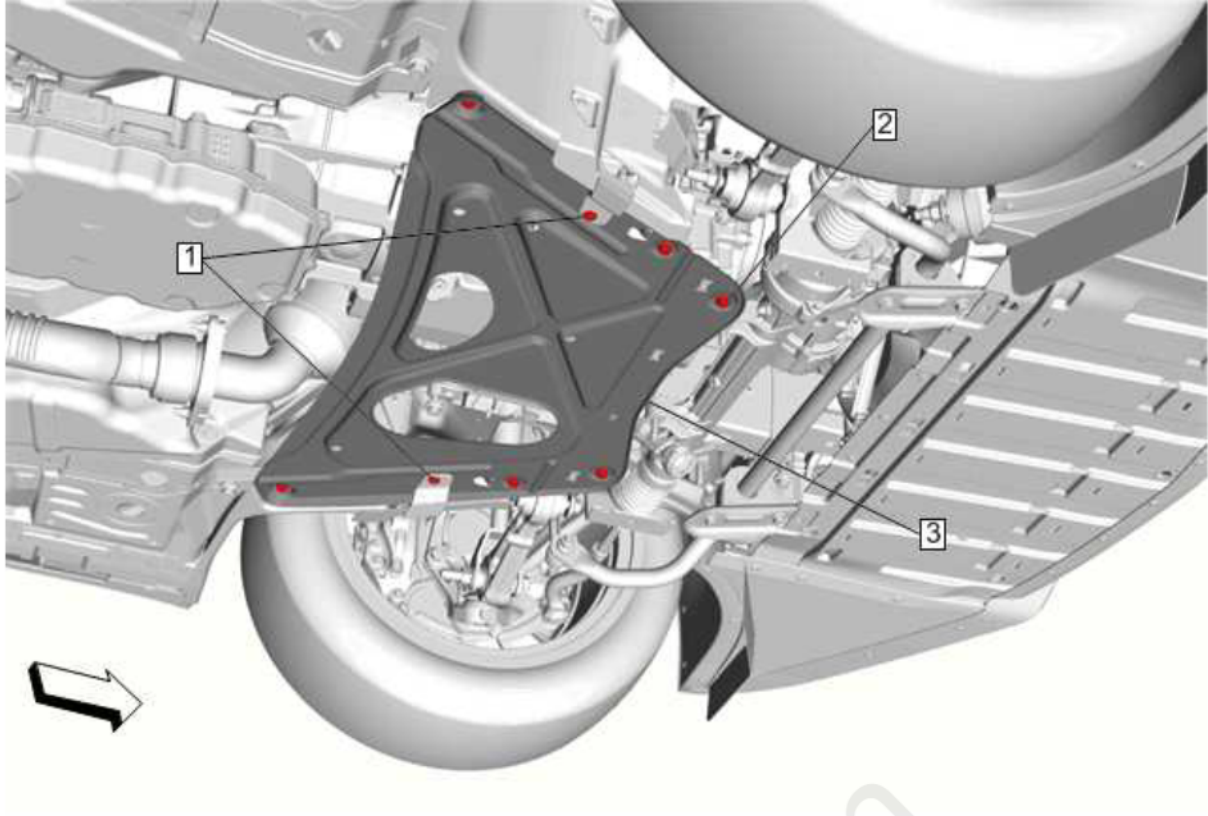


Fig. 55: Drivetrain and Front Suspension Cradle Plate
 Courtesy of GENERAL MOTORS COMPANY

8. {If equipped} Electrical Connector (1) » Disconnect

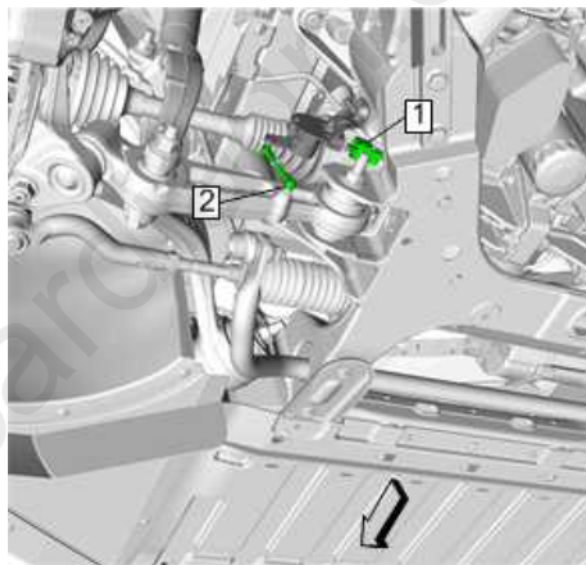


Fig. 56: Electrical Connector
 Courtesy of GENERAL MOTORS COMPANY

9. {If equipped} Electronic Suspension Front Position Sensor (2) » Disconnect
10. Steering Linkage Outer Tie Rod (3) @ Steering Knuckle » Remove - **Steering Linkage Outer Tie Rod Replacement**

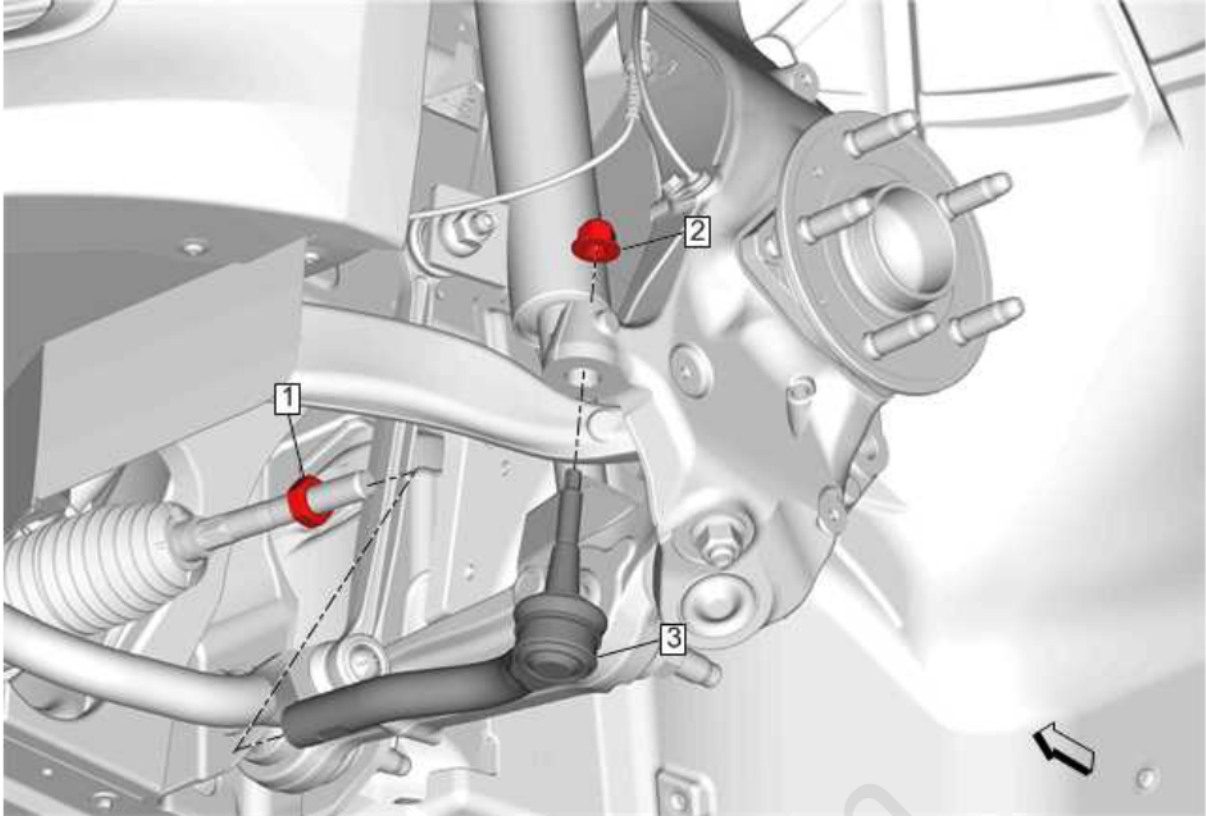


Fig. 57: Steering Linkage Outer Tie Rod

Courtesy of GENERAL MOTORS COMPANY

11. Stabilizer Shaft Link (2) @ Stabilizer Shaft» Remove - [Stabilizer Shaft Link Replacement \(RWD\)](#) and/or [Stabilizer Shaft Link Replacement \(AWD\)](#)

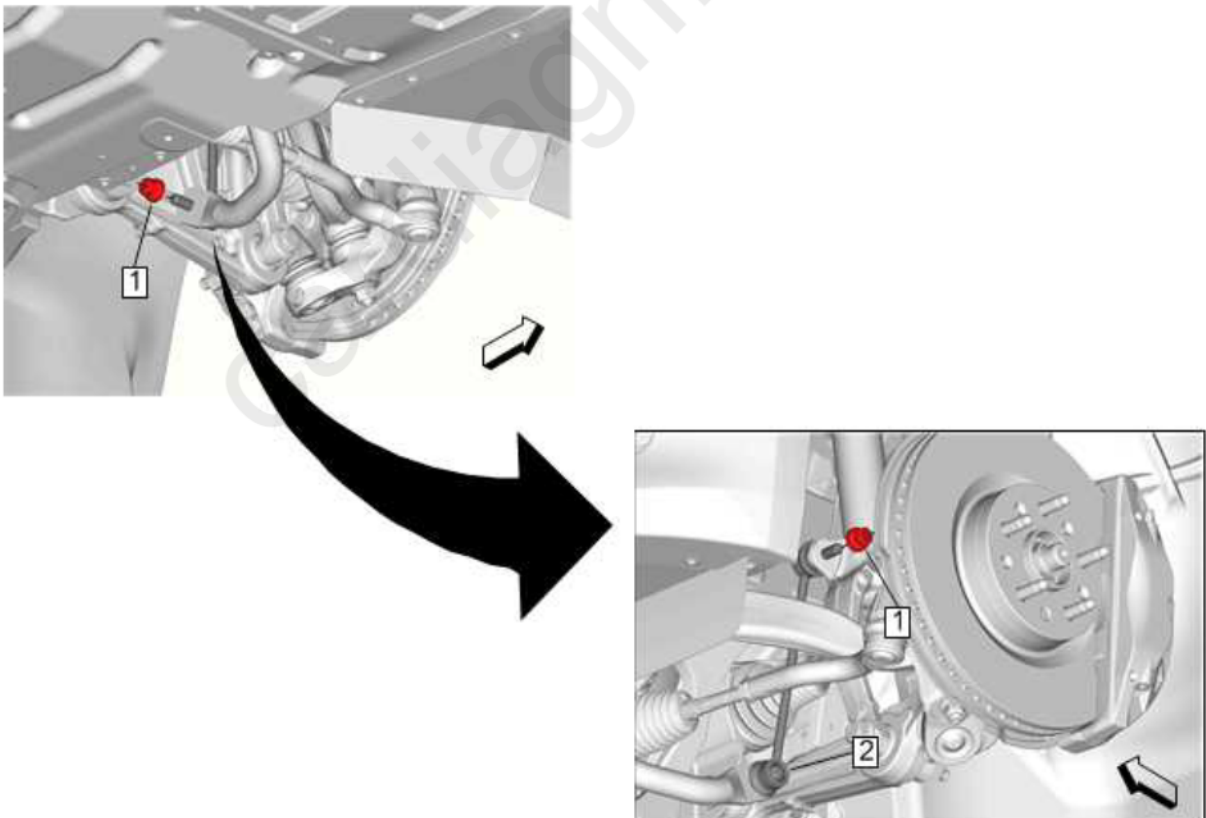


Fig. 58: Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

12. Shock Absorber and Spring (1) @ Front Lower Control Rear Link» Remove - [Shock Absorber and Spring Removal and Installation \(RWD Without F55\)](#) , [Shock Absorber and Spring Removal and Installation \(AWD Without F55\)](#) , [Shock Absorber and Spring Removal and Installation \(RWD With F55\)](#) and/or [Shock Absorber and Spring Removal and Installation \(AWD With F55\)](#)

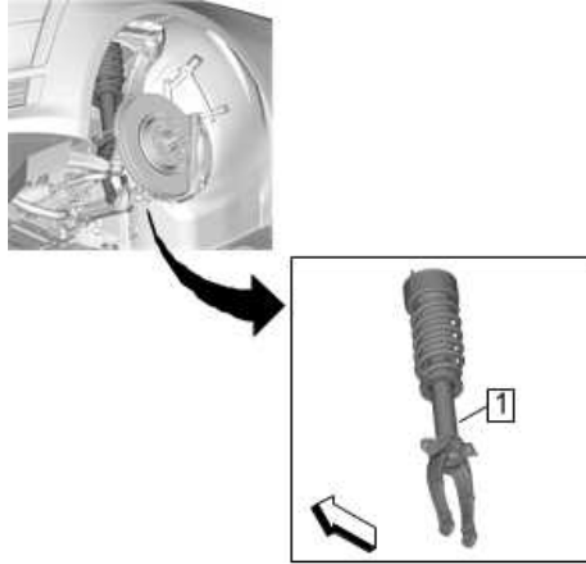


Fig. 59: Shock Absorber and Spring

Courtesy of GENERAL MOTORS COMPANY

13. Front Lower Control Front Link (1) @ Steering Knuckle» Remove - **Front Lower Control Front Link Replacement (RWD)** and/or **Front Lower Control Front Link Replacement (AWD)**

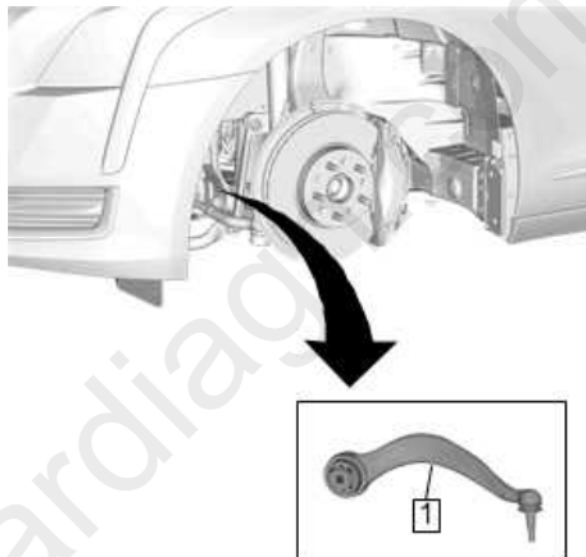


Fig. 60: Front Lower Control Front Link

Courtesy of GENERAL MOTORS COMPANY

14. Front Lower Control Rear Link (1) @ Frame» Remove - **Front Lower Control Rear Link Replacement (RWD)** and/or **Front Lower Control Rear Link Replacement (AWD)**

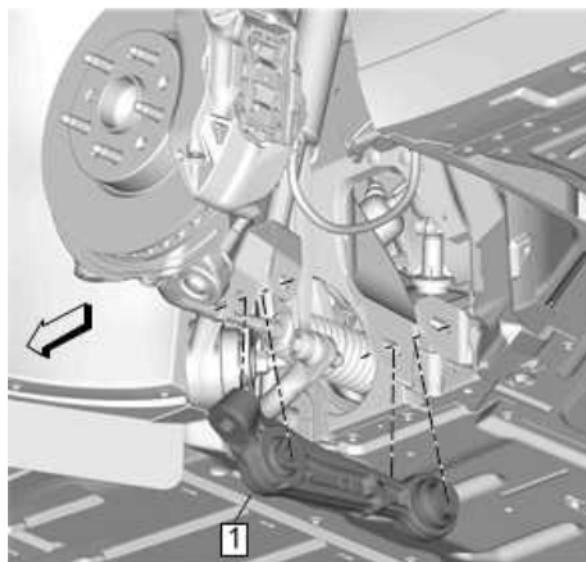


Fig. 61: Front Lower Control Rear Link
Courtesy of GENERAL MOTORS COMPANY

15. Intermediate Steering Shaft (1) @ Steering Gear» Remove - **Intermediate Steering Shaft Replacement (RWD)** and/or **Intermediate Steering Shaft Replacement (AWD)**

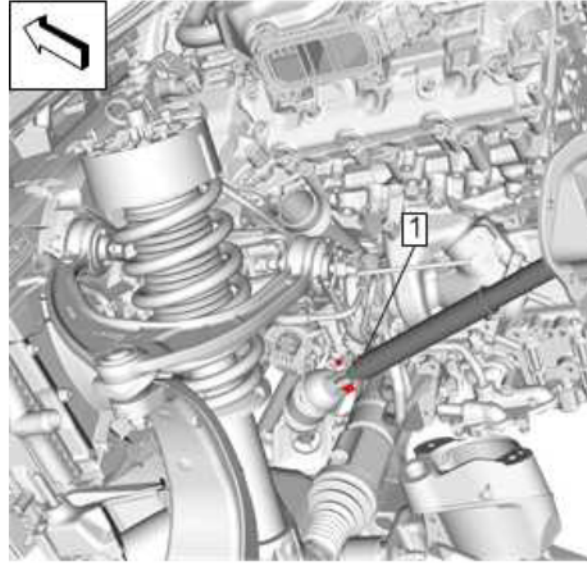


Fig. 62: Intermediate Steering Shaft
Courtesy of GENERAL MOTORS COMPANY

16. Disconnect the steering gear electrical connectors. (1)

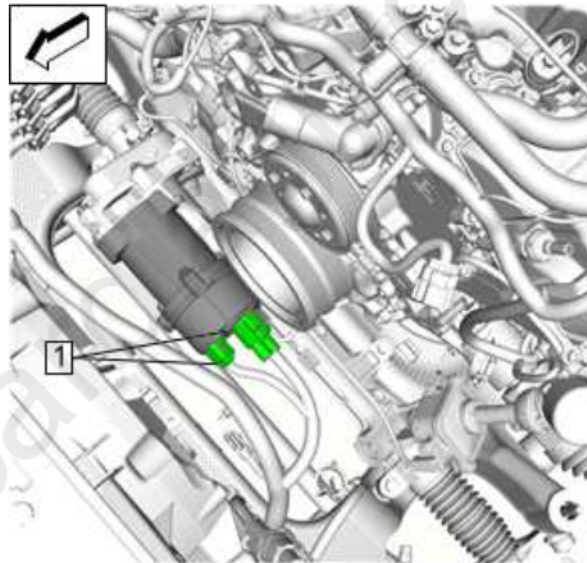


Fig. 63: Steering Gear Electrical Connectors
Courtesy of GENERAL MOTORS COMPANY

17. {If equipped} Accessory DC Power Control Module Bracket Nut (1) @ Accessory DC Power Control Module Bracket (2)» Remove [2x]

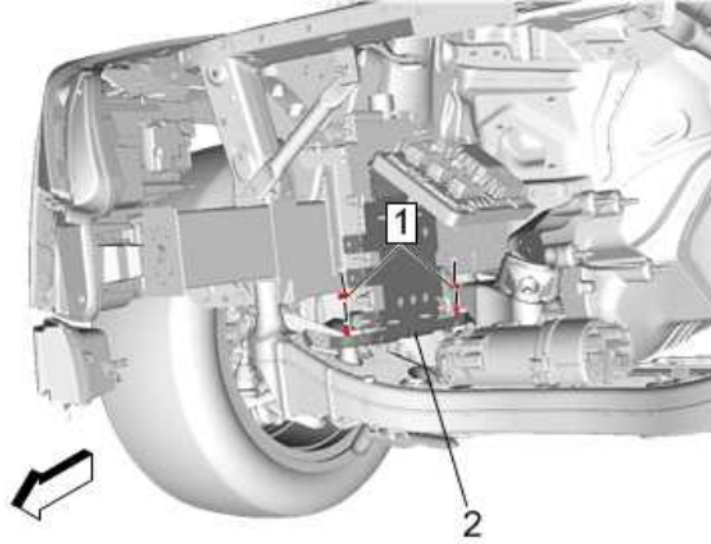


Fig. 64: Accessory DC Power Control Module Bracket Nut
Courtesy of GENERAL MOTORS COMPANY

18. Wiring Harness Retainer (1) » Disengage [6x]

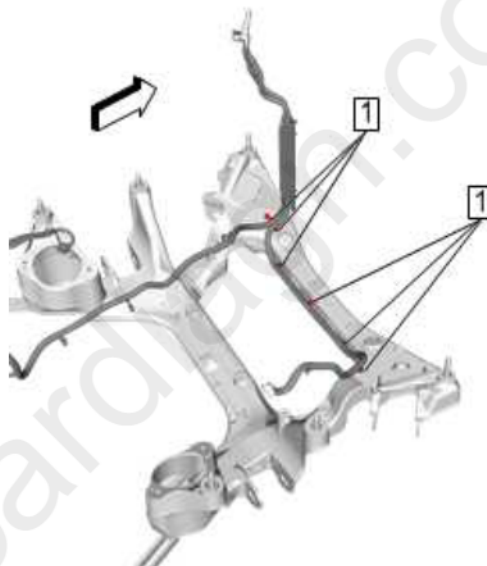


Fig. 65: Wiring Harness Retainers And Frame
Courtesy of GENERAL MOTORS COMPANY

19. Engine Mount Nut - Left Side (1) » Remove

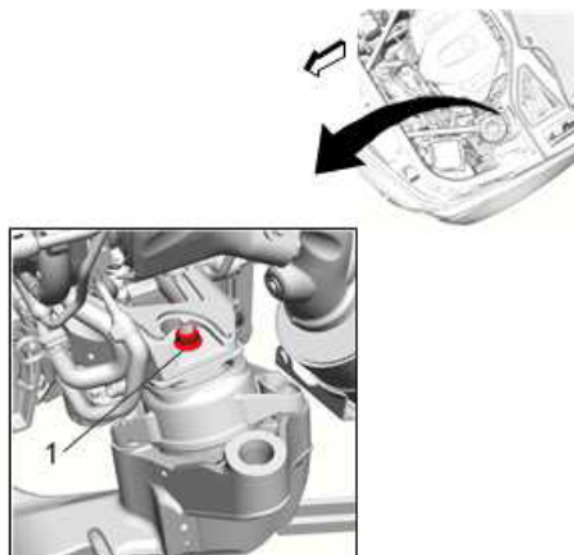


Fig. 66: Engine Mount Nut
Courtesy of GENERAL MOTORS COMPANY

20. Engine Mount Nut - Right Side (1)» Remove

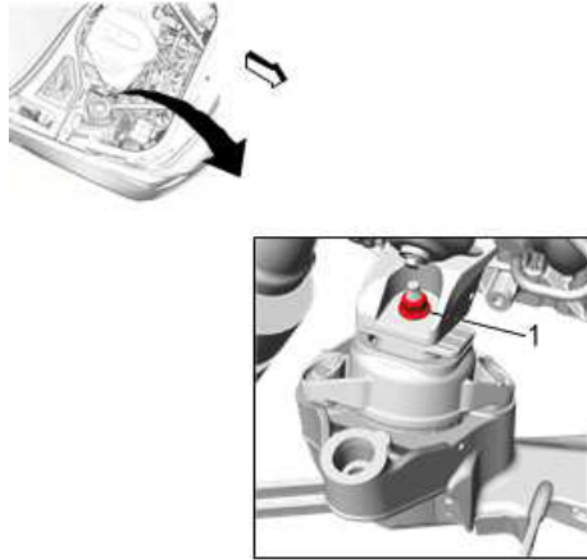


Fig. 67: Engine Mount Nut
Courtesy of GENERAL MOTORS COMPANY

21. Install EN-39580 engine support stand under the drivetrain and front suspension cradle.

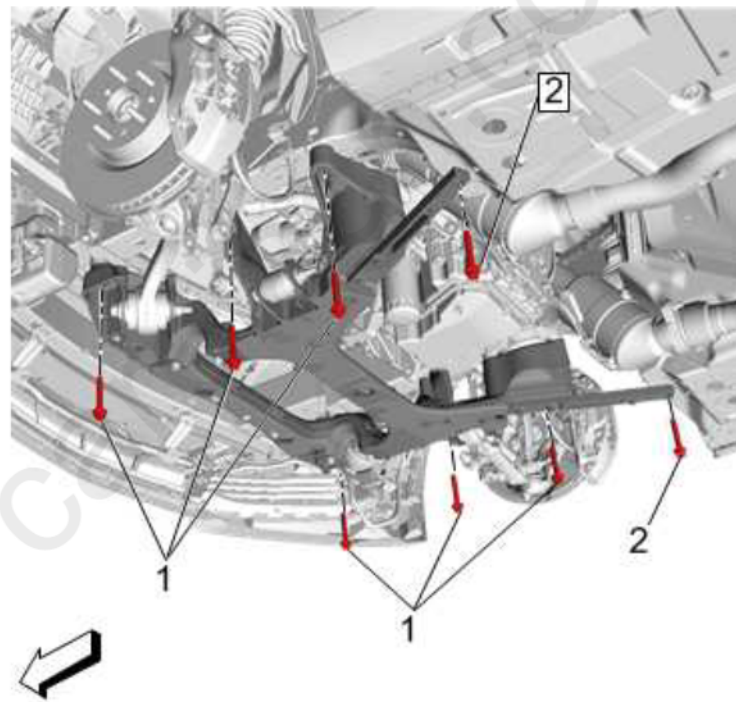


Fig. 68: Drivetrain and Front Suspension Cradle Mounting Bolts
Courtesy of GENERAL MOTORS COMPANY

22. Lower the vehicle until the drivetrain and front suspension frame is resting lightly on the jackstands.
23. Drivetrain and Front Suspension Cradle Mounting Bolts (1)» Remove and DISCARD the bolts. [6x]
24. Drivetrain and Front Suspension Cradle Mounting Bolts (2)» Remove and DISCARD the bolts. [2x]
25. With the aid of an assistant, carefully raise the body from the frame.
26. Ensure when raising the body the following items are clear from the frame:
 - Vacuum lines
 - Steering knuckles
 - Electrical wiring harnesses

- Oil coolers lines

27. Drivetrain and Front Suspension Cradle (1)» Remove

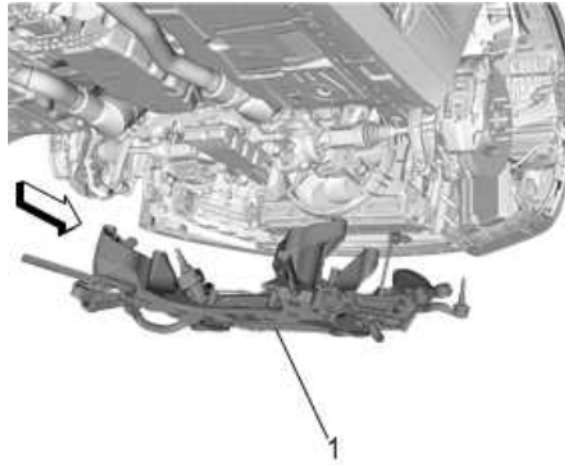


Fig. 69: Lowering Body To Frame

Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Inspect the engine mount to ensure the phenolic spacer (1) is in place and not damaged.

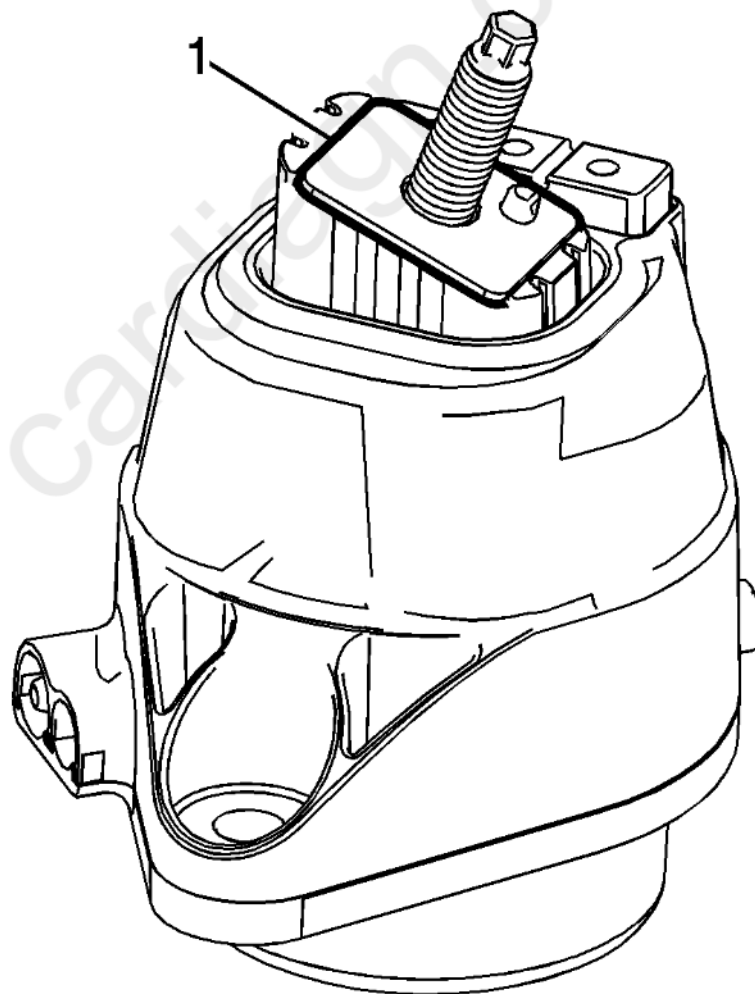


Fig. 70: Phenolic Spacer

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Phenolic spacer must be present to prevent galvanic/corrosive reaction and/or excessive temperature conduction between engine

mount bracket and engine mount. Replace mount if phenolic spacer is missing or damaged. Failure to ensure phenolic spacer is intact and not damaged can lead to premature failure of engine mount and/or engine mount bracket.

2. With the aid of an assistant, carefully lower the body to the frame. (1)

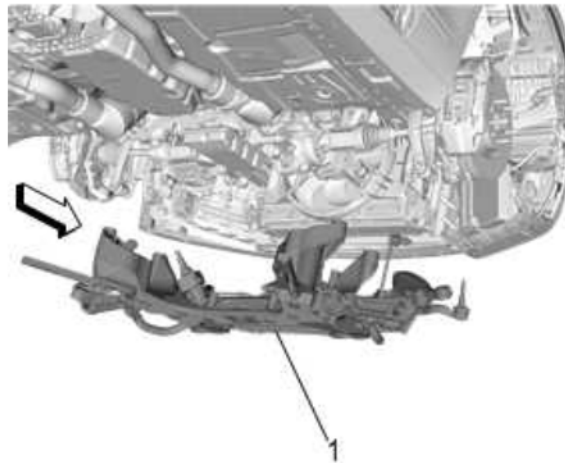


Fig. 71: Lowering Body To Frame

Courtesy of GENERAL MOTORS COMPANY

3. Ensure the following components are clear from the frame:
 - Vacuum lines
 - Steering knuckles
 - Electrical wiring harnesses
 - Oil cooler lines
4. Drivetrain and Front Suspension Cradle Bolts (1) and Front Cradle Mount Bolt Bracket Bolt (2)» Install and hand tighten the NEW Bolts [8X]

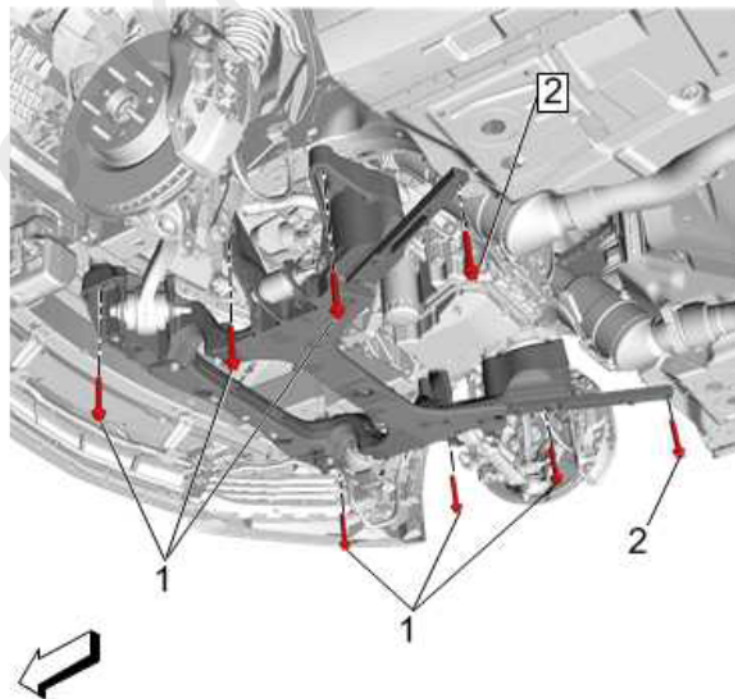


Fig. 72: Drivetrain and Front Suspension Cradle Mounting Bolts

Courtesy of GENERAL MOTORS COMPANY

5. Drivetrain and Front Suspension Cradle Bolt» Install and tighten the NEW bolt. (1) 100 N.m (74 lb ft) plus 30 to 45 degrees (6x)

CAUTION: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

6. Front Cradle Mount Bolt Bracket Bolt» Install and tighten the NEW bolt. (2) 100 N.m (74 lb ft) (2x)
7. Remove the EN-39580 engine support stand from under the vehicle.
8. Engine Mount Nut-Left Side (1)» Install and tighten 70 N.m (52 lb ft)

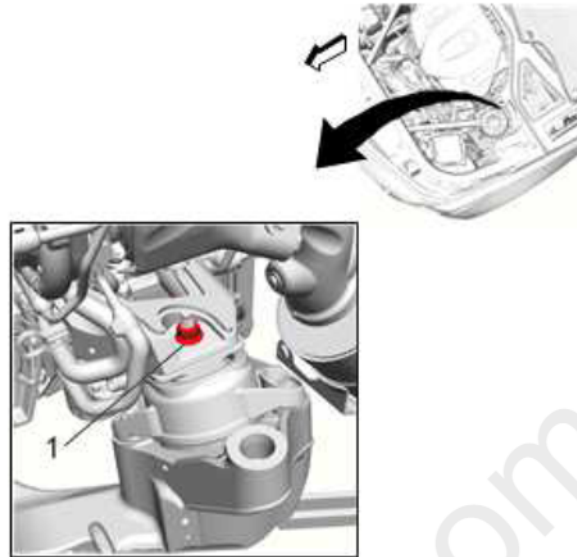


Fig. 73: Engine Mount Nut

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution**

9. Engine Mount Nut-Right Side (1)» Install and tighten 70 N.m (52 lb ft)

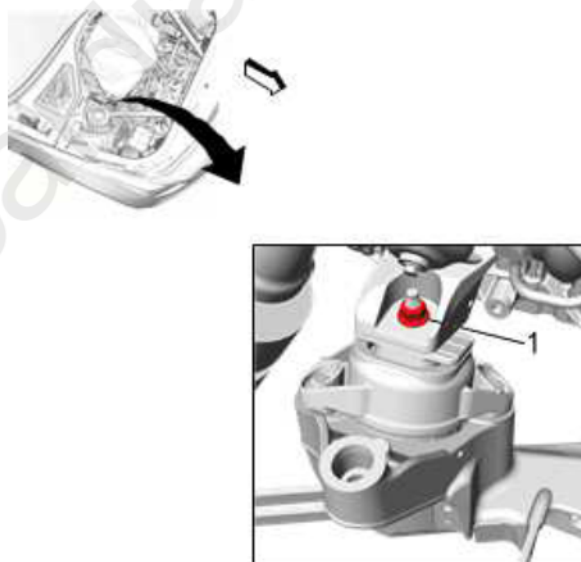


Fig. 74: Engine Mount Nut

Courtesy of GENERAL MOTORS COMPANY

10. Intermediate Steering Shaft (1) @ Steering Gear» Install - **Intermediate Steering Shaft Replacement (RWD)** **Intermediate Steering Shaft Replacement (AWD)**

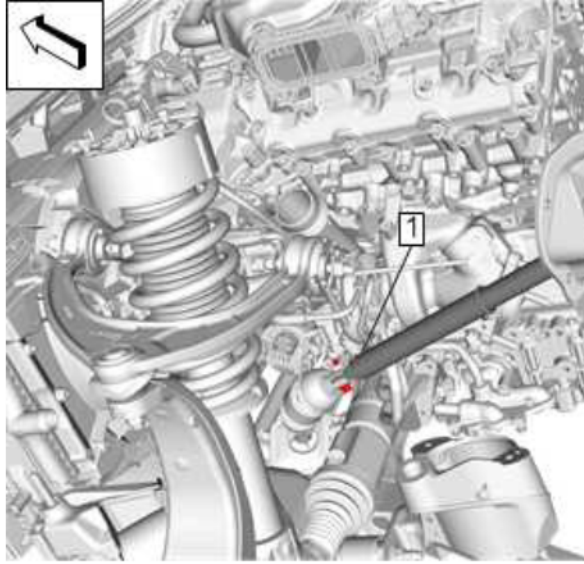


Fig. 75: Intermediate Steering Shaft
 Courtesy of GENERAL MOTORS COMPANY

11. Install the wiring harness retainers to the frame. (1)

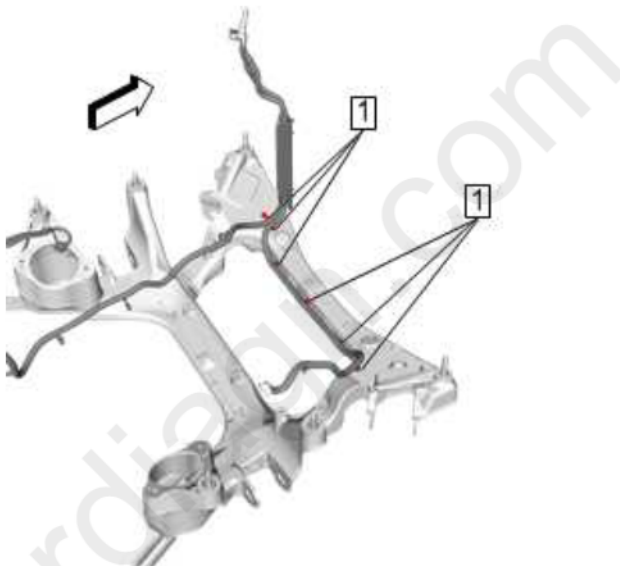


Fig. 76: Wiring Harness Retainers And Frame
 Courtesy of GENERAL MOTORS COMPANY

12. Connect the steering gear electrical connectors. (1)

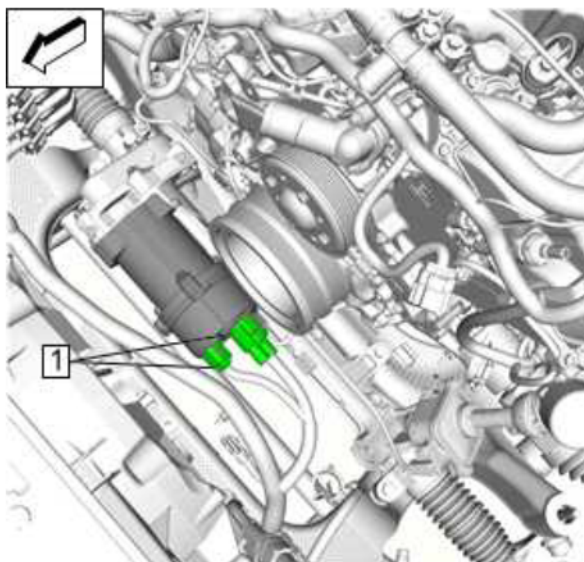


Fig. 77: Steering Gear Electrical Connectors
 Courtesy of GENERAL MOTORS COMPANY

13. {If equipped} Accessory DC Power Control Module Bracket Nut (1) @ Accessory DC Power Control Module Bracket (2)» Install and tighten [2x] 22 N.m (16 lb ft)

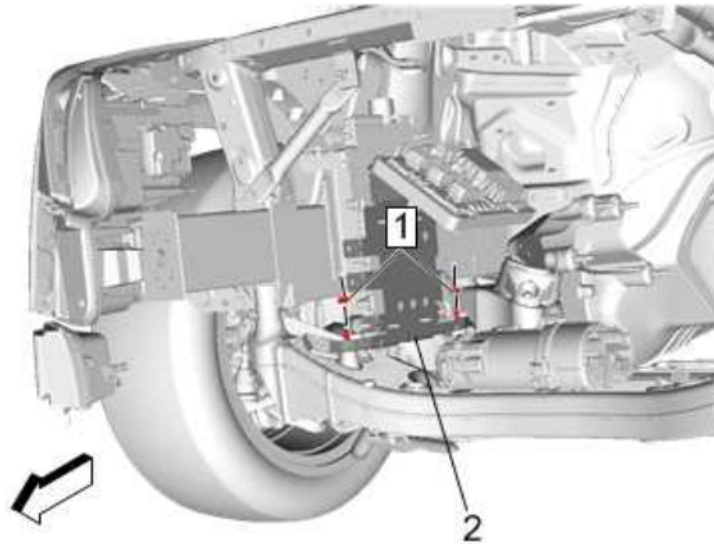


Fig. 78: Accessory DC Power Control Module Bracket Nut
Courtesy of GENERAL MOTORS COMPANY

14. Front Lower Control Rear Link (1) @ Frame» Install - **Front Lower Control Rear Link Replacement (RWD)** and/or **Front Lower Control Rear Link Replacement (AWD)**

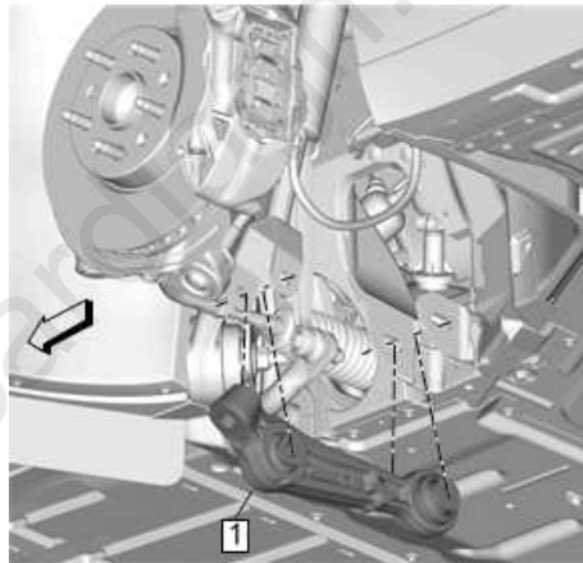


Fig. 79: Front Lower Control Rear Link
Courtesy of GENERAL MOTORS COMPANY

15. Front Lower Control Front Link (1) @ Steering Knuckle» Install - **Front Lower Control Front Link Replacement (RWD)** and/or **Front Lower Control Front Link Replacement (AWD)**

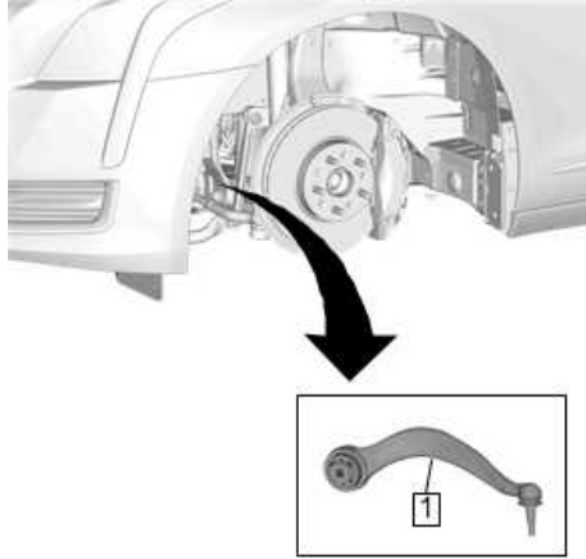


Fig. 80: Front Lower Control Front Link

Courtesy of GENERAL MOTORS COMPANY

16. Shock Absorber and Spring (1) @ Front Lower Control Rear Link» Install - **Shock Absorber and Spring Removal and Installation (RWD Without F55)** , **Shock Absorber and Spring Removal and Installation (AWD Without F55)** , **Shock Absorber and Spring Removal and Installation (RWD With F55)** and/or **Shock Absorber and Spring Removal and Installation (AWD With F55)**



Fig. 81: Shock Absorber and Spring

Courtesy of GENERAL MOTORS COMPANY

17. Stabilizer Shaft Link (2) @ Stabilizer Shaft» Install - **Stabilizer Shaft Link Replacement (RWD)** and/or **Stabilizer Shaft Link Replacement (AWD)**

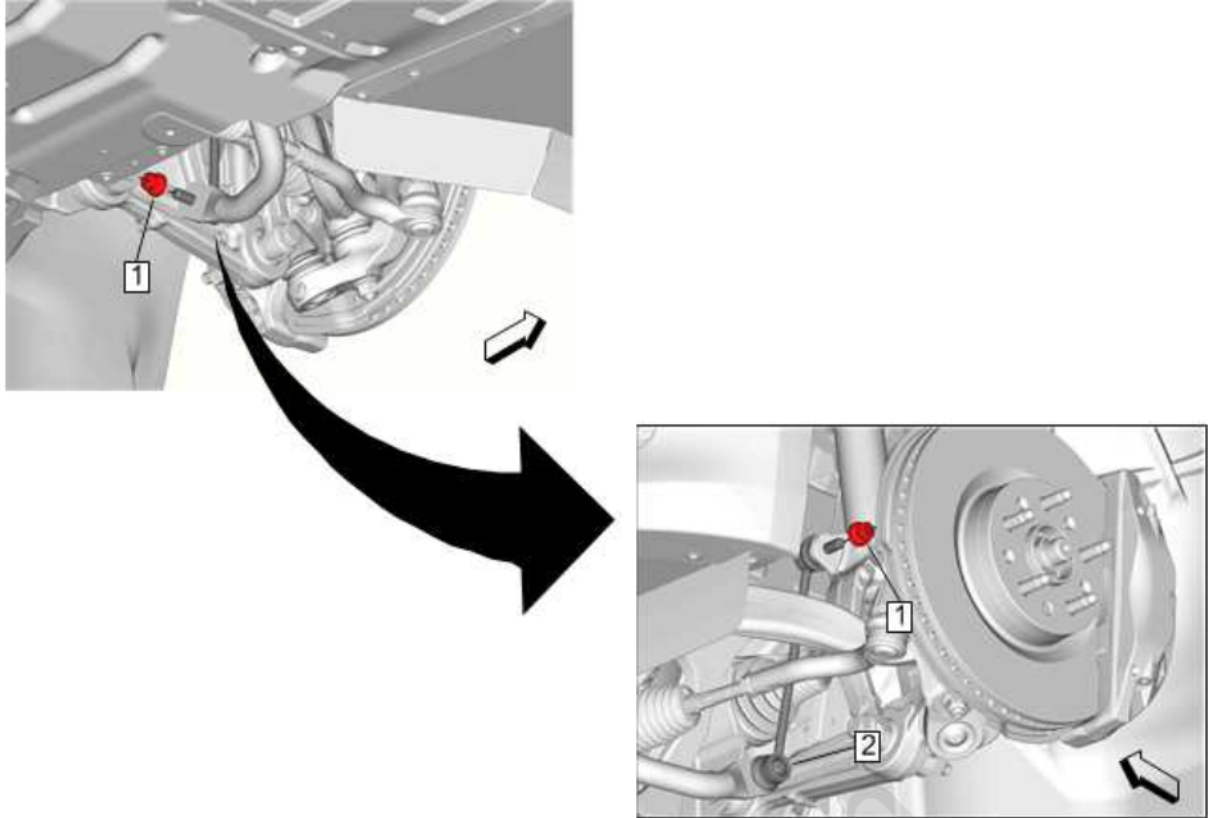


Fig. 82: Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

18. Steering Linkage Outer Tie Rod (3) @ Steering Knuckle» Install - **Steering Linkage Outer Tie Rod Replacement**

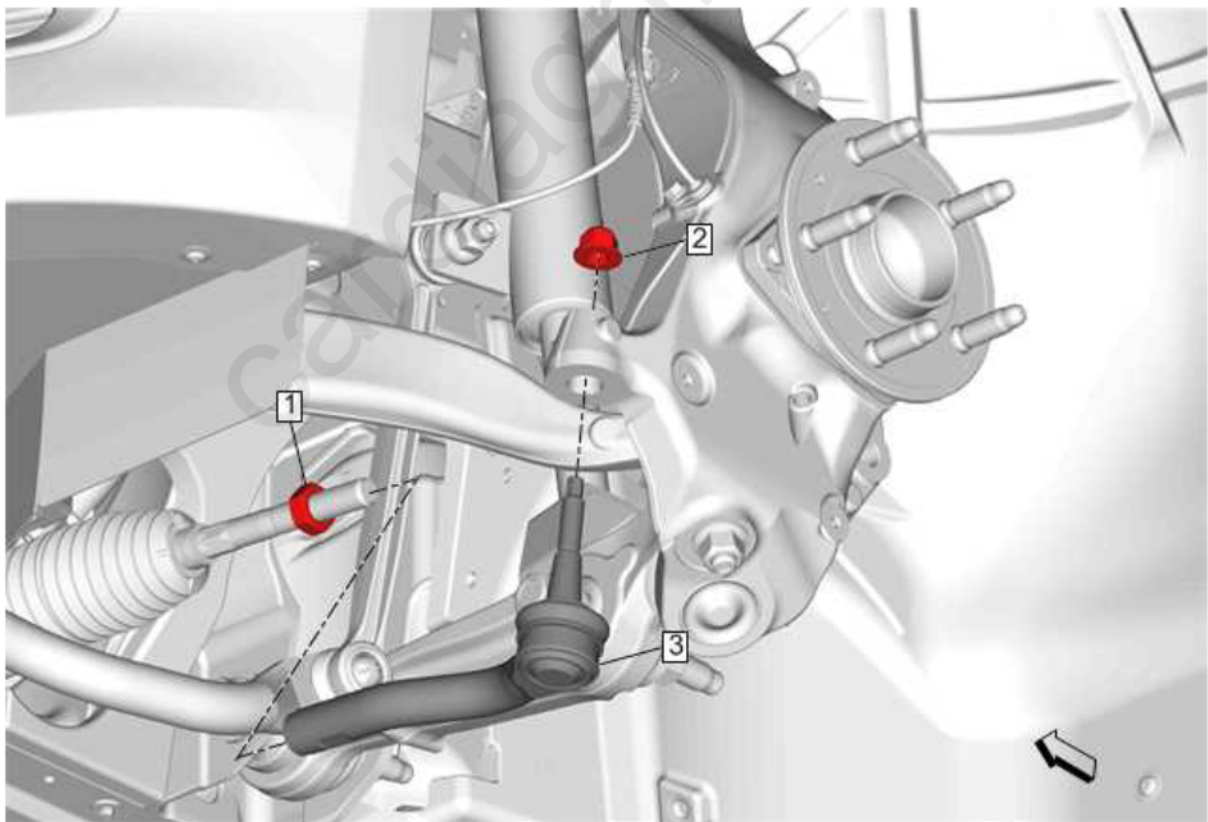


Fig. 83: Steering Linkage Outer Tie Rod

Courtesy of GENERAL MOTORS COMPANY

19. {If equipped} Electrical Connector (1)» Connect

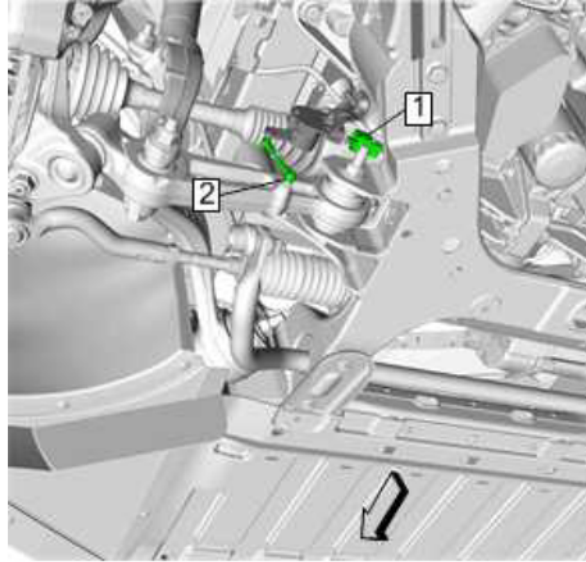


Fig. 84: Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

20. {If equipped} Electronic Suspension Front Position Sensor (2)» Connect
21. Drivetrain and Front Suspension Cradle Plate (3)» Install - **Drivetrain and Front Suspension Cradle Plate Replacement**

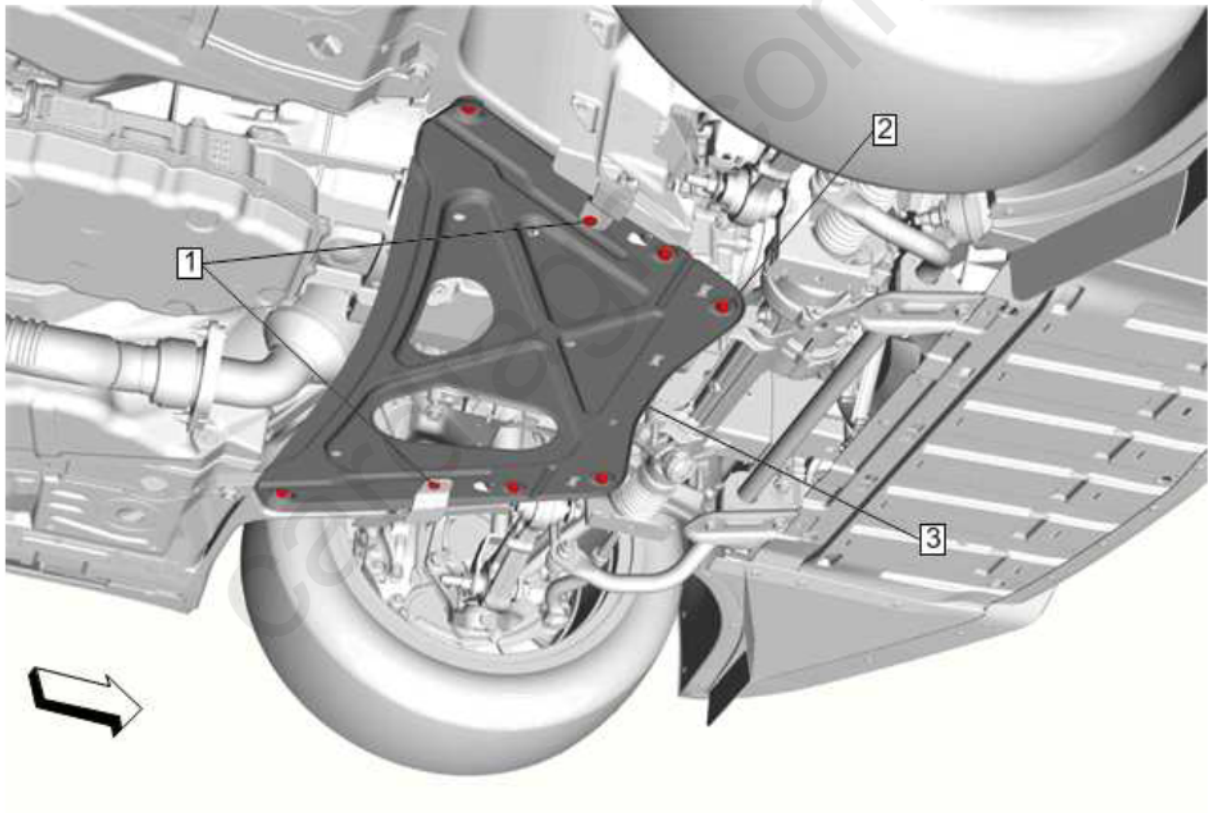


Fig. 85: Drivetrain and Front Suspension Cradle Plate

Courtesy of GENERAL MOTORS COMPANY

22. Front Bumper Fascia Lower Stiffener (1)» Install - **Front Bumper Fascia Lower Stiffener Replacement**

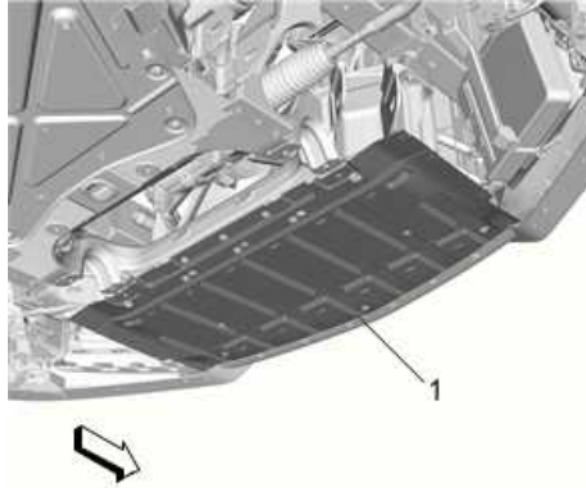


Fig. 86: Front Bumper Fascia Lower Stiffener
 Courtesy of GENERAL MOTORS COMPANY

23. Underbody Front Air Deflector (3)» Install - [**Underbody Front Air Deflector Replacement**](#)

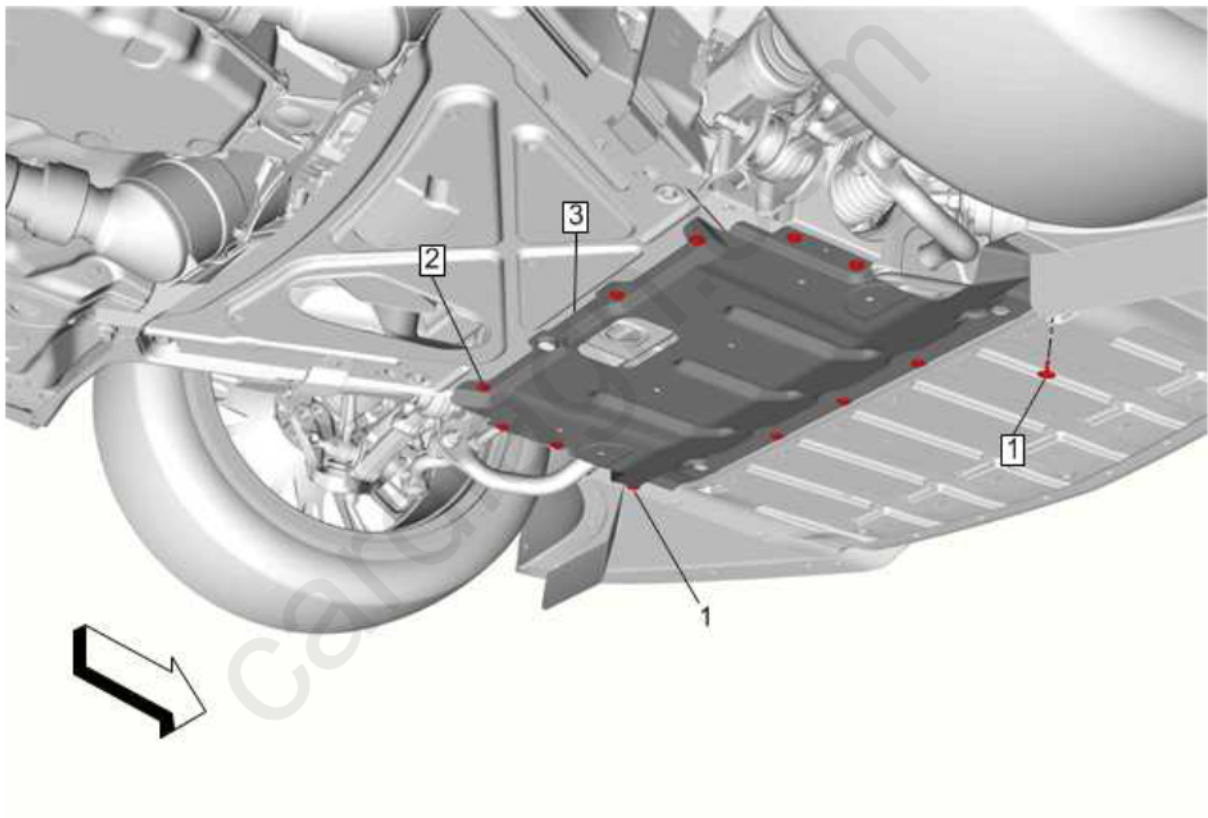


Fig. 87: Underbody Front Air Deflector
 Courtesy of GENERAL MOTORS COMPANY

24. Front Tire Front Air Deflector (2)» Install - [**Front Tire Front Air Deflector Replacement**](#)

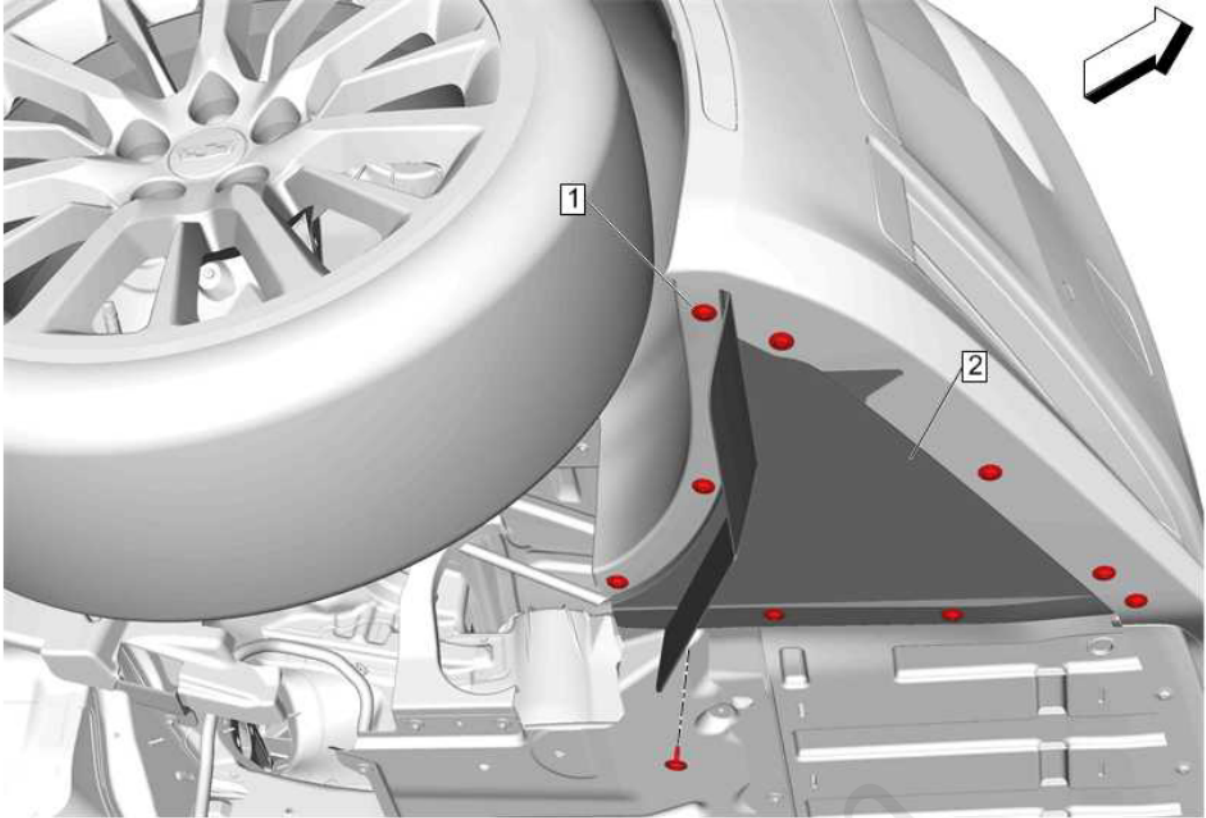


Fig. 88: Front Tire Front Air Deflector

Courtesy of GENERAL MOTORS COMPANY

25. Front Wheelhouse Liner (2)» Install - **Front Wheelhouse Liner Replacement**

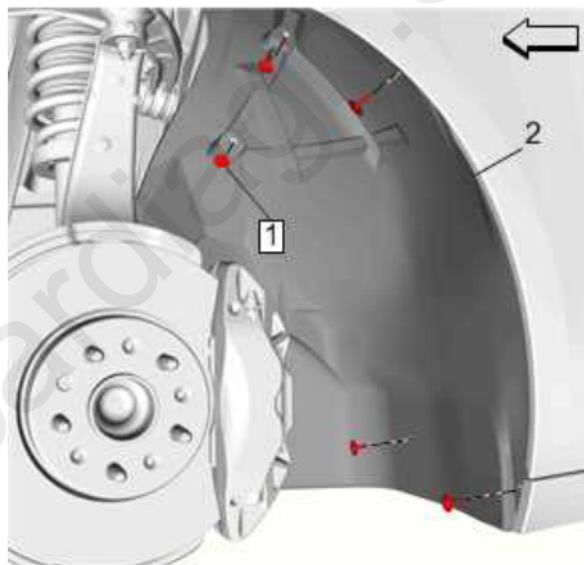


Fig. 89: Front Wheelhouse Liner

Courtesy of GENERAL MOTORS COMPANY

26. Lower the vehicle.
27. Remove the engine support fixture.

TRANSMISSION SUPPORT CROSSMEMBER REPLACEMENT (LTG)

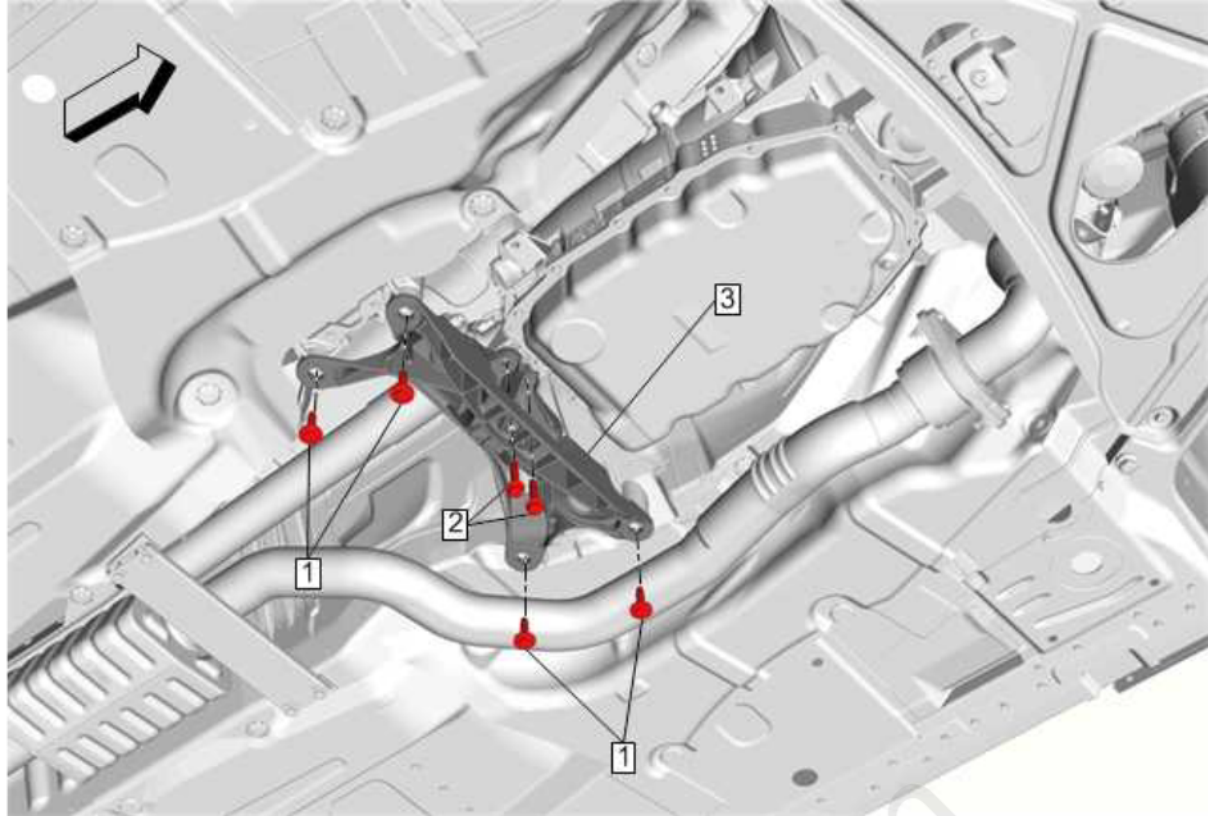


Fig. 90: Transmission Support Crossmember (LTG)

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 suitable jack.	
1	Transmission Support Crossmember Bolt [4x] CAUTION: Refer to Fastener Caution Tighten 58 N.m (43 lb ft)
2	Transmission Support Crossmember Bolt [2x] Tighten 58 N.m (43 lb ft)
3	Transmission Support Crossmember

REAR CRADLE MOUNT BOLT BRACKET REPLACEMENT (BRACKET)

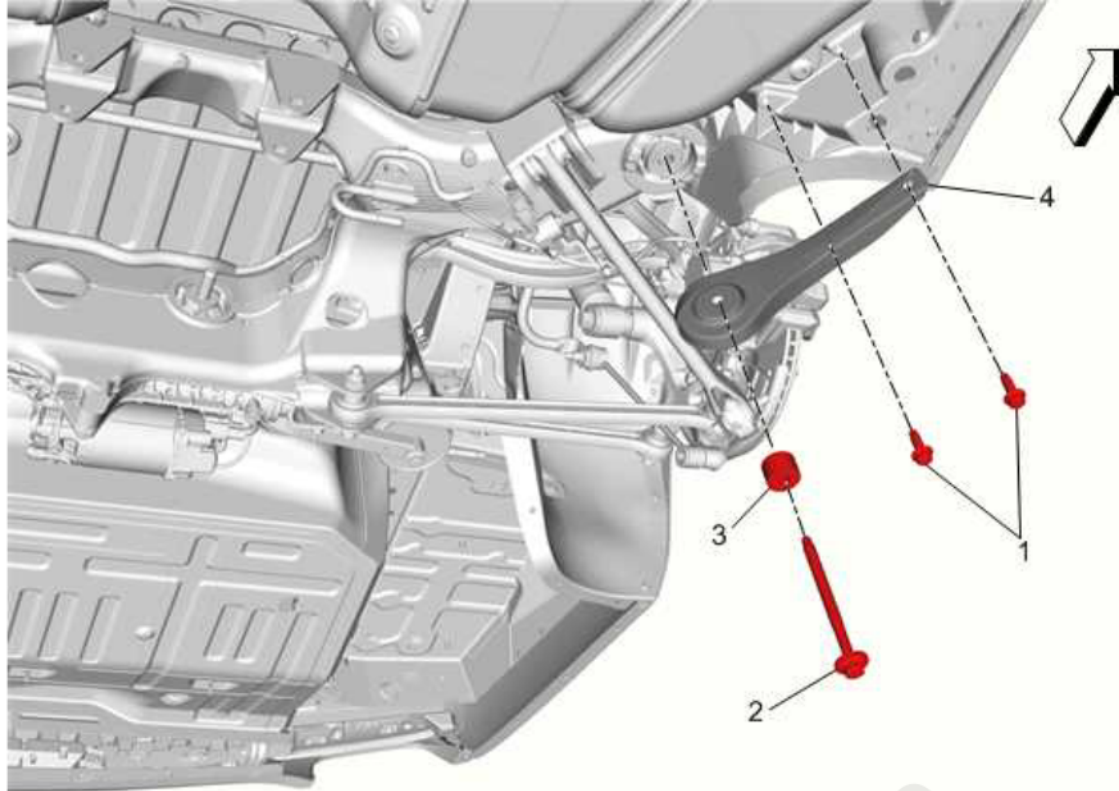


Fig. 91: Rear Cradle Mount Bolt Bracket (Bracket)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Rear Cradle Mount Bolt Bracket Bolt [2x] Tighten 58 N.m (43 lb ft)
2	Rear Suspension Cradle Bolt CAUTION: Refer to Fastener Caution NOTE: Discard and replace with a NEW bolt. Tighten 100 N.m (74 lb ft)
3	Spacer
4	Rear Cradle Mount Bolt Bracket

REAR CRADLE MOUNT BOLT BRACKET REPLACEMENT (BRACE)

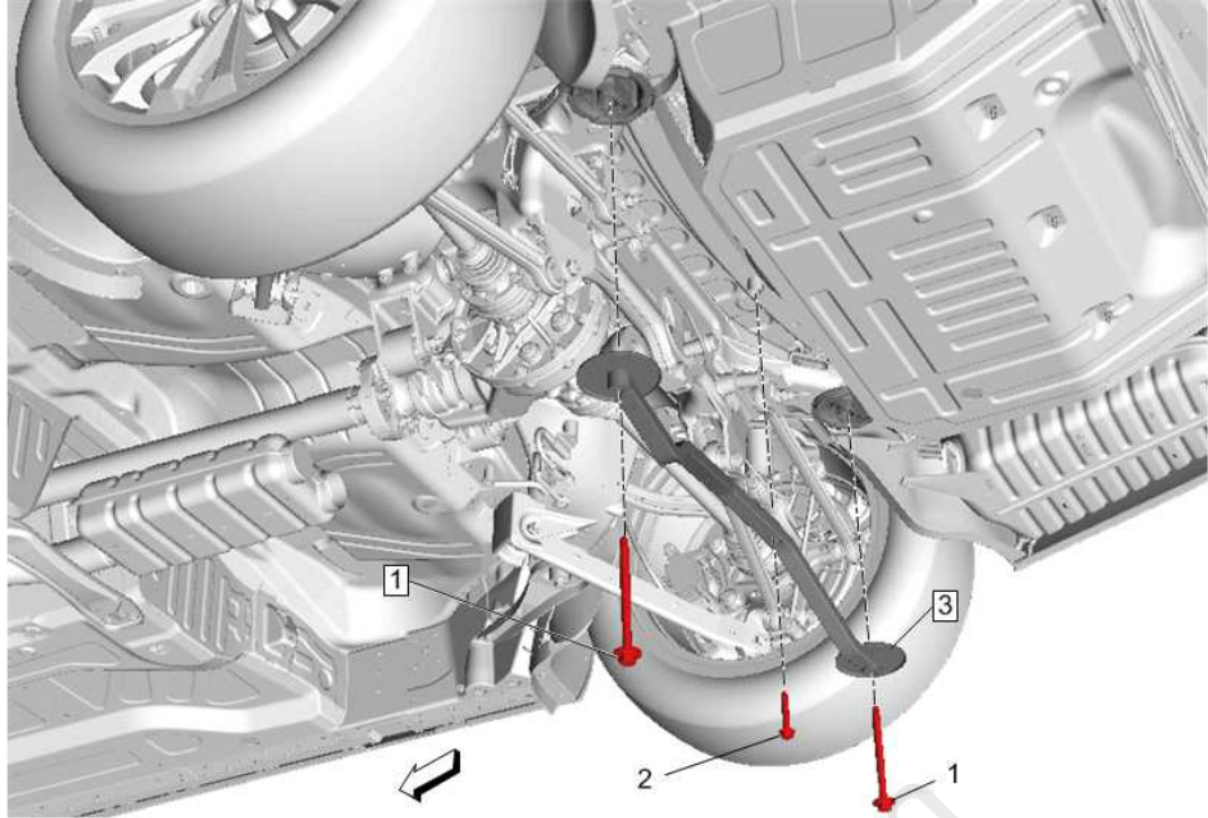


Fig. 92: Rear Cradle Mount Bolt Bracket (Brace)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Rear Suspension Cradle Bolt [2x] CAUTION: Refer to Fastener Caution NOTE: Discard and replace with NEW bolts. Tighten 100 N.m (74 lb ft)
2	Rear Suspension Cradle Brace Bolt Tighten 58 N.m (43 lb ft)
3	Rear Suspension Cradle Brace

REAR SUSPENSION CRADLE REPLACEMENT

Special Tools

EN-39580 Support Stand

Equivalent regional tools: [Special Tools](#)

Removal Procedure

1. Exhaust Muffler Assembly (2) » Remove - [Exhaust Muffler Replacement \(LTG without HP9\)](#) , [Exhaust Muffler Replacement \(LGW, LGX\)](#) and/or [Exhaust Muffler Replacement \(LTG with HP9\)](#)

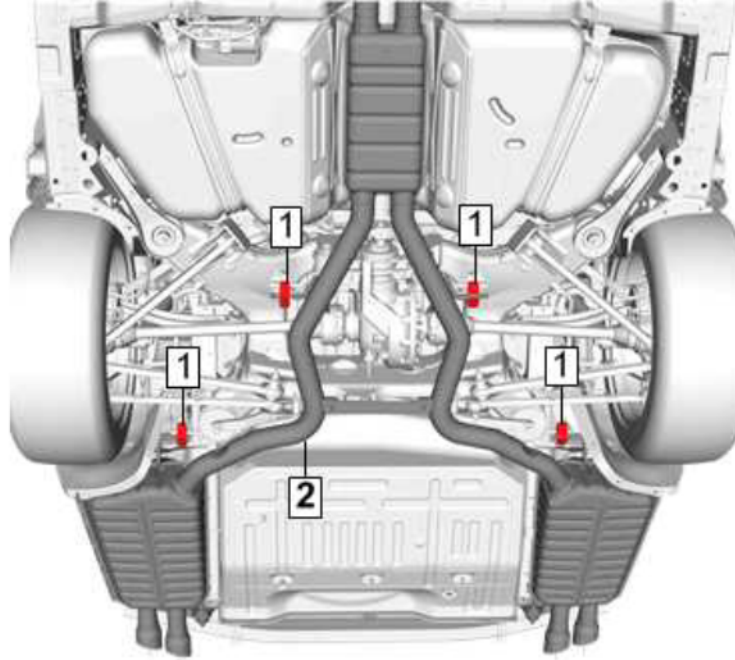


Fig. 93: Exhaust Muffler Assembly

Courtesy of GENERAL MOTORS COMPANY

2. Rear Wheelhouse Liner (2) » Remove - **Rear Wheelhouse Liner Replacement (LTG)** and/or **Rear Wheelhouse Liner Replacement (LGX, LGW)**

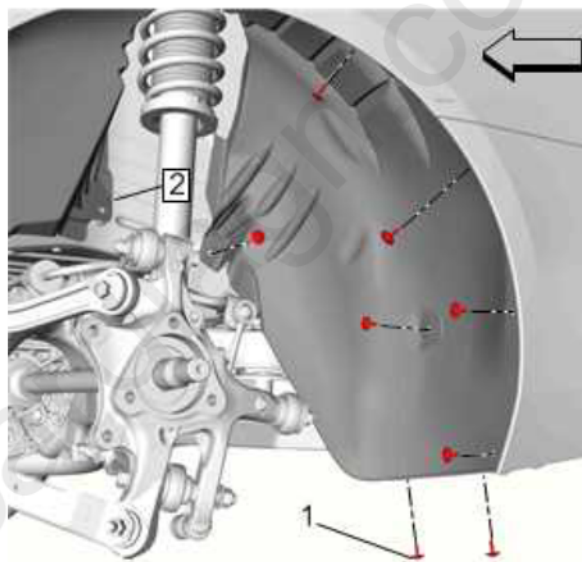


Fig. 94: Rear Wheelhouse Liner

Courtesy of GENERAL MOTORS COMPANY

3. Electrical Connector (1) @ Rear Brake Caliper (2) » Disconnect

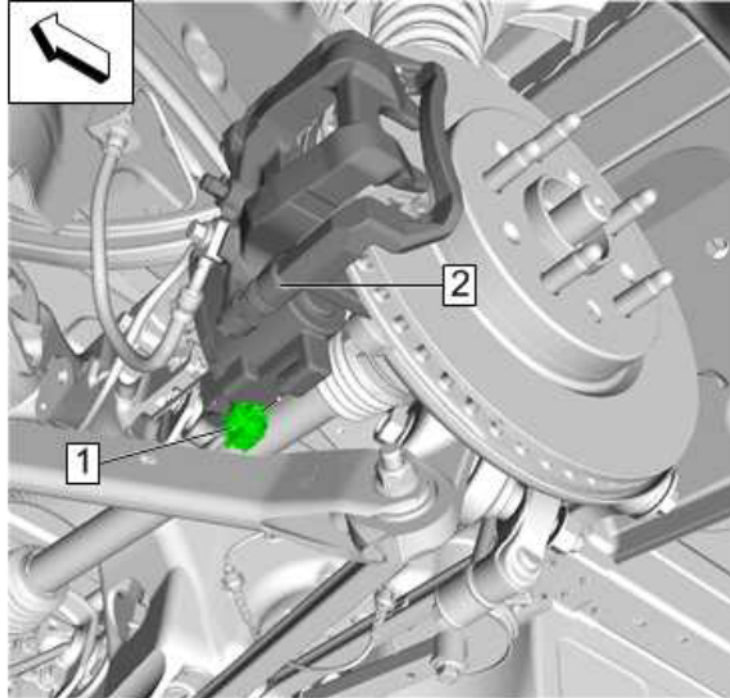


Fig. 95: Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

4. Wiring Harness Retainer (1)» Disengage [2x]

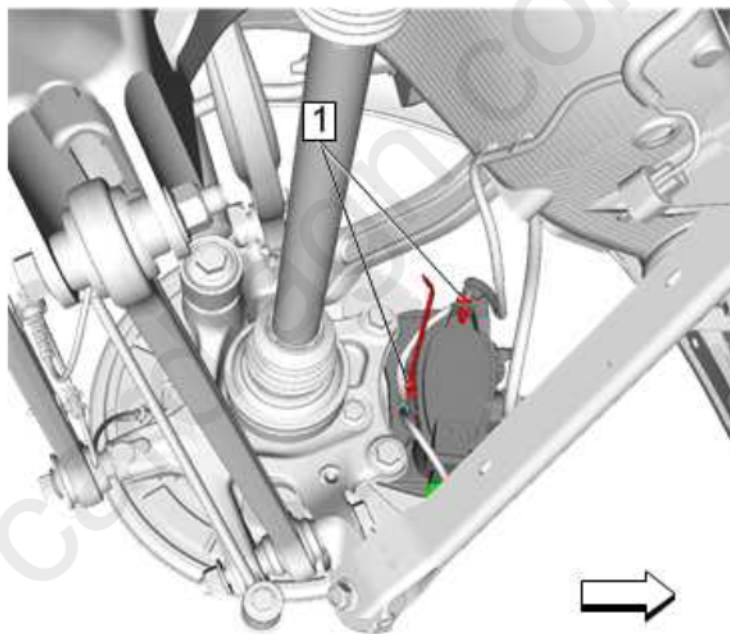


Fig. 96: Wiring Harness Retainer

Courtesy of GENERAL MOTORS COMPANY

5. Brake Caliper Bracket Bolt (1)» Remove [2x]

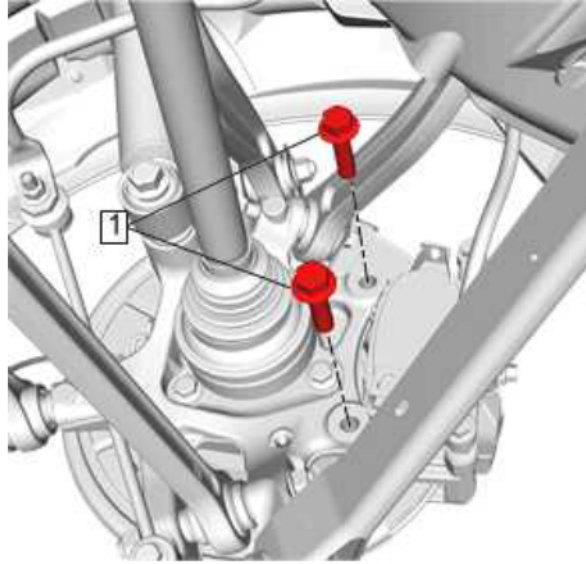


Fig. 97: Brake Caliper Bracket Bolt

Courtesy of GENERAL MOTORS COMPANY

6. Brake Caliper and Bracket Assembly (1) » Remove

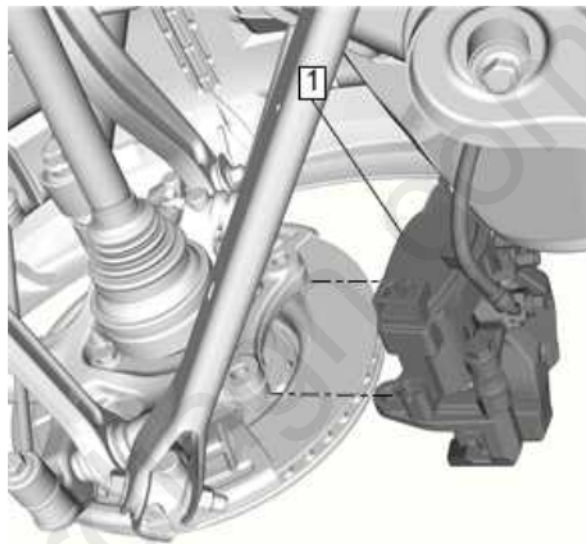


Fig. 98: Brake Caliper and Bracket Assembly

Courtesy of GENERAL MOTORS COMPANY

7. Support the brake caliper and bracket assembly with heavy mechanics wire.

CAUTION: Support the brake caliper with heavy mechanic wire or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

8. Mark (1) the relationship of the propeller shaft (2) and the rear axle pinion flange (3).

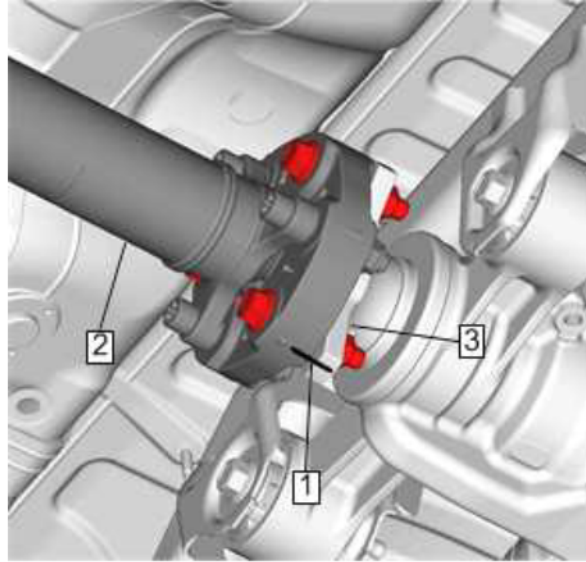


Fig. 99: Propeller Shaft Flange And Rear Axle Pinion Flange
 Courtesy of GENERAL MOTORS COMPANY

9. Separate and support the propeller shaft (2). Refer to [Propeller Shaft Replacement](#)
10. Shock Absorber (2) @ Rear Knuckle (1) » Separate [Shock Absorber and Spring Removal and Installation](#)

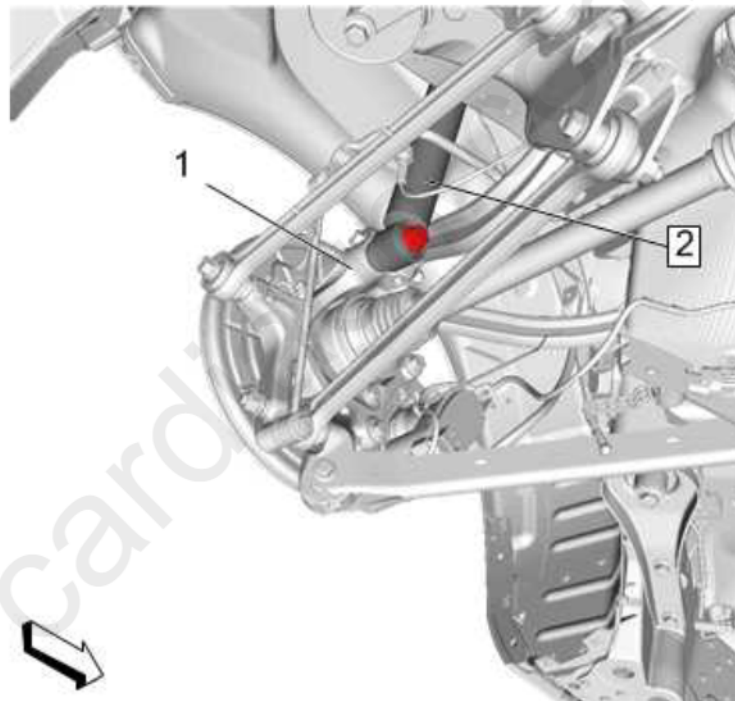


Fig. 100: Shock Absorber
 Courtesy of GENERAL MOTORS COMPANY

11. Wiring Harness Retainer (1) » Disengage [3x]

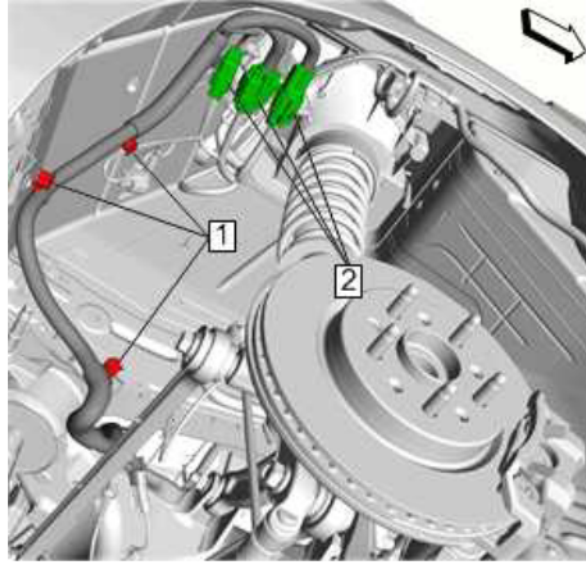


Fig. 101: Wiring Harness Retainer

Courtesy of GENERAL MOTORS COMPANY

12. Electrical Connector (2) » Disconnect [3x]
13. Using the **EN-39580** Support Stand support the rear suspension cradle.

NOTE: Ensure that the rear suspension cradle is securely attached to the support stand.

14. Rear Suspension Cradle Bolt (1) » Remove and DISCARD [2x]



Fig. 102: Rear Suspension Cradle Bolt

Courtesy of GENERAL MOTORS COMPANY

15. Rear Cradle Brace Bolt (2) » Remove
16. Rear Cradle Brace (3) » Remove
17. Rear Suspension Cradle Bolt (1) » Remove and DISCARD [2x]

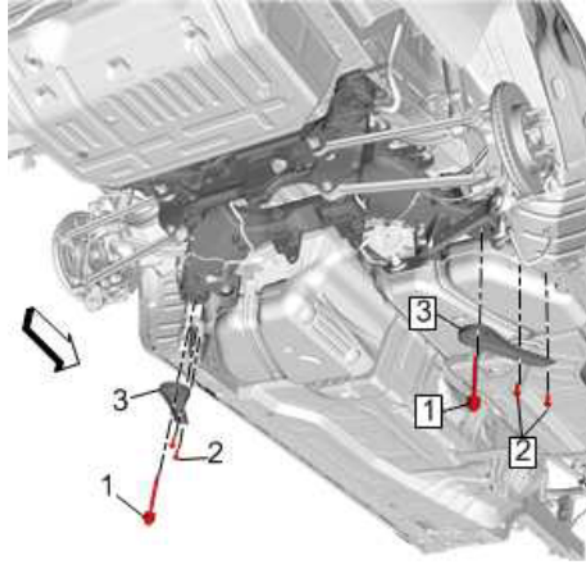


Fig. 103: Rear Suspension Cradle Bolt

Courtesy of GENERAL MOTORS COMPANY

18. Rear Cradle Mount Bracket Bolt (2)» Remove [4x]

19. Rear Suspension Cradle (1)» Remove

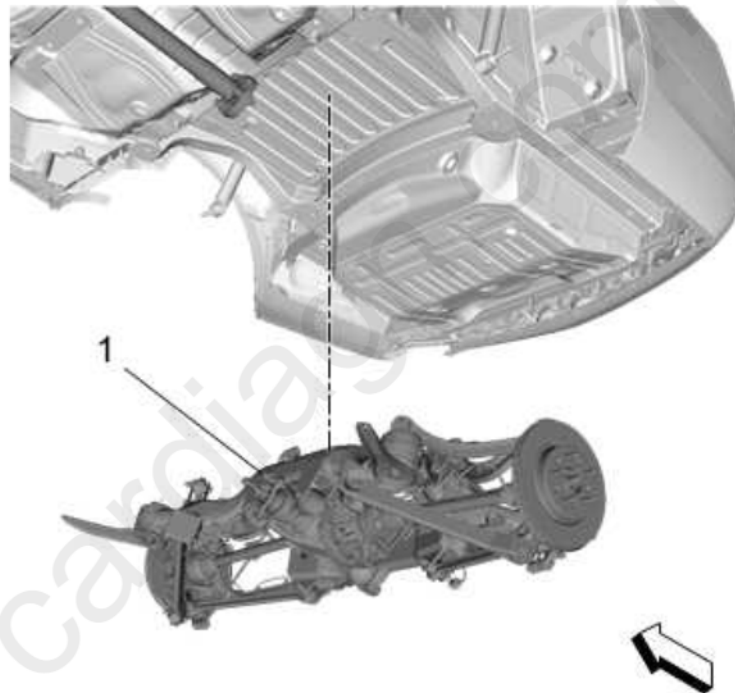


Fig. 104: Rear Suspension Cradle

Courtesy of GENERAL MOTORS COMPANY

20. If replacing the rear suspension cradle, transfer the following:

- Rear Suspension Lateral Link @ Rear Suspension Cradle» Separate - **Rear Suspension Lateral Link Replacement**
- Rear Suspension Lower Trailing Link @ Rear Suspension Cradle» Separate - **Rear Suspension Lower Trailing Link Replacement**
- Rear Suspension Adjust Link @ Rear Suspension Cradle» Separate - **Adjust Link Replacement (Without NYS) Adjust Link Replacement (With NYS)**
- Rear Suspension Upper Trailing Link @ Rear Suspension Cradle» Separate - **Rear Suspension Upper Trailing Link Replacement**
- Rear Suspension Upper Lateral Link @ Rear Suspension Cradle» Separate - **Rear Suspension Upper Lateral Link Replacement**
- Rear Wheel Drive Shaft - Left Side **Rear Wheel Drive Shaft Replacement - Left Side (LTG) Rear Wheel Drive Shaft Replacement - Left Side (LGX, LGW)**
- Rear Wheel Drive Shaft - Right Side **Rear Wheel Drive Shaft Replacement - Right Side**

- Rear Stabilizer Shaft» Remove [Stabilizer Shaft Replacement](#)
- Differential Carrier Assembly» Remove [Differential Carrier Assembly Replacement](#)

21. {If equipped} Rear Wheel Steering Actuator (1)» Remove- [Rear Wheel Steering Actuator Replacement](#)

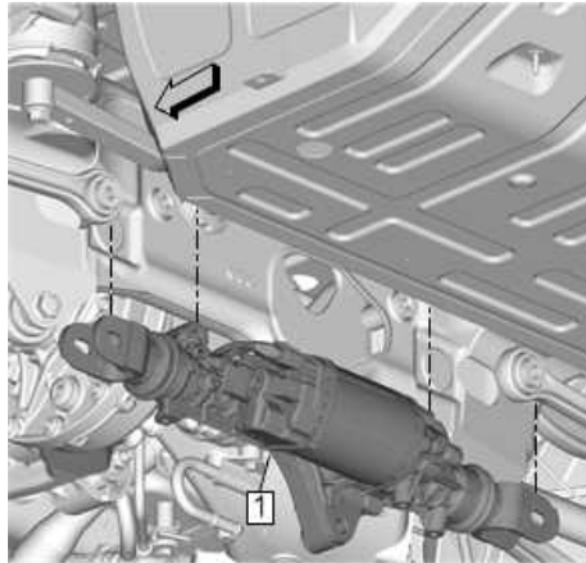


Fig. 105: Rear Wheel Steering Actuator

Courtesy of GENERAL MOTORS COMPANY

22. {If equipped} Electrical Connector (1)» Disconnect [2x]

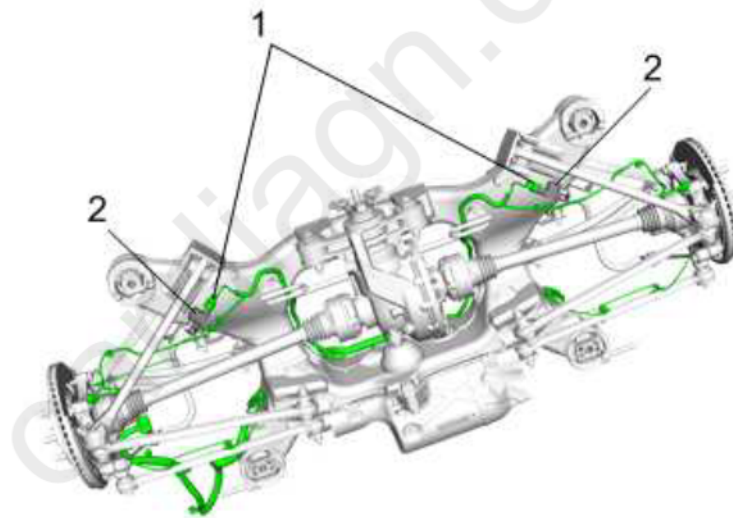


Fig. 106: Electrical Connectors

Courtesy of GENERAL MOTORS COMPANY

23. Rear Suspension Automatic Forward Lighting Leveling Sensor (2)» Remove - [Rear Suspension Automatic Forward Lighting Leveling Position Sensor Replacement](#)

24. Disconnect the chassis harness retainers (1) and transfer the chassis harness (2) to the NEW rear suspension cradle.

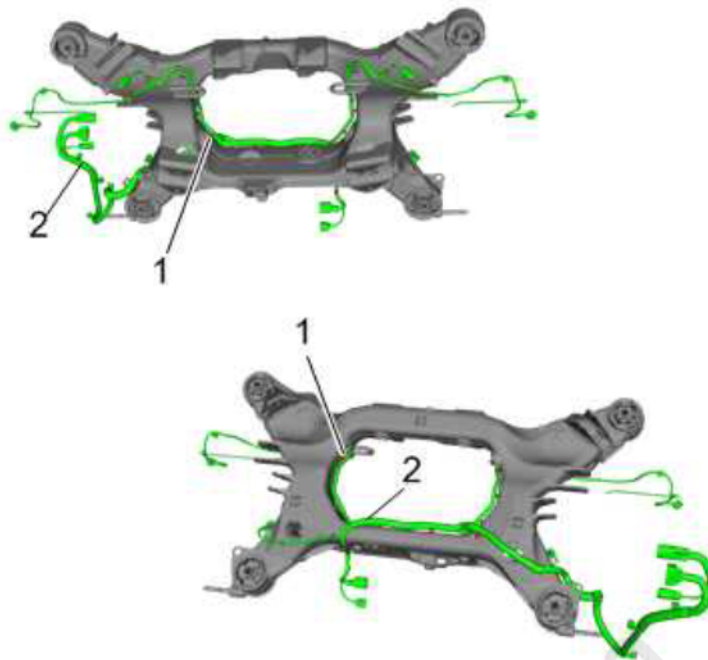


Fig. 107: Chassis Harness Retainers

Courtesy of GENERAL MOTORS COMPANY

Installation Procedure

1. Using the **EN-39580** Support Stand Install the rear suspension cradle into position. (1)

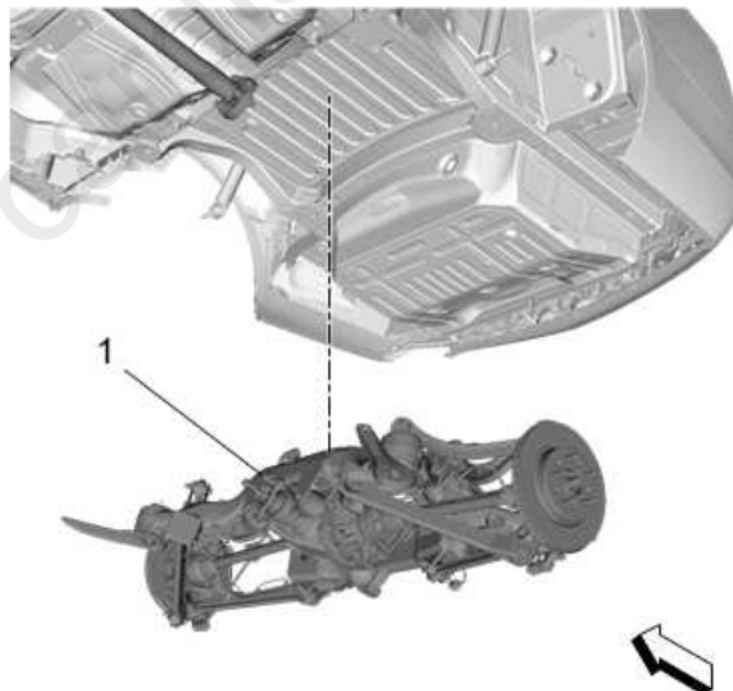


Fig. 108: Rear Suspension Cradle

Courtesy of GENERAL MOTORS COMPANY

NOTE: Ensure that the rear suspension cradle is securely attached to the hydraulic jack stand

2. Use a wooden dowel or suitable alignment pin and insert into the alignment holes (1) to guide the rear cradle assembly into position.

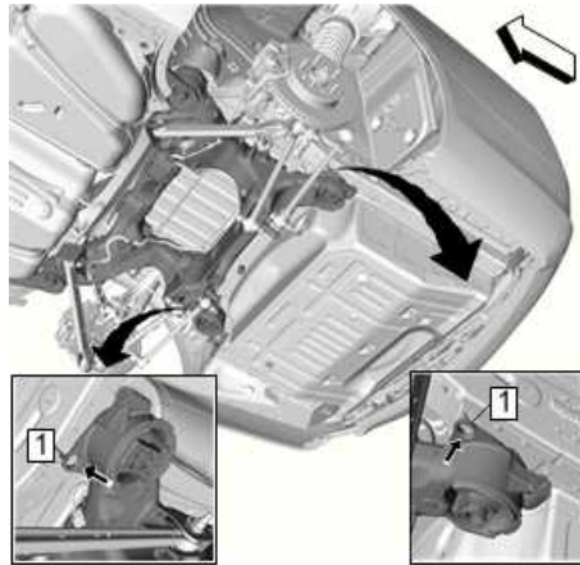


Fig. 109: Using Alignment Pin In To Alignment Holes
Courtesy of GENERAL MOTORS COMPANY

3. Rear Suspension Cradle Bolt (1)» Tighten [2x] 100 N.m (74 lb ft)

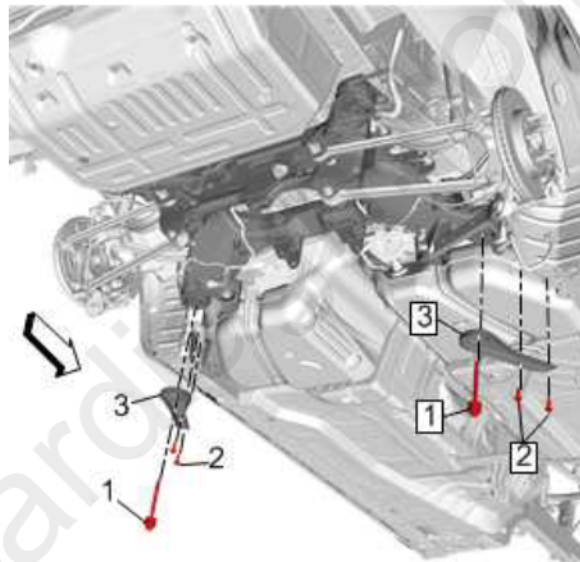


Fig. 110: Rear Suspension Cradle Bolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: Install NEW bolts (1) and hand tighten.

CAUTION: Refer to **Fastener Caution**

4. Rear Cradle Mount Bracket Bolt (2)» Tighten [4x] 58 N.m (43 lb ft)
5. Rear Cradle Brace (3)» Install



Fig. 111: Rear Suspension Cradle Bolt

Courtesy of GENERAL MOTORS COMPANY

6. Rear Suspension Cradle Bolt (1)» Tighten [2x] 100 N.m (74 lb ft)

NOTE: Install NEW bolts (1) and hand tighten.

7. Rear Cradle Brace Bolt (2)» Install and tighten 58 N.m (43 lb ft)
8. Remove the hydraulic jack.
9. Brake Caliper and Bracket Assembly (1)» Install [Rear Brake Rotor Replacement](#)

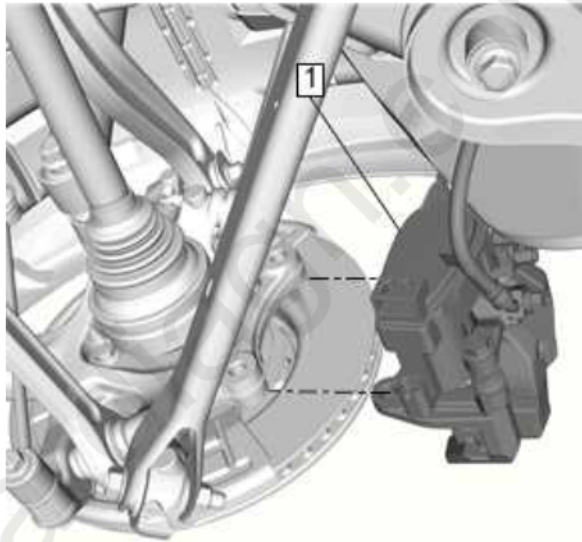


Fig. 112: Brake Caliper and Bracket Assembly

Courtesy of GENERAL MOTORS COMPANY

10. Electrical Connector (1) @ Rear Brake Caliper (2)» Connect

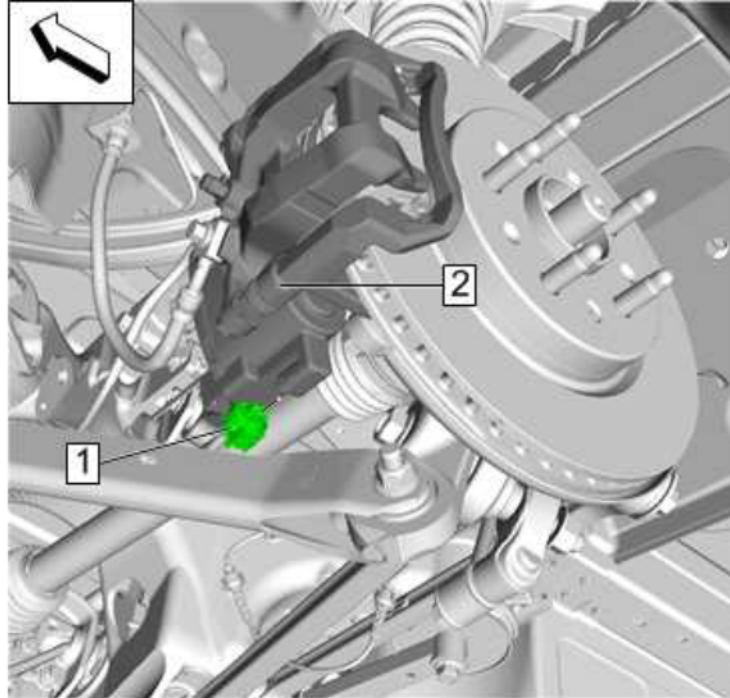


Fig. 113: Electrical Connector

Courtesy of GENERAL MOTORS COMPANY

11. Wiring Harness Retainer (1) » Engage [2x]

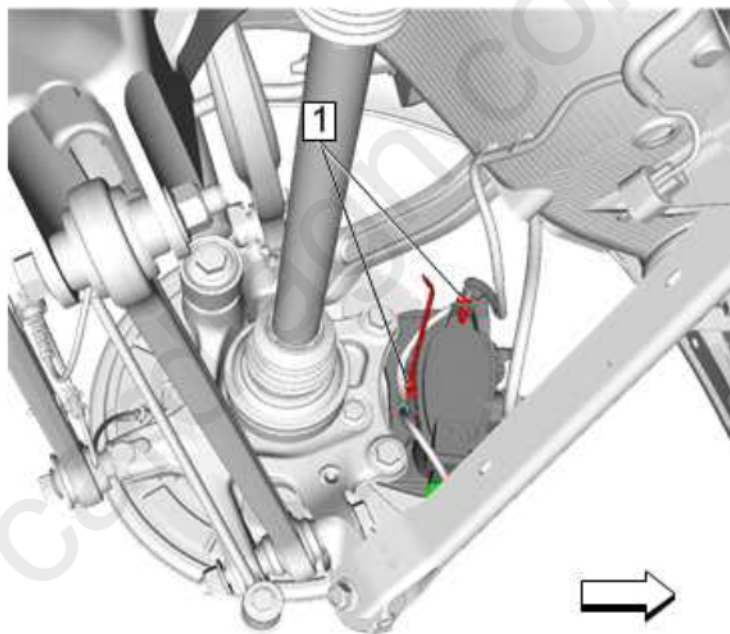


Fig. 114: Wiring Harness Retainer

Courtesy of GENERAL MOTORS COMPANY

12. Shock Absorber (2) @ Rear Knuckle (1) » Install **Shock Absorber and Spring Removal and Installation**

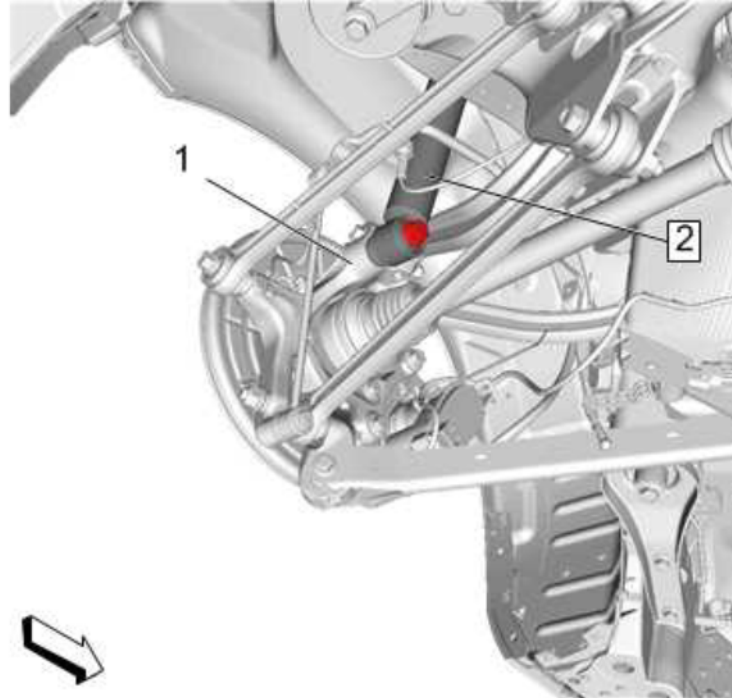


Fig. 115: Shock Absorber

Courtesy of GENERAL MOTORS COMPANY

13. Wiring Harness Retainer (1)» Engage [3x]

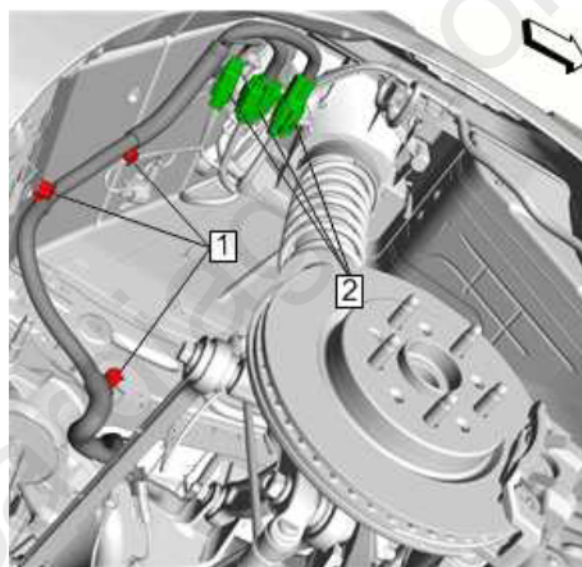


Fig. 116: Wiring Harness Retainer

Courtesy of GENERAL MOTORS COMPANY

14. Electrical Connector (2)» Connect [3x]
 15. Install the propeller shaft (2) to the rear axle pinion flange. Refer to **Propeller Shaft Replacement**

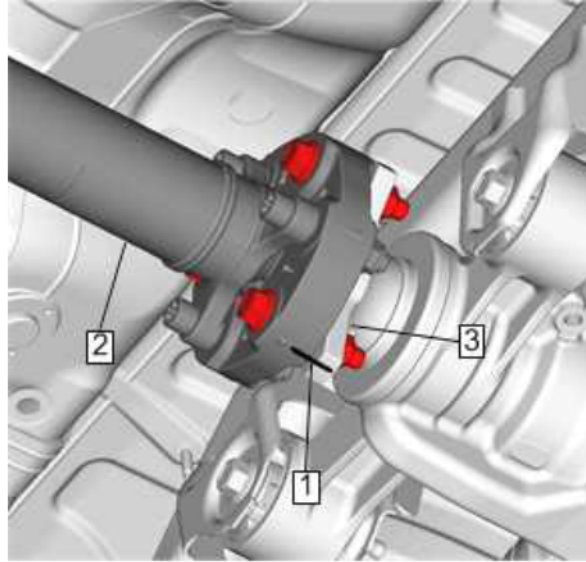


Fig. 117: Propeller Shaft Flange And Rear Axle Pinion Flange
 Courtesy of GENERAL MOTORS COMPANY

16. Rear Wheelhouse Liner (2) » Install - **Rear Wheelhouse Liner Replacement (LTG)** and/or **Rear Wheelhouse Liner Replacement (LGX, LGW)**

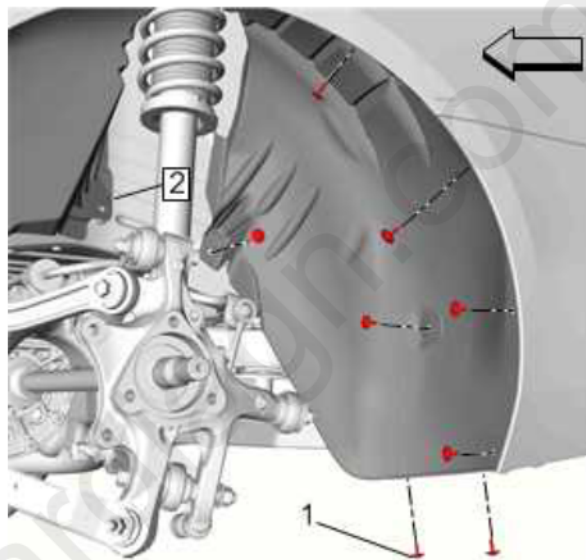


Fig. 118: Rear Wheelhouse Liner
 Courtesy of GENERAL MOTORS COMPANY

17. Exhaust Muffler Assembly (2) » Install - **Exhaust Muffler Replacement (LTG without HP9)** , **Exhaust Muffler Replacement (LGW, LGX)** and/or **Exhaust Muffler Replacement (LTG with HP9)**

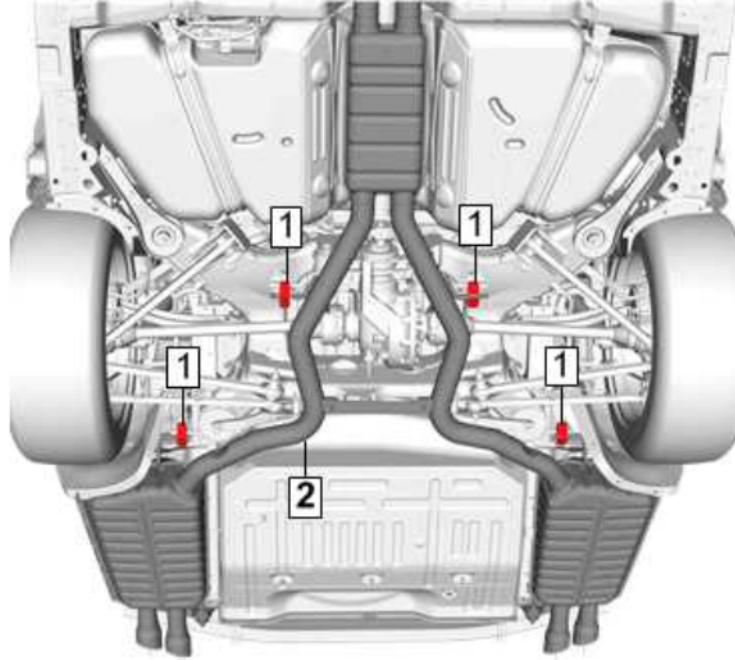


Fig. 119: Exhaust Muffler Assembly

Courtesy of GENERAL MOTORS COMPANY

18. Perform an alignment only if the rear suspension cradle is replaced. Refer to [Wheel Alignment Specifications](#)

FRONT WHEELHOUSE LINER REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
2. Remove the left front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
3. Engine Front Splash Shield-Left Side (Front/Rear)» Remove - [Engine Front Splash Shield Replacement - Left Side \(Rear\)](#)[Engine Front Splash Shield Replacement - Left Side \(Front\)](#) or Engine Front Splash Shield-Right Side (Front/Rear)» Remove - [Engine Front Splash Shield Replacement - Right Side \(Rear\)](#)[Engine Front Splash Shield Replacement - Right Side \(Front\)](#)
4. Front Wheelhouse Liner Screw (1)» Remove [8x]

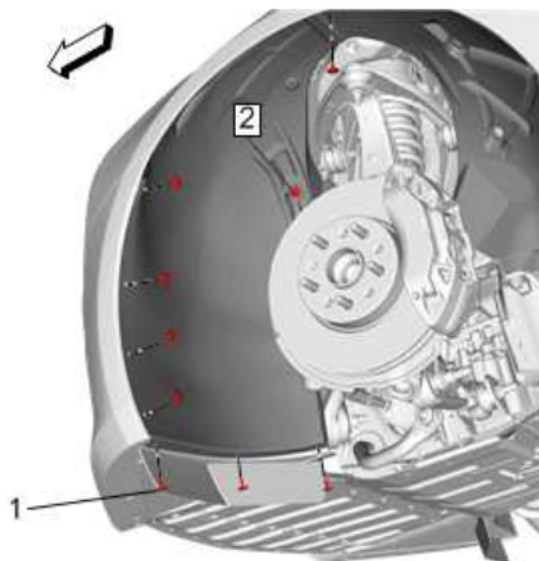


Fig. 120: Front Wheelhouse Liner Screw

Courtesy of GENERAL MOTORS COMPANY

5. Front Wheelhouse Liner Retainer (2)» Remove
6. Front Wheelhouse Liner Screw (1)» Remove [5x]

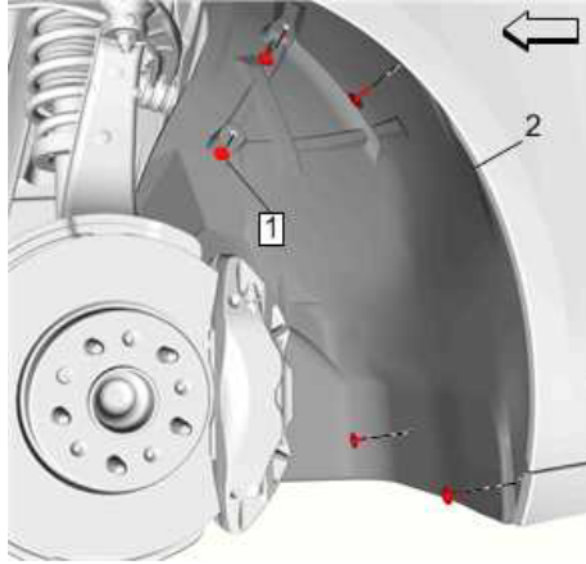


Fig. 121: Front Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

7. Front Wheelhouse Liner (2)» Remove
8. Lower the vehicle.

Installation Procedure

1. Front Wheelhouse Liner (2)» Install

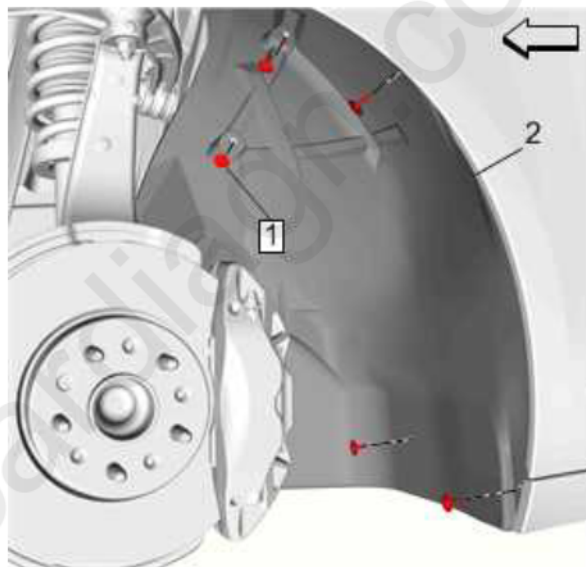


Fig. 122: Front Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

2. Front Wheelhouse Liner Screw (1)» Install and tighten [5x] 2.5 N.m (22 lb in)

CAUTION: Refer to **Fastener Caution**

3. Front Wheelhouse Liner Screw (1)» Install and tighten [8x] 2.5 N.m (22 lb in)

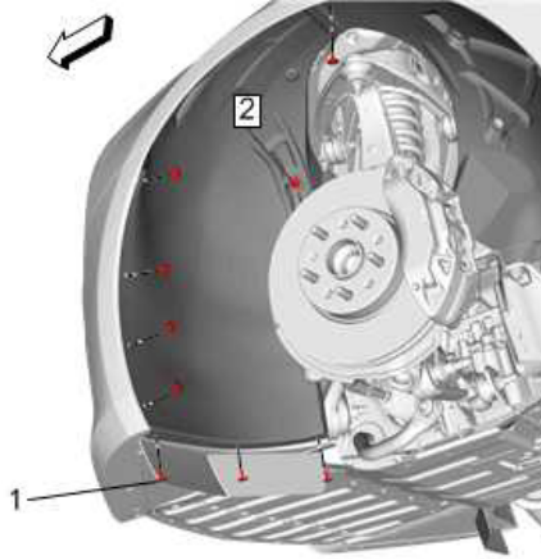


Fig. 123: Front Wheelhouse Liner Screw
Courtesy of GENERAL MOTORS COMPANY

4. Front Wheelhouse Liner Retainer (2) » Install
5. Engine Front Splash Shield-Left Side (Front/Rear) » Install - [Engine Front Splash Shield Replacement - Left Side \(Rear\)](#) [Engine Front Splash Shield Replacement - Left Side \(Front\)](#) or Engine Front Splash Shield-Right Side (Front/Rear) » Install - [Engine Front Splash Shield Replacement - Right Side \(Rear\)](#) [Engine Front Splash Shield Replacement - Right Side \(Front\)](#)
6. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
7. Lower the vehicle.

REAR WHEELHOUSE LINER REPLACEMENT (LTG)

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
2. Remove the left rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
3. Rear Tire Front Air Deflector » Remove - [Rear Tire Front Air Deflector Replacement](#)
4. Rear Wheelhouse Liner Screw (1) » Remove [5x]

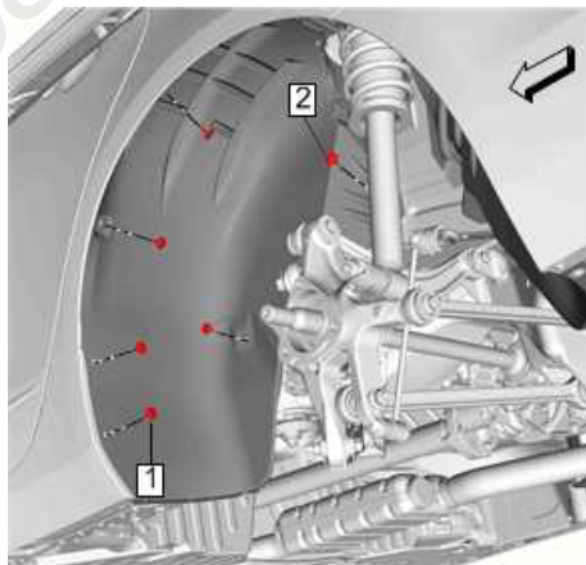


Fig. 124: Rear Wheelhouse Liner Screws
Courtesy of GENERAL MOTORS COMPANY

5. Rear Wheelhouse Liner Retainer (2) » Remove
6. Rear Wheelhouse Liner Screw (1) » Remove [8x]

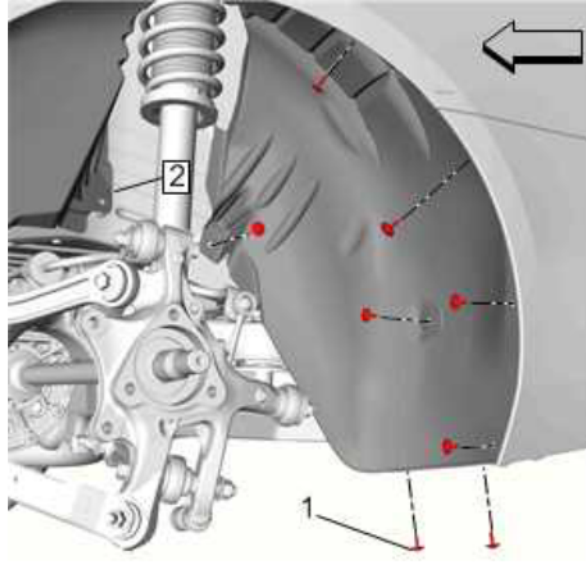


Fig. 125: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

7. Rear Wheelhouse Liner (2)» Remove
8. Lower the vehicle.

Installation Procedure

1. Rear Wheelhouse Liner (2)» Install

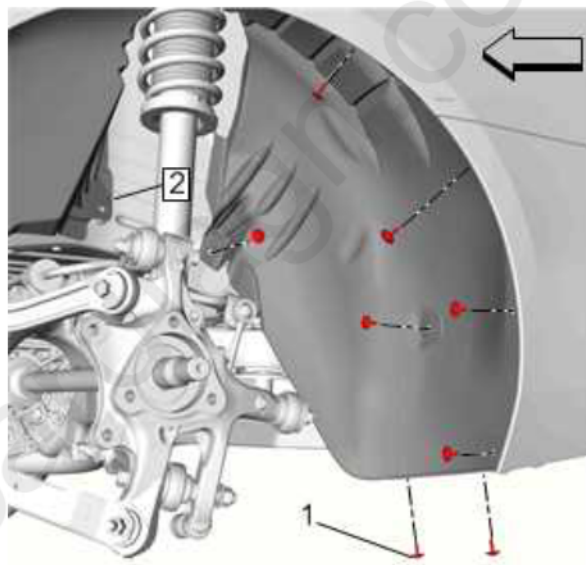


Fig. 126: Rear Wheelhouse Liner
Courtesy of GENERAL MOTORS COMPANY

2. Rear Wheelhouse Liner Screw (1)» Install and tighten [8x] 2.5 N.m (22 lb in)

CAUTION: Refer to **Fastener Caution**

3. Rear Wheelhouse Liner Screw (1)» Install and tighten [5x] 2.5 N.m (22 lb in)

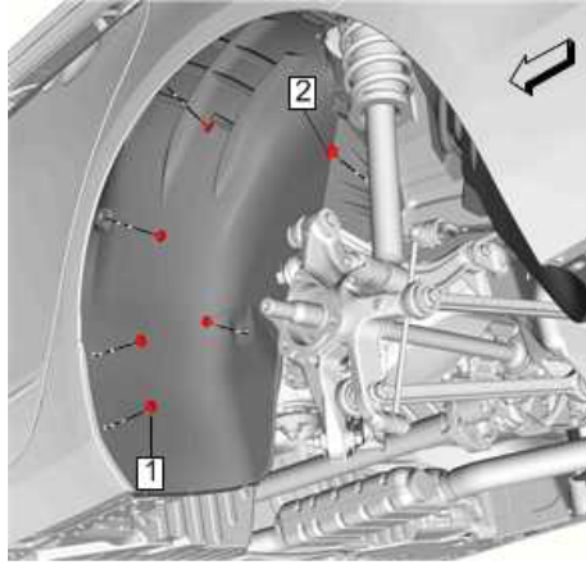


Fig. 127: Rear Wheelhouse Liner Screws

Courtesy of GENERAL MOTORS COMPANY

4. Rear Wheelhouse Liner Retainer (2)» Install
5. Rear Tire Front Air Deflector» Install - [Rear Tire Front Air Deflector Replacement](#)
6. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
7. Lower the vehicle.

REAR WHEELHOUSE LINER REPLACEMENT (LGX, LGW)

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
2. Remove the left rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
3. Rear Tire Front Air Deflector» Remove - [Rear Tire Front Air Deflector Replacement](#)
4. Rear Wheelhouse Liner Screw (1)» Remove [5x]

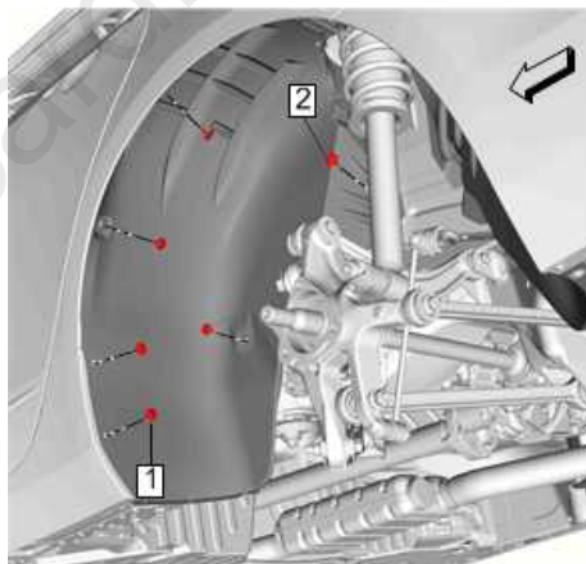


Fig. 128: Rear Wheelhouse Liner Screws

Courtesy of GENERAL MOTORS COMPANY

5. Rear Wheelhouse Liner Retainer (2)» Remove
6. Rear Wheelhouse Liner Screw (1)» Remove [6x]

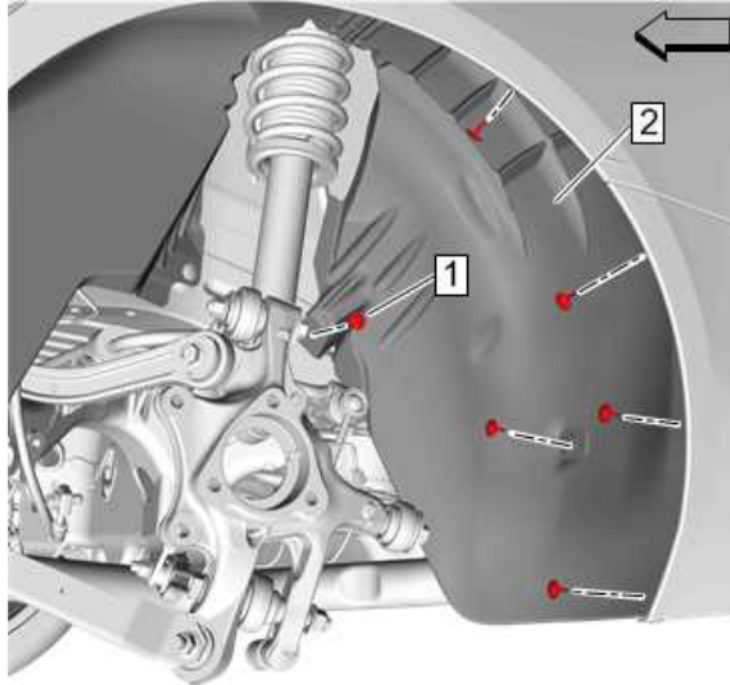


Fig. 129: Rear Wheelhouse Liner Screws
 Courtesy of GENERAL MOTORS COMPANY

7. Rear Wheelhouse Liner (2)» Remove
8. Lower the vehicle.

Installation Procedure

1. Rear Wheelhouse Liner (2)» Install

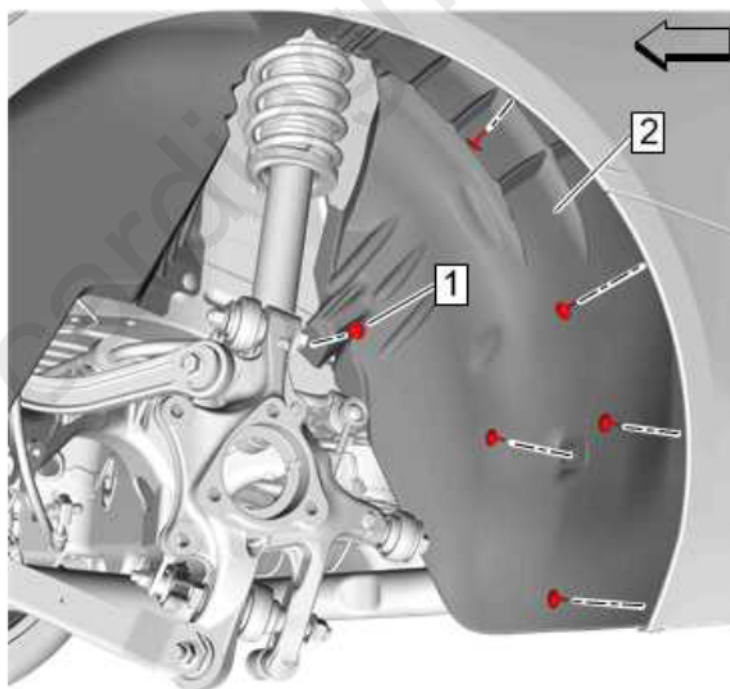


Fig. 130: Rear Wheelhouse Liner Screws
 Courtesy of GENERAL MOTORS COMPANY

2. Rear Wheelhouse Liner Screw (1)» Install and tighten [6x] 2.5 N.m (22 lb in)

CAUTION: Refer to **Fastener Caution**

3. Rear Wheelhouse Liner Screw (1)» Install and tighten [5x] 2.5 N.m (22 lb in)

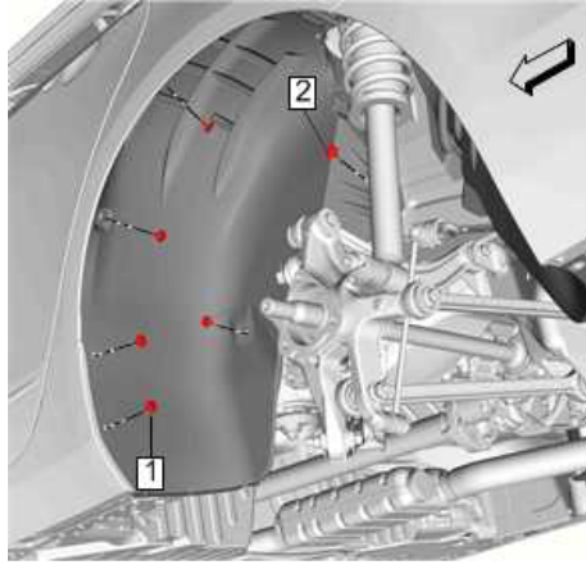


Fig. 131: Rear Wheelhouse Liner Screws
 Courtesy of GENERAL MOTORS COMPANY

4. Rear Wheelhouse Liner Retainer (2)» Install
5. Rear Tire Front Air Deflector» Install - [Rear Tire Front Air Deflector Replacement](#)
6. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
7. Lower the vehicle.

FRONT WHEELHOUSE PANEL BRACE REPLACEMENT (REAR)

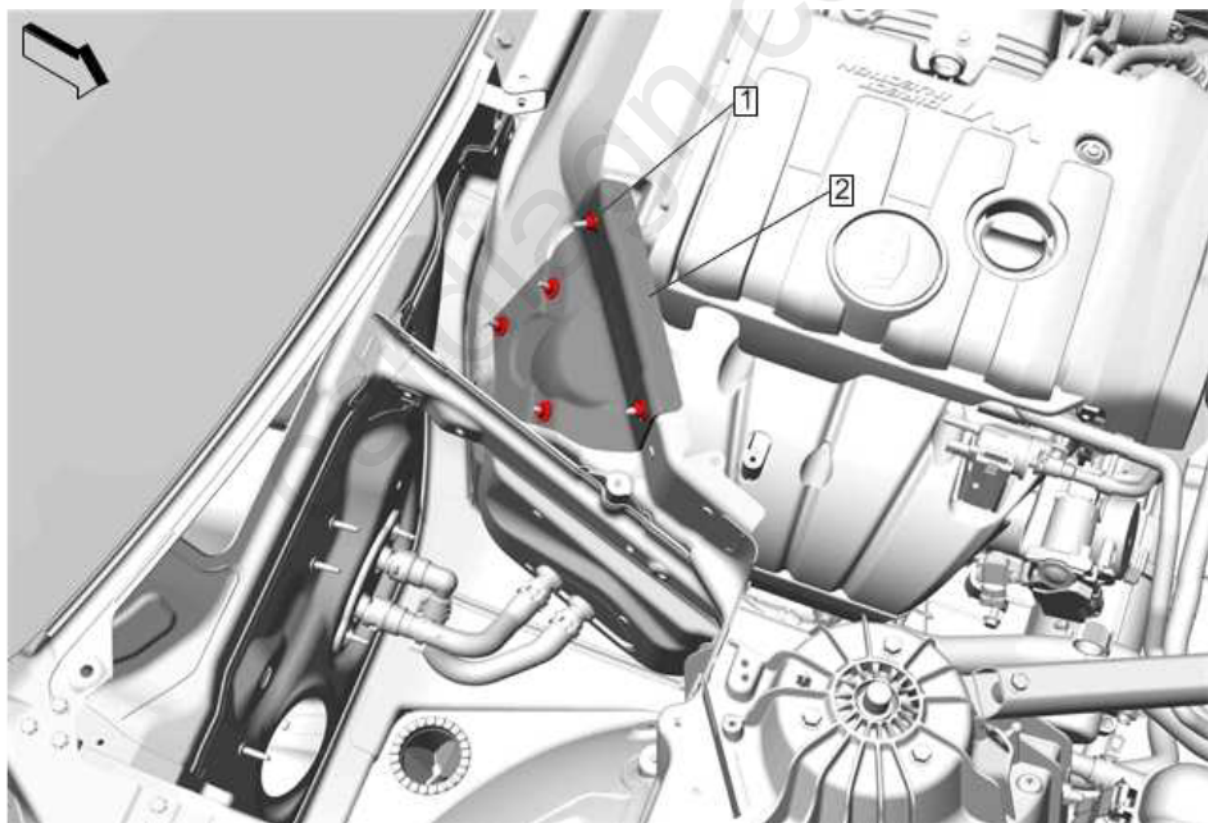


Fig. 132: Front Wheelhouse Panel Brace (Rear)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Front End Sheet Metal Cross Brace Replacement	

Callout	Component Name
1	Front Wheelhouse Panel Brace Fastener [5x] CAUTION: Refer to Fastener Caution Tighten 9 N.m (80 lb in)
2	Front Wheelhouse Panel Brace

FRONT WHEELHOUSE PANEL BRACE REPLACEMENT (FRONT)

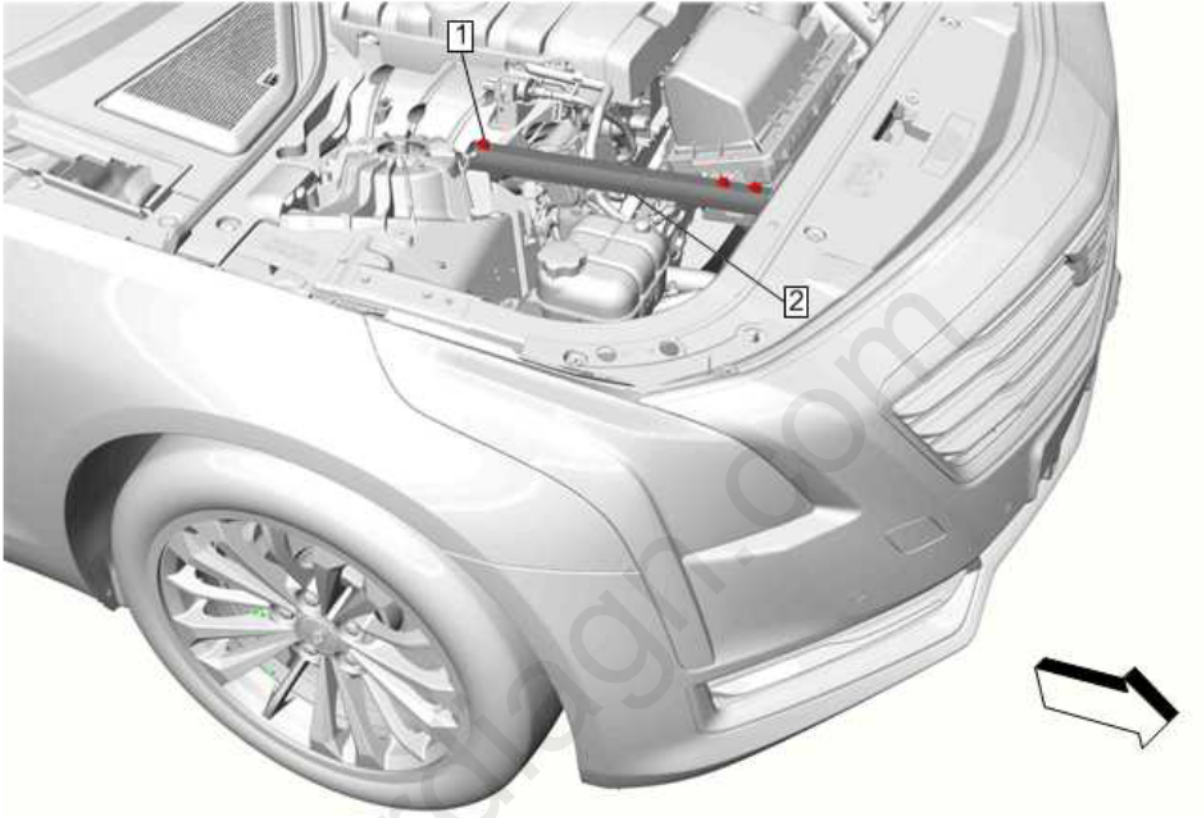


Fig. 133: Front Wheelhouse Panel Brace (Front)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Air Cleaner Assembly Replacement	
1	Front Wheelhouse Panel Brace Fastener [3x] CAUTION: Refer to Fastener Caution Tighten 22 N.m (16 lb ft)
2	Front Wheelhouse Panel Brace

FRONT WHEELHOUSE FRONT PANEL REPLACEMENT (HP9)

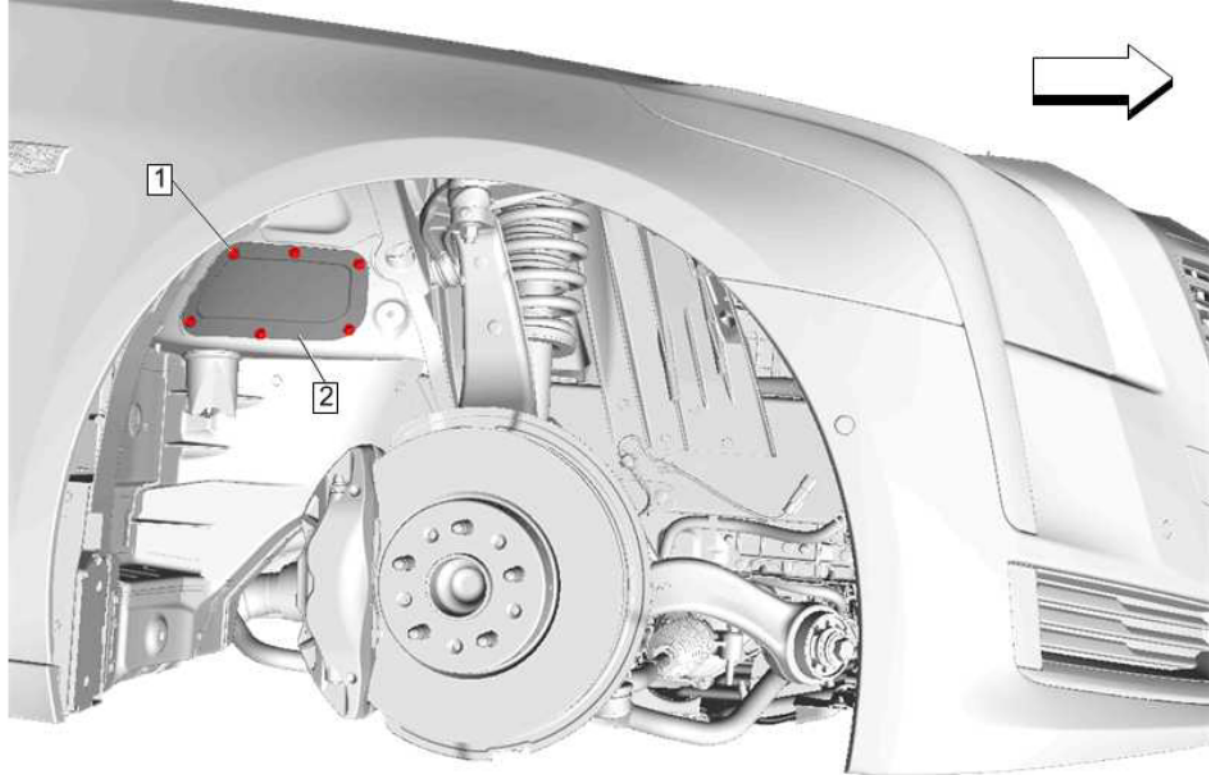


Fig. 134: Front Wheelhouse Front Panel (HP9)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Wheelhouse Liner Replacement	
1	Front Wheelhouse Front Panel Fastener [6x] CAUTION: Refer to Fastener Caution . Tighten 9 N.m (80 lb in)
2	Front Wheelhouse Front Panel

FRONT TIRE FRONT AIR DEFLECTOR REPLACEMENT

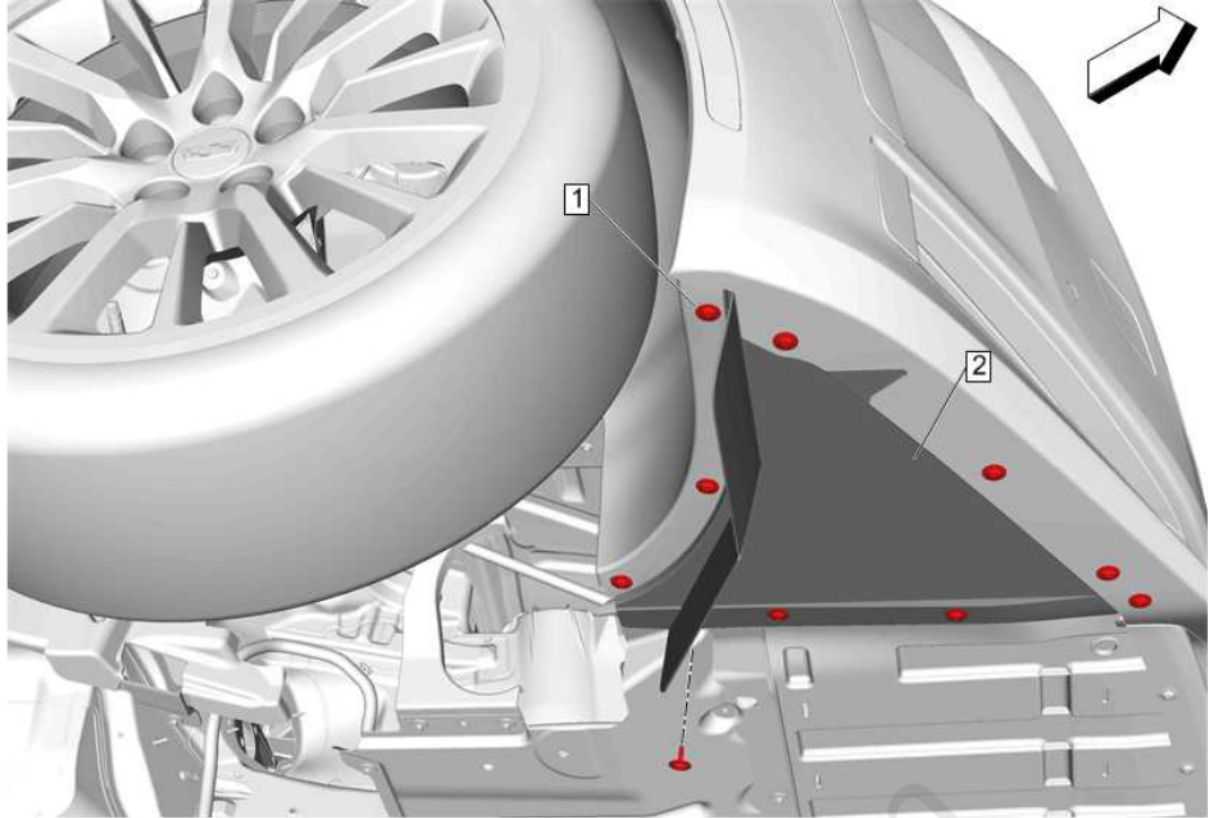


Fig. 135: Front Tire Front Air Deflector
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Front Tire Front Air Deflector Fastener [10x] CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
2	Front Tire Front Air Deflector

REAR TIRE FRONT AIR DEFLECTOR REPLACEMENT

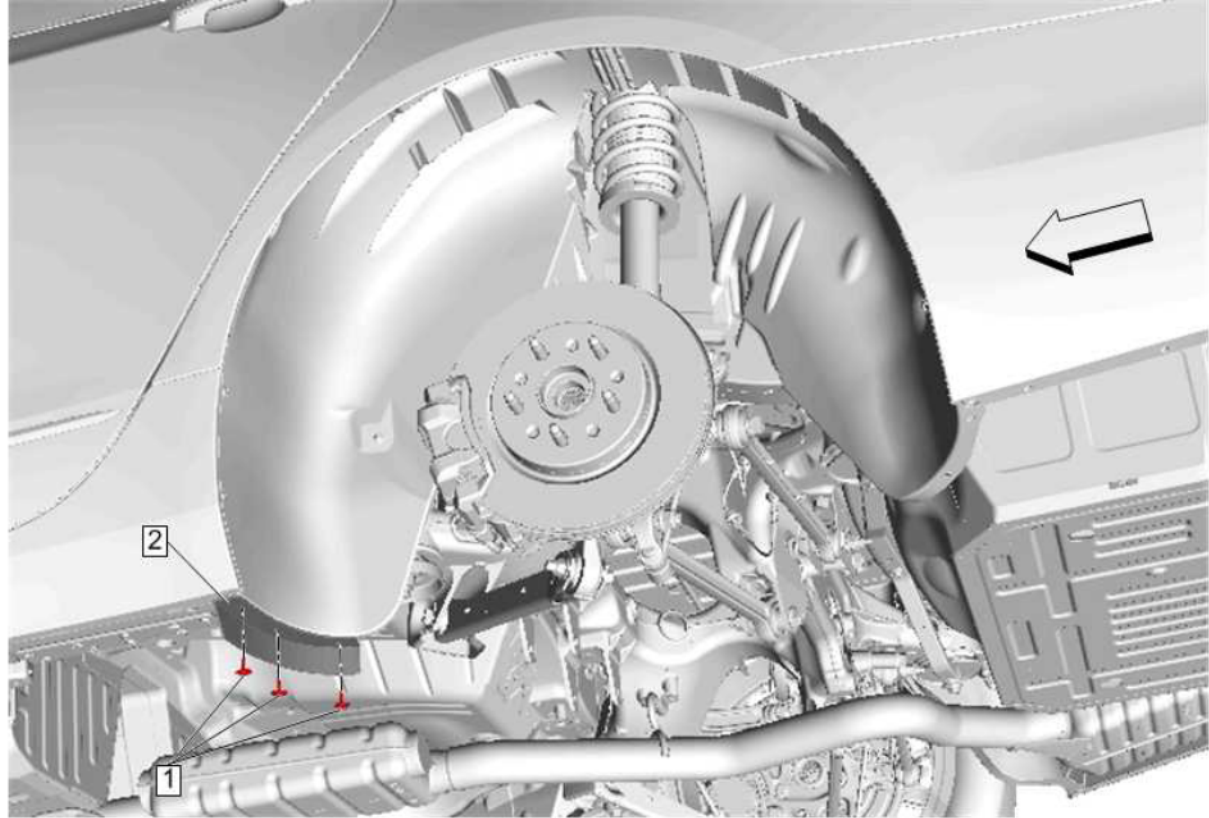


Fig. 136: Rear Tire Front Air Deflector
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Rear Tire Front Air Deflector Fastener [3x] CAUTION: Refer to Fastener Caution Tighten 2.5 N.m (22 lb in)
2	Rear Tire Front Air Deflector

FLOOR PANEL NUMBER 2 CROSS BAR REINFORCEMENT REPLACEMENT

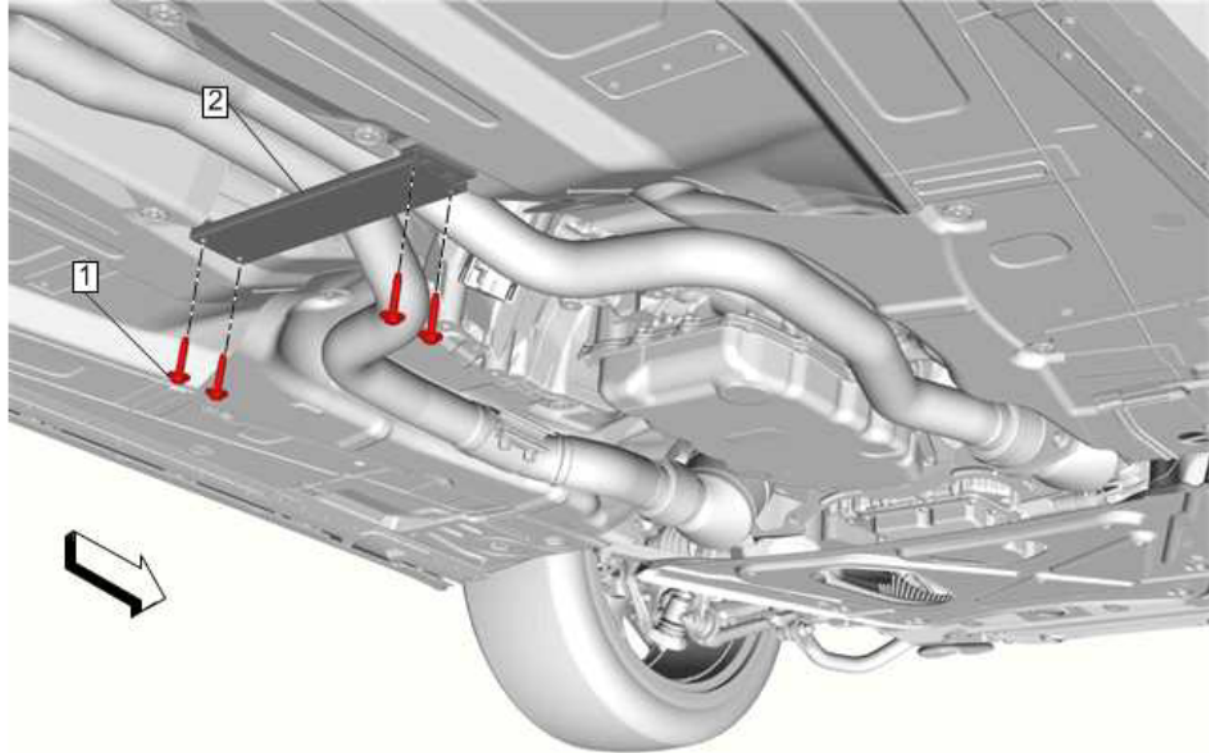


Fig. 137: Floor Panel Number 2 Cross Bar Reinforcement

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Floor Panel Number 2 Cross Bar Reinforcement Bolt [3x] CAUTION: Refer to Fastener Caution Tighten 22 N.m (16 lb ft)
2	Floor Panel Number 2 Cross Bar Reinforcement

FLOOR PANEL NUMBER 3 CROSS BAR REINFORCEMENT REPLACEMENT

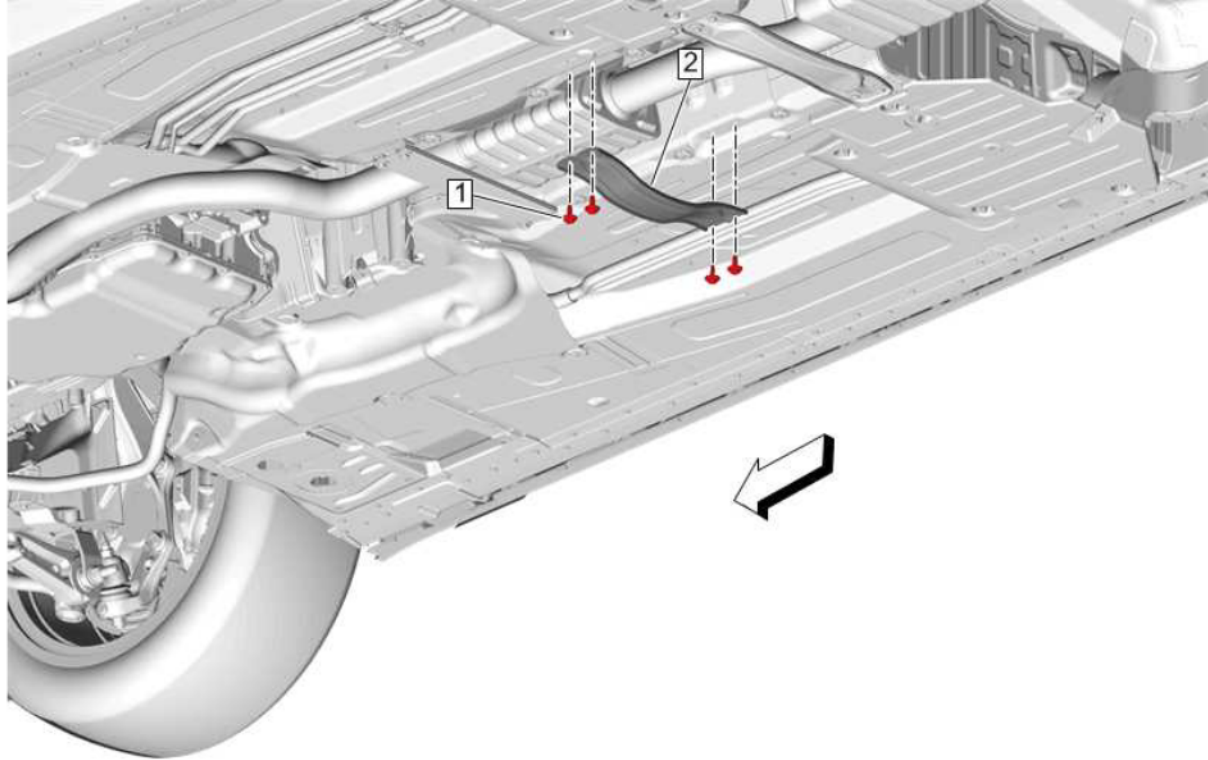


Fig. 138: Floor Panel Number 3 Cross Bar Reinforcement

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Floor Panel Number 3 Cross Bar Reinforcement Bolt [4x] CAUTION: Refer to Fastener Caution Tighten 22 N.m (16 lb ft)
2	Floor Panel Number 3 Cross Bar Reinforcement

FLOOR PANEL NUMBER 4 CROSS BAR REPLACEMENT

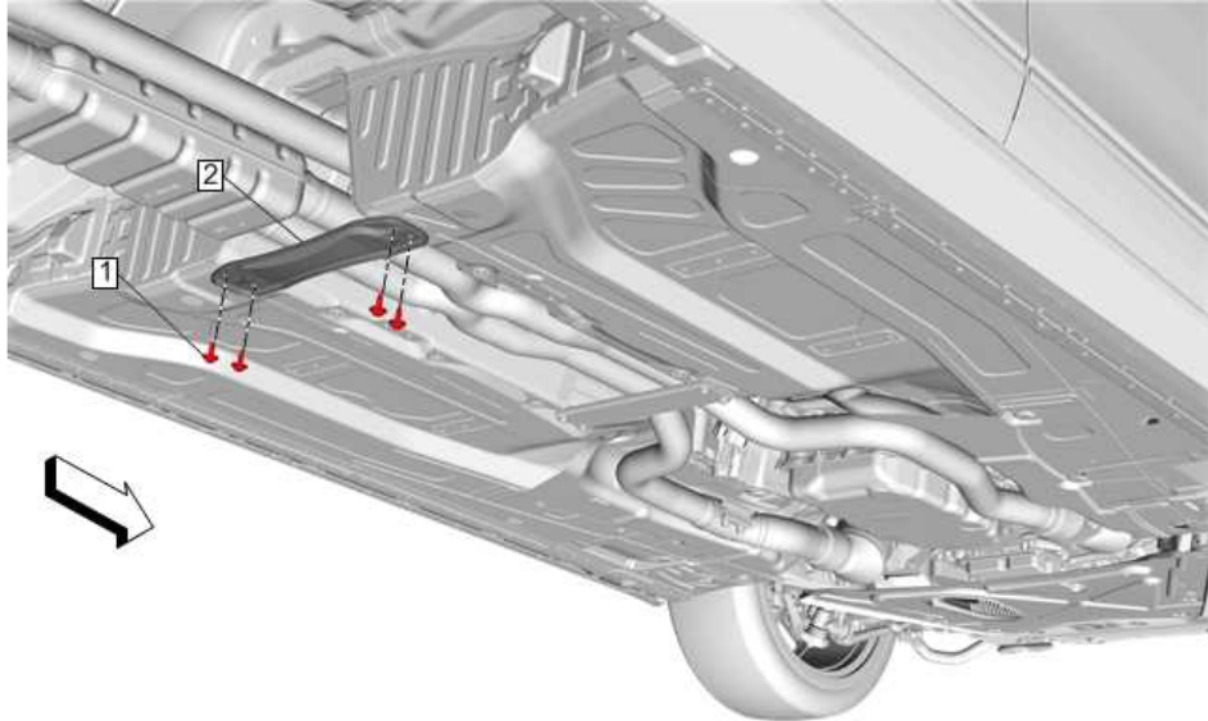


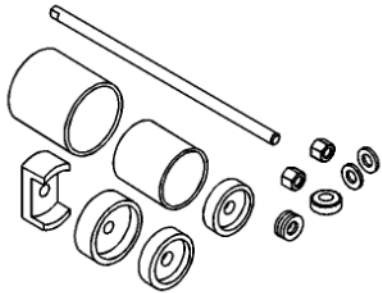
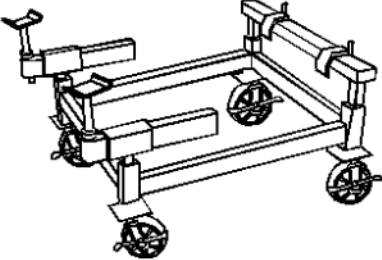
Fig. 139: Floor Panel Number 4 Cross Bar
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
1	Floor Panel Number 4 Cross Bar Reinforcement Bolt [4x] CAUTION: Refer to Fastener Caution Tighten 22 N.m (16 lb ft)
2	Floor Panel Number 4 Cross Bar Reinforcement

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Description
	CH-45725 J-45725-2 Cradle Bushing Replacer

Illustration	Tool Number/Description
	DT-50806 Bushings Replacer
	EN 39580 Engine Support Stand