

2018 SUSPENSION**Front Suspension - Equinox & Terrain****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)
Front Lower Control Arm Front Bolt	
• First Pass:	100 N.m (74 lb ft)
• Final Pass:	90 - 105 degrees
Front Lower Control Arm Rear Bolt	Torque mating fastener
Steering Knuckle Bolt	Torque mating fastener

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Front Lower Control Arm Ball Stud Nut	
• First Pass:	40 N.m (30 lb ft)
• Final Pass:	120 - 135 degrees
Front Lower Control Arm Rear Nut	
• First Pass:	100 N.m (74 lb ft)
• Final Pass:	90 - 105 degrees
Front Stabilizer Shaft Bracket Bolt	58 N.m (43 lb ft)
Front Stabilizer Shaft Link Nut	100 N.m (74 lb ft)
Front Suspension Mount Upper Bolt	22 N.m (16 lb ft)
Front Suspension Strut Nut	70 N.m (52 lb ft)
Front Wheel Bearing and Hub Assembly Bolt	
• First Pass:	100 N.m (74 lb ft)
• Final Pass:	20 - 30 degrees

NOTE:

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

Application	Specification
	Metric (English)
Steering Knuckle Nut	
• First Pass:	100 N.m (74 lb ft)
• Final Pass:	45 - 60 degrees

ADHESIVES, FLUIDS, LUBRICANTS AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
Front Lower Control Arm Front Bolt	Thread Locking Adhesive	19369733	10953488
Steering Knuckle Bearing Pilot Bore	Grease	12345996	10953501

REPAIR INSTRUCTIONS

STABILIZER SHAFT REPLACEMENT (EQUINOX, TERRAIN, FWD, LYX)

Removal Procedure

CAUTION:

With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the wheels of the vehicle in the straight ahead position, LOCK the steering column.
2. Remove Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
3. Install Engine Support Fixture. Refer to [Engine Support Fixture](#).
4. Remove the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
5. Remove Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).

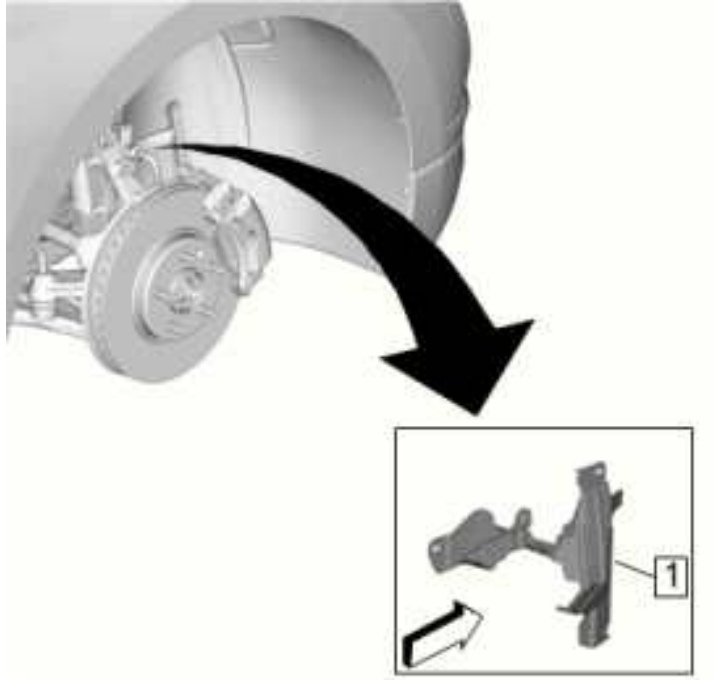


Fig. 1: Right Side Front Wheelhouse Splash Shield
Courtesy of GENERAL MOTORS COMPANY

6. Remove Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).

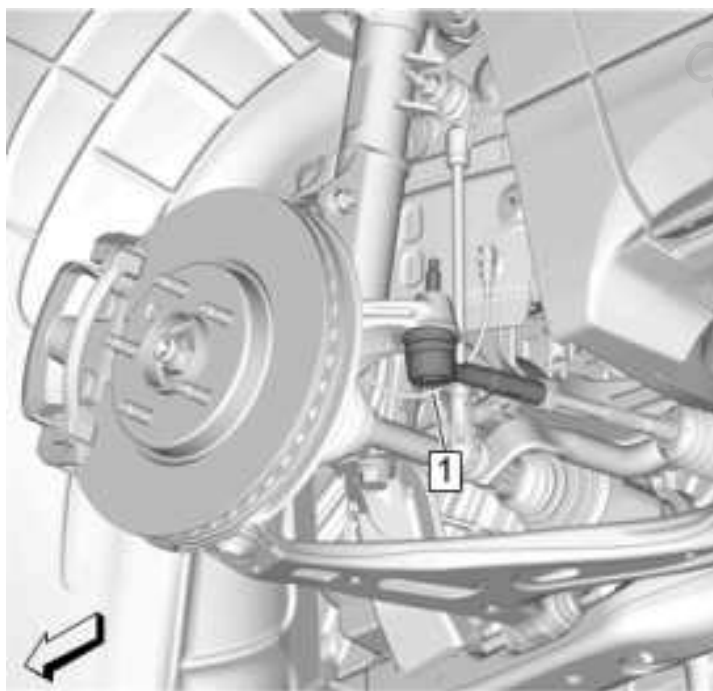


Fig. 2: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

7. Separate Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

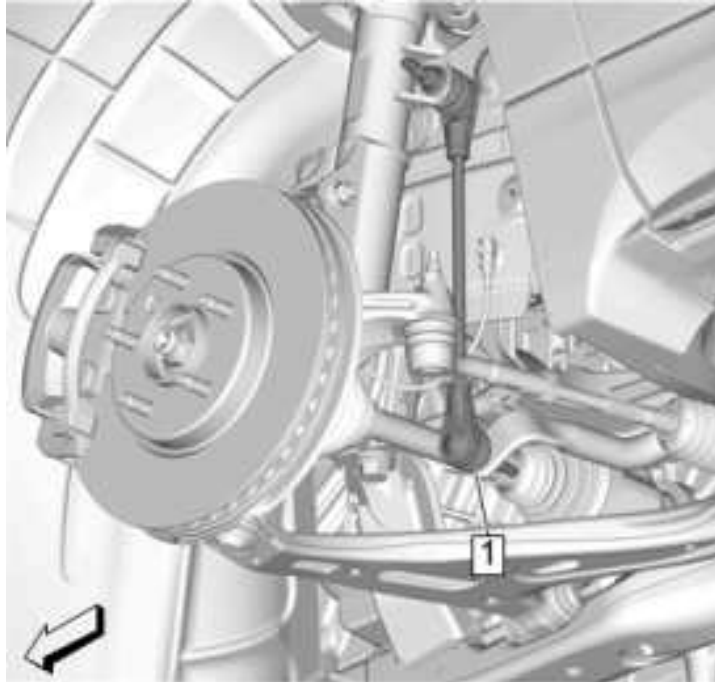


Fig. 3: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

8. Separate Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

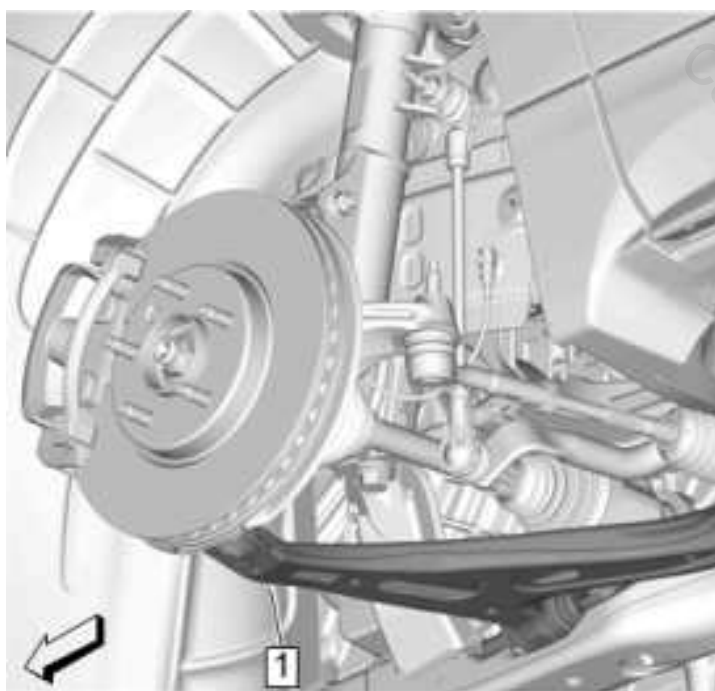


Fig. 4: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

9. Separate Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

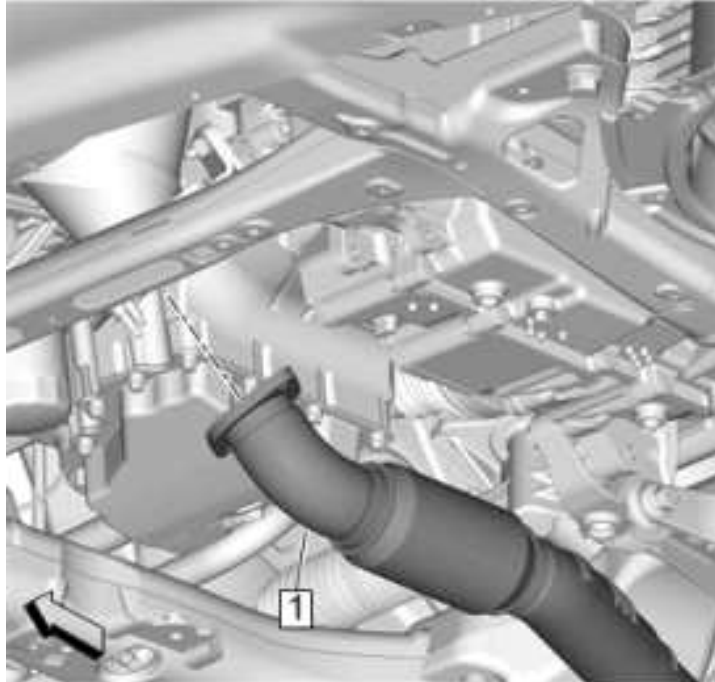


Fig. 5: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

10. Remove Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LYX\)](#)

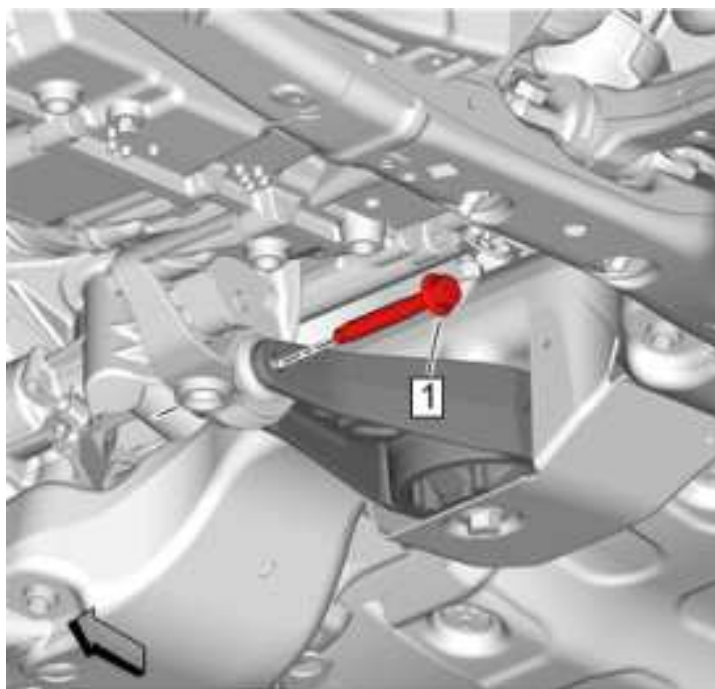


Fig. 6: Rear Transmission Mount Through Bolt

Courtesy of GENERAL MOTORS COMPANY

11. Remove Rear Transmission Mount Through Bolt (1). Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#)

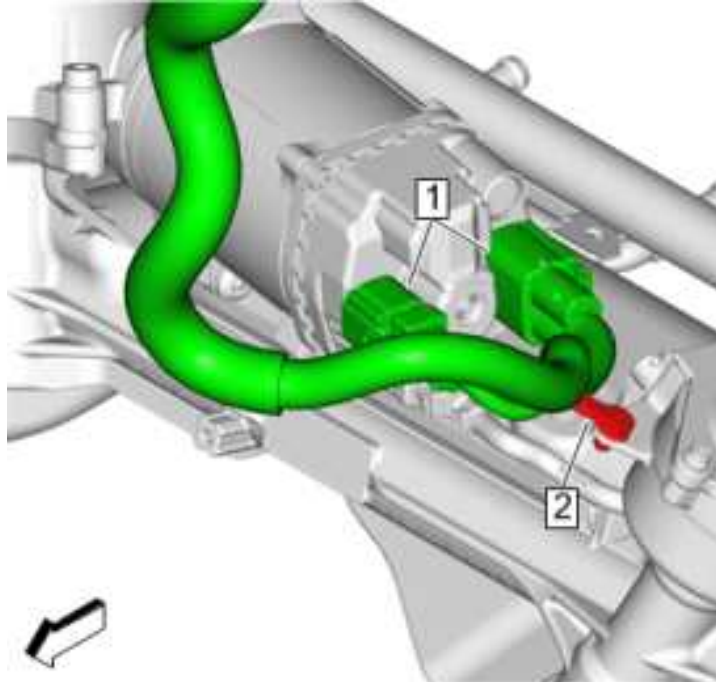


Fig. 7: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

12. Disconnect the steering gear electrical connectors (1).
13. Remove the steering gear wiring harness clip (2) from the mounting point on the steering gear.
14. Position adjustable stands underneath the left and right sides of the rear of the drivetrain and front suspension cradle.
15. Loosen the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#).
16. Remove the drivetrain and front suspension cradle middle bolts and rear bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#).
17. Partially lower the rear of the drivetrain and front suspension cradle to gain clearance for the front stabilizer shaft. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#).

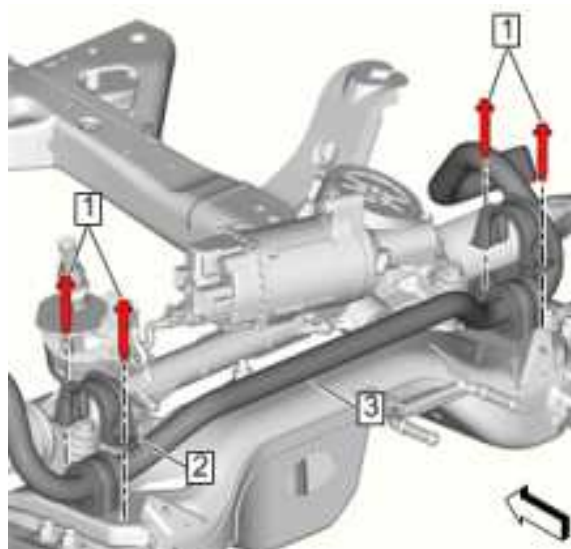


Fig. 8: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

18. Remove Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4)
19. Remove Front Stabilizer Shaft Clamps (2) (Qty: 2)
20. Remove the front stabilizer shaft (3) from the drivetrain and front suspension cradle.
21. Transfer components as necessary.

Installation Procedure

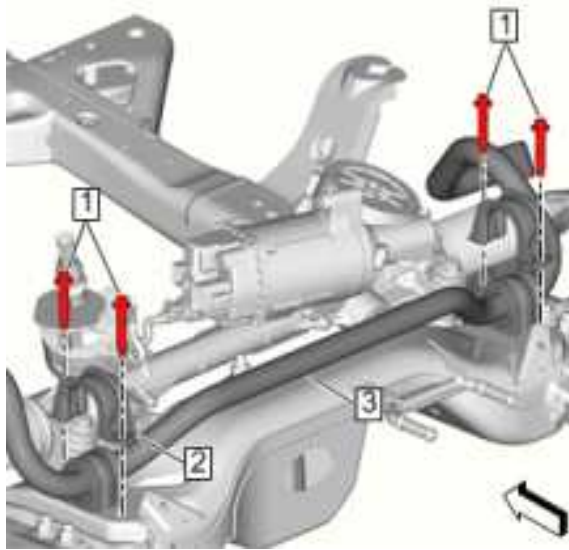


Fig. 9: Front Stabilizer Shaft, Clamps And Bolts

Courtesy of GENERAL MOTORS COMPANY

1. Position the front stabilizer shaft (3) on the drivetrain and front suspension cradle.
2. Install Front Stabilizer Shaft Clamps (2) (Qty: 2)

CAUTION: Refer to **Fastener Caution** .

3. Install and tighten Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4) to 58 N.m (43 lb ft)
4. Raise the rear of the drivetrain and front suspension cradle. Refer to **Drivetrain and Front Suspension Cradle Replacement (Front Wheel Drive)**.
5. Install and tighten the drivetrain and front suspension cradle rear bolts and middle bolts. Refer to **Drivetrain and Front Suspension Cradle Replacement (Front Wheel Drive)**.
6. Tighten the drivetrain and front suspension cradle front bolts. Refer to **Drivetrain and Front Suspension Cradle Replacement (Front Wheel Drive)**.
7. Remove the adjustable stands from underneath the vehicle.

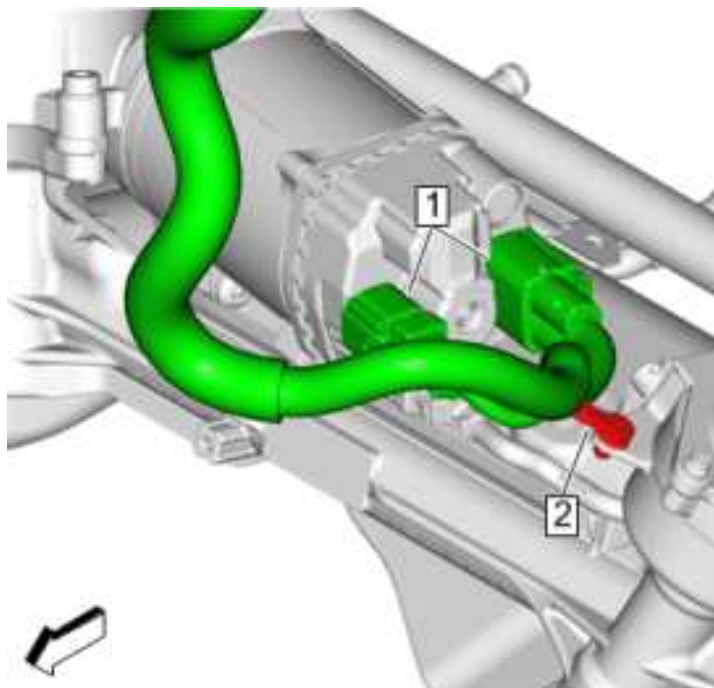


Fig. 10: Steering Gear Electrical Connectors And Wiring Harness Clip

Courtesy of GENERAL MOTORS COMPANY

8. Connect the steering gear electrical connectors (1).
9. Install the steering gear wiring harness clip (2) in the mounting point on the steering gear.

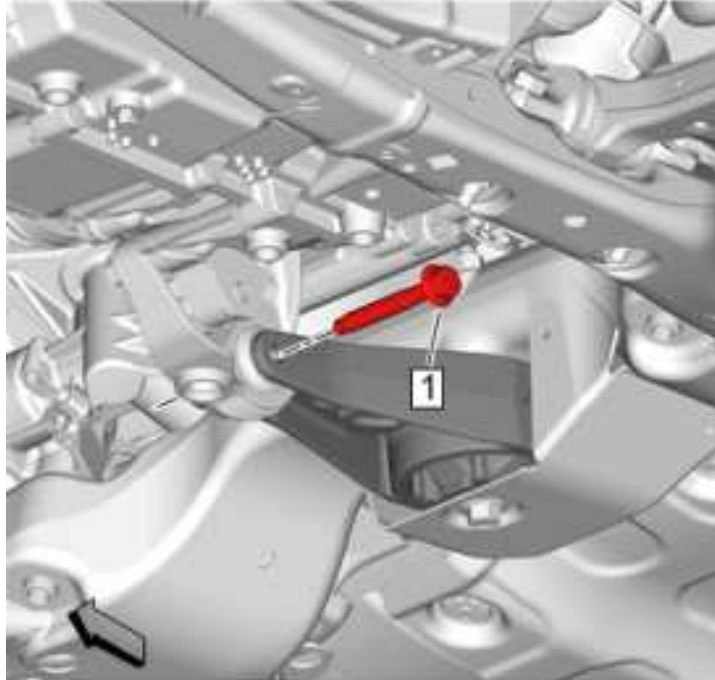


Fig. 11: Rear Transmission Mount Through Bolt
Courtesy of GENERAL MOTORS COMPANY

10. Install Rear Transmission Mount Through Bolt (1). Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#).

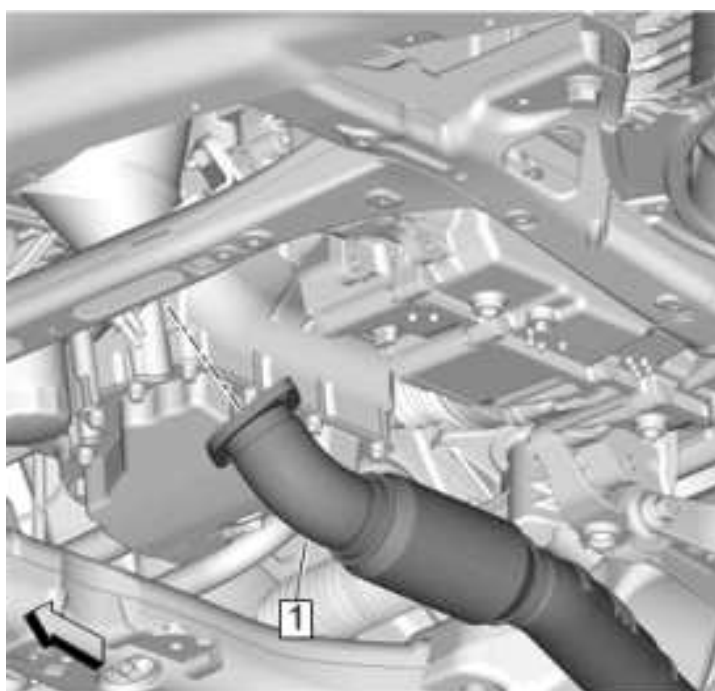


Fig. 12: Exhaust Front Pipe
Courtesy of GENERAL MOTORS COMPANY

11. Install Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LYX\)](#).

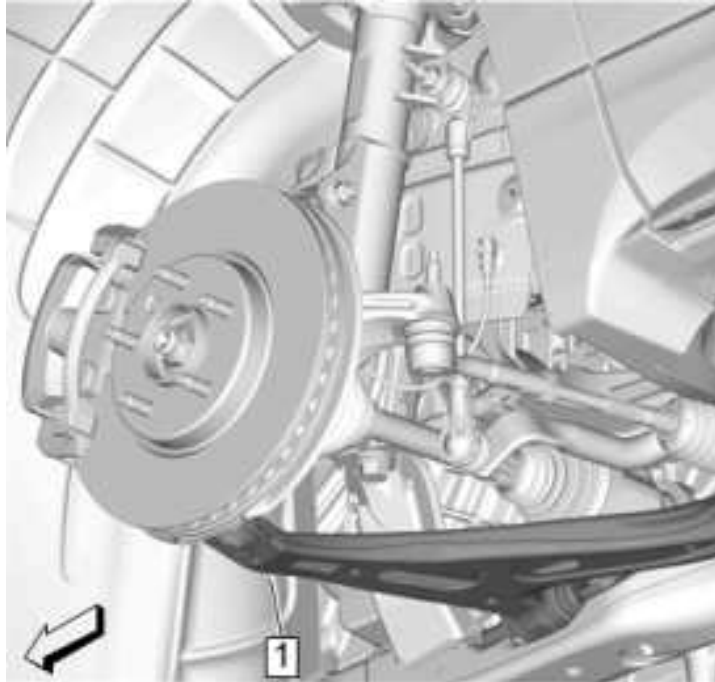


Fig. 13: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

12. Install Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

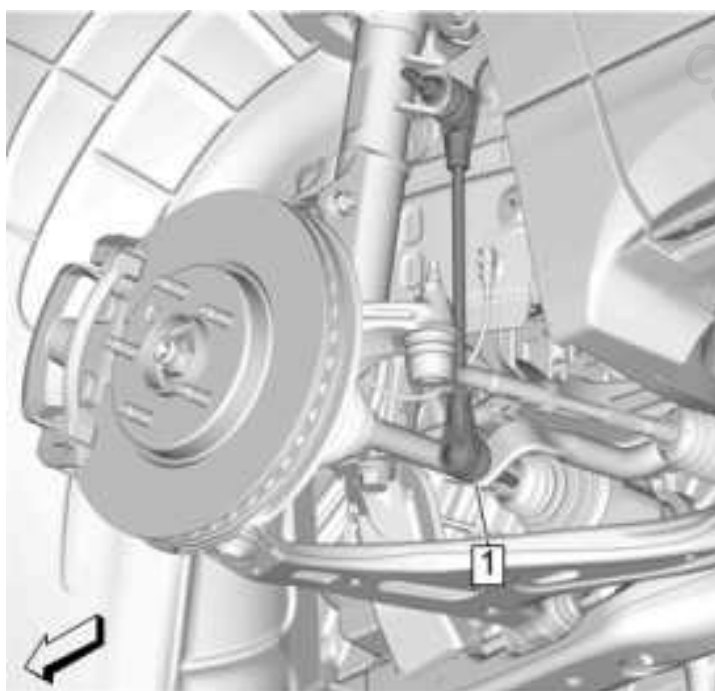


Fig. 14: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

13. Install Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

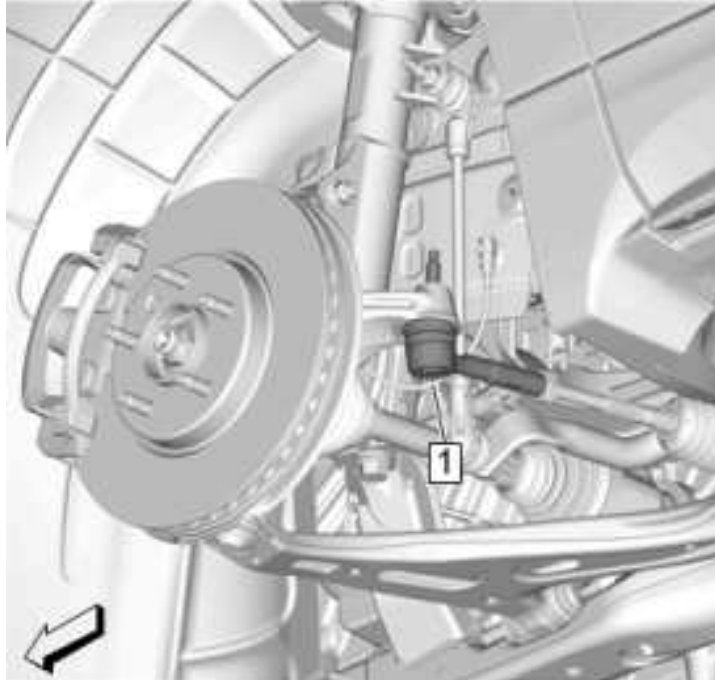


Fig. 15: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

14. Install Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

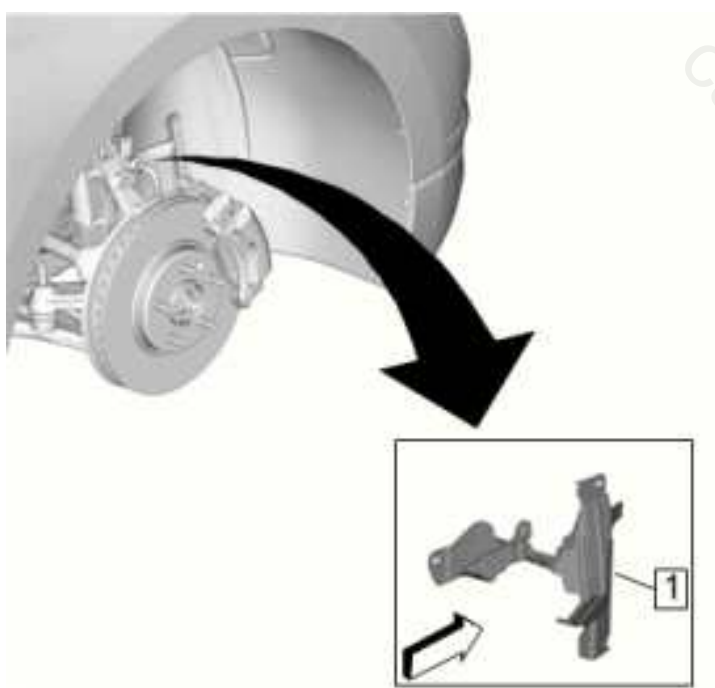


Fig. 16: Right Side Front Wheelhouse Splash Shield
Courtesy of GENERAL MOTORS COMPANY

15. Install Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).
16. Install Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).
17. Install the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
18. Lower the vehicle.
19. Remove Engine Support Fixture. Refer to [Engine Support Fixture](#)
20. Install Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
21. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

CAUTION:

With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the wheels of the vehicle in the straight ahead position, LOCK the steering column.
2. Remove Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#), [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
3. Install Engine Support Fixture. Refer to [Engine Support Fixture](#)
4. Remove the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
5. Remove Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#), [Underbody Front Air Deflector Replacement \(Terrain\)](#).

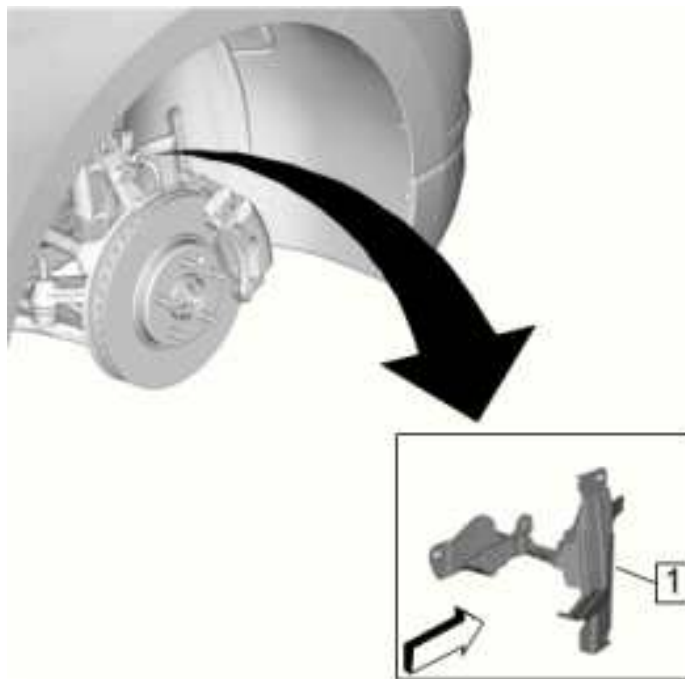


Fig. 17: Right Side Front Wheelhouse Splash Shield

Courtesy of GENERAL MOTORS COMPANY

6. Remove Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#), [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).

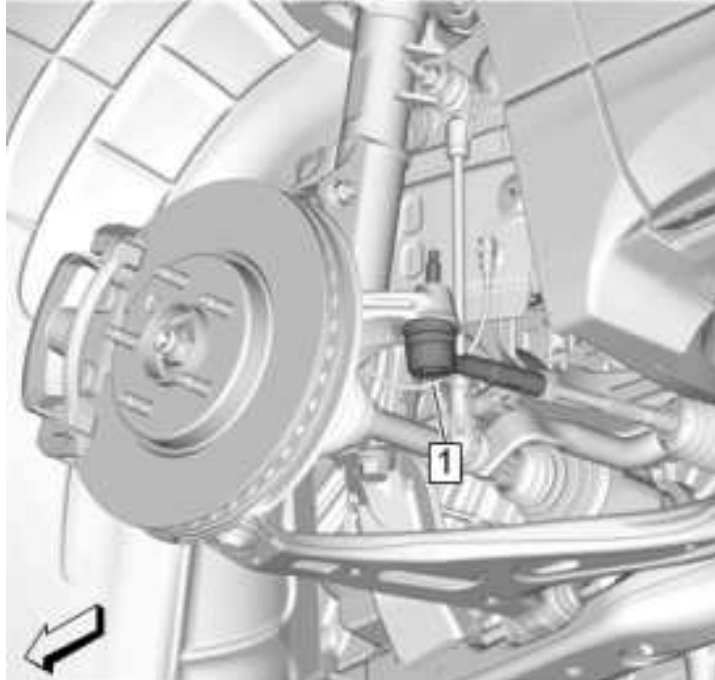


Fig. 18: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

7. Separate Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

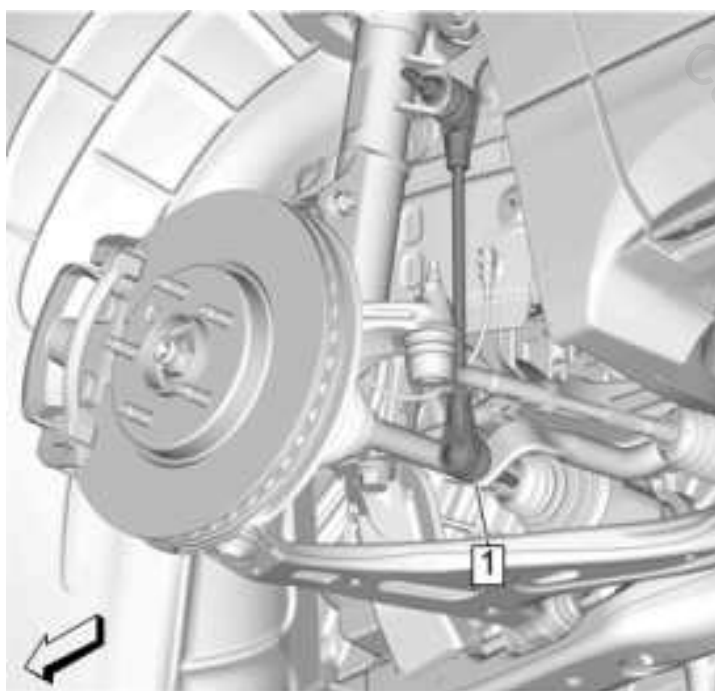


Fig. 19: Front Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

8. Separate Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#)

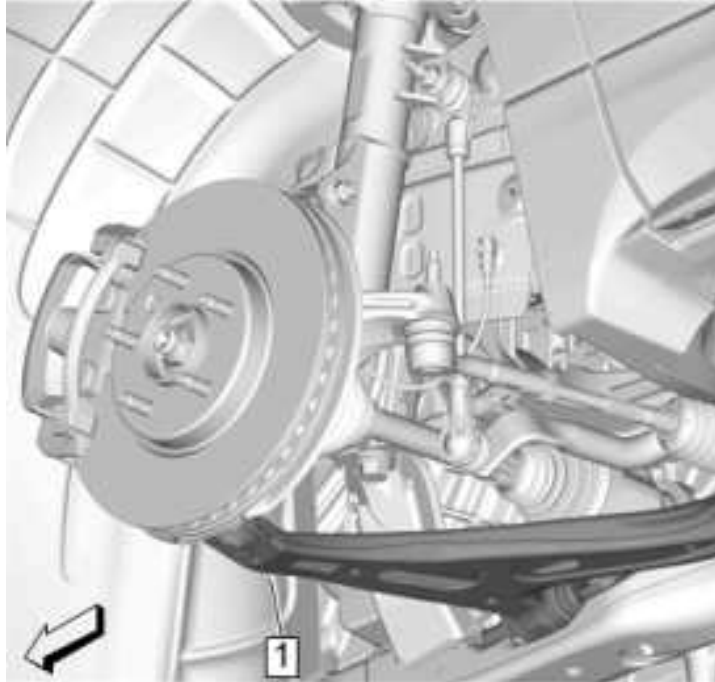


Fig. 20: Front Lower Control Arm
 Courtesy of GENERAL MOTORS COMPANY

9. Separate Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

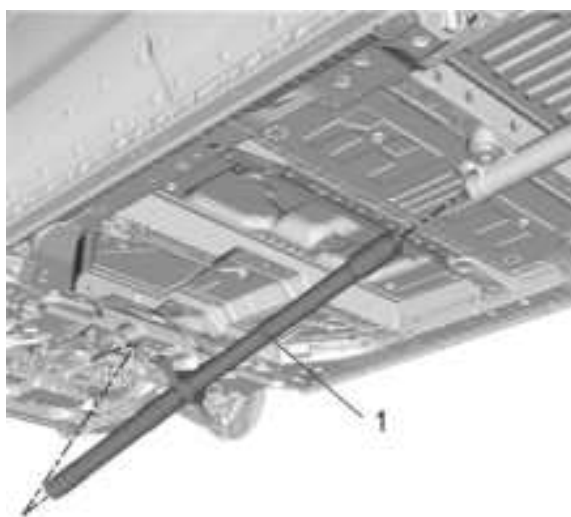


Fig. 21: Propeller Shaft
 Courtesy of GENERAL MOTORS COMPANY

10. Remove Two-Piece Propeller Shaft (1). Refer to [Two-Piece Propeller Shaft Replacement](#)

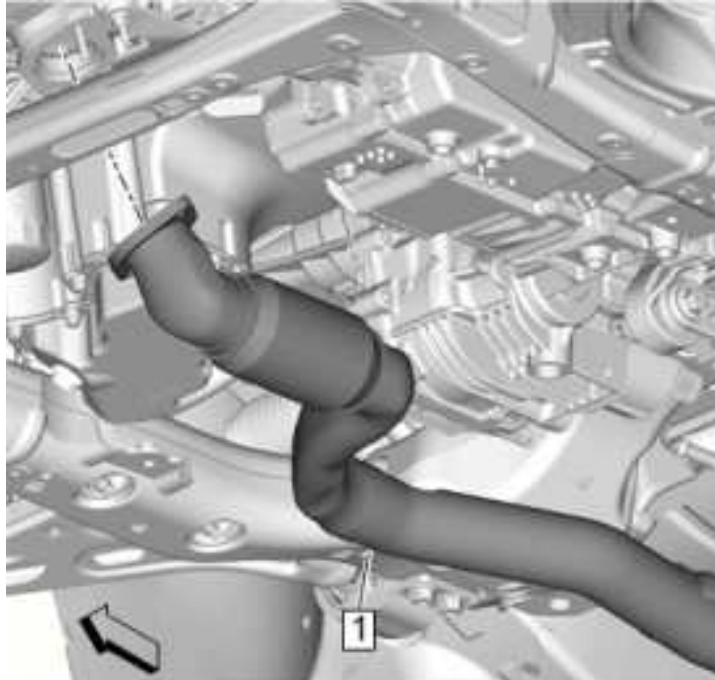


Fig. 22: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

11. Remove Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LYX\)](#)

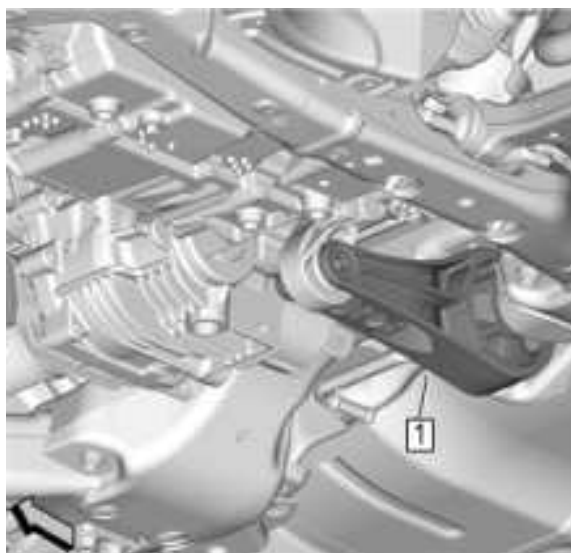


Fig. 23: Transmission Mount Strut

Courtesy of GENERAL MOTORS COMPANY

12. Remove Transmission Mount Strut (1). Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#)

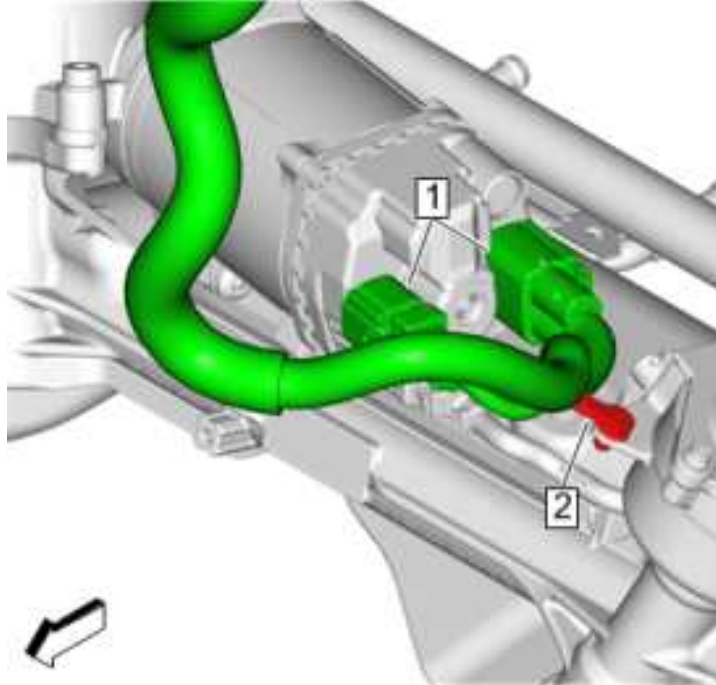


Fig. 24: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

13. Disconnect the steering gear electrical connectors (1).
14. Remove the steering gear wiring harness clip (2) from the mounting point on the steering gear.
15. Position adjustable stands underneath the left and right sides of the rear of the drivetrain and front suspension cradle.
16. Loosen the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
17. Remove the drivetrain and front suspension cradle middle bolts and rear bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
18. Partially lower the rear of the drivetrain and front suspension cradle to gain clearance for the front stabilizer shaft. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).

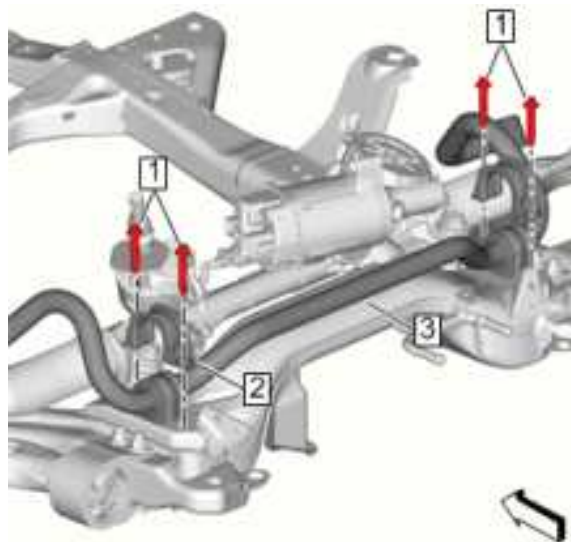


Fig. 25: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

19. Remove Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4)
20. Remove Front Stabilizer Shaft Clamps (2) (Qty: 2)
21. Remove the front stabilizer shaft (3) from the drivetrain and front suspension cradle.
22. Transfer components as necessary.

Installation Procedure

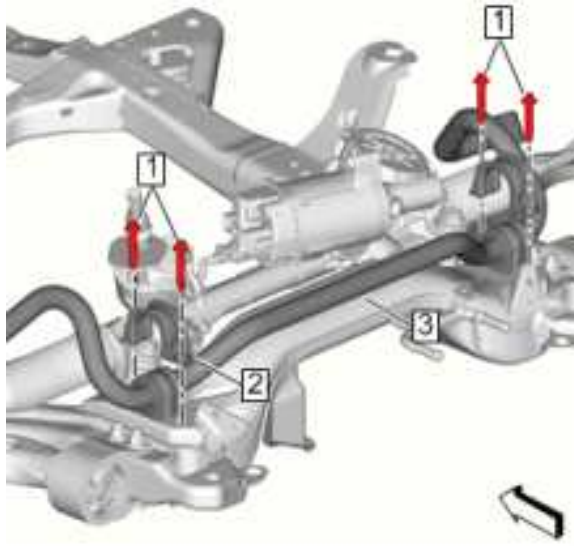


Fig. 26: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

1. Position the front stabilizer shaft (3) on the drivetrain and front suspension cradle.
2. Install Front Stabilizer Shaft Clamps (2) (Qty: 2)

CAUTION: Refer to [Fastener Caution](#) .

3. Install and tighten Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4) to 58 N.m (43 lb ft)
4. Raise the rear of the drivetrain and front suspension cradle. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
5. Install and tighten the drivetrain and front suspension cradle rear bolts and middle bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
6. Tighten the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
7. Remove the adjustable stands from underneath the vehicle.

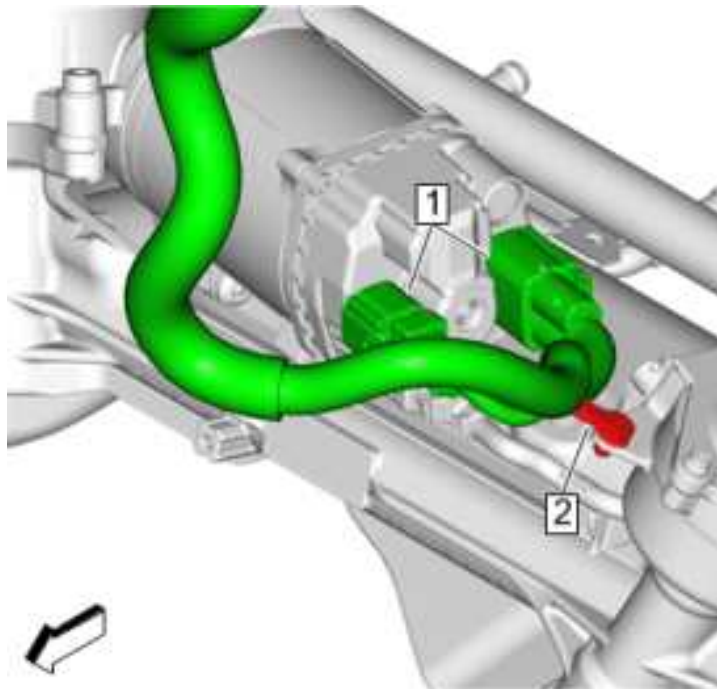


Fig. 27: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

8. Connect the steering gear electrical connectors (1).
9. Install the steering gear wiring harness clip (2) in the mounting point on the steering gear.

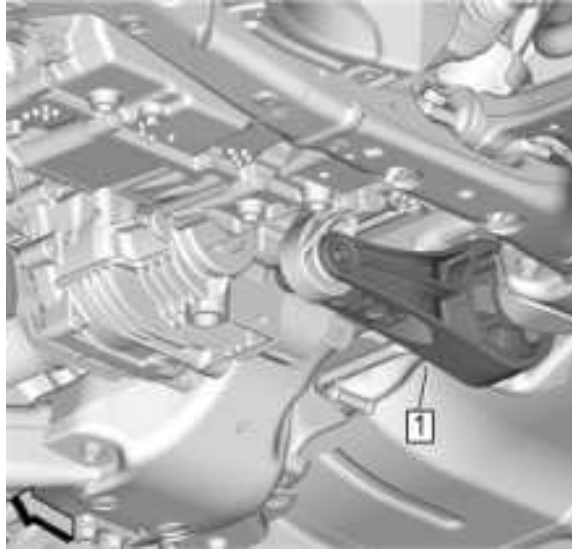


Fig. 28: Transmission Mount Strut
Courtesy of GENERAL MOTORS COMPANY

10. Install Transmission Mount Strut (1). Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#).

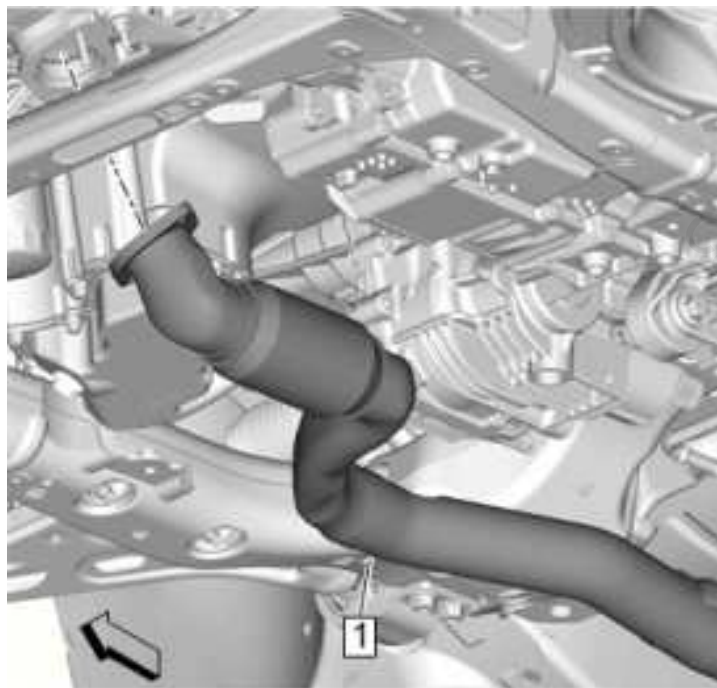
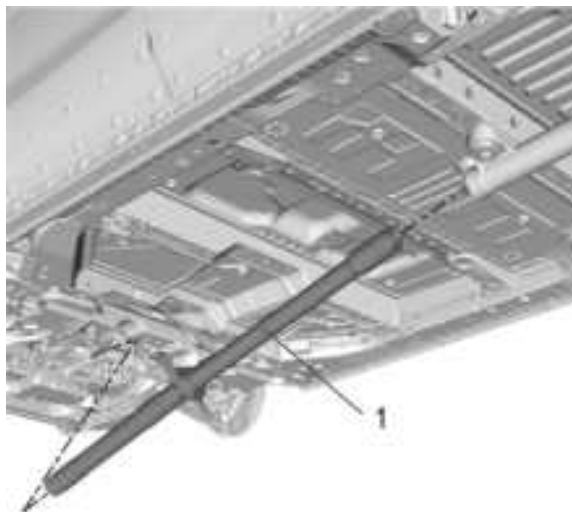


Fig. 29: Exhaust Front Pipe
Courtesy of GENERAL MOTORS COMPANY

11. Install Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LYX\)](#).



12. Install Two-Piece Propeller Shaft (1). Refer to [Two-Piece Propeller Shaft Replacement](#)

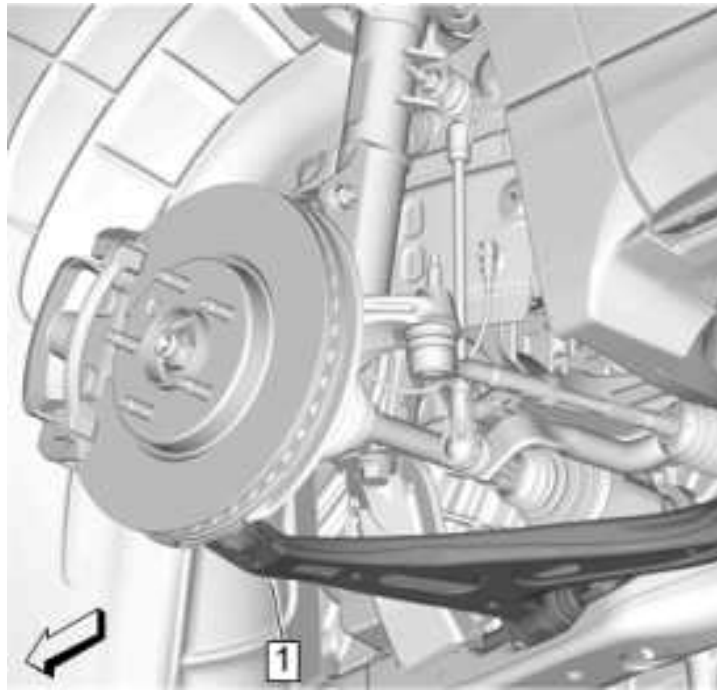


Fig. 31: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

13. Install Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#)

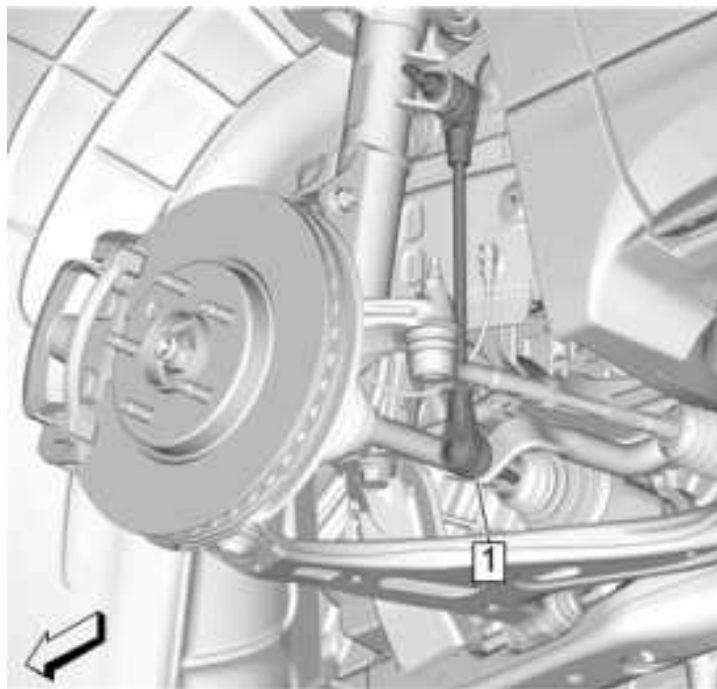


Fig. 32: Front Stabilizer Shaft Link
Courtesy of GENERAL MOTORS COMPANY

14. Install Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#)

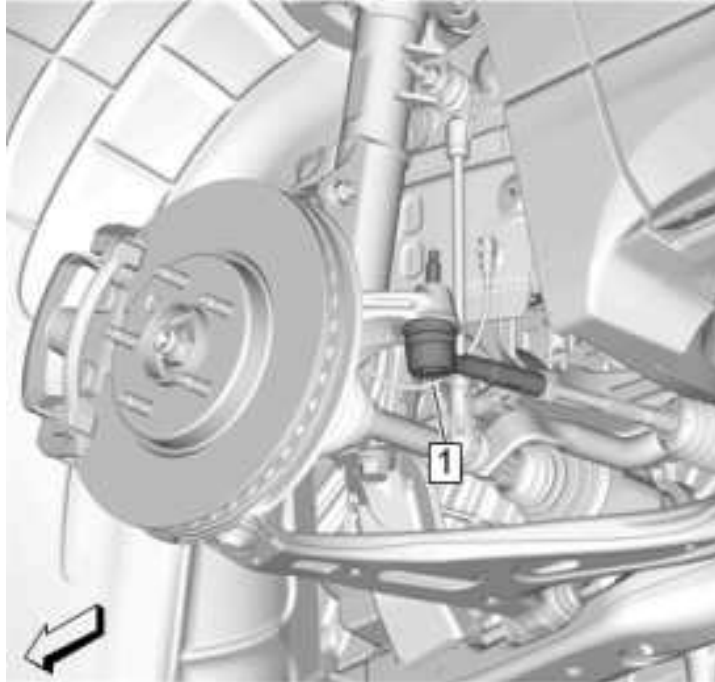


Fig. 33: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

15. Install Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

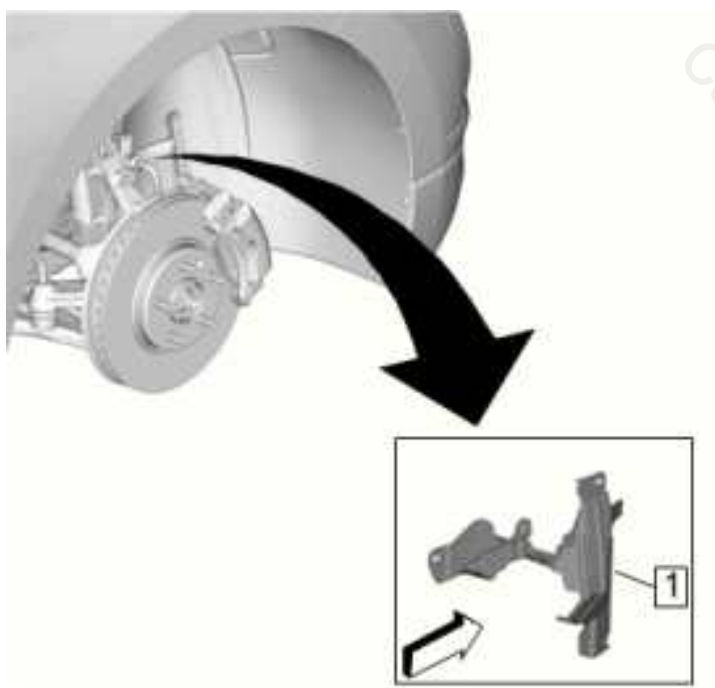


Fig. 34: Right Side Front Wheelhouse Splash Shield
Courtesy of GENERAL MOTORS COMPANY

16. Install Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).
17. Install Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).
18. Install the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
19. Lower the vehicle.
20. Remove Engine Support Fixture. Refer to [Engine Support Fixture](#)
21. Install Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
22. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

CAUTION:

With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the wheels of the vehicle in the straight ahead position, LOCK the steering column.
2. Remove Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
3. Install Engine Support Fixture. Refer to [Engine Support Fixture](#)
4. Remove the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
5. Remove Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).

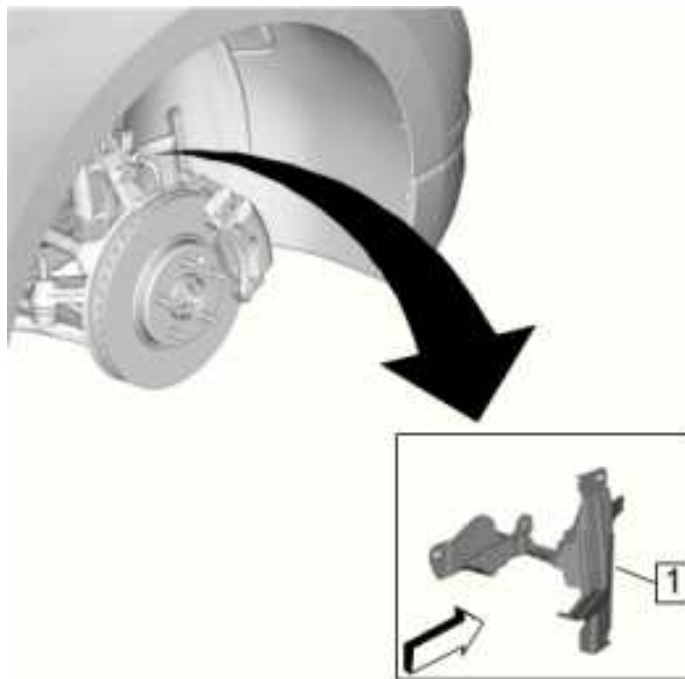


Fig. 35: Right Side Front Wheelhouse Splash Shield

Courtesy of GENERAL MOTORS COMPANY

6. Remove Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).

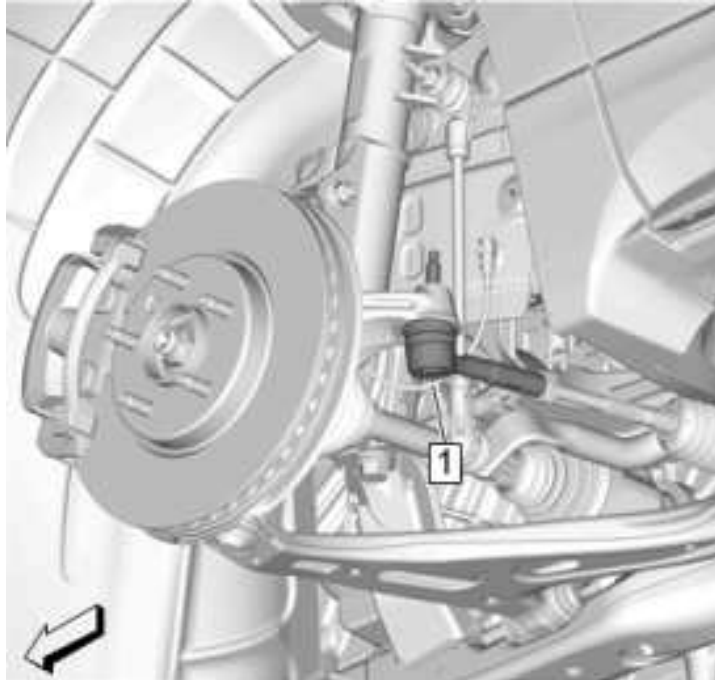


Fig. 36: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

7. Separate Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

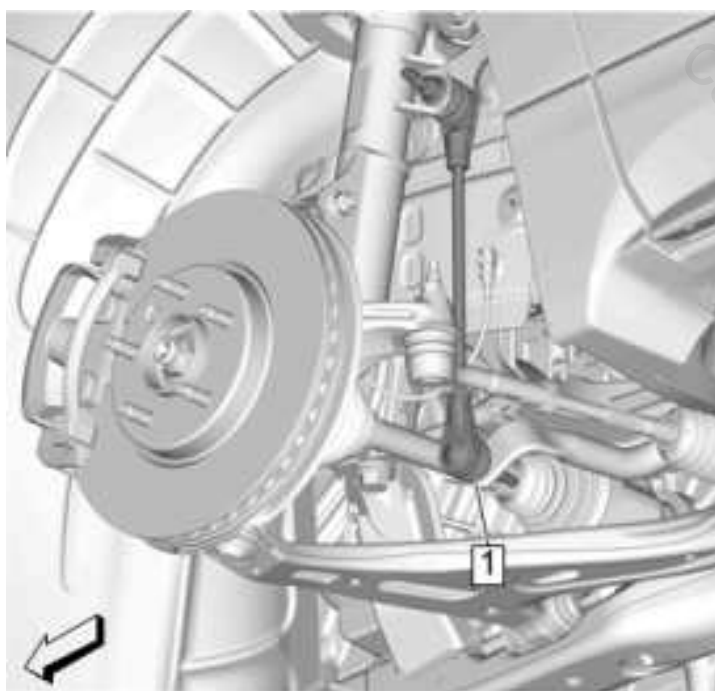


Fig. 37: Front Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

8. Separate Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#)

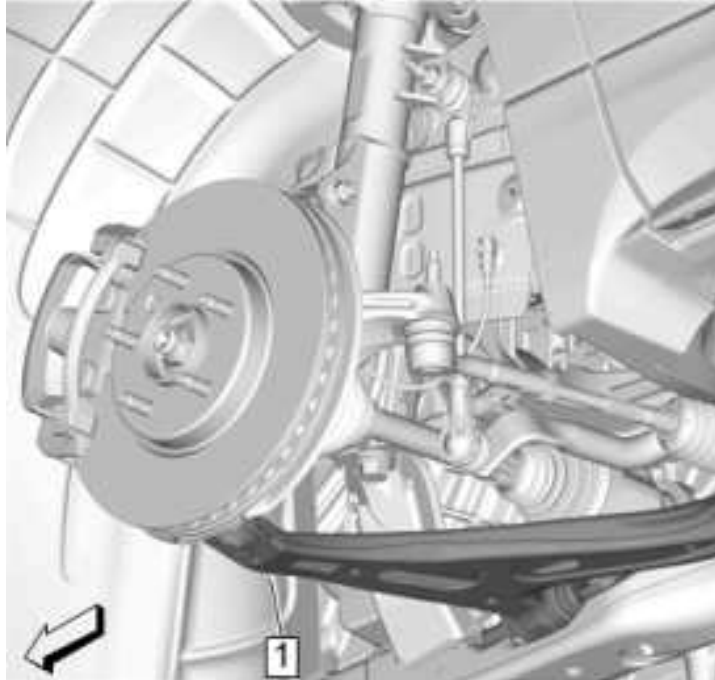


Fig. 38: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

9. Separate Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#) [Lower Control Arm Replacement \(Terrain\)](#).

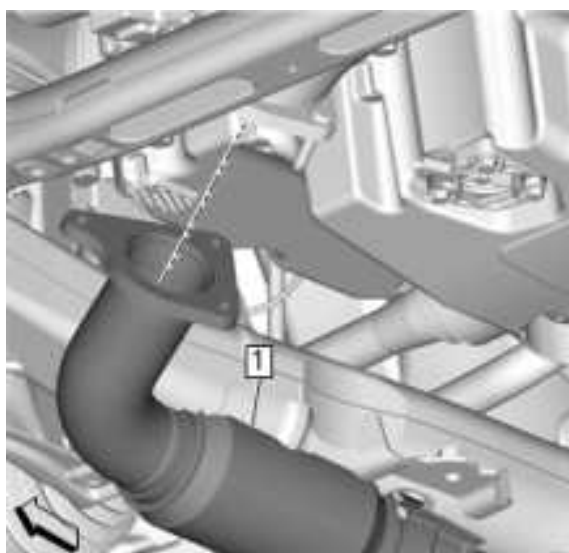
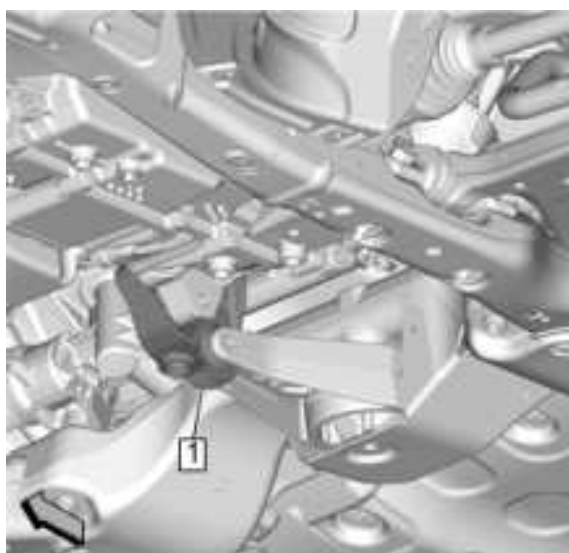


Fig. 39: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

10. Remove Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LH7\)](#).



11. Remove Transmission Mount Strut Bracket (1). Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#)

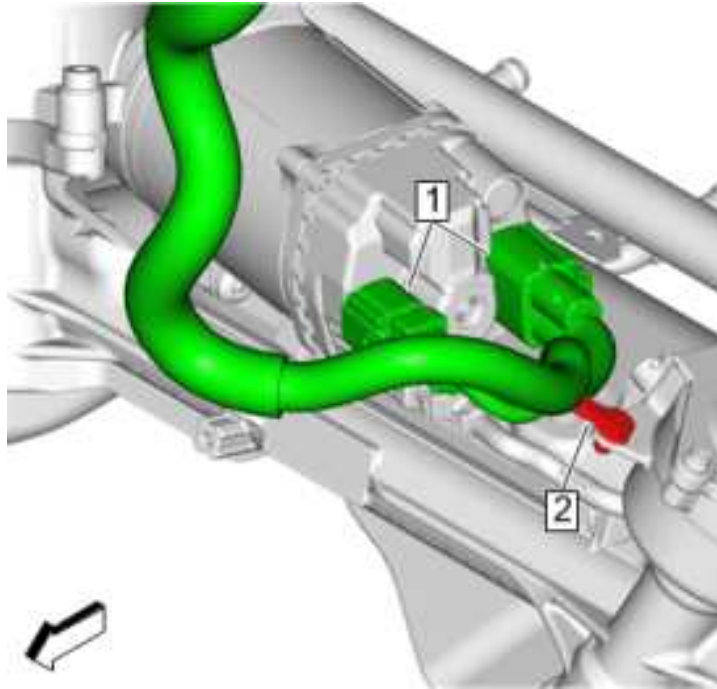


Fig. 41: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

12. Disconnect the steering gear electrical connectors (1).
13. Remove the steering gear wiring harness clip (2) from the mounting point on the steering gear.
14. Position adjustable stands underneath the left and right sides of the rear of the drivetrain and front suspension cradle.
15. Loosen the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#)
16. Remove the drivetrain and front suspension cradle middle bolts and rear bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#)
17. Partially lower the rear of the drivetrain and front suspension cradle to gain clearance for the front stabilizer shaft. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#)

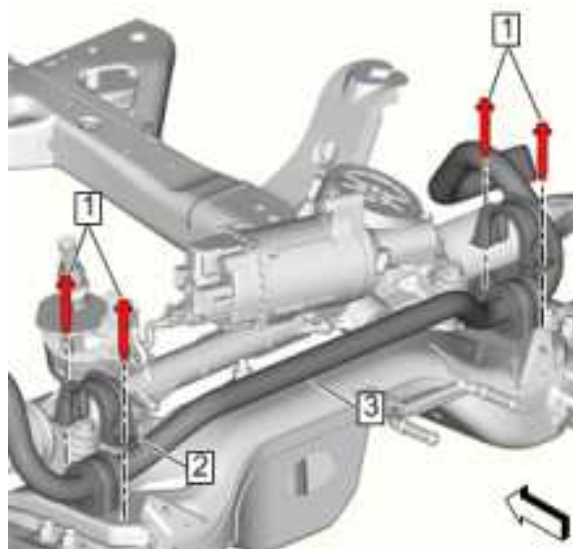


Fig. 42: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

18. Remove Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4)
19. Remove Front Stabilizer Shaft Clamps (2) (Qty: 2)

20. Remove the front stabilizer shaft (3) from the drivetrain and front suspension cradle.
21. Transfer components as necessary.

Installation Procedure

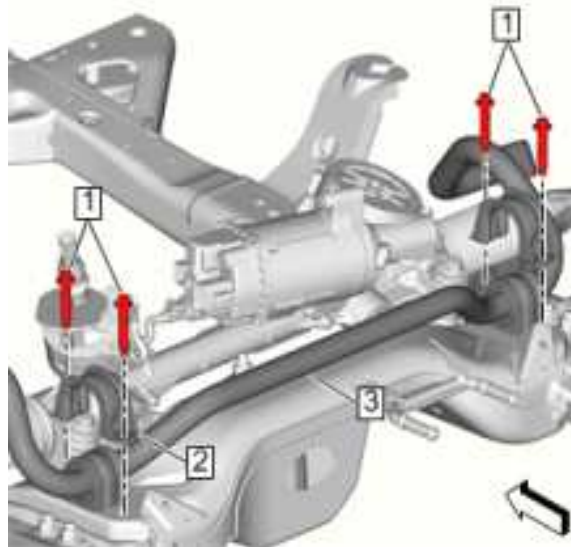


Fig. 43: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

1. Position the front stabilizer shaft (3) on the drivetrain and front suspension cradle.
2. Install Front Stabilizer Shaft Clamps (2) (Qty: 2)

CAUTION: Refer to **Fastener Caution** .

3. Install and tighten Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4) to 58 N.m (43 lb ft)
4. Raise the rear of the drivetrain and front suspension cradle. Refer to **Drivetrain and Front Suspension Cradle Replacement (Front Wheel Drive)**.
5. Install and tighten the drivetrain and front suspension cradle rear bolts and middle bolts. Refer to **Drivetrain and Front Suspension Cradle Replacement (Front Wheel Drive)**.
6. Tighten the drivetrain and front suspension cradle front bolts. Refer to **Drivetrain and Front Suspension Cradle Replacement (Front Wheel Drive)**.
7. Remove the adjustable stands from underneath the vehicle.

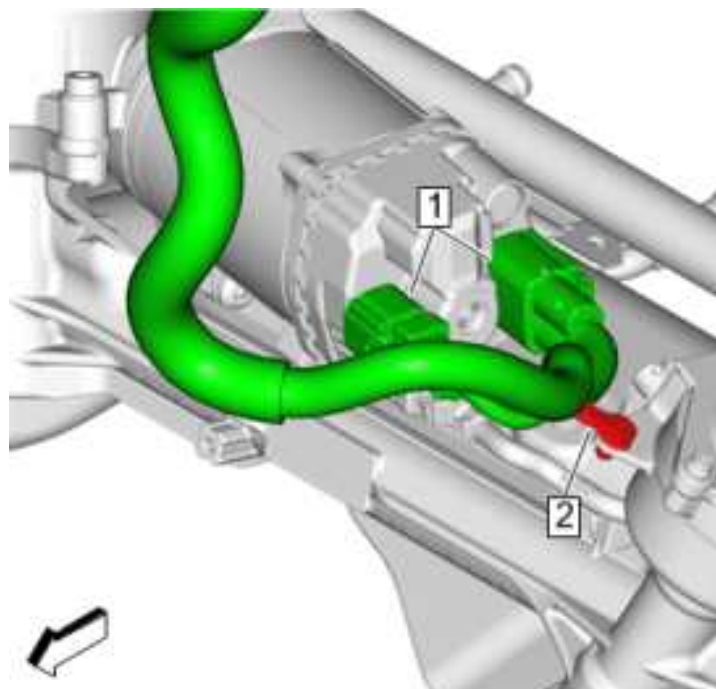


Fig. 44: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

8. Connect the steering gear electrical connectors (1).
9. Install the steering gear wiring harness clip (2) in the mounting point on the steering gear.

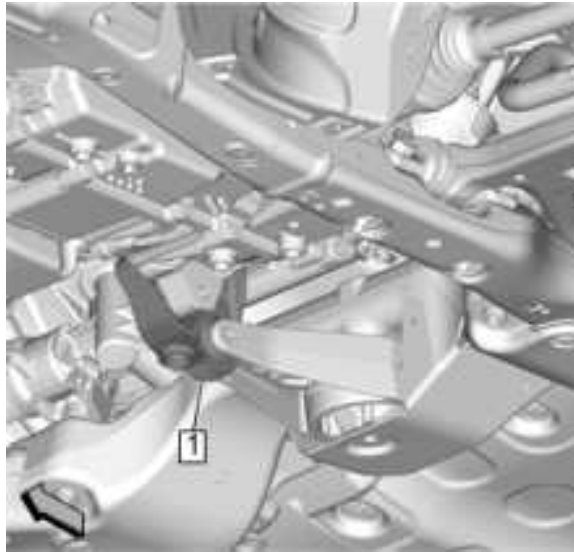


Fig. 45: Transmission Mount Strut Bracket
Courtesy of GENERAL MOTORS COMPANY

10. Install Transmission Mount Strut Bracket (1). Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#)

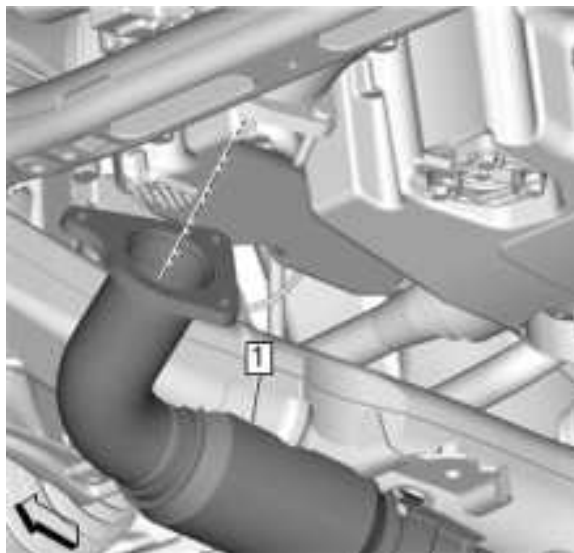


Fig. 46: Exhaust Front Pipe
Courtesy of GENERAL MOTORS COMPANY

11. Install Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LH7\)](#)

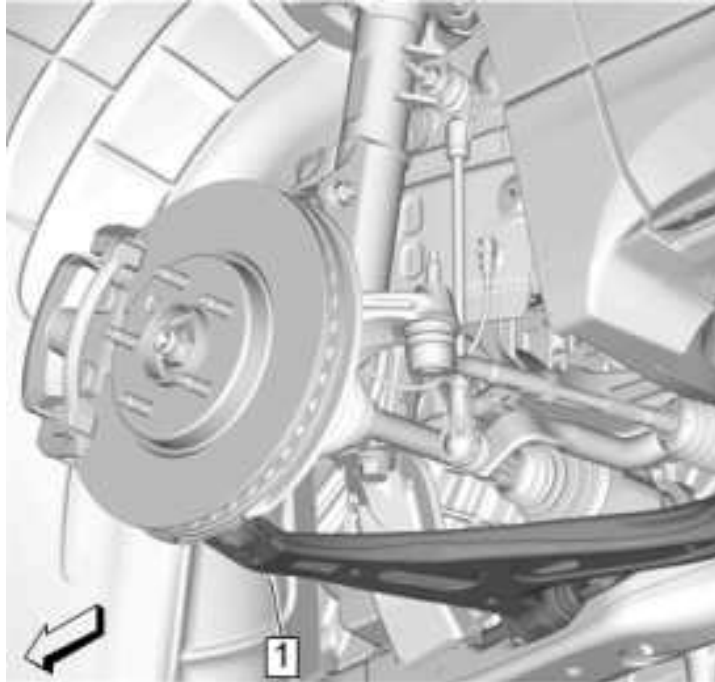


Fig. 47: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

12. Install Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

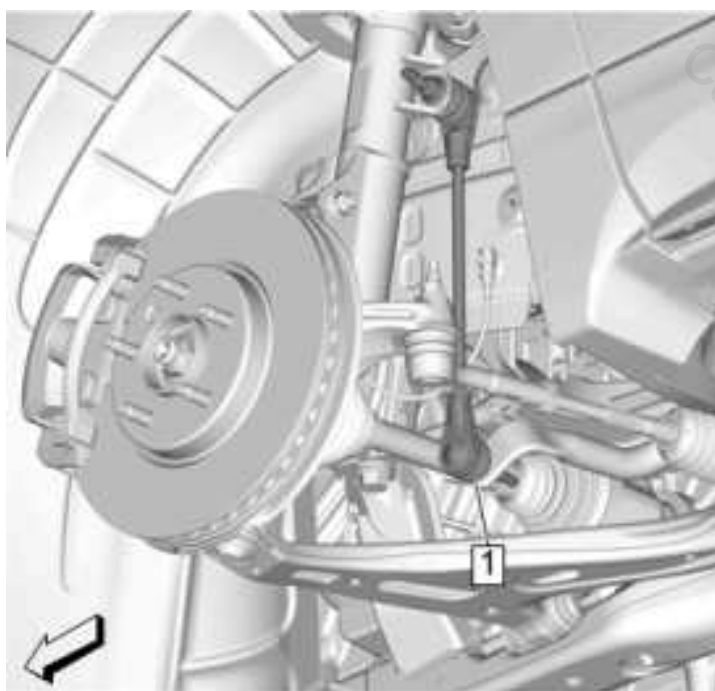


Fig. 48: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

13. Install Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

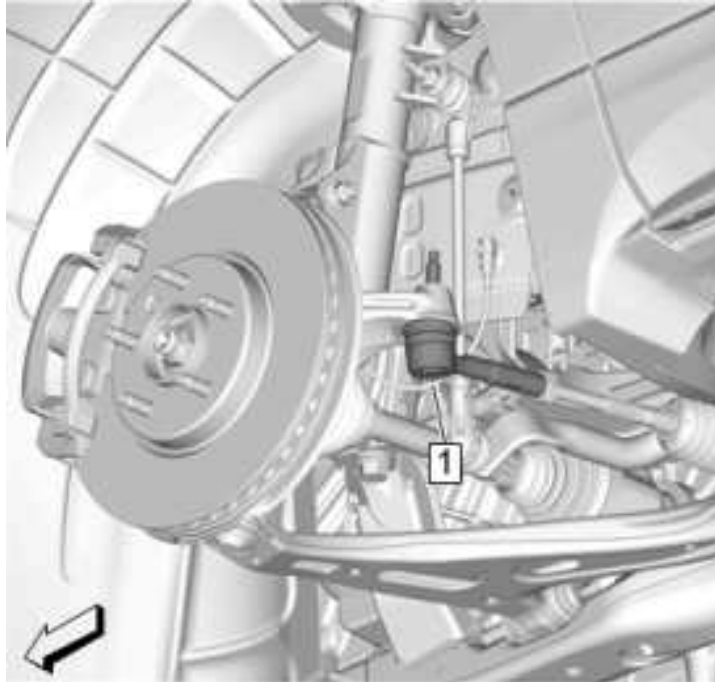


Fig. 49: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

14. Install Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

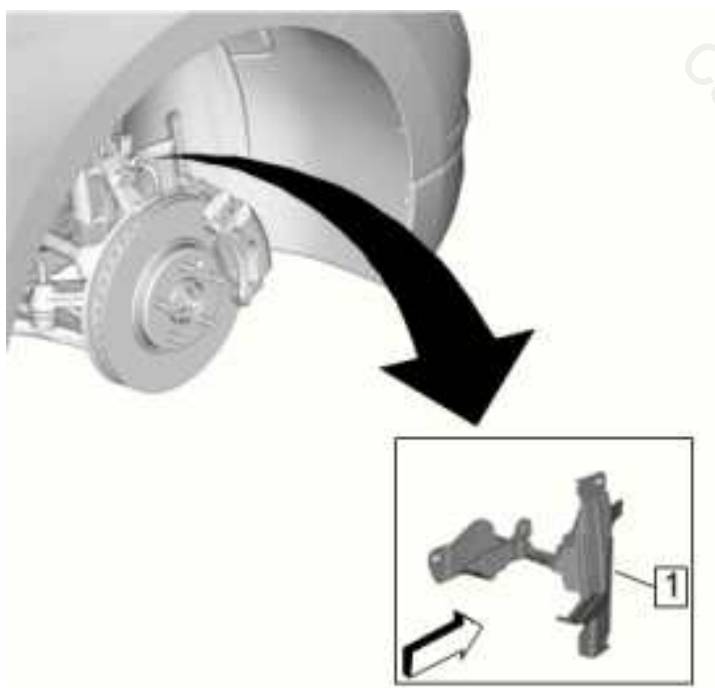


Fig. 50: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

15. Install Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).
16. Install Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).
17. Install the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
18. Lower the vehicle.
19. Remove Engine Support Fixture. Refer to [Engine Support Fixture](#)
20. Install Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
21. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

CAUTION:

With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the wheels of the vehicle in the straight ahead position, LOCK the steering column.
2. Remove Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
3. Install Engine Support Fixture. Refer to [Engine Support Fixture](#)
4. Remove the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
5. Remove Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).

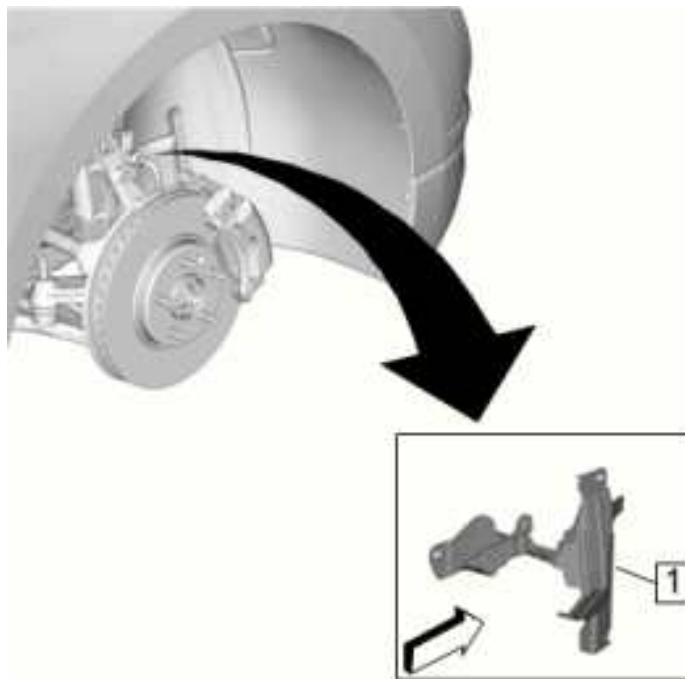


Fig. 51: Right Side Front Wheelhouse Splash Shield

Courtesy of GENERAL MOTORS COMPANY

6. Remove Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).

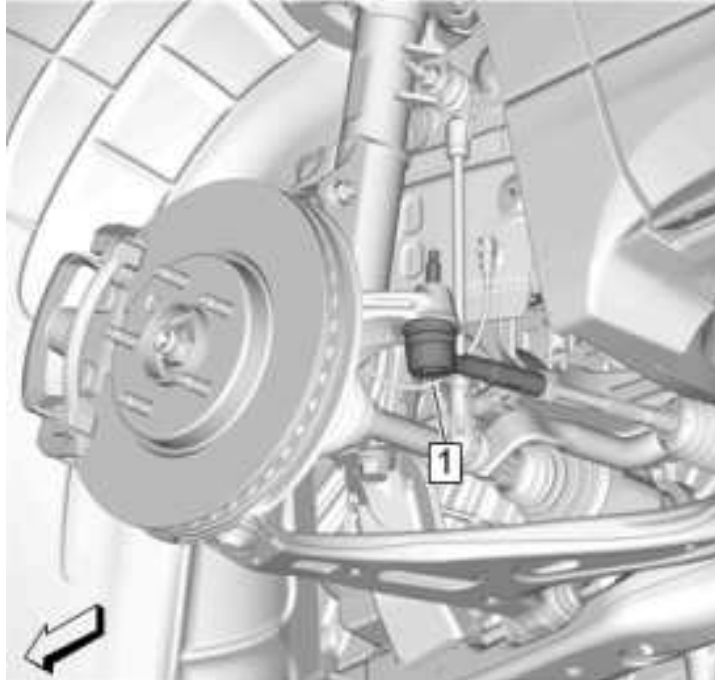


Fig. 52: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

7. Separate Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

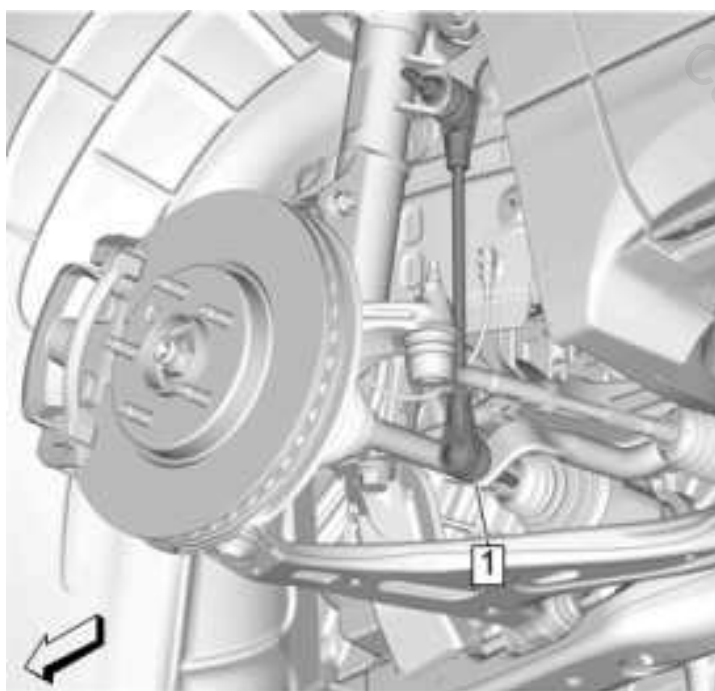


Fig. 53: Front Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

8. Separate Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#)

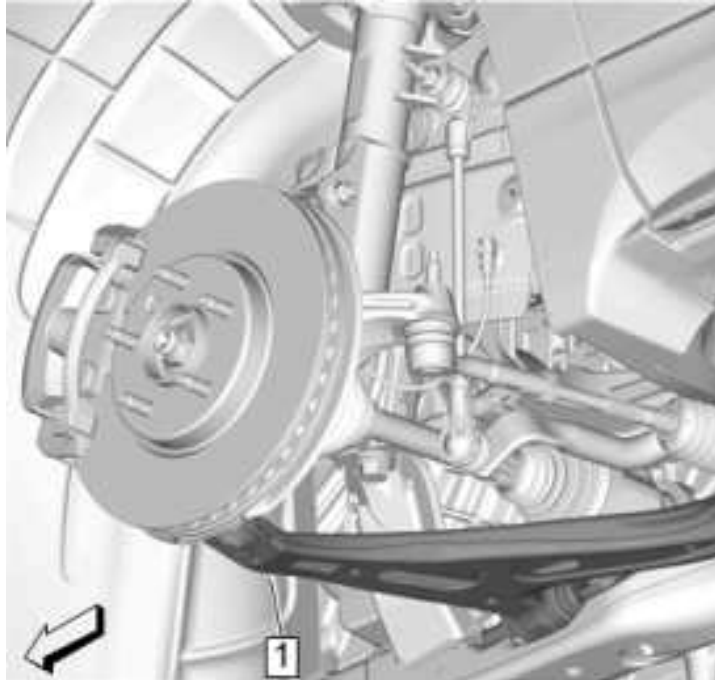


Fig. 54: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

9. Separate Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

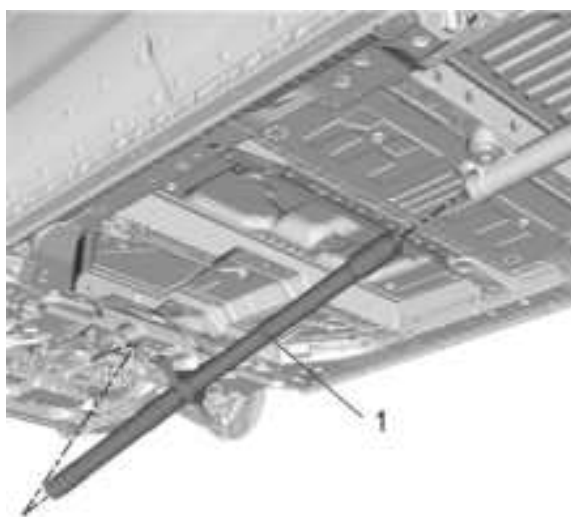


Fig. 55: Propeller Shaft

Courtesy of GENERAL MOTORS COMPANY

10. Remove Two-Piece Propeller Shaft (1). Refer to [Two-Piece Propeller Shaft Replacement](#)



11. Remove Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LH7\)](#).

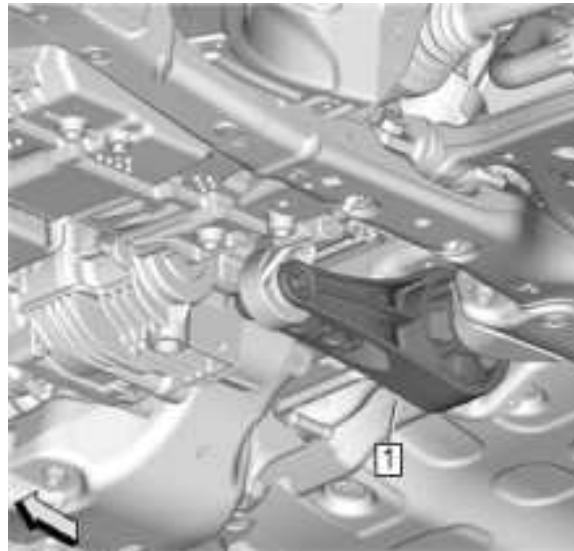


Fig. 57: Transmission Mount Strut
Courtesy of GENERAL MOTORS COMPANY

12. Remove Transmission Mount Strut (1). Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#).

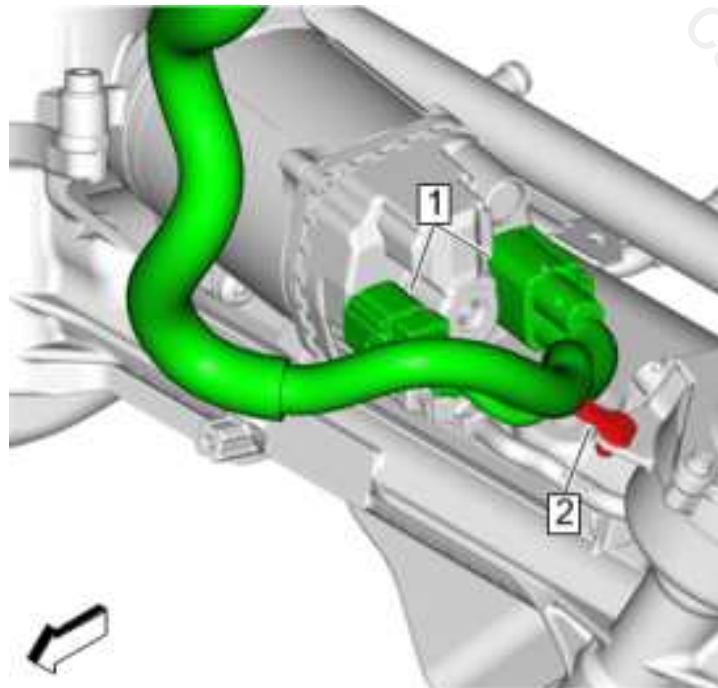


Fig. 58: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

13. Disconnect the steering gear electrical connectors (1).
14. Remove the steering gear wiring harness clip (2) from the mounting point on the steering gear.
15. Position adjustable stands underneath the left and right sides of the rear of the drivetrain and front suspension cradle.
16. Loosen the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
17. Remove the drivetrain and front suspension cradle middle bolts and rear bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
18. Partially lower the rear of the drivetrain and front suspension cradle to gain clearance for the front stabilizer shaft. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).

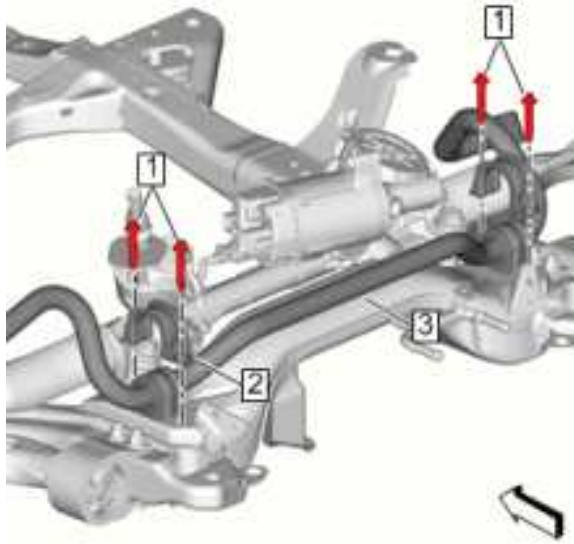


Fig. 59: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

19. Remove Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4)
20. Remove Front Stabilizer Shaft Clamps (2) (Qty: 2)
21. Remove the front stabilizer shaft (3) from the drivetrain and front suspension cradle.
22. Transfer components as necessary.

Installation Procedure

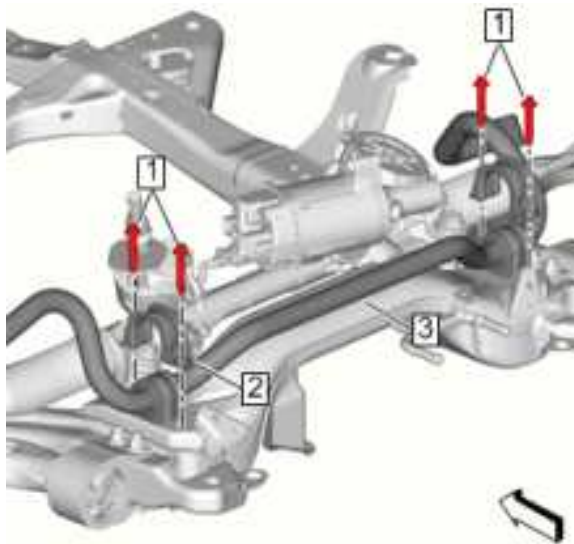


Fig. 60: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

1. Position the front stabilizer shaft (3) on the drivetrain and front suspension cradle.
2. Install Front Stabilizer Shaft Clamps (2) (Qty: 2)

CAUTION: Refer to [Fastener Caution](#) .

3. Install and tighten Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4) to 58 N.m (43 lb ft)
4. Raise the rear of the drivetrain and front suspension cradle. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#)
5. Install and tighten the drivetrain and front suspension cradle rear bolts and middle bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#)
6. Tighten the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#)
7. Remove the adjustable stands from underneath the vehicle.

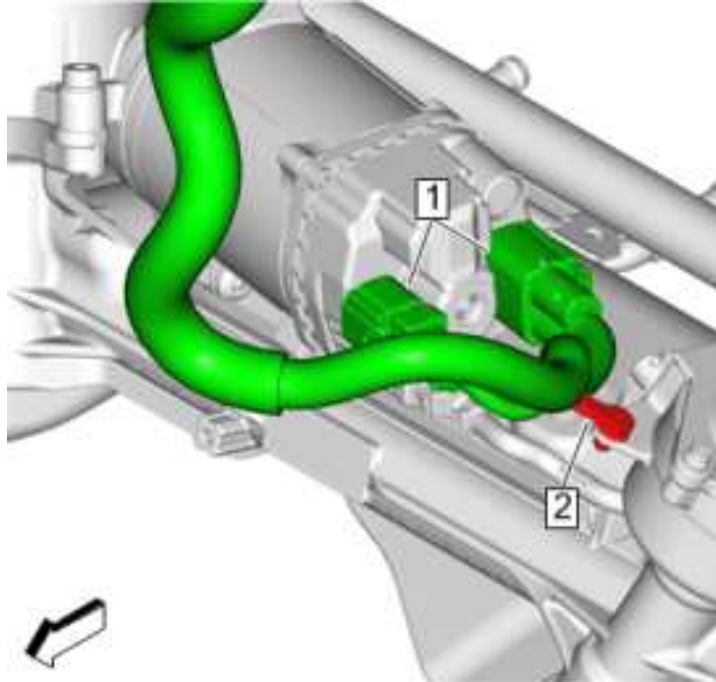


Fig. 61: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

8. Connect the steering gear electrical connectors (1).
9. Install the steering gear wiring harness clip (2) in the mounting point on the steering gear.

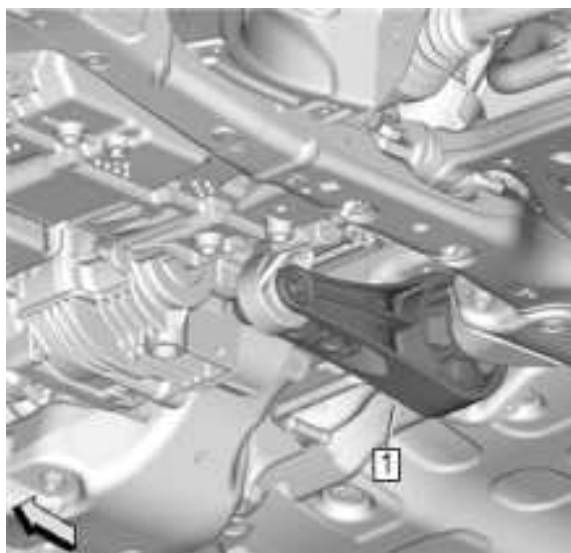


Fig. 62: Transmission Mount Strut
 Courtesy of GENERAL MOTORS COMPANY

10. Install Transmission Mount Strut (1). Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#).



Fig. 63: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

11. Install Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LH7\)](#).

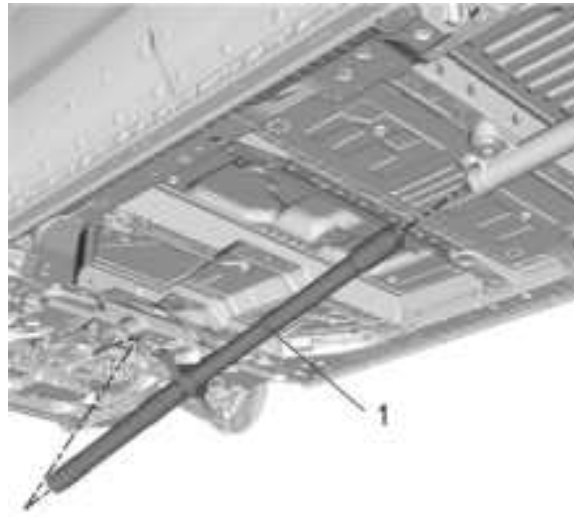


Fig. 64: Propeller Shaft

Courtesy of GENERAL MOTORS COMPANY

12. Install Two-Piece Propeller Shaft (1). Refer to [Two-Piece Propeller Shaft Replacement](#)

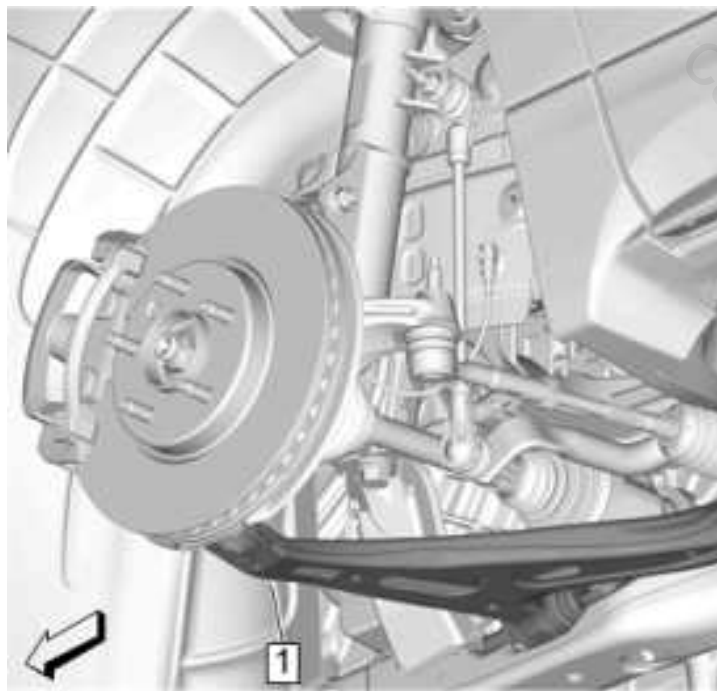


Fig. 65: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

13. Install Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

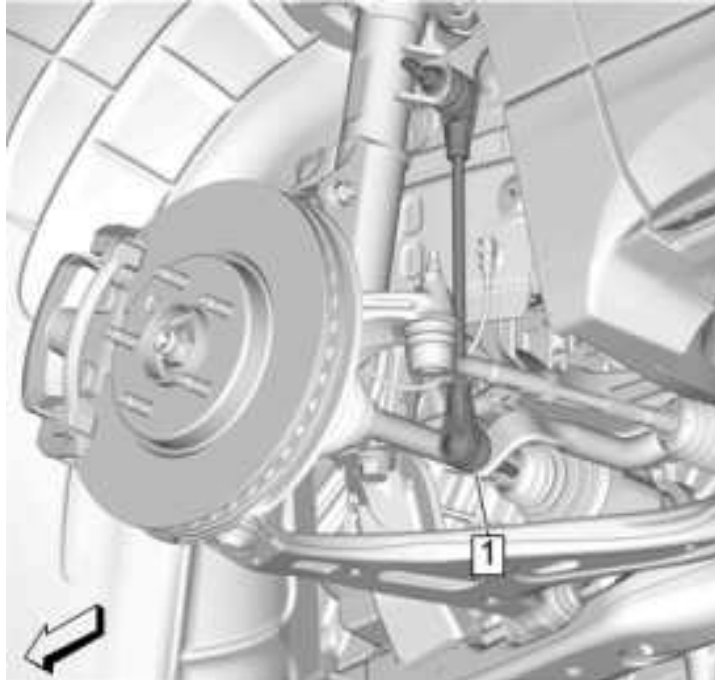


Fig. 66: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

14. Install Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

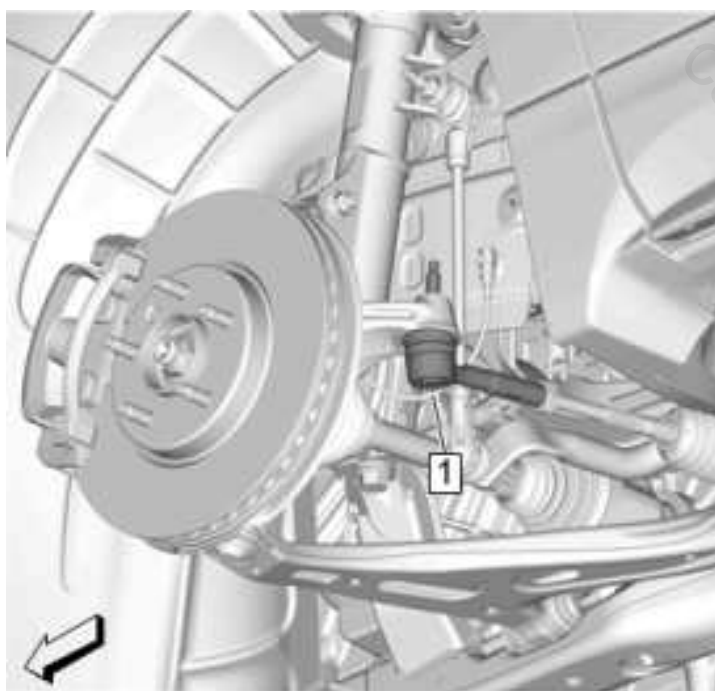


Fig. 67: Steering Linkage Outer Tie Rod

Courtesy of GENERAL MOTORS COMPANY

15. Install Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

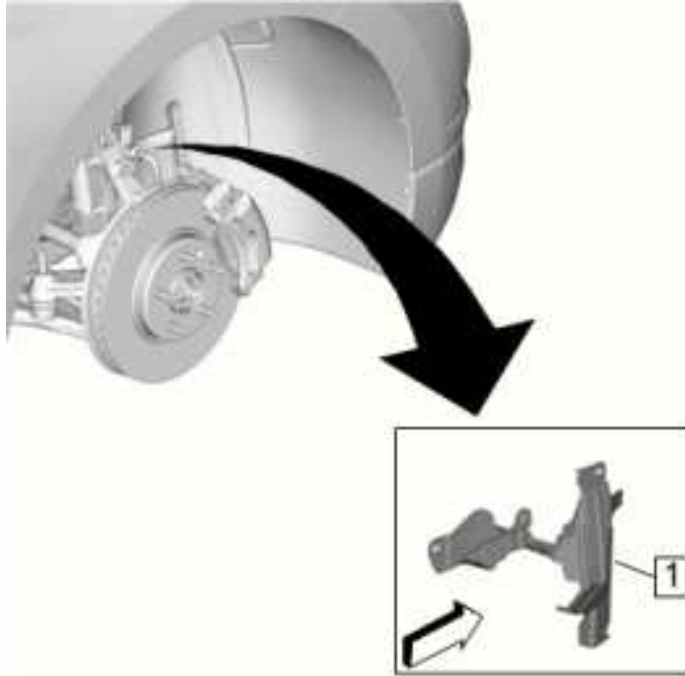


Fig. 68: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

16. Install Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).
17. Install Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).
18. Install the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
19. Lower the vehicle.
20. Remove Engine Support Fixture. Refer to [Engine Support Fixture](#).
21. Install Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
22. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#).

STABILIZER SHAFT REPLACEMENT (EQUINOX, TERRAIN, FWD, LTG)

Removal Procedure

CAUTION:

With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the wheels of the vehicle in the straight ahead position, LOCK the steering column.
2. Remove Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
3. Install Engine Support Fixture. Refer to [Engine Support Fixture](#).
4. Remove the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).

5. Remove Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#)
[Underbody Front Air Deflector Replacement \(Terrain\)](#)

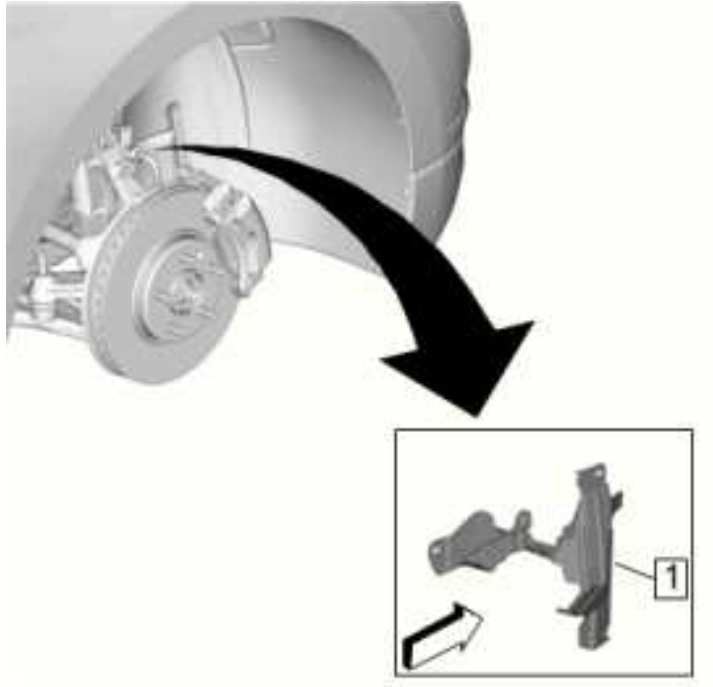


Fig. 69: Right Side Front Wheelhouse Splash Shield
Courtesy of GENERAL MOTORS COMPANY

6. Remove Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#)

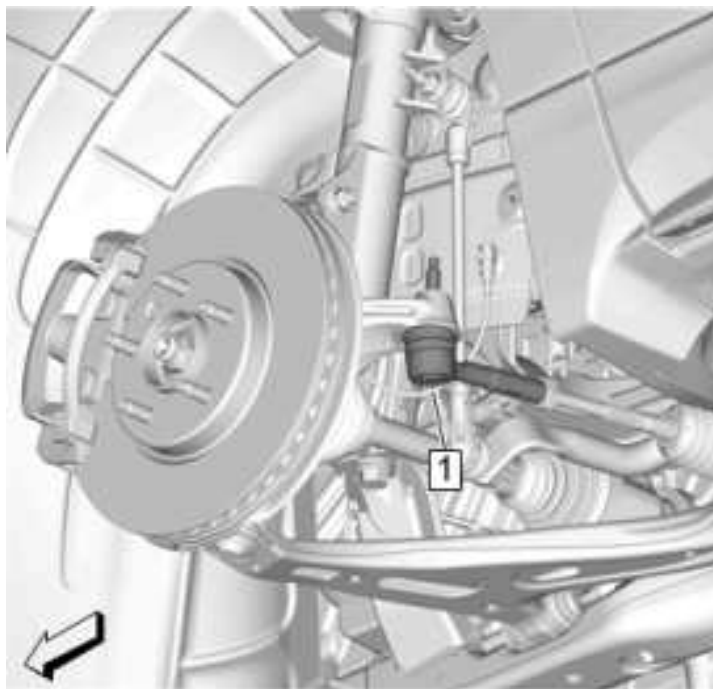


Fig. 70: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

7. Separate Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

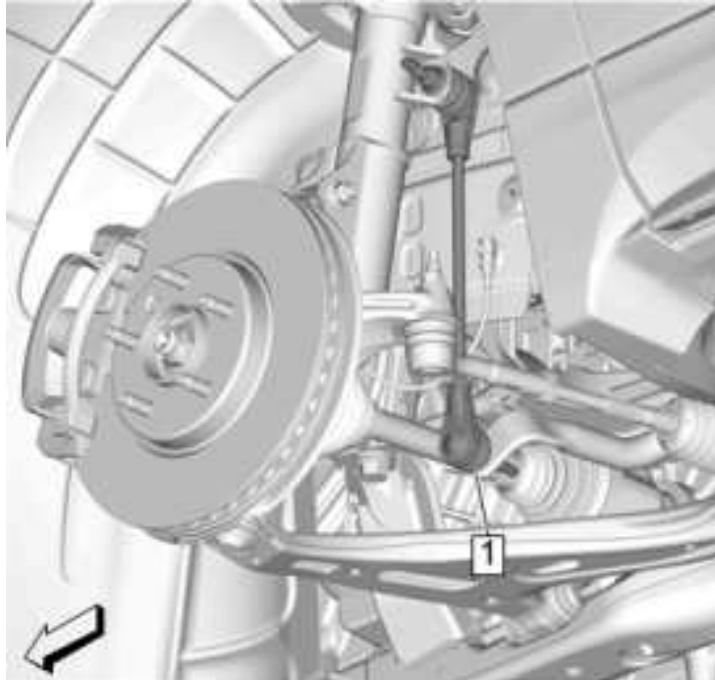


Fig. 71: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

8. Separate Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

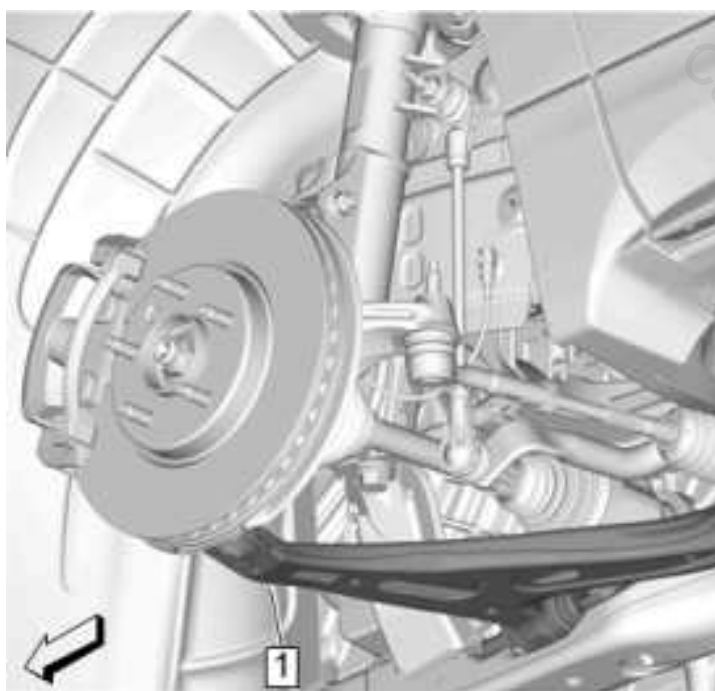


Fig. 72: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

9. Separate Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

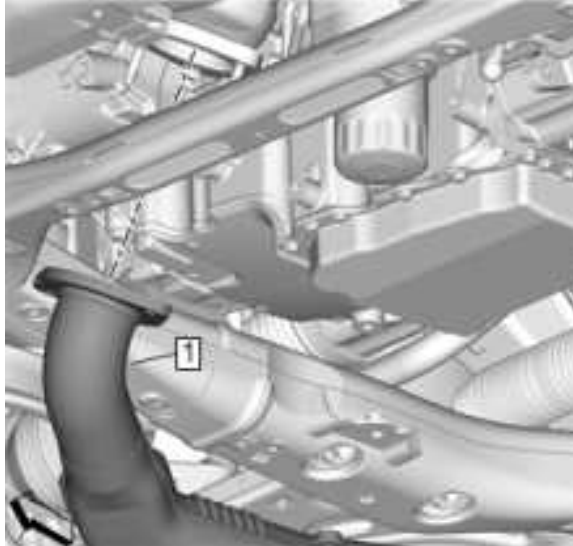


Fig. 73: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

10. Remove Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LTG\)](#)



Fig. 74: Transmission Mount Strut Bracket

Courtesy of GENERAL MOTORS COMPANY

11. Remove Transmission Mount Strut Bracket (1). Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#)

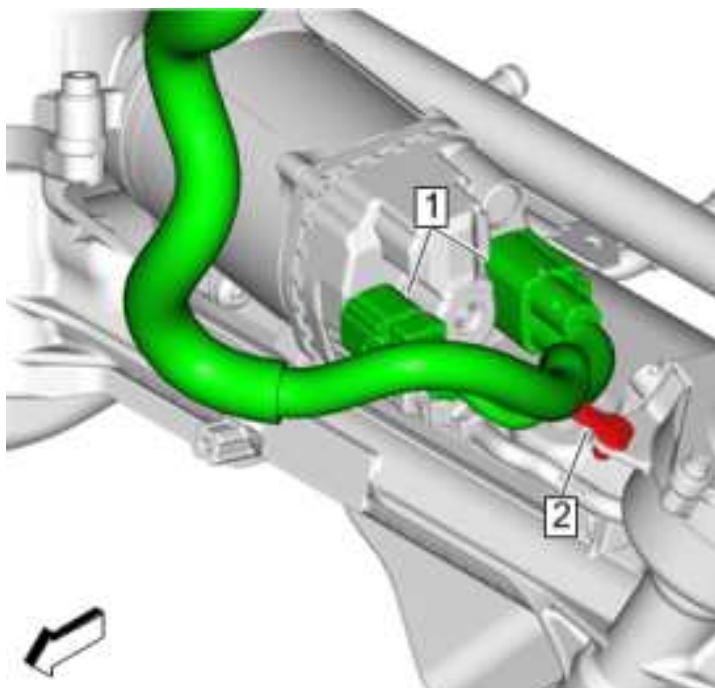


Fig. 75: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

12. Disconnect the steering gear electrical connectors (1).
13. Remove the steering gear wiring harness clip (2) from the mounting point on the steering gear.
14. Position adjustable stands underneath the left and right sides of the rear of the drivetrain and front suspension cradle.
15. Loosen the drivetrain and front suspension cradle front bolts. Refer to [**Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)**](#).
16. Remove the drivetrain and front suspension cradle middle bolts and rear bolts. Refer to [**Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)**](#).
17. Partially lower the rear of the drivetrain and front suspension cradle to gain clearance for the front stabilizer shaft. Refer to [**Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)**](#).

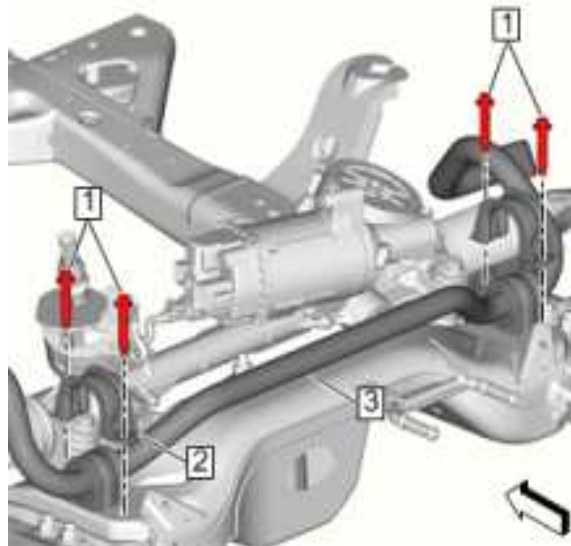


Fig. 76: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

18. Remove Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4)
19. Remove Front Stabilizer Shaft Clamps (2) (Qty: 2)
20. Remove the front stabilizer shaft (3) from the drivetrain and front suspension cradle.
21. Transfer components as necessary.

Installation Procedure

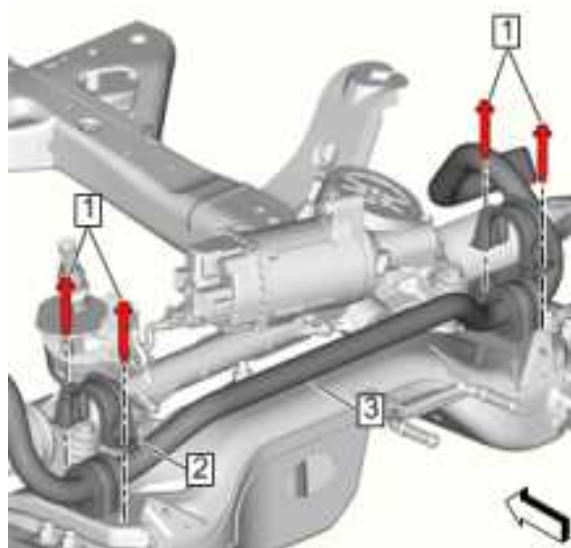


Fig. 77: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

1. Position the front stabilizer shaft (3) on the drivetrain and front suspension cradle.
2. Install Front Stabilizer Shaft Clamps (2) (Qty: 2)

CAUTION: Refer to [Fastener Caution](#) .

3. Install and tighten Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4) to 58 N.m (43 lb ft)
4. Raise the rear of the drivetrain and front suspension cradle. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#).
5. Install and tighten the drivetrain and front suspension cradle rear bolts and middle bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#).
6. Tighten the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(Front Wheel Drive\)](#).
7. Remove the adjustable stands from underneath the vehicle.

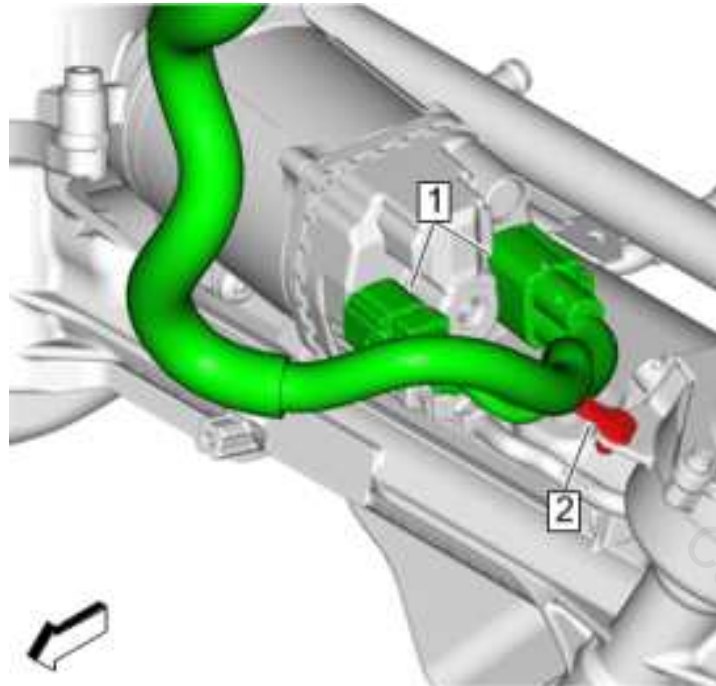


Fig. 78: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

8. Connect the steering gear electrical connectors (1).
9. Install the steering gear wiring harness clip (2) in the mounting point on the steering gear.



Fig. 79: Transmission Mount Strut Bracket
Courtesy of GENERAL MOTORS COMPANY

10. Install Transmission Mount Strut Bracket (1). Refer to [Transmission Mount Strut Bracket Replacement \(Front Wheel Drive\)](#).

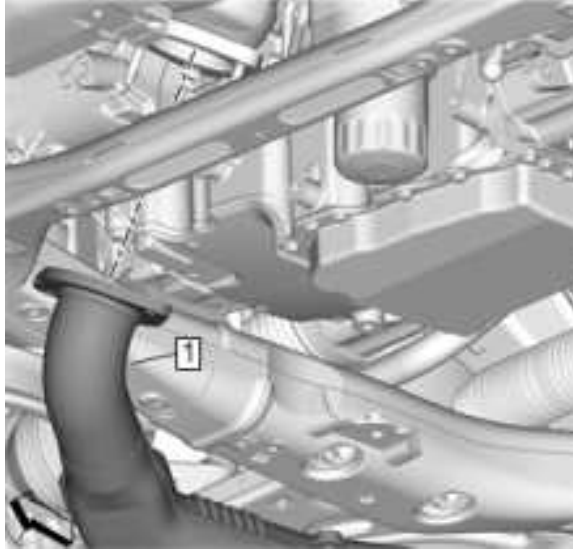


Fig. 80: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

11. Install Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LTG\)](#)

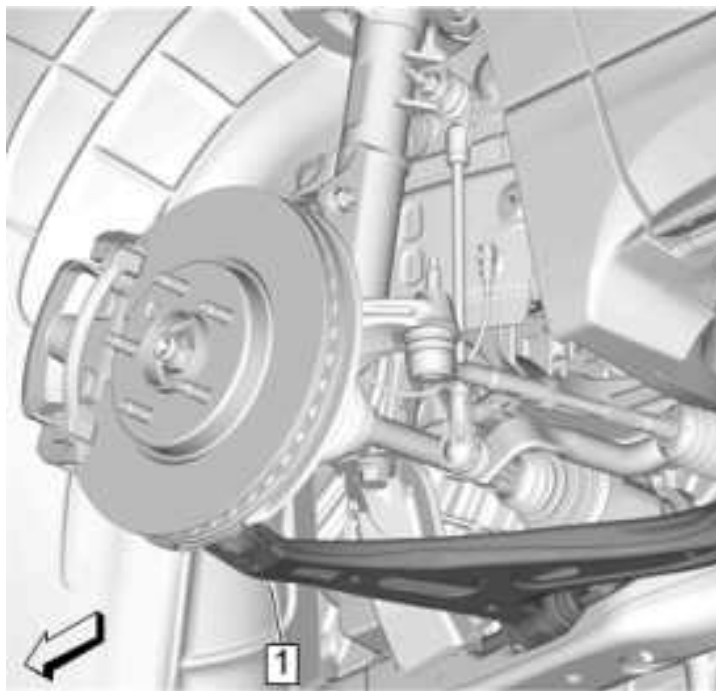


Fig. 81: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

12. Install Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#)

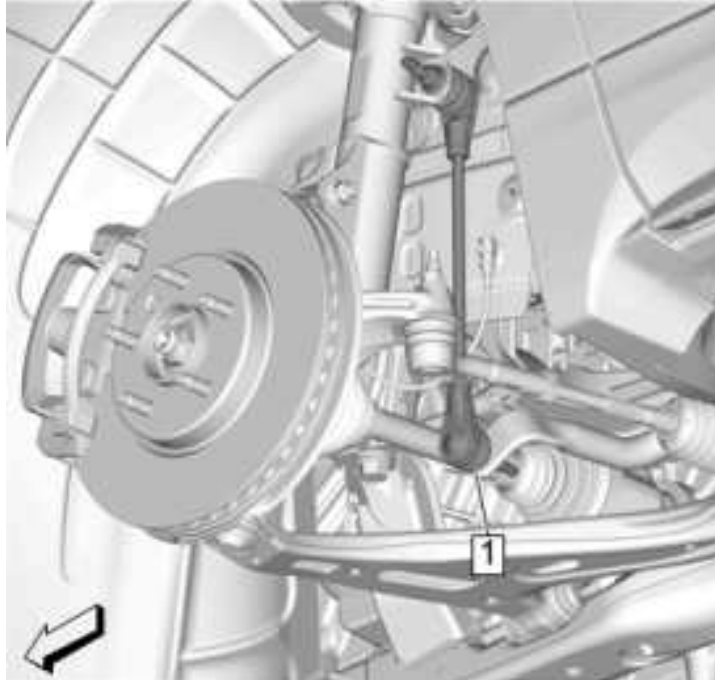


Fig. 82: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

13. Install Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

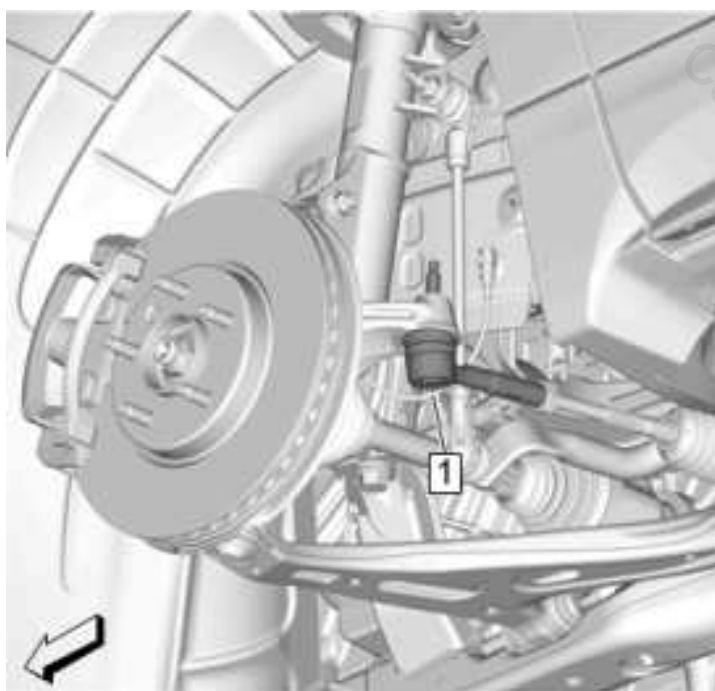


Fig. 83: Steering Linkage Outer Tie Rod

Courtesy of GENERAL MOTORS COMPANY

14. Install Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

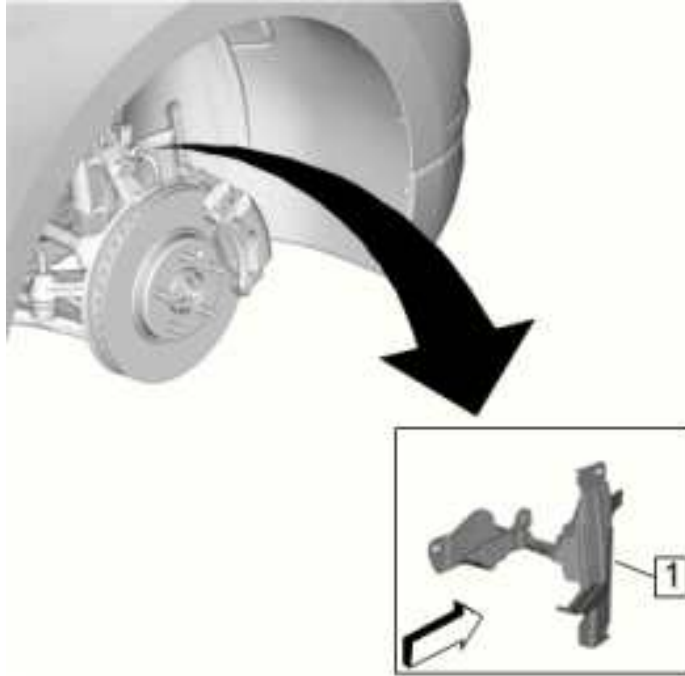


Fig. 84: Right Side Front Wheelhouse Splash Shield

Courtesy of GENERAL MOTORS COMPANY

15. Install Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).
16. Install Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).
17. Install the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
18. Lower the vehicle.
19. Remove Engine Support Fixture. Refer to [Engine Support Fixture](#).
20. Install Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
21. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#).

STABILIZER SHAFT REPLACEMENT (EQUINOX, TERRAIN, AWD, LTG)

Removal Procedure

CAUTION:

With wheels of the vehicle facing straight ahead, secure the steering wheel utilizing steering column anti-rotation pin, steering column lock, or a strap to prevent rotation. Locking of the steering column will prevent damage and a possible malfunction of the SIR system. The steering wheel must be secured in position before disconnecting the following components:

- The steering column
- The intermediate shaft(s)
- The steering gear

After disconnecting these components, do not rotate the steering wheel or move the front tires and wheels. Failure to follow this procedure may cause the SIR coil assembly to become un-centered and cause possible damage to the SIR coil. If you think the SIR coil has become un-centered, refer to your specific SIR coil's centering procedure to re-center SIR Coil.

1. With the wheels of the vehicle in the straight ahead position, LOCK the steering column.
2. Remove Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
3. Install Engine Support Fixture. Refer to [Engine Support Fixture](#).
4. Remove the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).

5. Remove Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#)
[Underbody Front Air Deflector Replacement \(Terrain\)](#).

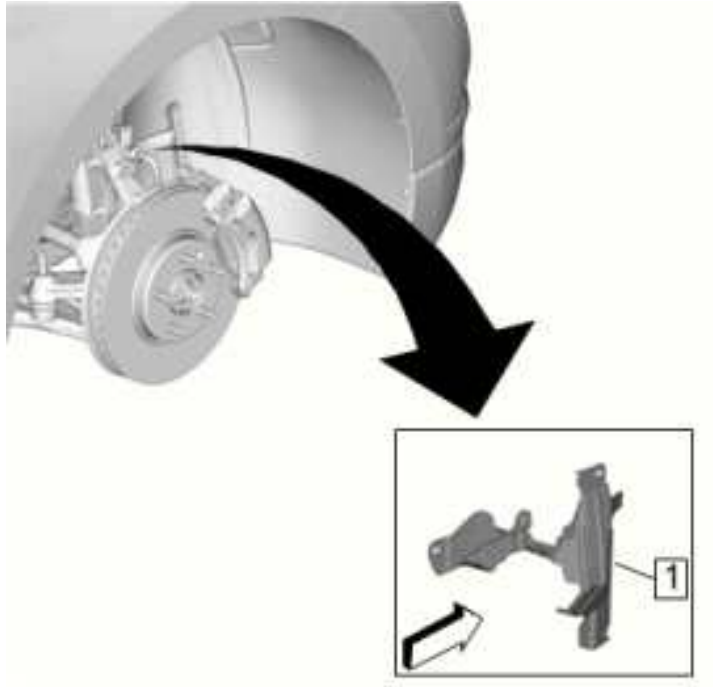


Fig. 85: Right Side Front Wheelhouse Splash Shield
Courtesy of GENERAL MOTORS COMPANY

6. Remove Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).

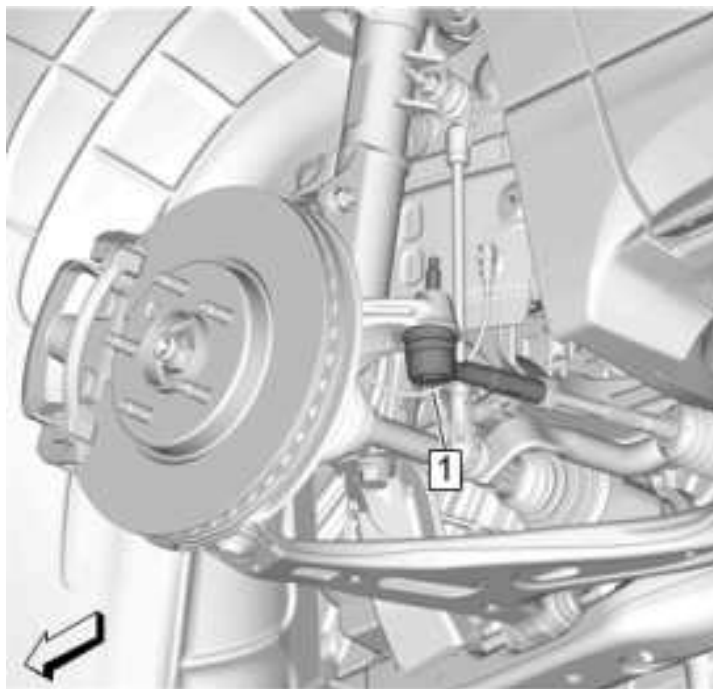


Fig. 86: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

7. Separate Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

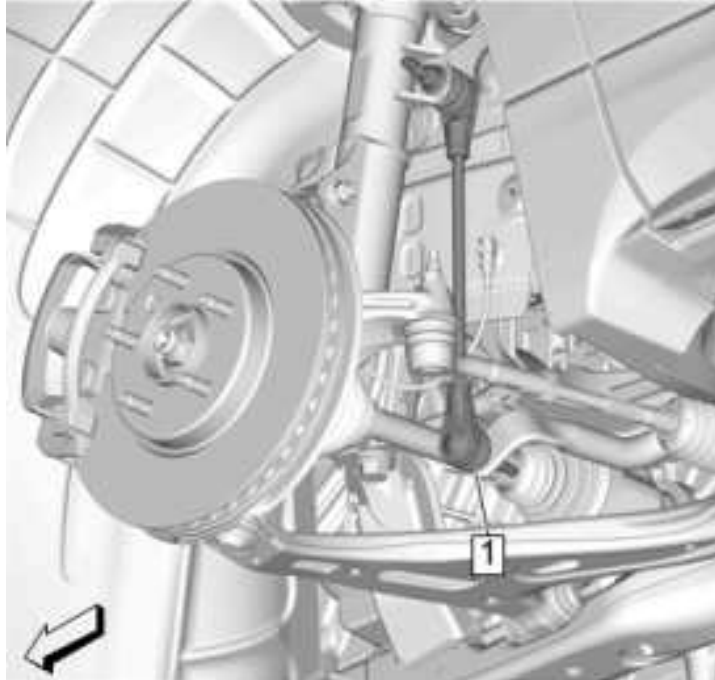


Fig. 87: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

8. Separate Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

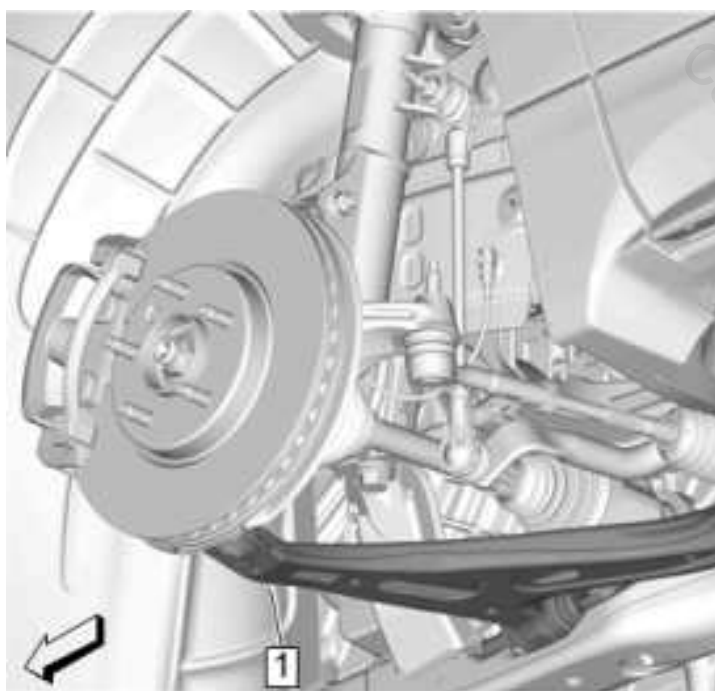


Fig. 88: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

9. Separate Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

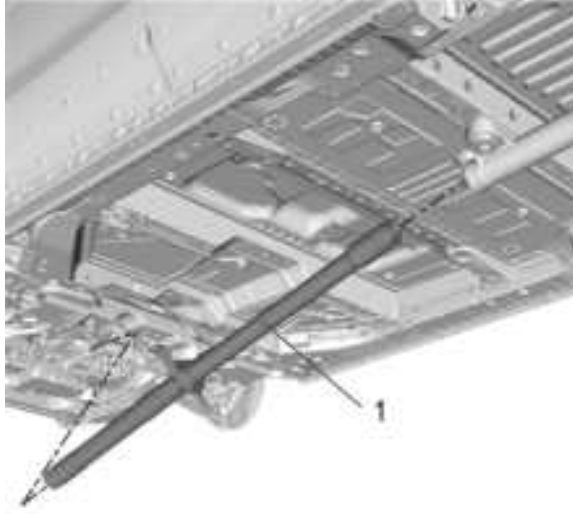


Fig. 89: Propeller Shaft

Courtesy of GENERAL MOTORS COMPANY

10. Remove Two-Piece Propeller Shaft (1). Refer to [Two-Piece Propeller Shaft Replacement](#)

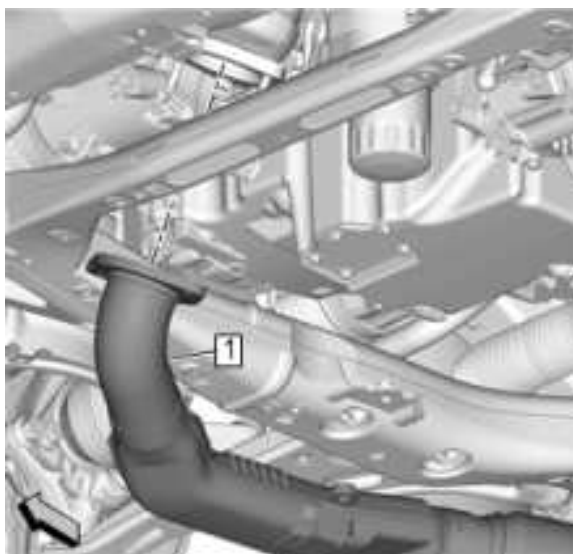


Fig. 90: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

11. Remove Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LTG\)](#)



Fig. 91: Transmission Mount Strut

Courtesy of GENERAL MOTORS COMPANY

12. Remove Transmission Mount Strut (1). Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#).

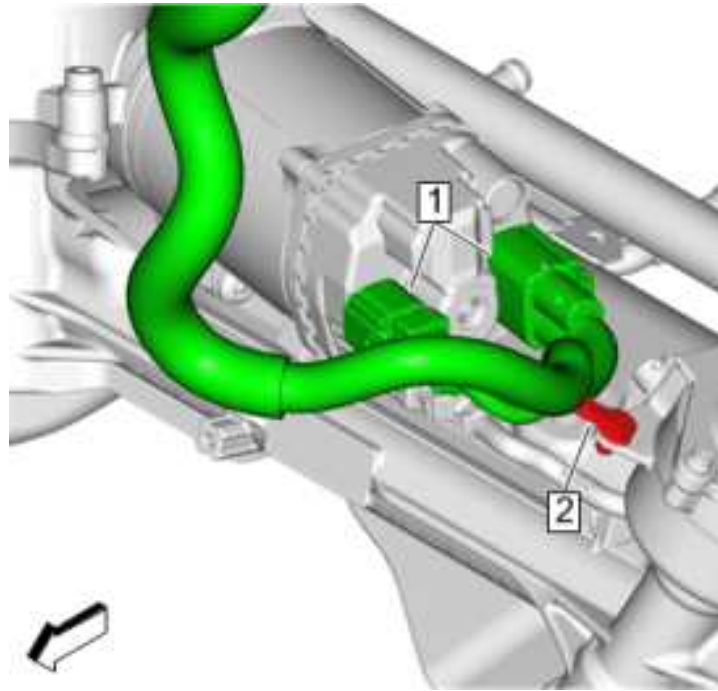


Fig. 92: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

13. Disconnect the steering gear electrical connectors (1).
14. Remove the steering gear wiring harness clip (2) from the mounting point on the steering gear.
15. Position adjustable stands underneath the left and right sides of the rear of the drivetrain and front suspension cradle.
16. Loosen the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
17. Remove the drivetrain and front suspension cradle middle bolts and rear bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
18. Partially lower the rear of the drivetrain and front suspension cradle to gain clearance for the front stabilizer shaft. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).

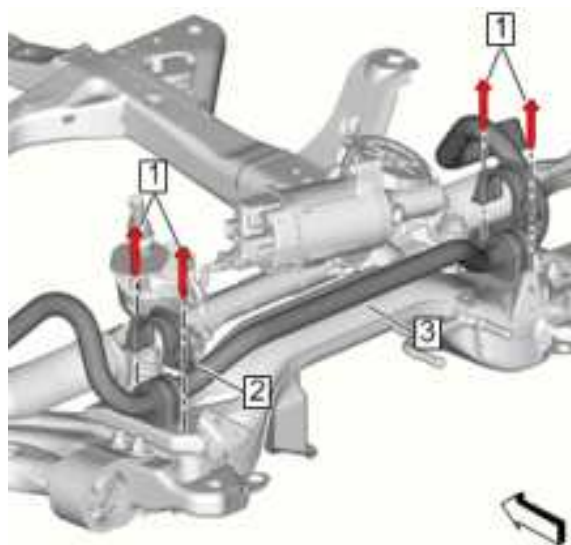


Fig. 93: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

19. Remove Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4)
20. Remove Front Stabilizer Shaft Clamps (2) (Qty: 2)
21. Remove the front stabilizer shaft (3) from the drivetrain and front suspension cradle.
22. Transfer components as necessary.

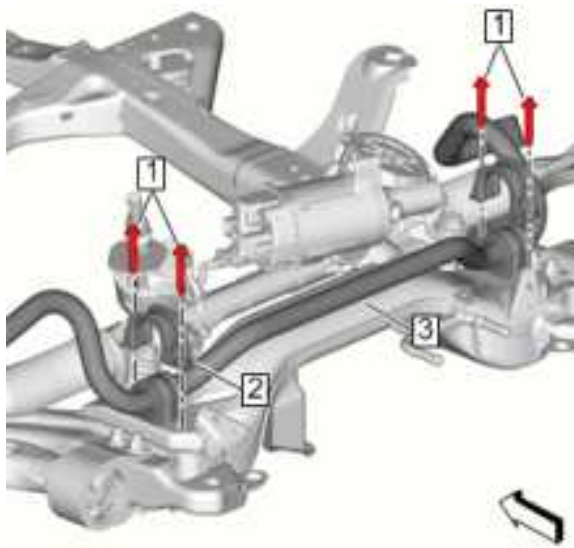


Fig. 94: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

1. Position the front stabilizer shaft (3) on the drivetrain and front suspension cradle.
2. Install Front Stabilizer Shaft Clamps (2) (Qty: 2)

CAUTION: Refer to [Fastener Caution](#) .

3. Install and tighten Front Stabilizer Shaft Bracket Bolts (1) (Qty: 4) to 58 N.m (43 lb ft)
4. Raise the rear of the drivetrain and front suspension cradle. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
5. Install and tighten the drivetrain and front suspension cradle rear bolts and middle bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
6. Tighten the drivetrain and front suspension cradle front bolts. Refer to [Drivetrain and Front Suspension Cradle Replacement \(All Wheel Drive\)](#).
7. Remove the adjustable stands from underneath the vehicle.

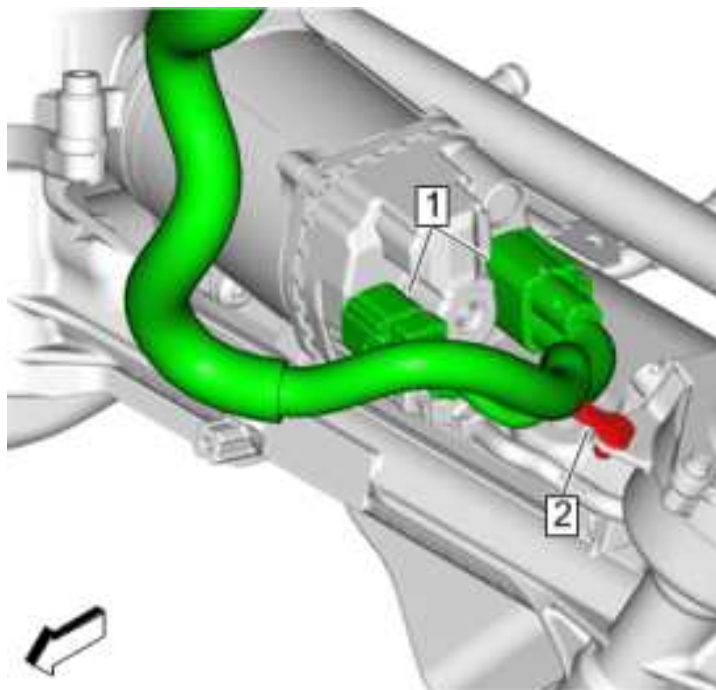


Fig. 95: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

8. Connect the steering gear electrical connectors (1).
9. Install the steering gear wiring harness clip (2) in the mounting point on the steering gear.



Fig. 96: Transmission Mount Strut

Courtesy of GENERAL MOTORS COMPANY

10. Install Transmission Mount Strut (1). Refer to [Transmission Mount Strut Replacement \(All Wheel Drive\)](#).

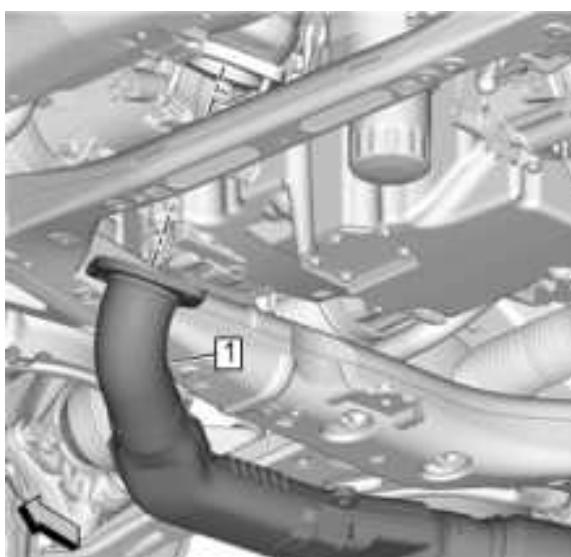


Fig. 97: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

11. Install Exhaust Front Pipe (1). Refer to [Exhaust Front Pipe Replacement \(LTG\)](#).

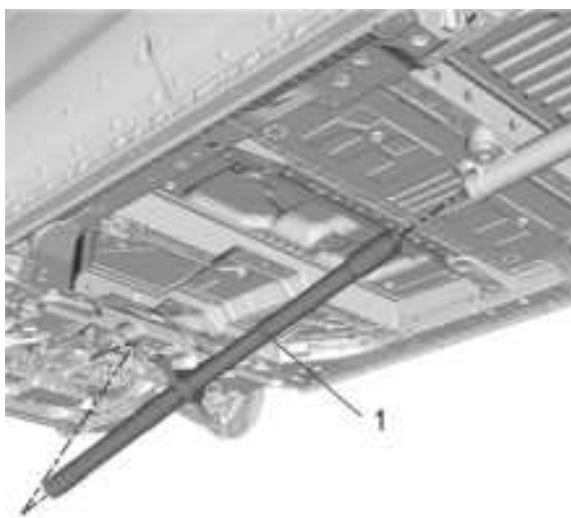


Fig. 98: Propeller Shaft

Courtesy of GENERAL MOTORS COMPANY

12. Install Two-Piece Propeller Shaft (1). Refer to [Two-Piece Propeller Shaft Replacement](#).

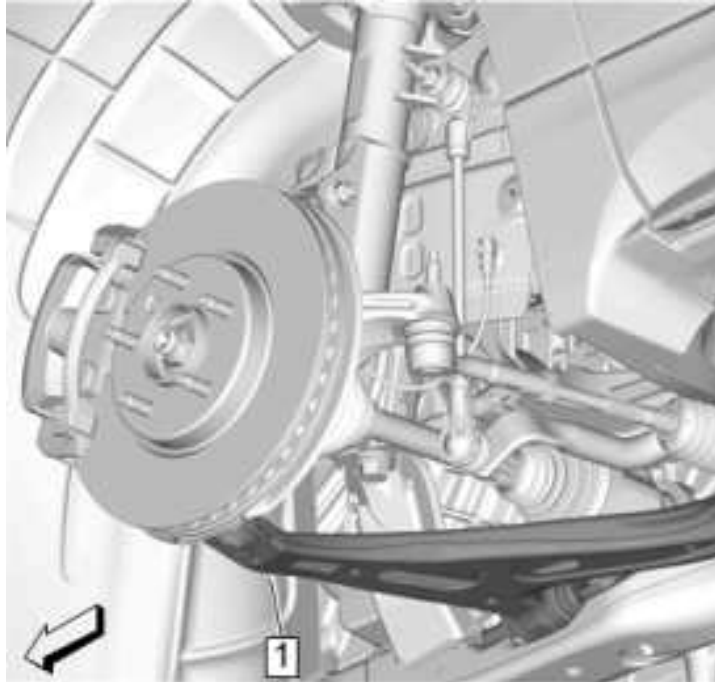


Fig. 99: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

13. Install Front Lower Control Arm (1) (Qty: 2) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

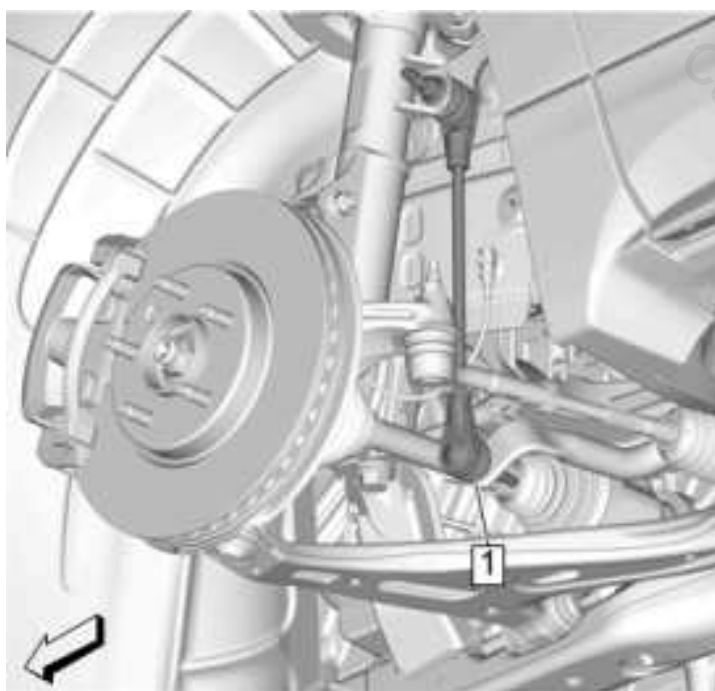


Fig. 100: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

14. Install Front Stabilizer Shaft Link (1) (Qty: 2) @ Front Stabilizer Shaft. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

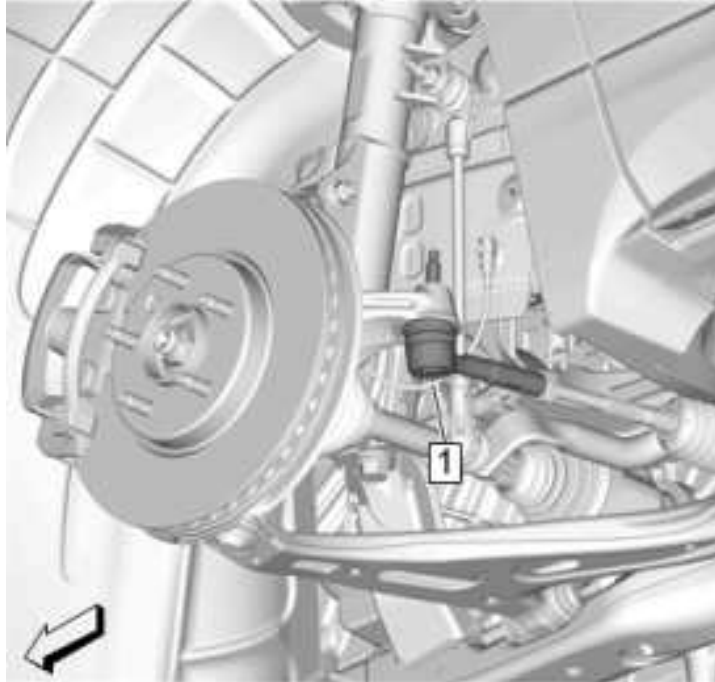


Fig. 101: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

15. Install Steering Linkage Outer Tie Rod (1) (Qty: 2) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

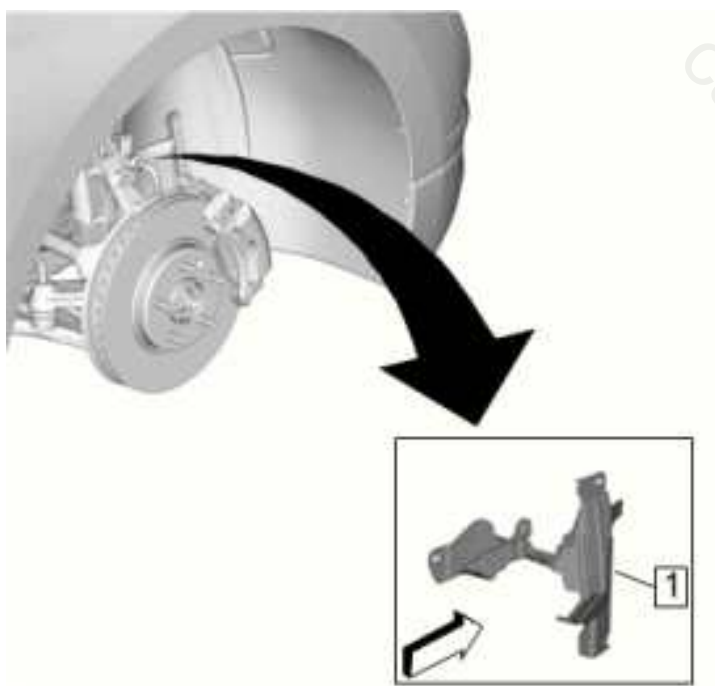


Fig. 102: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

16. Install Front Wheelhouse Splash Shield-Right Side (1). Refer to [Front Wheelhouse Splash Shield Replacement \(Equinox\)](#) [Front Wheelhouse Splash Shield Replacement \(Terrain\)](#).
17. Install Underbody Front Air Deflector. Refer to [Underbody Front Air Deflector Replacement \(Equinox\)](#) [Underbody Front Air Deflector Replacement \(Terrain\)](#).
18. Install the front tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
19. Lower the vehicle.
20. Remove Engine Support Fixture. Refer to [Engine Support Fixture](#)
21. Install Steering Column Dash Inner Seal. Refer to [Steering Column Dash Inner Seal Replacement \(Equinox\)](#) [Steering Column Dash Inner Seal Replacement \(Terrain\)](#).
22. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

STABILIZER SHAFT LINK REPLACEMENT (EQUINOX)

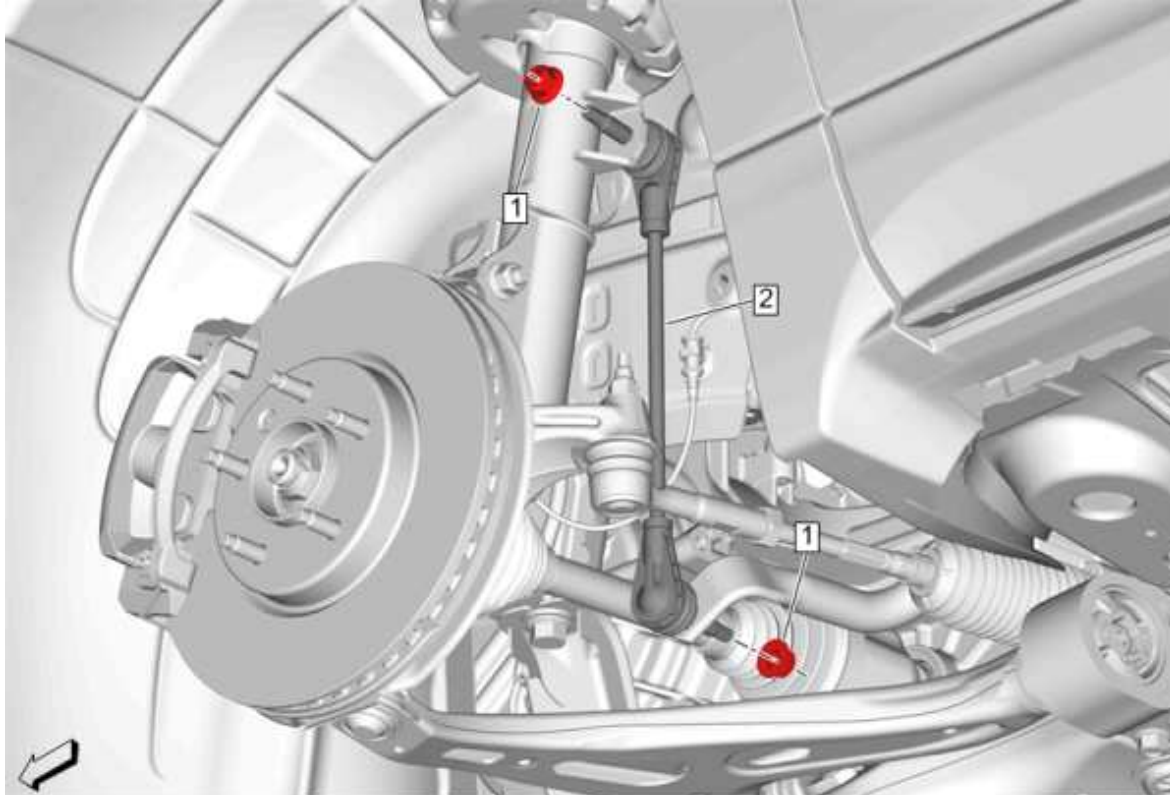


Fig. 103: Stabilizer Shaft Link (Equinox)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Front Stabilizer Shaft Link Nut (Qty: 2) CAUTION: Refer to Fastener Caution . Tighten 100 N.m (74 lb ft)
2	Front Stabilizer Shaft Link

STABILIZER SHAFT LINK REPLACEMENT (TERRAIN)

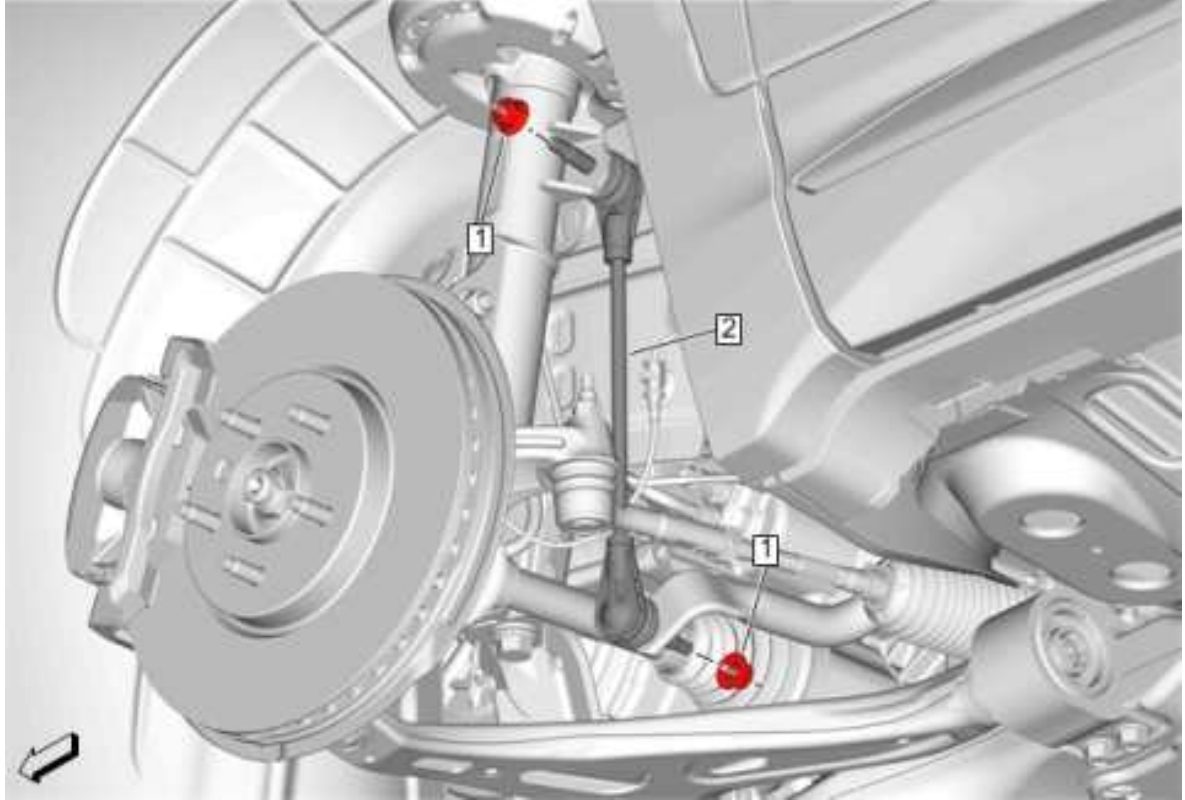


Fig. 104: Stabilizer Shaft Link (Terrain)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation	
1	Front Stabilizer Shaft Link Nut (Qty: 2) CAUTION: Refer to Fastener Caution . Tighten 100 N.m (74 lb ft)
2	Front Stabilizer Shaft Link

FRONT WHEEL BEARING AND HUB REPLACEMENT (EQUINOX)

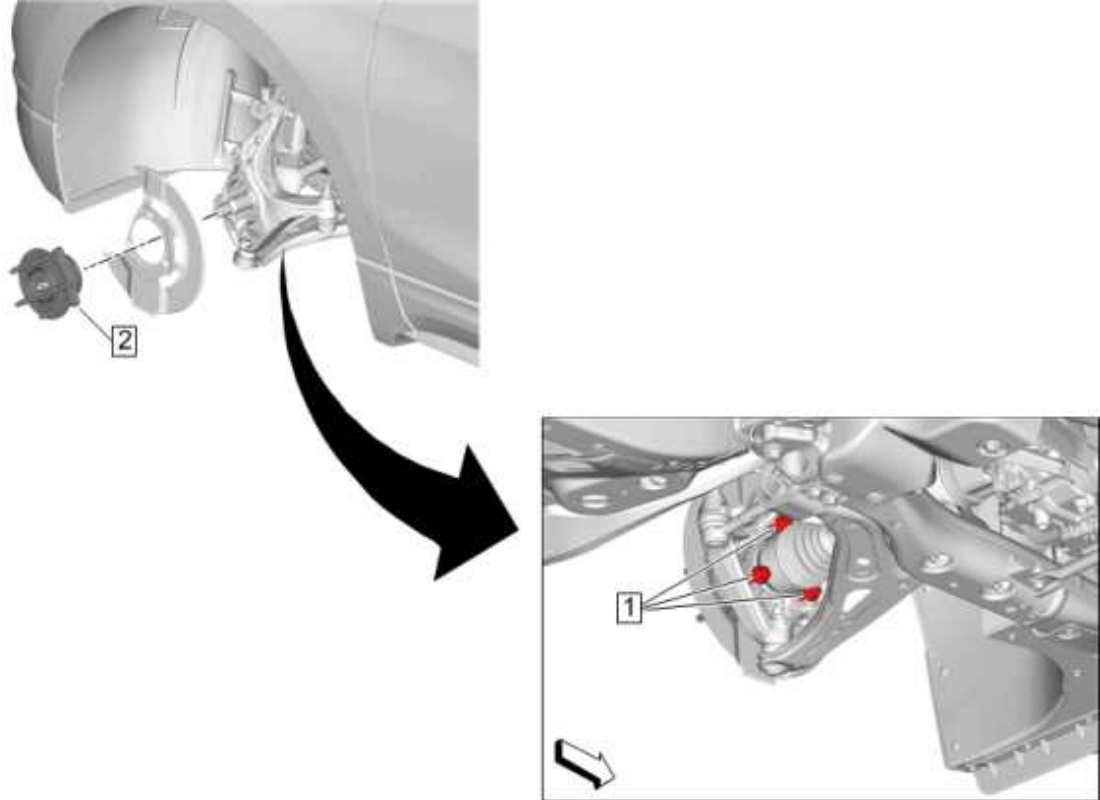


Fig. 105: Front Wheel Bearing And Hub (Equinox)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front wheel speed sensor from the steering knuckle and position to the side. Refer to Front Wheel Speed Sensor Replacement (Left) Front Wheel Speed Sensor Replacement (Right). 2. Separate Front Wheel Drive Half Shaft @ Front Wheel Bearing and Hub Assembly. Refer to Front Wheel Drive Half Shaft Replacement - Left Side or Front Wheel Drive Half Shaft Replacement - Right Side (AWD) Front Wheel Drive Half Shaft Replacement - Right Side (M3U, MHG, MNH, MNK with FWD) Front Wheel Drive Half Shaft Replacement - Right Side (M3D, M3H with FWD). 3. Remove Front Brake Rotor. Refer to Front Brake Rotor Replacement	
1	Front Wheel Bearing and Hub Assembly Bolt (Qty: 3) CAUTION: Refer to Fastener Caution . Tighten First Pass: 100 N.m (74 lb ft) Final Pass: (20 - 30 degrees)
2	Front Wheel Bearing and Hub Assembly Procedure Apply grease evenly and ensure complete coverage to the steering knuckle bearing pilot bore only. Refer to Adhesives, Fluids, Lubricants and Sealers NOTE: Avoid applying grease to any other machined surfaces, holes, or threads. Ensure the drain channel at the bottom of the bore is not blocked with grease or debris.

FRONT WHEEL BEARING AND HUB REPLACEMENT (TERRAIN)

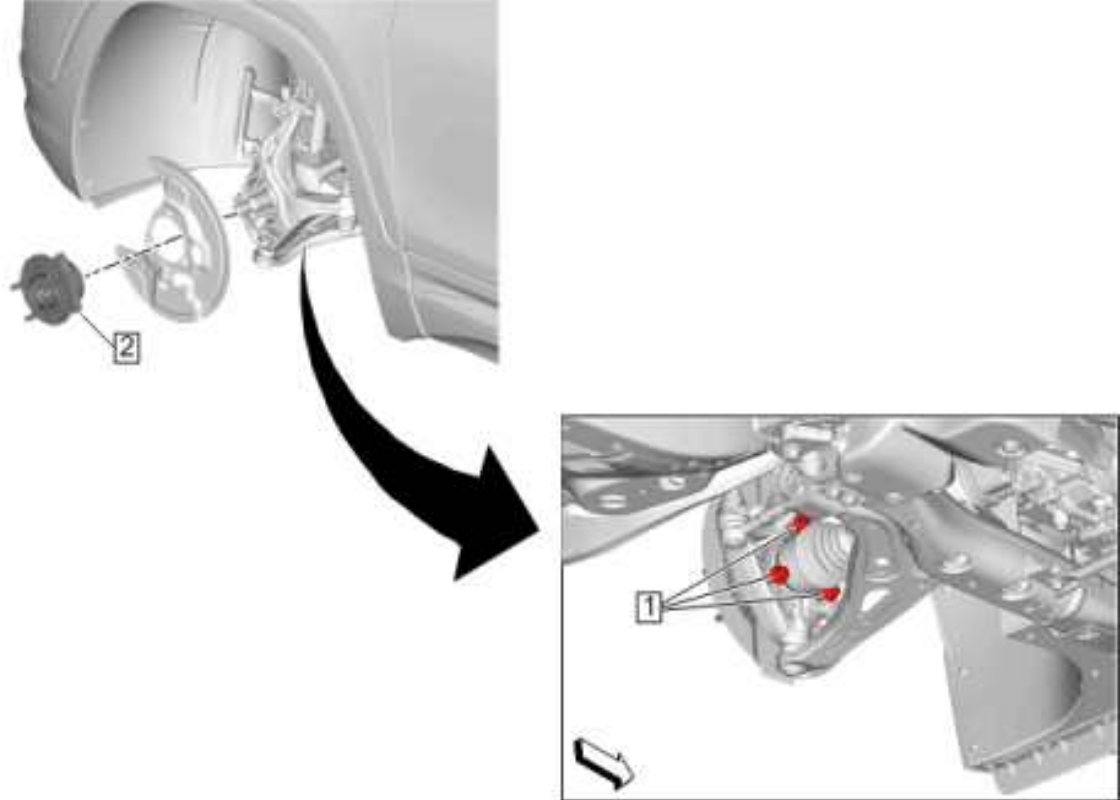


Fig. 106: Front Wheel Bearing And Hub (Terrain)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front wheel speed sensor from the steering knuckle and position to the side. Refer to Front Wheel Speed Sensor Replacement (Left) Front Wheel Speed Sensor Replacement (Right). 2. Separate Front Wheel Drive Half Shaft @ Front Wheel Bearing and Hub Assembly. Refer to Front Wheel Drive Half Shaft Replacement - Left Side , or Front Wheel Drive Half Shaft Replacement - Right Side (AWD) Front Wheel Drive Half Shaft Replacement - Right Side (M3U, MHG, MNH, MNK with FWD) Front Wheel Drive Half Shaft Replacement - Right Side (M3D, M3H with FWD). 3. Remove Front Brake Rotor. Refer to Front Brake Rotor Replacement	
1	Front Wheel Bearing and Hub Assembly Bolt (Qty: 3) CAUTION: Refer to Fastener Caution . Tighten First Pass: 100 N.m (74 lb ft) Final Pass: (20 - 30 degrees)
2	Front Wheel Bearing and Hub Assembly Procedure Apply grease evenly and ensure complete coverage to the steering knuckle bearing pilot bore only. Refer to Adhesives, Fluids, Lubricants, and Sealers NOTE: Avoid applying grease to any other machined surfaces, holes, or threads. Ensure the drain channel at the bottom of the bore is not blocked with grease or debris.

STEERING KNUCKLE REPLACEMENT

Removal Procedure

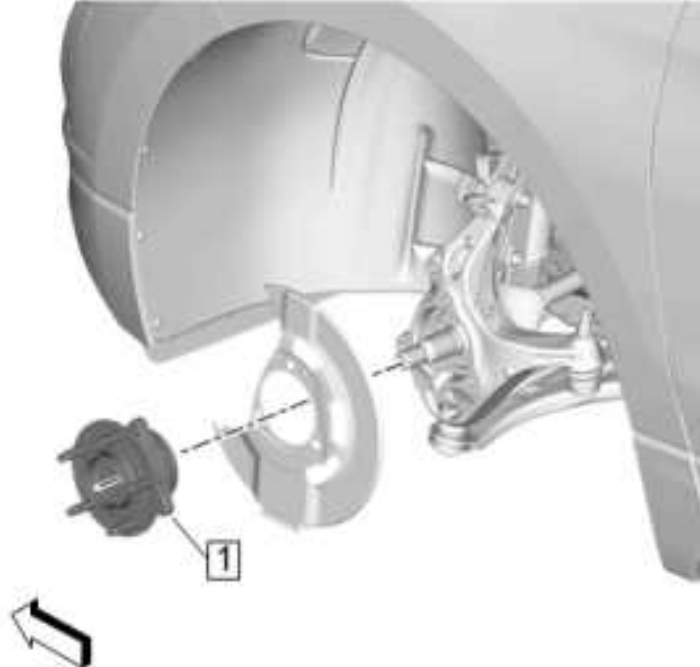


Fig. 107: Front Wheel Bearing And Hub Assembly
 Courtesy of GENERAL MOTORS COMPANY

1. Remove Front Wheel Bearing and Hub Assembly (1). Refer to [Front Wheel Bearing and Hub Replacement \(Equinox\)](#) [Front Wheel Bearing and Hub Replacement \(Terrain\)](#).

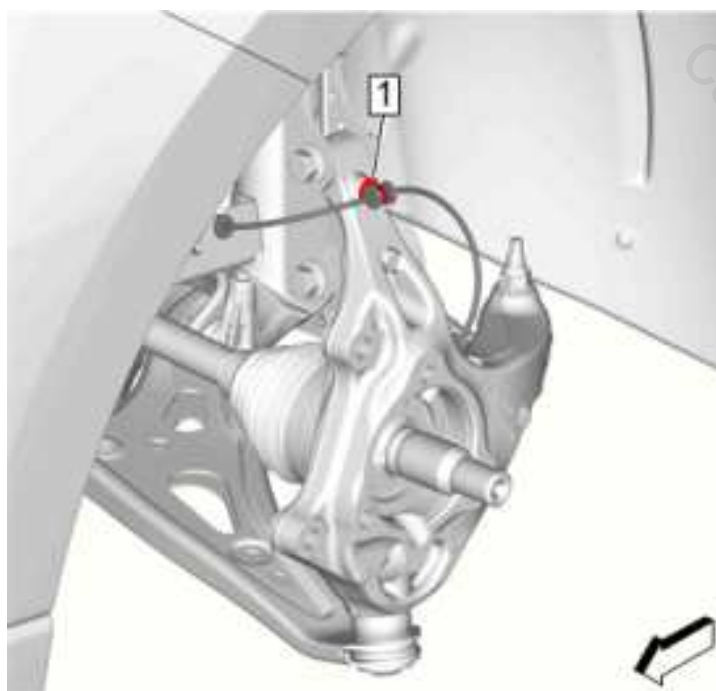


Fig. 108: Front Wheel Speed Sensor Retainer
 Courtesy of GENERAL MOTORS COMPANY

2. Remove Front Wheel Speed Sensor Retainer (1) @ Steering Knuckle. Refer to [Front Wheel Speed Sensor Replacement \(Left\)](#) [Front Wheel Speed Sensor Replacement \(Right\)](#).

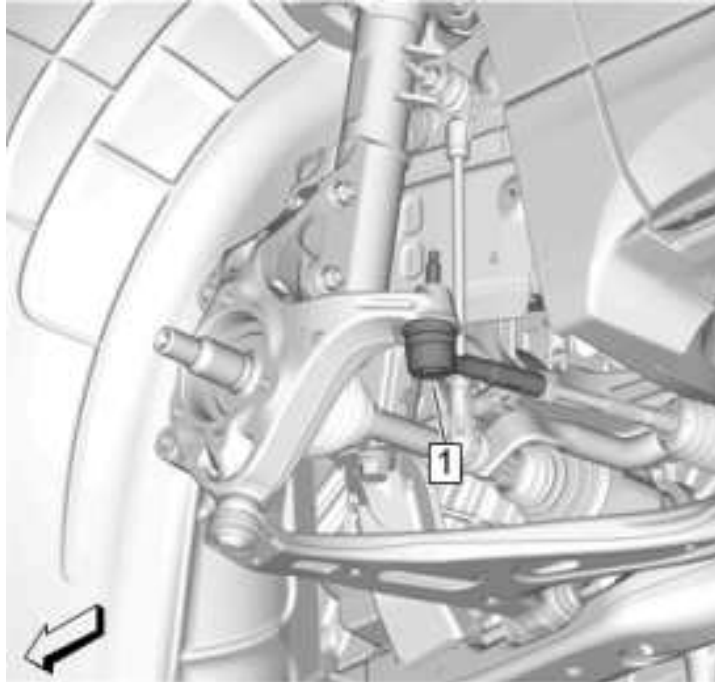


Fig. 109: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

3. Separate Steering Linkage Outer Tie Rod (1) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

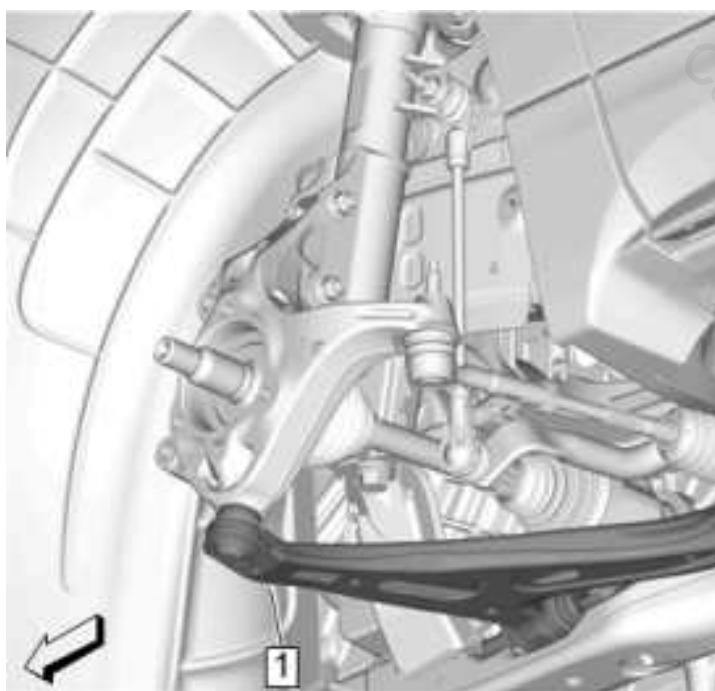


Fig. 110: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

4. Separate Front Lower Control Arm (1) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#)

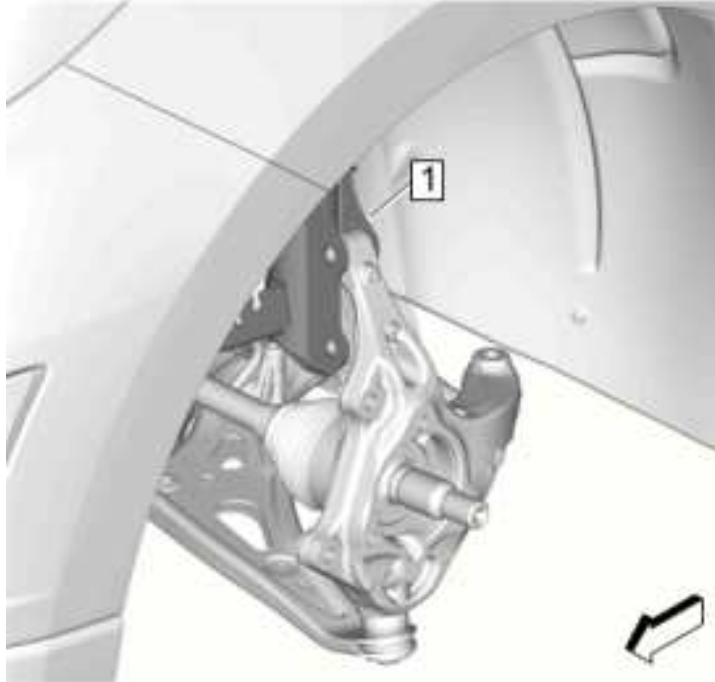


Fig. 111: Strut Assembly

Courtesy of GENERAL MOTORS COMPANY

5. Separate Strut Assembly (1) @ Steering Knuckle. Refer to [Strut Assembly Removal and Installation](#)

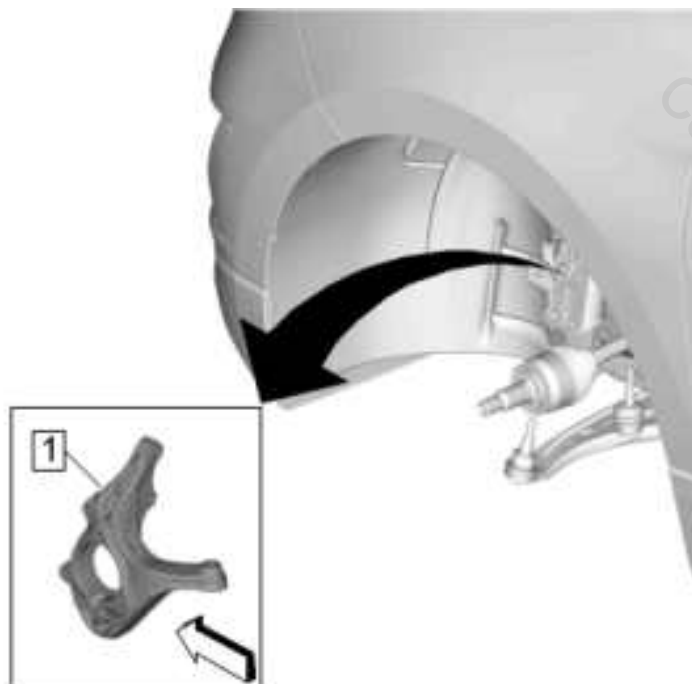


Fig. 112: Steering Knuckle

Courtesy of GENERAL MOTORS COMPANY

6. Remove the steering knuckle (1) from the vehicle.

Installation Procedure

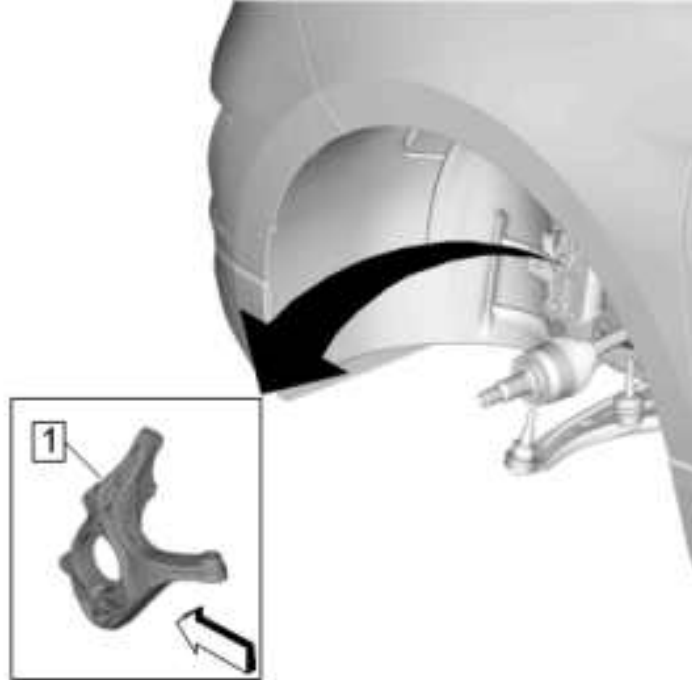


Fig. 113: Steering Knuckle

Courtesy of GENERAL MOTORS COMPANY

1. Position the steering knuckle (1) on the vehicle.

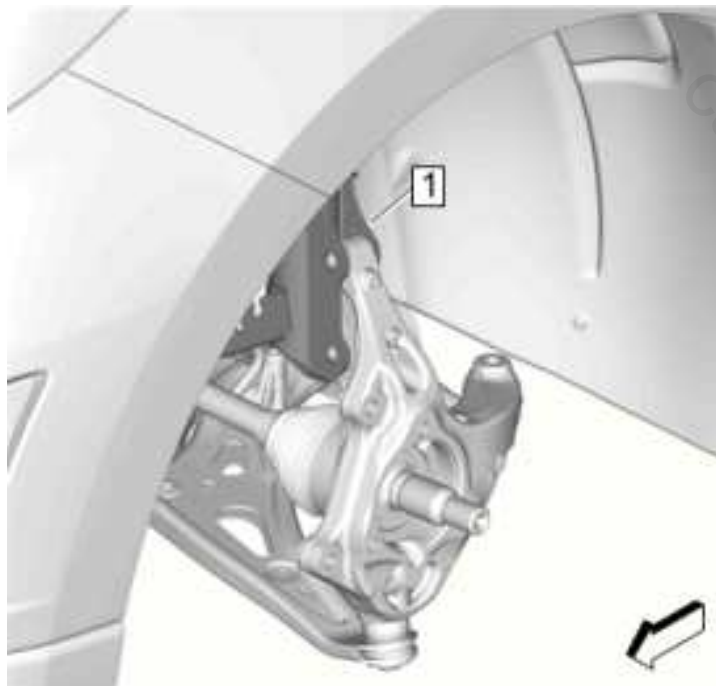


Fig. 114: Strut Assembly

Courtesy of GENERAL MOTORS COMPANY

2. Install Strut Assembly (1) @ Steering Knuckle. Refer to [Strut Assembly Removal and Installation](#)

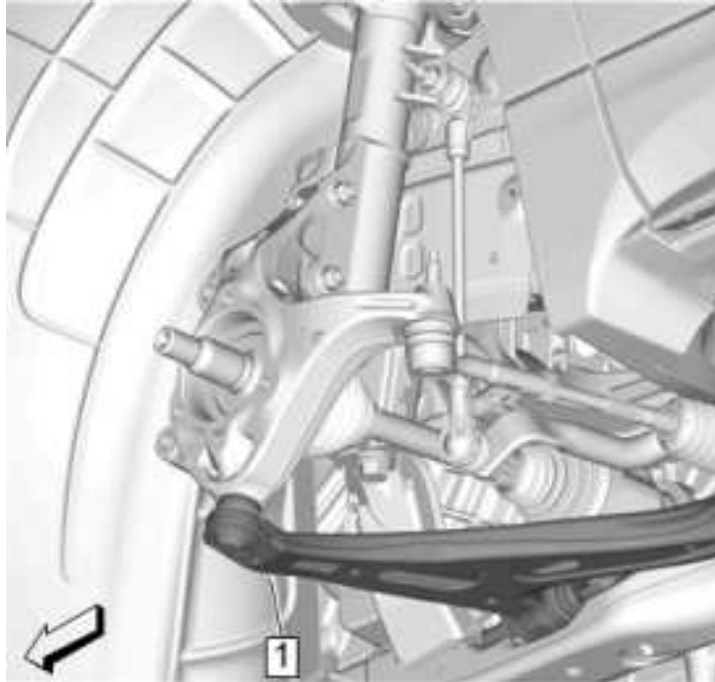


Fig. 115: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

3. Install Front Lower Control Arm (1) @ Steering Knuckle. Refer to [Lower Control Arm Replacement \(Equinox\)](#)[Lower Control Arm Replacement \(Terrain\)](#).

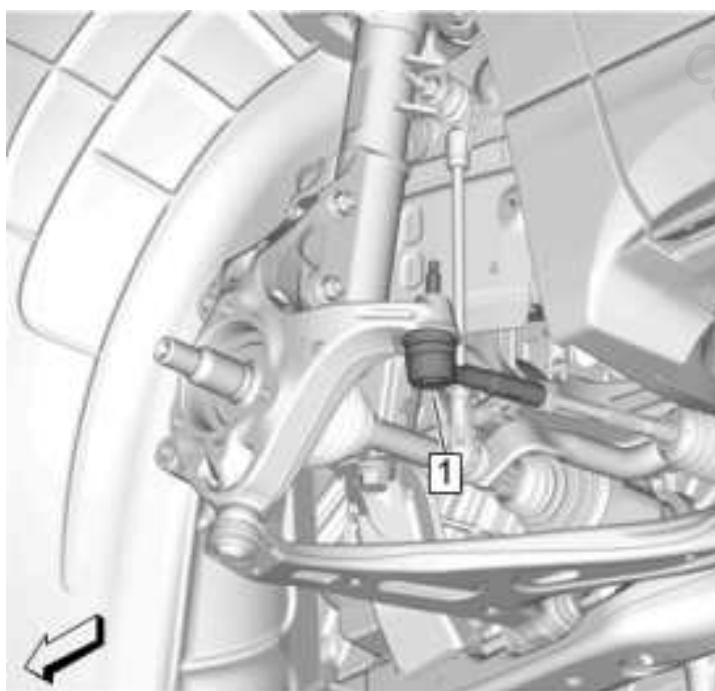


Fig. 116: Steering Linkage Outer Tie Rod

Courtesy of GENERAL MOTORS COMPANY

4. Install Steering Linkage Outer Tie Rod (1) @ Steering Knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#)

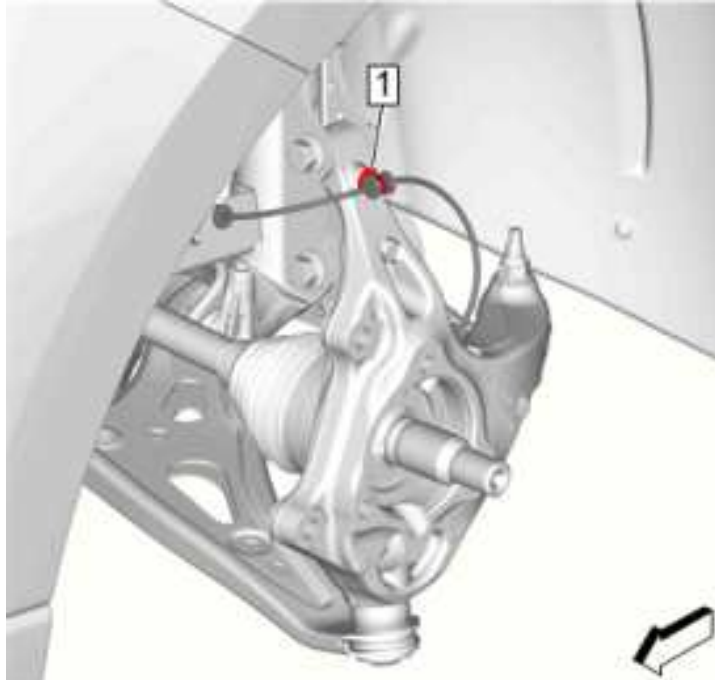


Fig. 117: Front Wheel Speed Sensor Retainer
 Courtesy of GENERAL MOTORS COMPANY

5. Install Front Wheel Speed Sensor Retainer (1) @ Steering Knuckle. Refer to [Front Wheel Speed Sensor Replacement \(Left\)](#) [Front Wheel Speed Sensor Replacement \(Right\)](#).

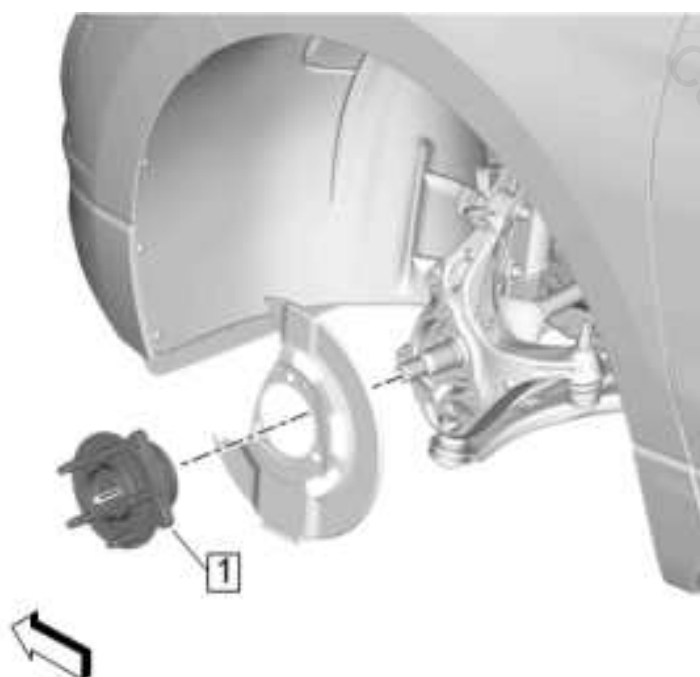


Fig. 118: Front Wheel Bearing And Hub Assembly
 Courtesy of GENERAL MOTORS COMPANY

6. Install Front Wheel Bearing and Hub Assembly (1). Refer to [Front Wheel Bearing and Hub Replacement \(Equinox\)](#) [Front Wheel Bearing and Hub Replacement \(Terrain\)](#).
7. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

LOWER CONTROL ARM REPLACEMENT (EQUINOX)

Special Tools

CH-42188-B Ball Joint Separator

Equivalent regional tools: [Special Tools](#)

Removal Procedure

1. Remove the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)

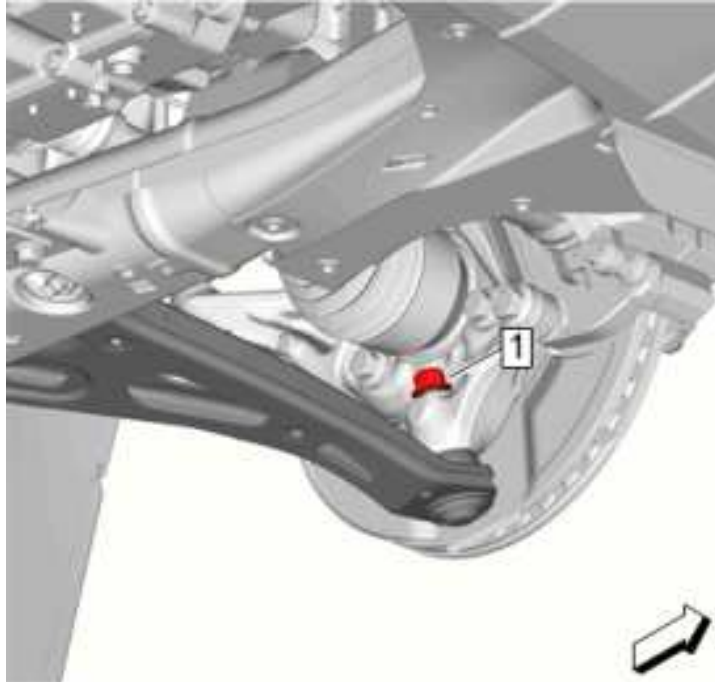


Fig. 119: Front Lower Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

NOTE: Use the hex-holding feature to prevent the ball stud from turning while loosening front lower control arm ball stud nut (1).

2. Loosen Front Lower Control Arm Ball Stud Nut (1).

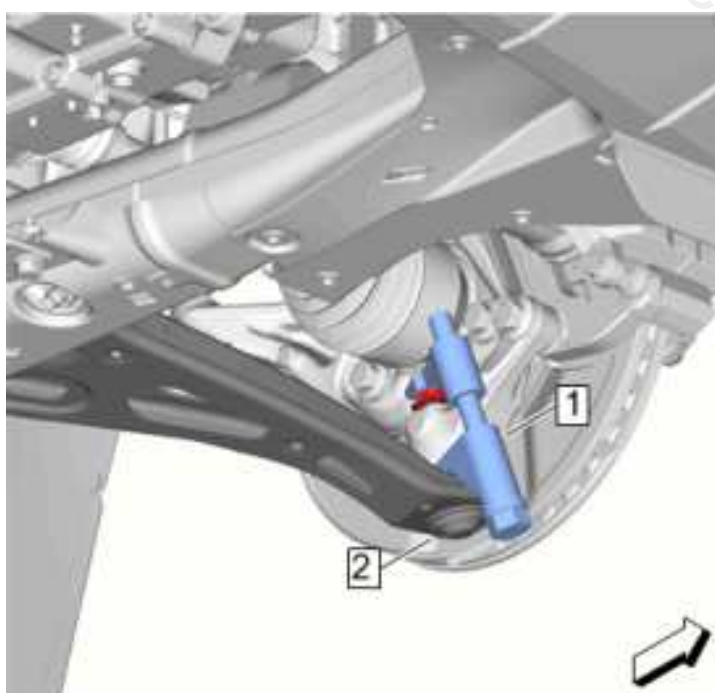


Fig. 120: Front Lower Control Arm And Ball Joint Separator
Courtesy of GENERAL MOTORS COMPANY

3. Separate Front Lower Control Arm (2) @ Steering Knuckle using **CH-42188-B** Ball Joint Separator (1)
4. Remove the **CH-42188-B** Ball Joint Separator (1) from the steering knuckle.

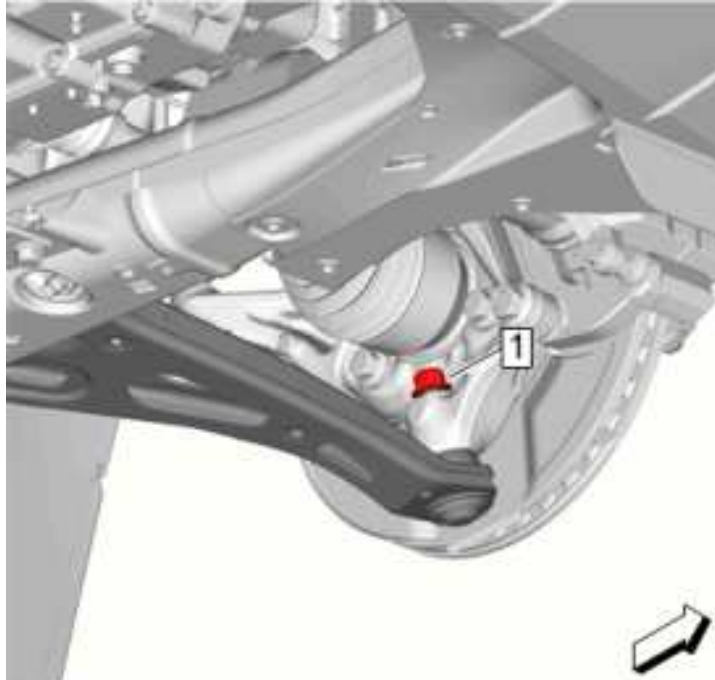


Fig. 121: Front Lower Control Arm Ball Stud Nut
 Courtesy of GENERAL MOTORS COMPANY

5. Remove Front Lower Control Arm Ball Stud Nut (1)

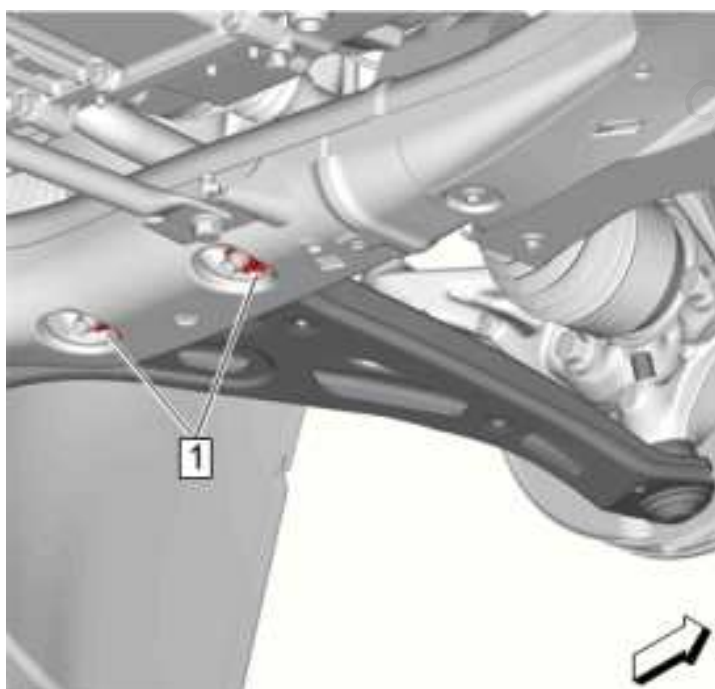


Fig. 122: Welded Front Lower Control Arm Front Nuts
 Courtesy of GENERAL MOTORS COMPANY

6. Use a heat gun to pre-heat the welded front lower control arm front nuts (1) to 175°C (347°F).

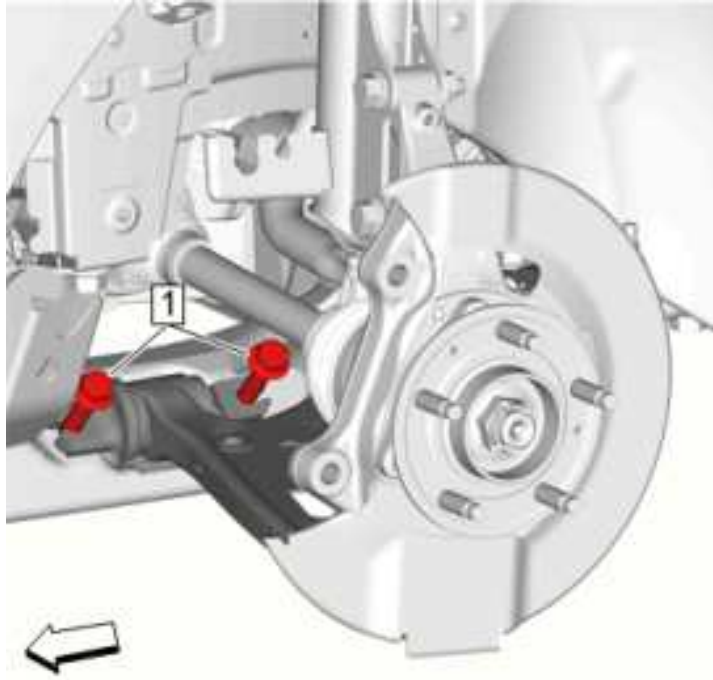


Fig. 123: Front Lower Control Arm Front Bolts
 Courtesy of GENERAL MOTORS COMPANY

NOTE: Some components not shown for graphic clarity.

7. Remove and DISCARD Front Lower Control Arm Front Bolts (1) (Qty: 2)

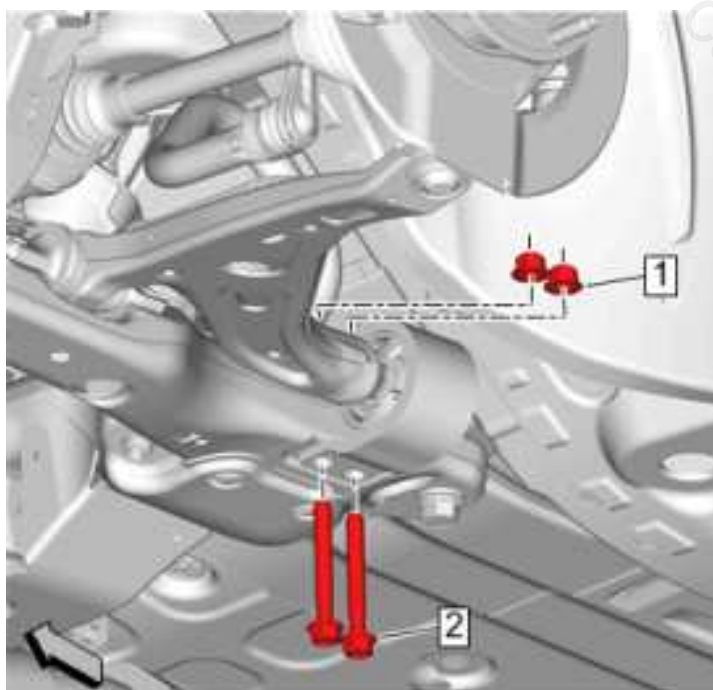


Fig. 124: Front Lower Control Arm Rear Nuts And Rear Bolts
 Courtesy of GENERAL MOTORS COMPANY

8. Remove Front Lower Control Arm Rear Nuts (1) (Qty: 2)
9. Remove and DISCARD Front Lower Control Arm Rear Bolts (2) (Qty: 2)

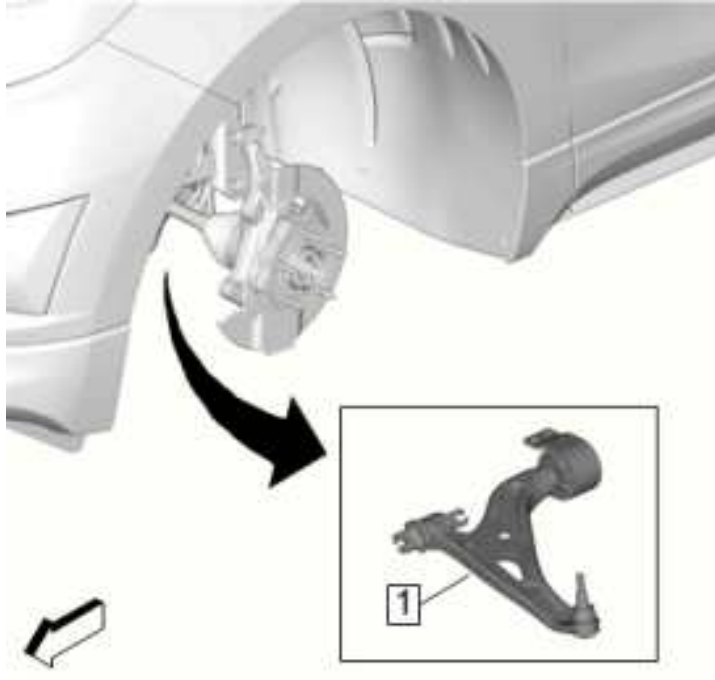


Fig. 125: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

10. Remove Front Lower Control Arm (1)
11. Transfer components as necessary.

Installation Procedure

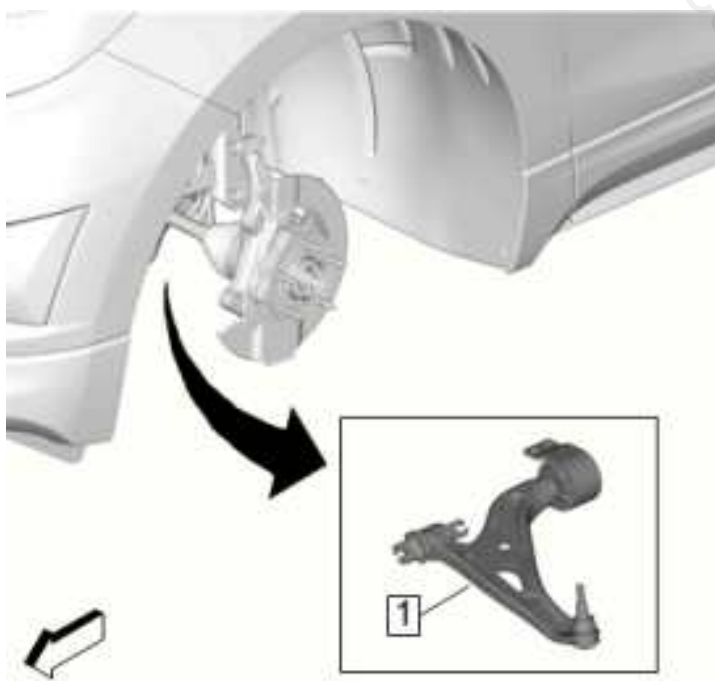


Fig. 126: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

1. Install Front Lower Control Arm (1)

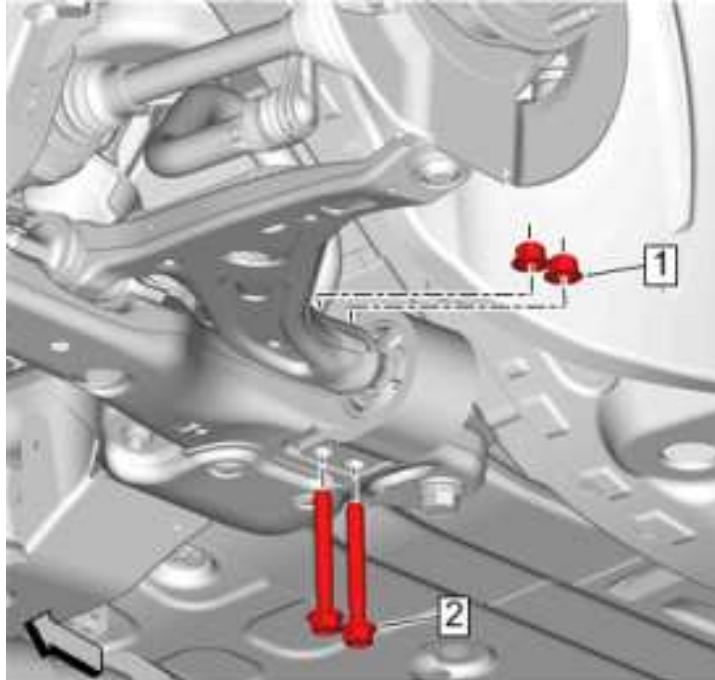


Fig. 127: Front Lower Control Arm Rear Nuts And Rear Bolts

Courtesy of GENERAL MOTORS COMPANY

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.

2. Install NEW Front Lower Control Arm Rear Bolts (2) (Qty: 2)
3. Install, but do NOT tighten Front Lower Control Arm Rear Nuts (1) (Qty: 2)

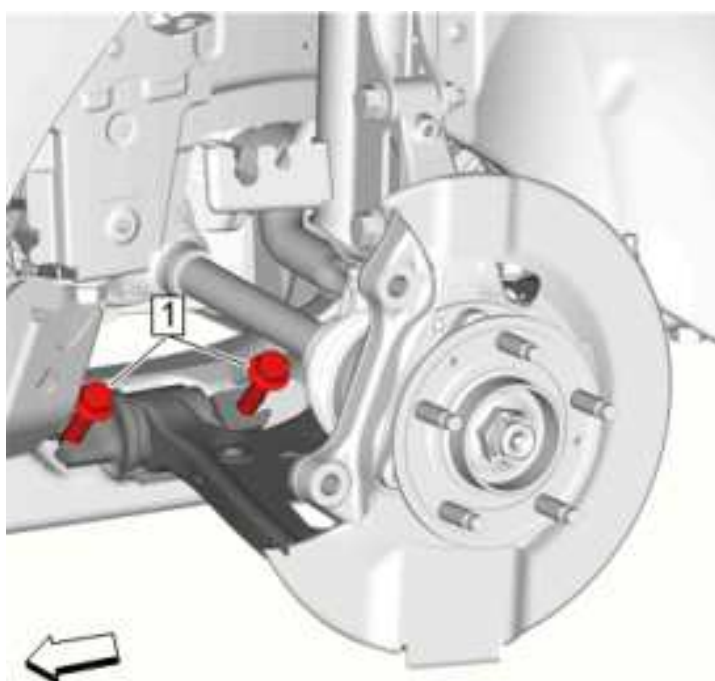


Fig. 128: Front Lower Control Arm Front Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: Some components not shown for graphic clarity.

4. Due to unknown shelf life of the NEW front lower control arm front bolt (1) adhesive patches, prepare the NEW bolts as follows:
 1. Remove all traces of the adhesive patches from the NEW front lower control arm front bolts (1).
 2. Clean the threads of the NEW bolts with denatured alcohol.

3. Apply thread locking adhesive to the NEW front lower control arm front bolts (1). Refer to [Adhesives, Fluids, Lubricants and Sealers](#)

4. Ensure there are no gaps in the thread locking adhesive along the length of the filled area of the threads on the bolt shafts.

CAUTION: Refer to [Fastener Caution](#) .

5. Install NEW Front Lower Control Arm Front Bolts (1) (Qty: 2) and tighten:
 1. First Pass: 100 N.m (74 lb ft)
 2. Final Pass: (90 - 105 degrees)

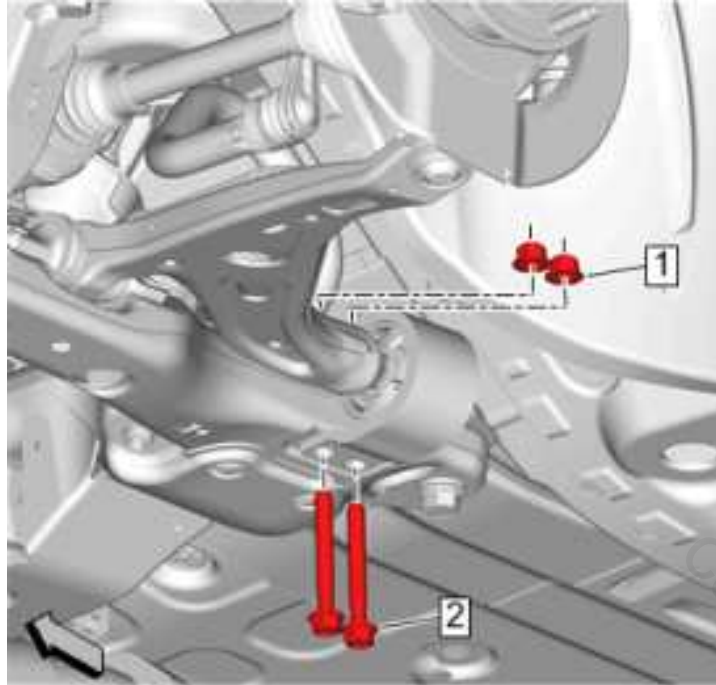


Fig. 129: Front Lower Control Arm Rear Nuts And Rear Bolts
Courtesy of GENERAL MOTORS COMPANY

6. Tighten Front Lower Control Arm Rear Nuts (1) (Qty: 2)
 1. First Pass: 100 N.m (74 lb ft)
 2. Final Pass: (90 - 105 degrees)

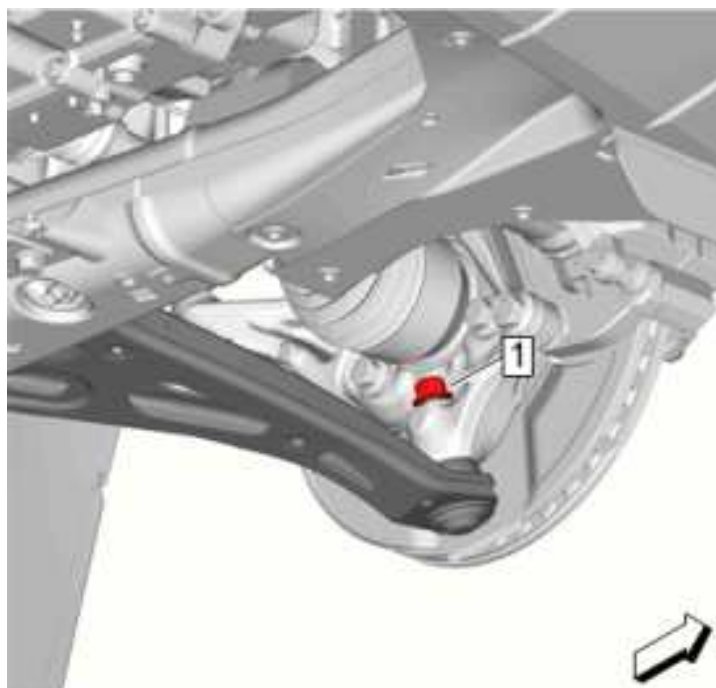


Fig. 130: Front Lower Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

NOTE:

Use the hex-holding feature to prevent the ball stud from turning while tightening front lower control arm ball stud nut (1).

7. Install and tighten Front Lower Control Arm Ball Stud Nut (1)
 1. First Pass: 40 N.m (30 lb ft)
 2. Final Pass: (120 - 135 degrees)
8. Install the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
9. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

LOWER CONTROL ARM REPLACEMENT (TERRAIN)

Special Tools

CH-42188-B Ball Joint Separator

Equivalent regional tools: [Special Tools](#)

Removal Procedure

1. Remove the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)

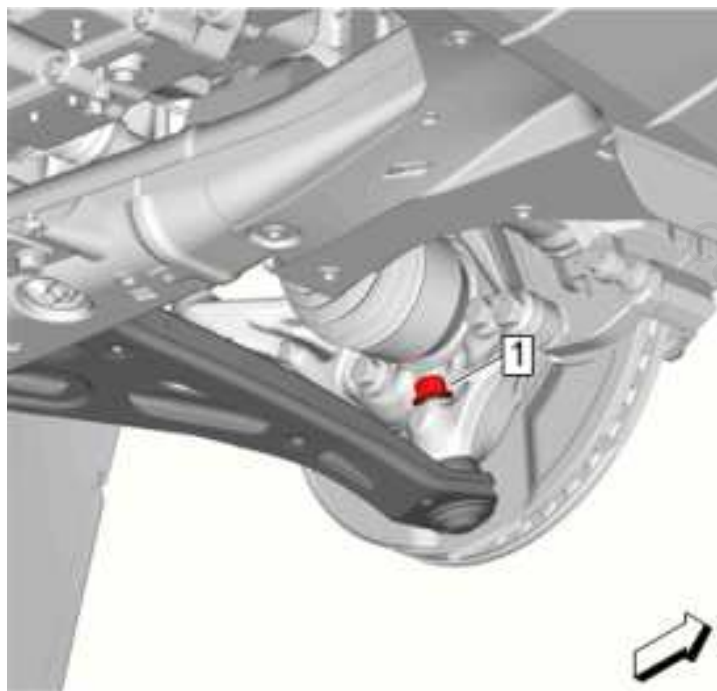


Fig. 131: Front Lower Control Arm Ball Stud Nut

Courtesy of GENERAL MOTORS COMPANY

NOTE:

Use the hex-holding feature to prevent the ball stud from turning while loosening front lower control arm ball stud nut (1).

2. Loosen Front Lower Control Arm Ball Stud Nut (1)

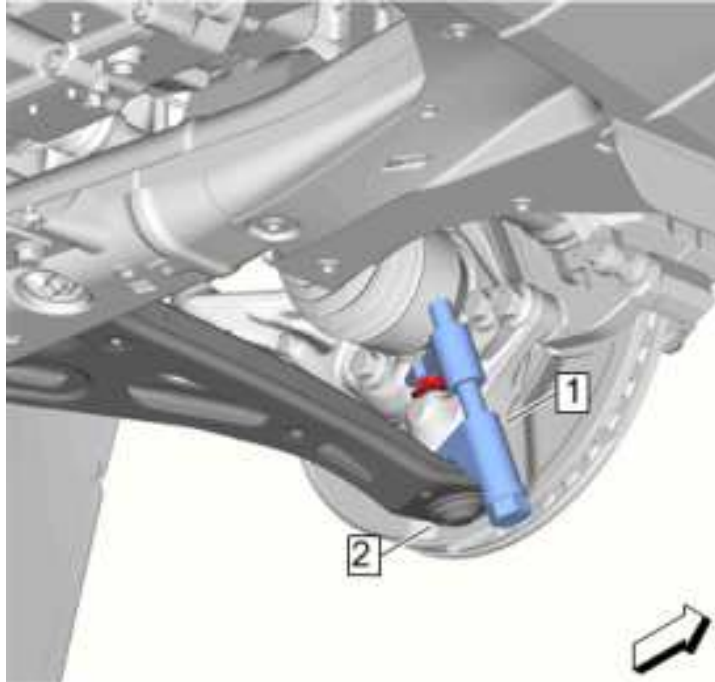


Fig. 132: Front Lower Control Arm And Ball Joint Separator
 Courtesy of GENERAL MOTORS COMPANY

3. Separate Front Lower Control Arm (2) @ Steering Knuckle using **CH-42188-B** Ball Joint Separator (1)
4. Remove the **CH-42188-B** Ball Joint Separator (1) from the steering knuckle.

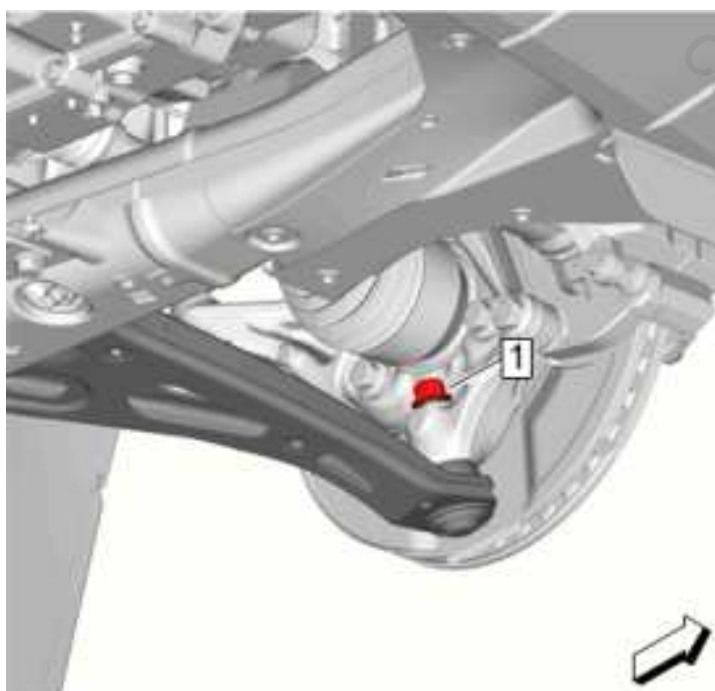


Fig. 133: Front Lower Control Arm Ball Stud Nut
 Courtesy of GENERAL MOTORS COMPANY

5. Remove Front Lower Control Arm Ball Stud Nut (1)

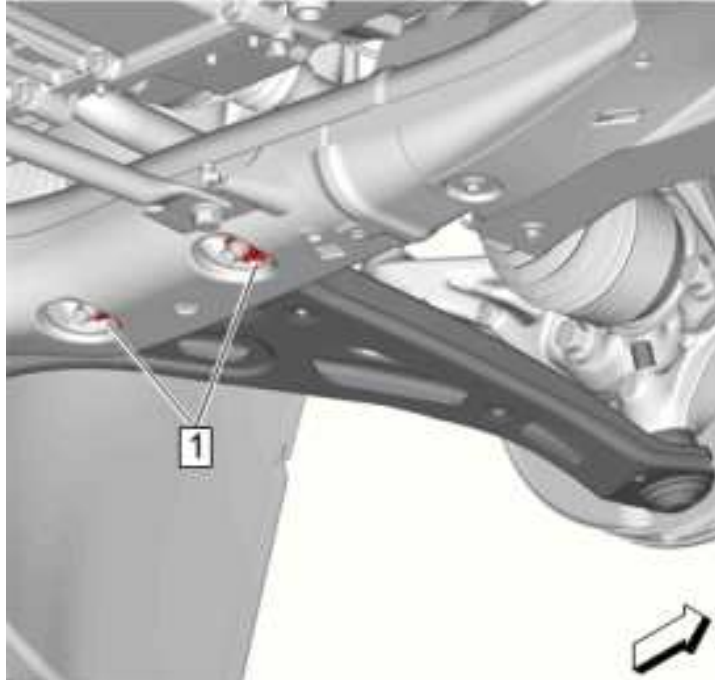


Fig. 134: Welded Front Lower Control Arm Front Nuts

Courtesy of GENERAL MOTORS COMPANY

6. Use a heat gun to pre-heat the welded front lower control arm front nuts (1) to 175°C (347°F).

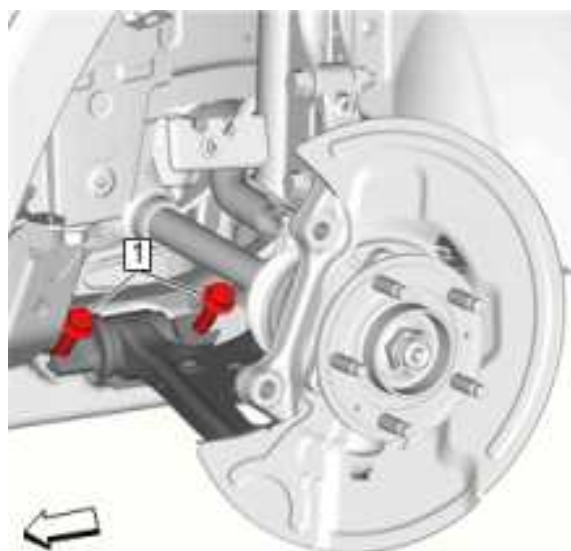


Fig. 135: Front Lower Control Arm Front Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: Some components not shown for graphic clarity.

7. Remove and DISCARD Front Lower Control Arm Front Bolts (1) (Qty: 2)

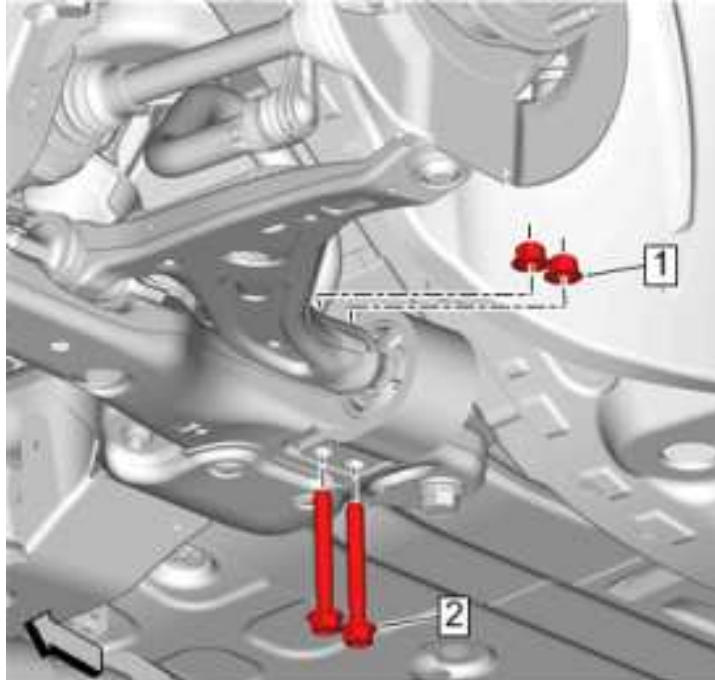


Fig. 136: Front Lower Control Arm Rear Nuts And Rear Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Remove Front Lower Control Arm Rear Nuts (1) (Qty: 2)
9. Remove and DISCARD Front Lower Control Arm Rear Bolts (2) (Qty: 2)



Fig. 137: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

10. Remove Front Lower Control Arm (1)
11. Transfer components as necessary.

Installation Procedure



Fig. 138: Front Lower Control Arm

Courtesy of GENERAL MOTORS COMPANY

1. Install Front Lower Control Arm (1)

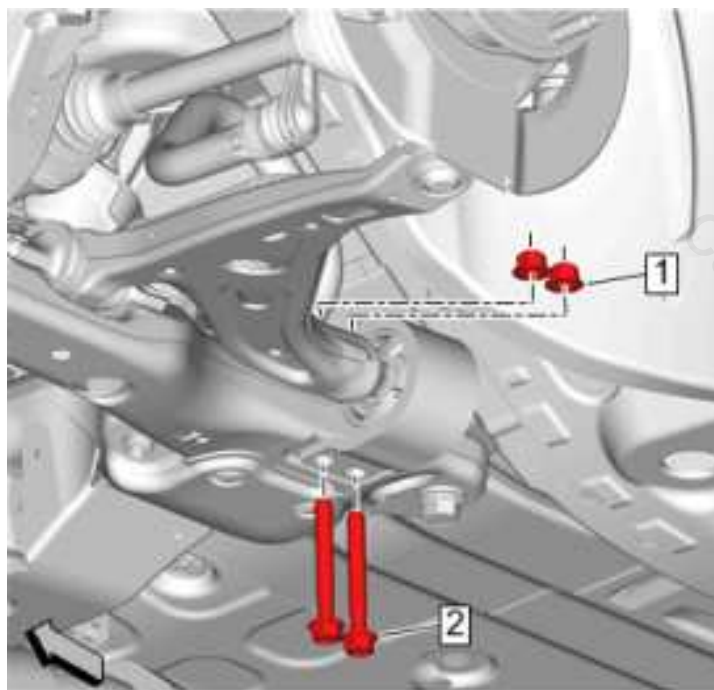


Fig. 139: Front Lower Control Arm Rear Nuts And Rear Bolts

Courtesy of GENERAL MOTORS COMPANY

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.

2. Install NEW Front Lower Control Arm Rear Bolts (2) (Qty: 2)
3. Install, but do NOT tighten Front Lower Control Arm Rear Nuts (1) (Qty: 2)



Fig. 140: Front Lower Control Arm Front Bolts
 Courtesy of GENERAL MOTORS COMPANY

NOTE: Some components not shown for graphic clarity.

4. Due to unknown shelf life of the NEW front lower control arm front bolt (1) adhesive patches, prepare the NEW bolts as follows:
 1. Remove all traces of the adhesive patches from the NEW front lower control arm front bolts (1).
 2. Clean the threads of the NEW bolts with denatured alcohol.
 3. Apply thread locking adhesive to the NEW front lower control arm front bolts (1). Refer to [Adhesives, Fluids, Lubricants, and Sealers](#)
 4. Ensure there are no gaps in the thread locking adhesive along the length of the filled area of the threads on the bolt shafts.

CAUTION: Refer to [Fastener Caution](#) .

5. Install NEW Front Lower Control Arm Front Bolts (1) (Qty: 2) and tighten:
 1. First Pass: 100 N.m (74 lb ft)
 2. Final Pass: (90 - 105 degrees)

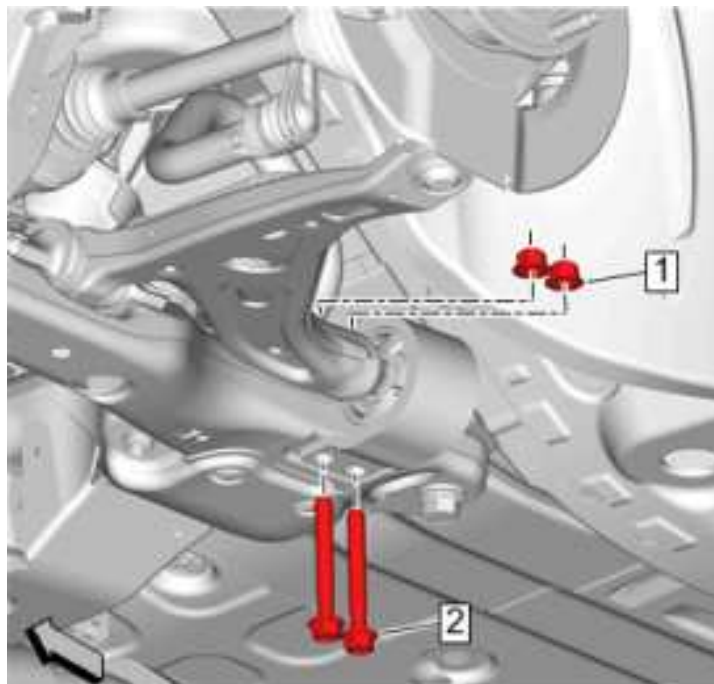


Fig. 141: Front Lower Control Arm Rear Nuts And Rear Bolts
 Courtesy of GENERAL MOTORS COMPANY

6. Tighten Front Lower Control Arm Rear Nuts (1) (Qty: 2)

1. First Pass: 100 N.m (74 lb ft)
2. Final Pass: (90 - 105 degrees)

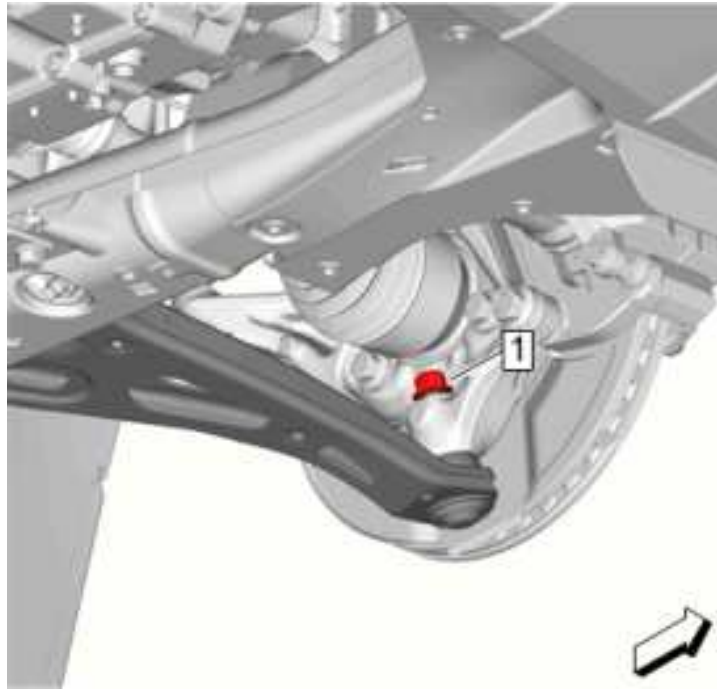


Fig. 142: Front Lower Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

NOTE: Use the hex-holding feature to prevent the ball stud from turning while tightening front lower control arm ball stud nut (1).

7. Install and tighten Front Lower Control Arm Ball Stud Nut (1)
 1. First Pass: 40 N.m (30 lb ft)
 2. Final Pass: (120 - 135 degrees)
8. Install the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
9. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

FRONT LOWER CONTROL ARM REAR BUSHING REPLACEMENT (EQUINOX, TERRAIN)

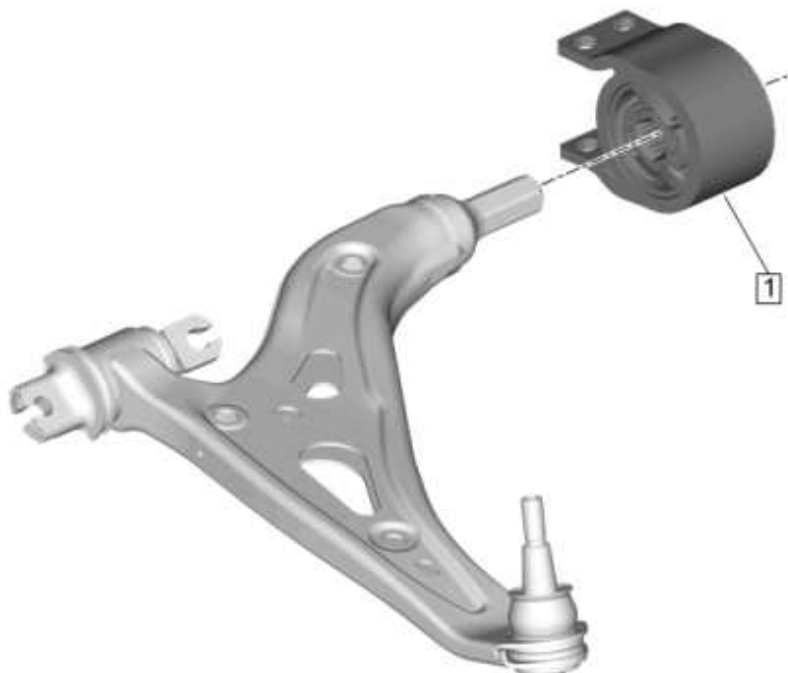


Fig. 143: Front Lower Control Arm Rear Bushing (Equinox, Terrain)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove Lower Control Arm. Refer to Lower Control Arm Replacement (Equinox) Lower Control Arm Replacement (Terrain)	
1	Front Lower Control Arm Rear Bushing Procedure 1. Place match marks on the front lower control arm and front lower control arm rear bushing to aid in installation. 2. Secure the front lower control arm in a vise and use a suitable puller to remove the front lower control arm rear bushing. 3. Copy any match marks to aid in installation, if necessary.

WHEEL STUD REPLACEMENT (EQUINOX, TERRAIN)

Special Tools

CH-43631 Ball Joint Separator

Equivalent regional tools: [Special Tools](#)

Removal Procedure

1. Remove Front Wheel Bearing and Hub Assembly. Refer to [Front Wheel Bearing and Hub Replacement \(Equinox\)](#)[Front Wheel Bearing and Hub Replacement \(Terrain\)](#).

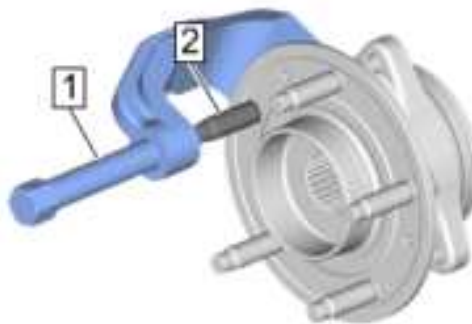


Fig. 144: Wheel Stud And Separator

Courtesy of GENERAL MOTORS COMPANY

2. Use the **CH-43631** separator (1) to remove the wheel stud (2) from the flange on the hub assembly.

DISCARD the stud.

Installation Procedure

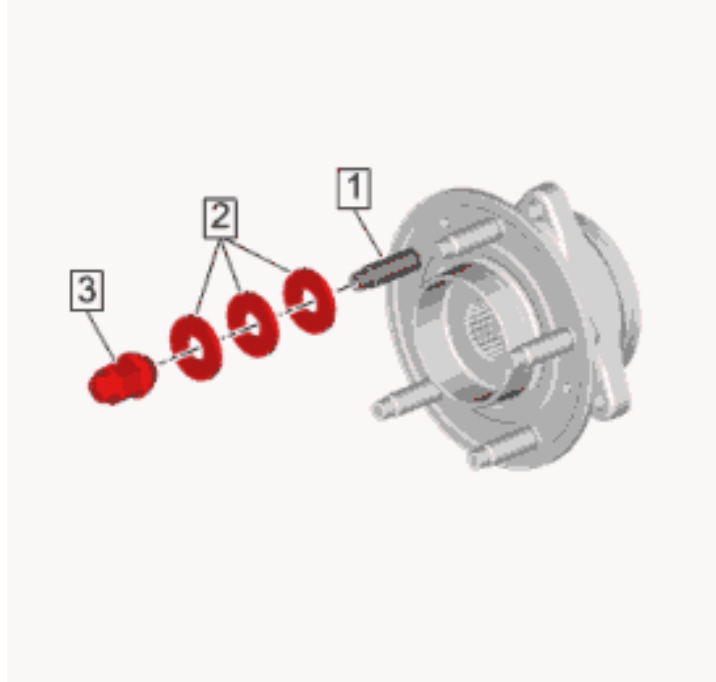


Fig. 145: Wheel Stud, Nut And Washers

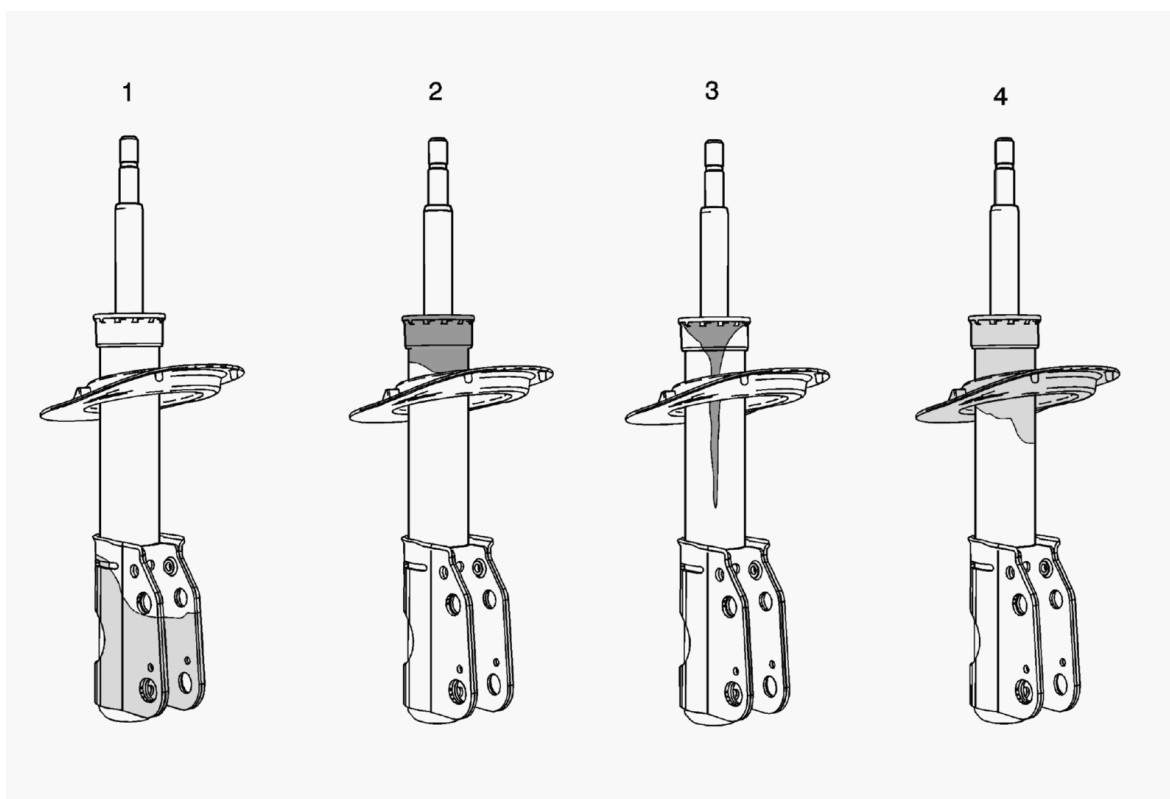
Courtesy of GENERAL MOTORS COMPANY

1. Position the NEW wheel stud (1) in the flange of the hub assembly.
2. Install flat washers (2) and an OLD wheel nut (3) on the wheel stud.
3. Use a suitable tool to prevent the flange on the hub assembly from rotating.
4. Tighten the wheel nut until the wheel stud is firmly seated.
5. Remove the wheel nut and flat washers.
6. Install Front Wheel Bearing and Hub Assembly. Refer to [Front Wheel Bearing and Hub Replacement \(Equinox\)](#)[Front Wheel Bearing and Hub Replacement \(Terrain\)](#).

STRUT AND SHOCK ABSORBER INSPECTION

NOTE: The strut assembly **DOES NOT** have to be removed from the vehicle to perform the following inspection procedure.

NOTE: A light film of oil on the top portion of the strut is normal. **DO NOT** replace the strut for this condition.



Condition 1

Oil or fluid residue only on the bottom of the strut tube or on other strut components and not originating from the shaft seal, is not a strut related problem. DO NOT replace the strut, look for other external leaks.

Condition 2

Light film/residue on the strut tube, but not on the spring seat and originating from the shaft seal, is a NORMAL condition. DO NOT replace the strut.

Condition 3

Oil drip or trail down the strut tube and originating from the shaft seal, is an ABNORMAL condition. Replace the strut.

Condition 4

Extreme wet film of oil covering the strut tube and pooling in the spring seat and originating from the shaft seal, is an ABNORMAL condition. Replace the strut.

Inspection

1. Verify the customer's concern is present. If the concern is present, continue to the next step. If the concern is not present, then the vehicle is operating normally.

NOTE: **The strut assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.**

2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Visually inspect each of the shock absorbers or struts for external fluid leaks. Refer to the following conditions 1, 2, 3, and 4 for visual inspection.
 - If conditions 1 or 2 are found, continue to step 4.
 - If conditions 3 or 4 are found, replace strut. Refer to Strut Replacement.
4. If equipped with electronic suspension control system, ensure that the system is working properly. Refer to Diagnostic Starting Point - Electronic Suspension Control.
5. Use your hands in order to lift up and push down on each corner of the vehicle 3 times. Remove your hands from the vehicle. If the corner motion exceeds 2 cycles, replace the strut. If the strut does not exceed 2 cycles, NO repair is necessary.

STRUT ASSEMBLY REMOVAL AND INSTALLATION

Removal Procedure

1. Remove the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
2. Remove Front Brake Hose @ Front Suspension Strut. Refer to [Front Brake Hose Replacement \(Prior to December 2016\)](#) [Front Brake Hose Replacement \(After December 2016\)](#)

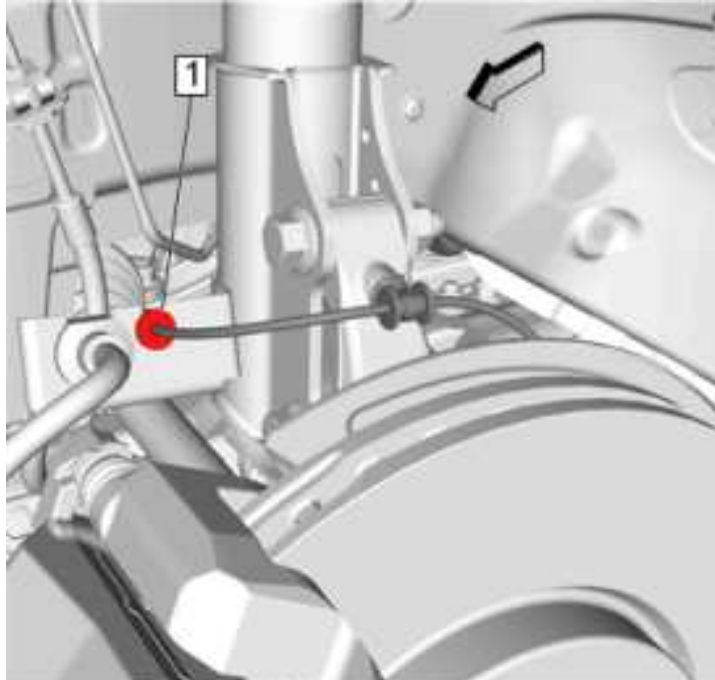


Fig. 147: Front Wheel Speed Sensor Harness Grommet

Courtesy of GENERAL MOTORS COMPANY

3. Remove Front Wheel Speed Sensor Grommet (1). Refer to [Front Wheel Speed Sensor Replacement \(Left\)](#)
[Front Wheel Speed Sensor Replacement \(Right\)](#).

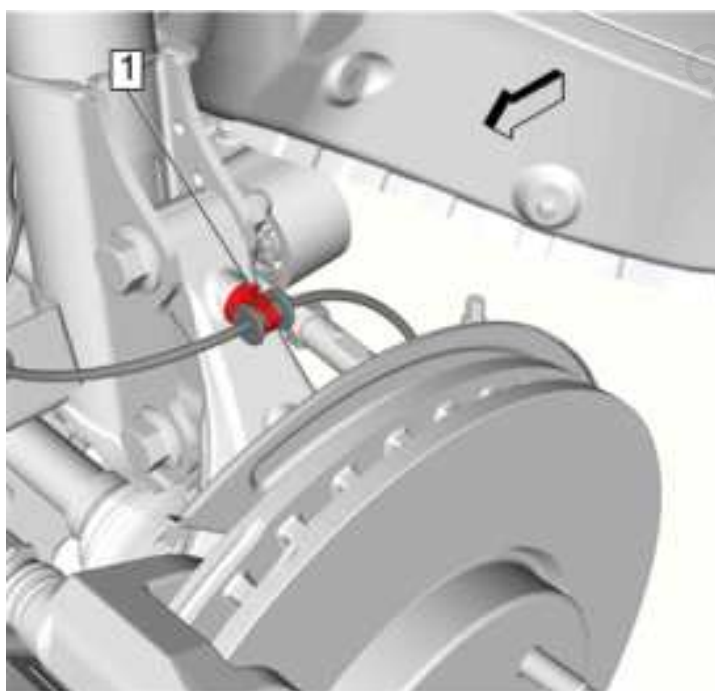


Fig. 148: Front Wheel Speed Sensor Harness Retainer

Courtesy of GENERAL MOTORS COMPANY

4. Remove Front Wheel Speed Sensor Retainer (1). Refer to [Front Wheel Speed Sensor Replacement \(Left\)](#)
[Front Wheel Speed Sensor Replacement \(Right\)](#).

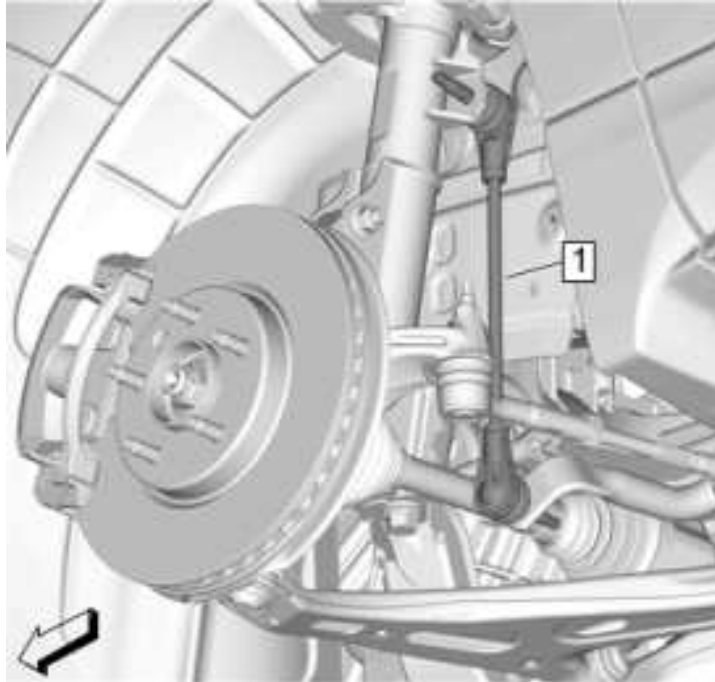


Fig. 149: Front Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

5. Remove Front Stabilizer Shaft Link (1) @ Strut Assembly. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#)[Stabilizer Shaft Link Replacement \(Terrain\)](#).

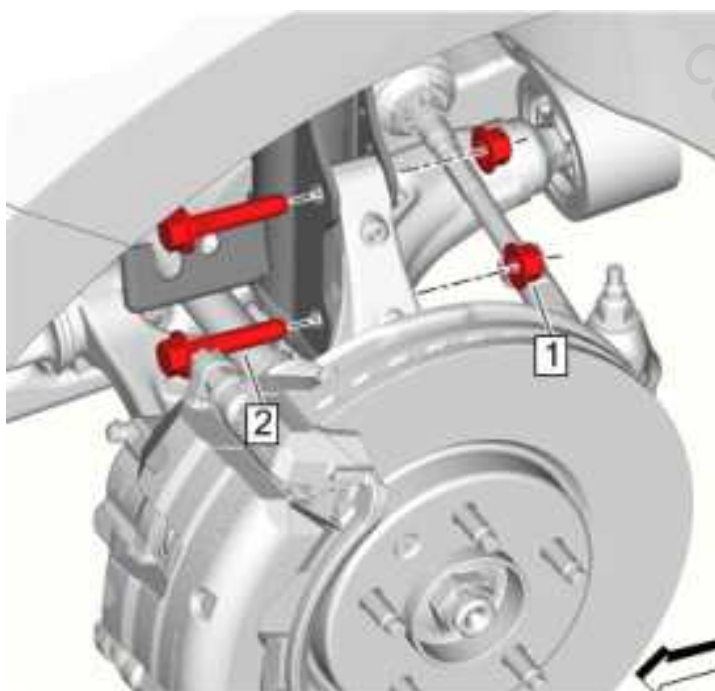


Fig. 150: Steering Knuckle Nuts And Bolts

Courtesy of GENERAL MOTORS COMPANY

6. Remove Steering Knuckle Nuts (1) (Qty: 2)
7. Remove Steering Knuckle Bolts (2) (Qty: 2)

DISCARD the bolts.

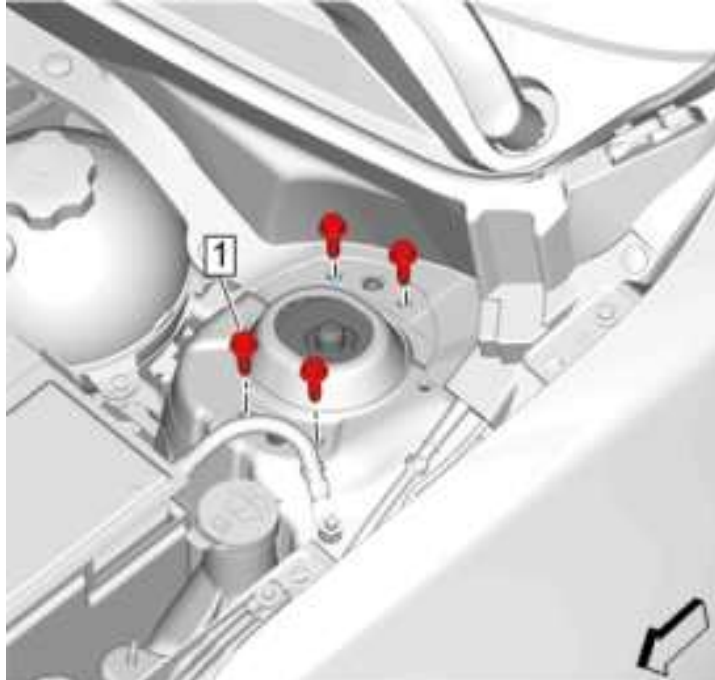


Fig. 151: Front Suspension Mount Upper Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Remove Front Suspension Mount Upper Bolts (1) (Qty: 4)

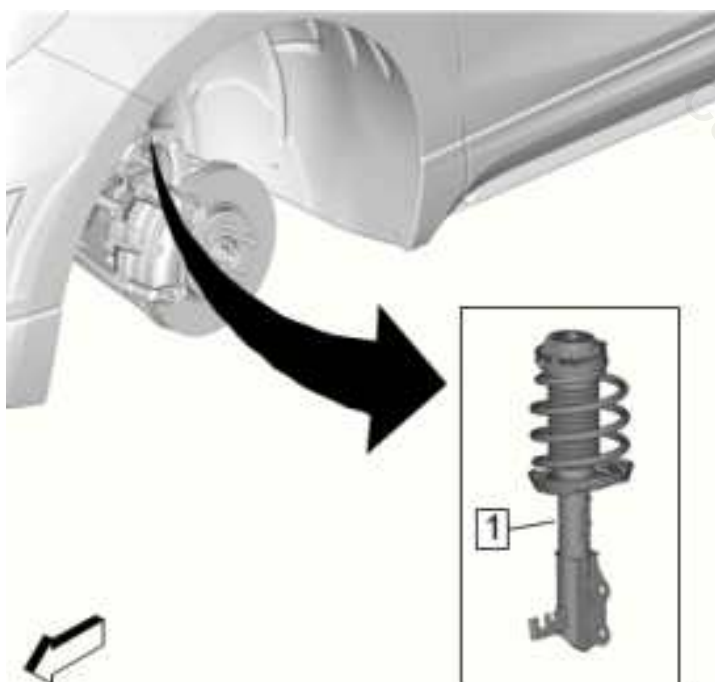


Fig. 152: Front Suspension Strut Assembly
Courtesy of GENERAL MOTORS COMPANY

NOTE:

- The front strut mount **MUST** be installed in the proper orientation. Place match marks on the outboard side of the front strut mount and the front suspension strut. Do **NOT** rotate the mount after removing the assembly from the vehicle.
- If replacing the strut assembly, match the orientation of the **NEW** front strut mount to the orientation of the **OLD** front strut mount and transfer the match marks to ensure proper installation of the strut assembly.

9. Remove the front suspension strut assembly (1) from the vehicle.
10. Transfer components as necessary.

Installation Procedure



Fig. 153: Front Suspension Strut Assembly
 Courtesy of GENERAL MOTORS COMPANY

NOTE: The front strut mount **MUST** be installed in the proper orientation. Ensure the match marks on the front strut mount and the front suspension strut match the outboard direction as marked before removing the assembly from the vehicle.

1. Position the front suspension strut assembly (1) on the vehicle.

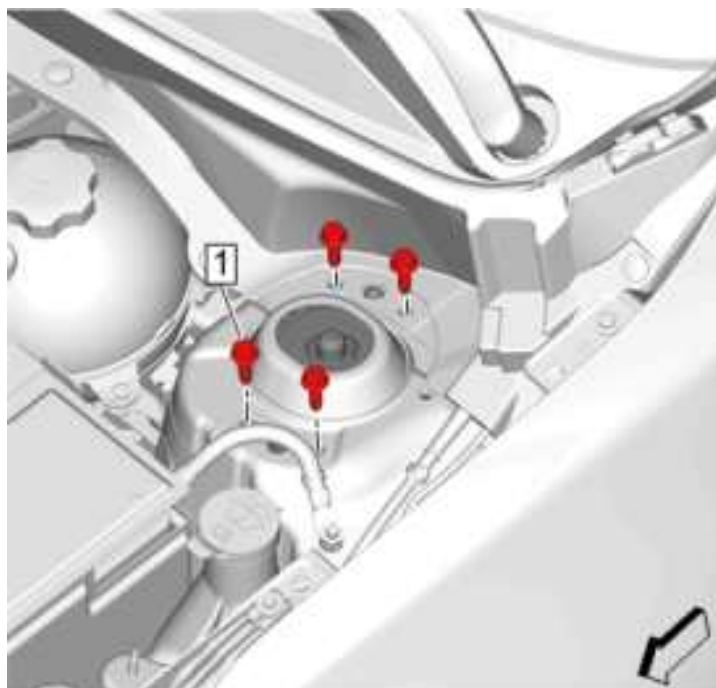


Fig. 154: Front Suspension Mount Upper Bolts
 Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to [Fastener Caution](#) .

2. Install and tighten Front Suspension Mount Upper Bolts (1) (Qty: 4) to 22 N.m (16 lb ft)

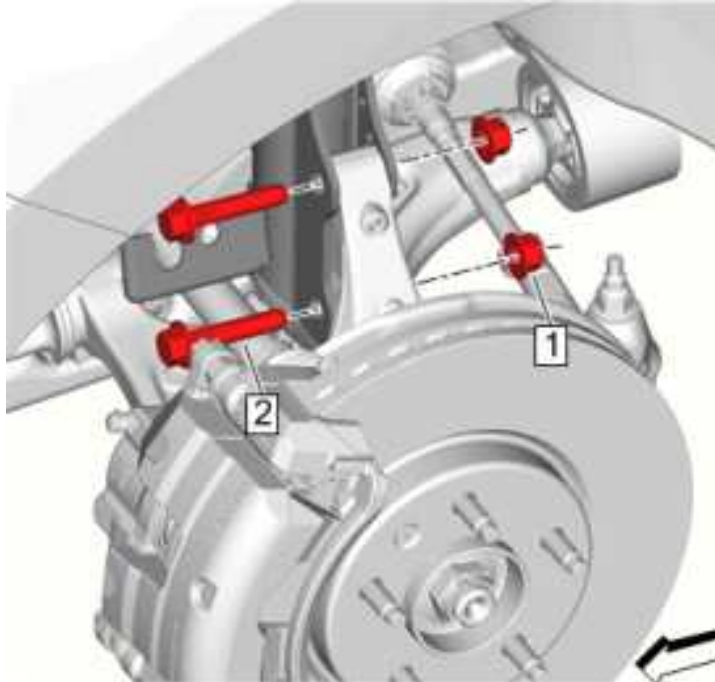


Fig. 155: Steering Knuckle Nuts And Bolts
Courtesy of GENERAL MOTORS COMPANY

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.

3. Install Steering Knuckle Bolts (2) (Qty: 2)

Install NEW bolts.

4. Install and tighten Steering Knuckle Nuts (1) (Qty: 2)

Tighten

1. First Pass: 100 N.m (74 lb ft)
2. Final Pass: (45 - 60 degrees)

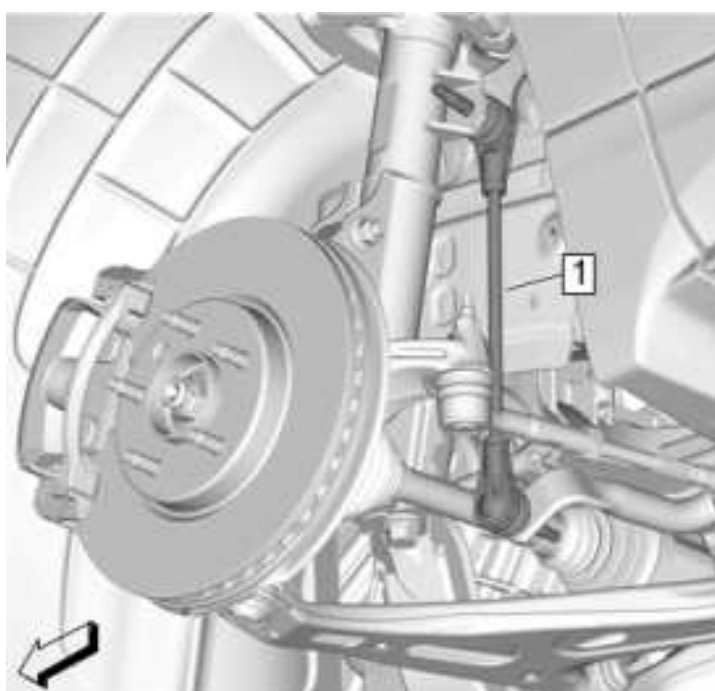


Fig. 156: Front Stabilizer Shaft Link
Courtesy of GENERAL MOTORS COMPANY

5. Install Front Stabilizer Shaft Link (1) @ Strut Assembly. Refer to [Stabilizer Shaft Link Replacement \(Equinox\)](#) [Stabilizer Shaft Link Replacement \(Terrain\)](#).

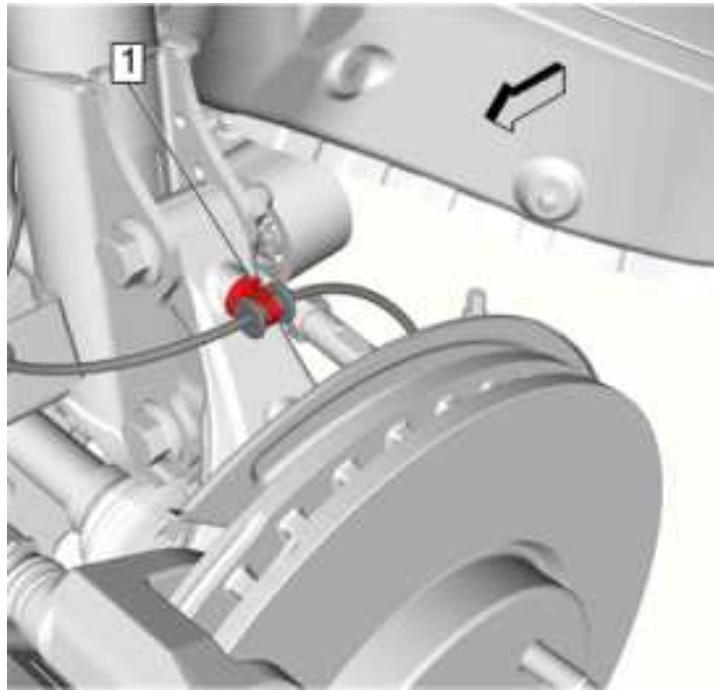


Fig. 157: Front Wheel Speed Sensor Harness Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Install Front Wheel Speed Sensor Retainer (1). Refer to [Front Wheel Speed Sensor Replacement \(Left\)](#) [Front Wheel Speed Sensor Replacement \(Right\)](#).

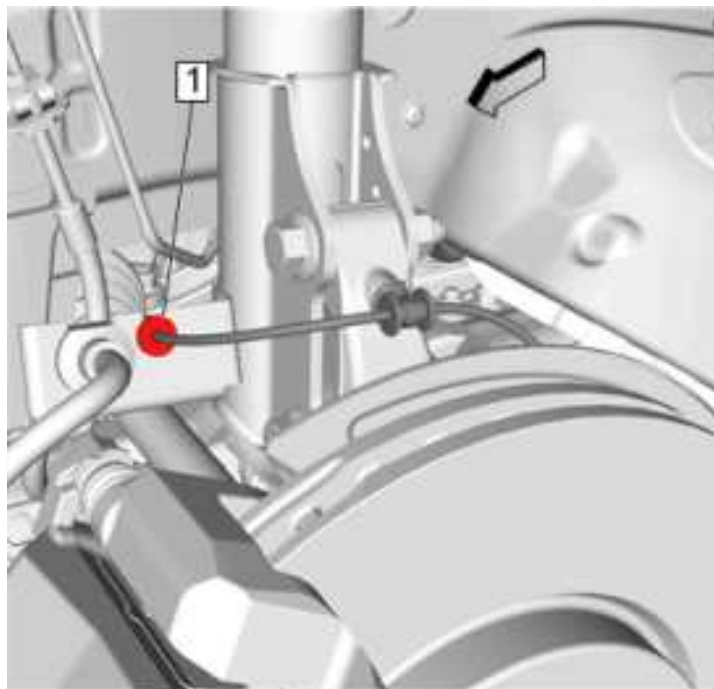


Fig. 158: Front Wheel Speed Sensor Harness Grommet
Courtesy of GENERAL MOTORS COMPANY

7. Install Front Wheel Speed Sensor Grommet (1). Refer to [Front Wheel Speed Sensor Replacement \(Left\)](#) [Front Wheel Speed Sensor Replacement \(Right\)](#).
8. Install Front Brake Hose @ Front Suspension Strut. Refer to [Front Brake Hose Replacement \(Prior to December 2016\)](#) [Front Brake Hose Replacement \(After December 2016\)](#)
9. Install the front tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
10. Measure and adjust the wheel alignment. Refer to [Wheel Alignment Measurement](#)

SUSPENSION STRUT DISPOSAL

WARNING: Use the proper eye protection when drilling to prevent metal chips from causing

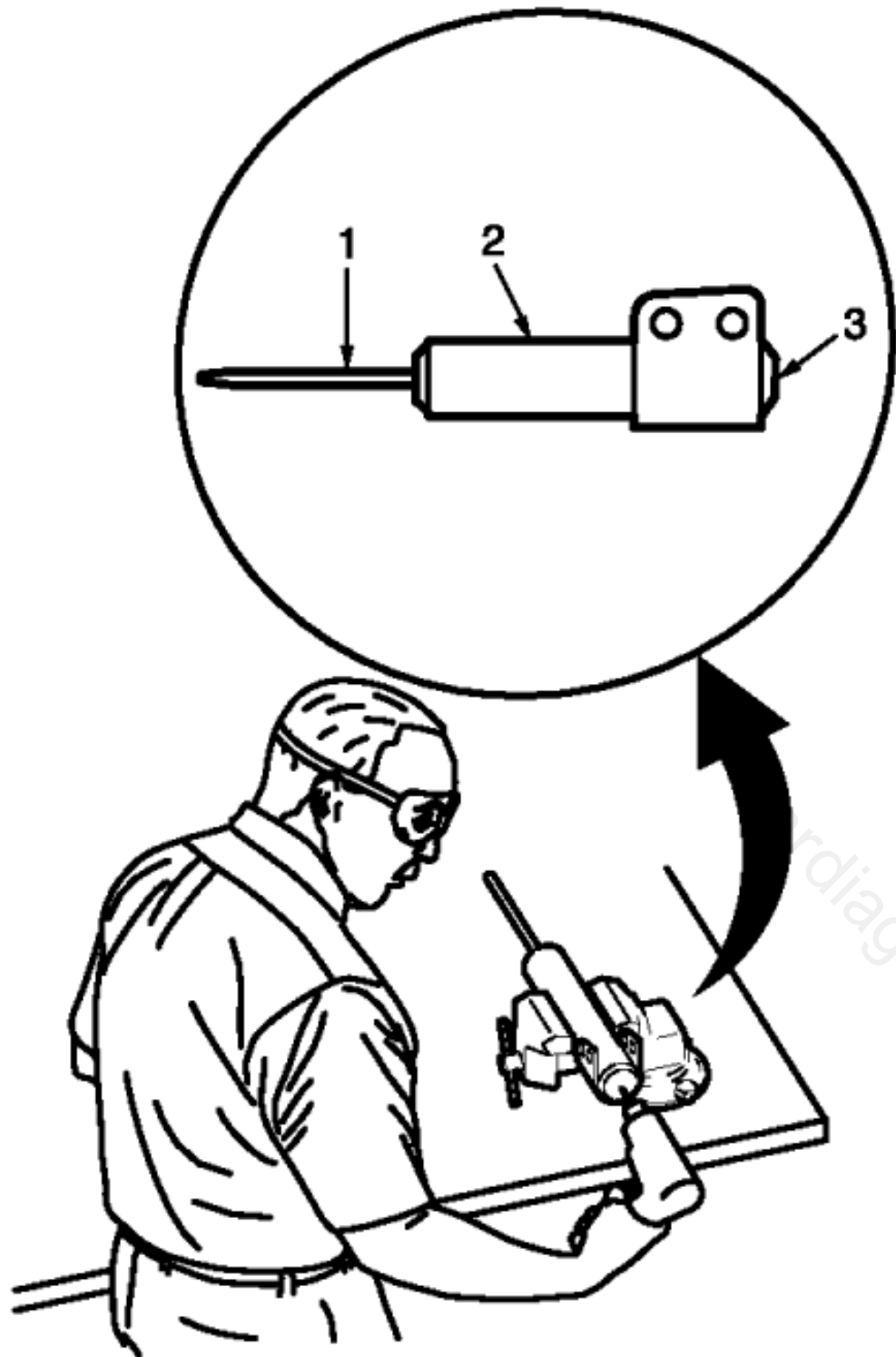


Fig. 159: Drilling Hole In Strut At Center Of End Cap
Courtesy of GENERAL MOTORS COMPANY

1. Clamp the strut in a vise horizontally with the rod (1) completely extended.
2. Drill a hole in the strut at the center of the end cap (3) using a 5 mm (3/16 in) drill bit. Gas or a gas/oil mixture will exhaust when the drill bit penetrates the strut. Use shop towels in order to contain the escaping oil.
3. Remove the strut from the vise.
4. Hold the strut over a drain pan vertically with the hole down.
5. Move the rod (1) in and out of the tube (2) to completely drain the oil from the strut.

STRUT, STRUT COMPONENT OR SPRING REPLACEMENT (EQUINOX, TERRAIN)

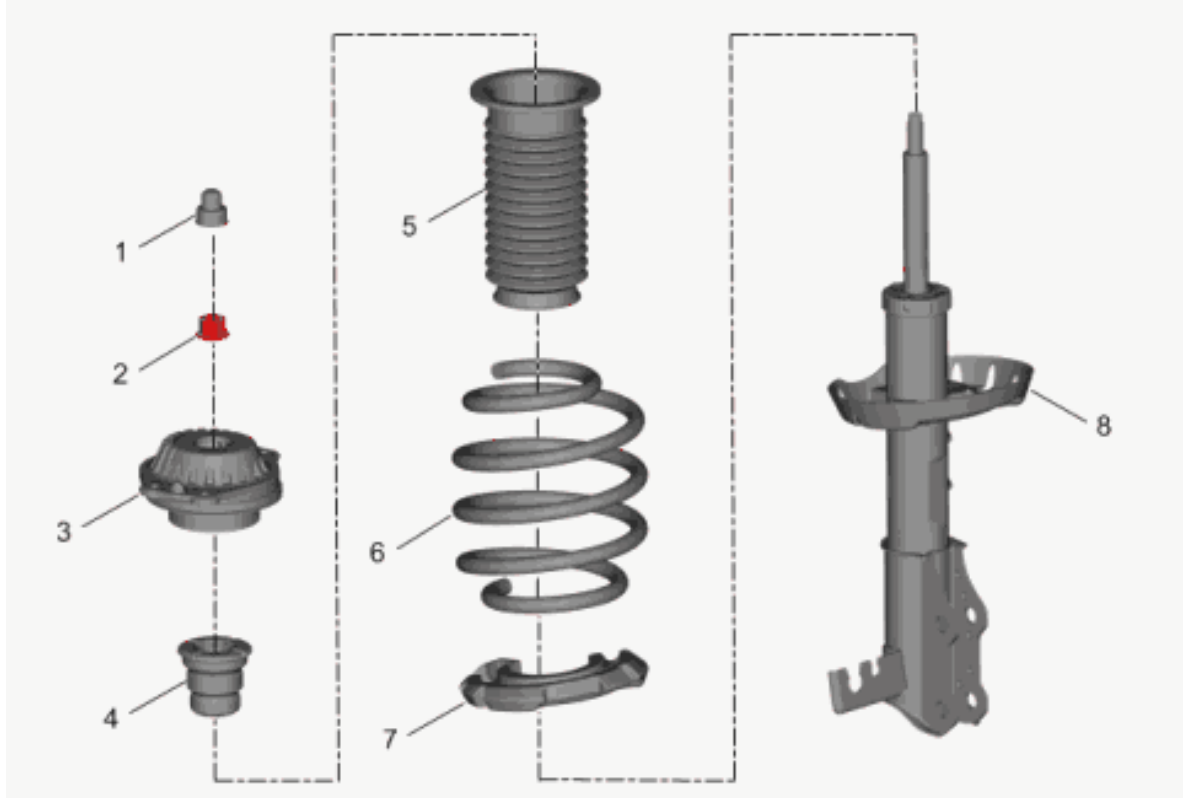


Fig. 160: Strut, Strut Component Or Spring.(Equinox, Terrain)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: To prevent personal injury and/or component damage, use the proper tools to support and compress the coil spring prior to removal of the strut shaft nut when removing the coil spring. The coil spring is under extreme pressure and can become a projectile should the spring separate from the strut before all of the tension is relieved.	
Preliminary Procedure Remove Strut Assembly. Refer to Strut Assembly Removal and Installation	
1	Front Suspension Strut Nut Cap

Callout	Component Name
2	Front Suspension Strut Nut CAUTION: Refer to Fastener Caution . CAUTION: The 10 mm, 12-Point Triple Square or XZN bit are the only two approved tools for this design and are commercially available. Using any other wrench or bit can cause damage (cracking) to the strut rod, requiring complete suspension strut replacement. Procedure 1. Use the CH-6066 holder and the CH-6068 tensioner to compress the front coil spring. 2. Use the J-42991 socket to remove and install the front suspension strut nut. Tighten 70 N.m (52 lb ft) Special Tools • CH-6066 Holder • CH-6068 Spring Tensioner • J-42991 Strut Rod Nut Socket Equivalent regional tools: Special Tools
3	Front Suspension Strut Mount Procedure 1. Before removing, place match marks on the front strut mount and on the front coil spring. 2. When installing, align the match marks on the front strut mount and the front coil spring. NOTE: • The front strut mount MUST be installed in the proper orientation. Place match marks on the front strut mount and the front coil spring before disassembling the strut assembly. • If replacing the front strut mount, place match marks on the NEW mount in the same position as the OLD mount.
4	Front Suspension Strut Bumper
5	Front Strut Boot
6	Front Coil Spring
7	Front Coil Spring Lower Insulator
8	Front Suspension Strut

DESCRIPTION AND OPERATION

GENERAL DESCRIPTION

The front suspension has 2 primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

The front suspension absorbs the impact of the tires travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The rate at which the suspension dissipates the energy and the amount of energy that is absorbed is how the suspension defines the vehicles ride characteristics. Ride characteristics are designed into the suspension system and are not adjustable. The ride characteristics are mentioned in this description in order to aid in the understanding of the functions of the suspension system. The suspension system must allow for the vertical movement of the tire and wheel assembly as the vehicle travels over irregular road surfaces while maintaining the tire's horizontal relationship to the road.

This requires that the steering knuckle be suspended between a lower control arm and a strut assembly. The lower control arm attaches from the steering knuckle at the outermost point of the control arm. The attachment is through a ball and socket type joint. The innermost end of the control arm attached at 2 points to the vehicle frame through semi-rigid bushings. The upper portion of the steering knuckle is attached to a strut assembly. The strut assembly then connects to the vehicle body by way of an upper bearing. The steering knuckle is allowed to travel up and down independent of the vehicle body structure and frame.

This up and down motion of the steering knuckle as the vehicle travels over bumps is absorbed predominantly by the coil spring. This spring is retained under tension over the strut assembly. A strut is used in conjunction with this system in order to dampen out the oscillations of the coil spring. A strut is a basic hydraulic cylinder. The strut is filled with oil and has a moveable shaft that connects to a piston inside the strut. Valves inside the shock absorber offer resistance to oil flow and consequently inhibit rapid movement of the piston and shaft. Each end of the shock absorber is connected in such a fashion to utilize this recoil action of a spring alone. Each end of the strut is designed as the connection point of the suspension system to the vehicle and acts as the coil spring seat. This allows the strut to utilize the dampening action to reduce the recoil of a spring alone. The lower control arm is allowed to pivot at the vehicle frame in a vertical fashion. The ball joint allows the steering knuckle to maintain the perpendicular relationship to the road surface.

Front suspensions systems utilize a stabilizer shaft. The stabilizer bar connects between the left and right lower control arm assemblies through the stabilizer link and stabilizer shaft insulators. This bar controls the amount of independent movement of the suspension when the vehicle turns. Limiting the independent movement defines the vehicles handling characteristics on turns.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Description

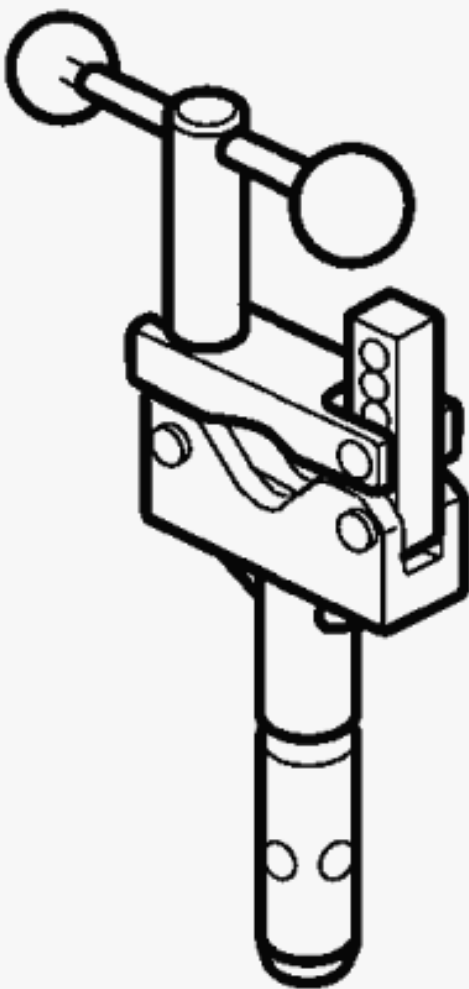
Illustration	Tool Number/Description
	CH-6066 KM-6066 Holder

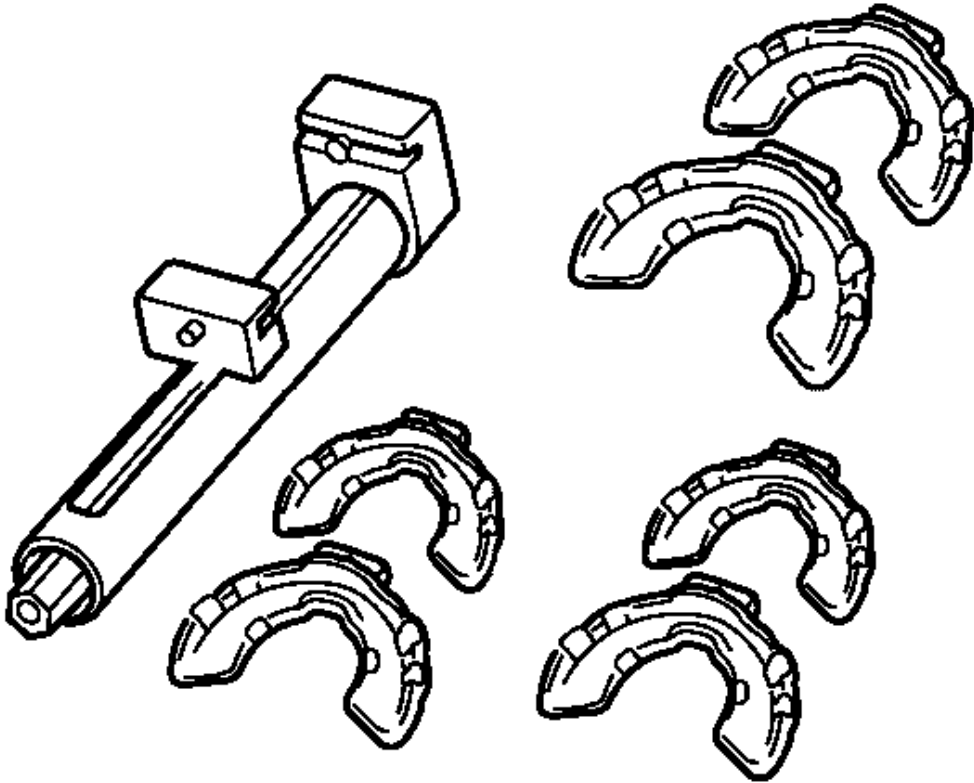
Illustration	Tool Number/Description
	CH-6068 MKM-6068 Spring Tensioner cardiagn.com

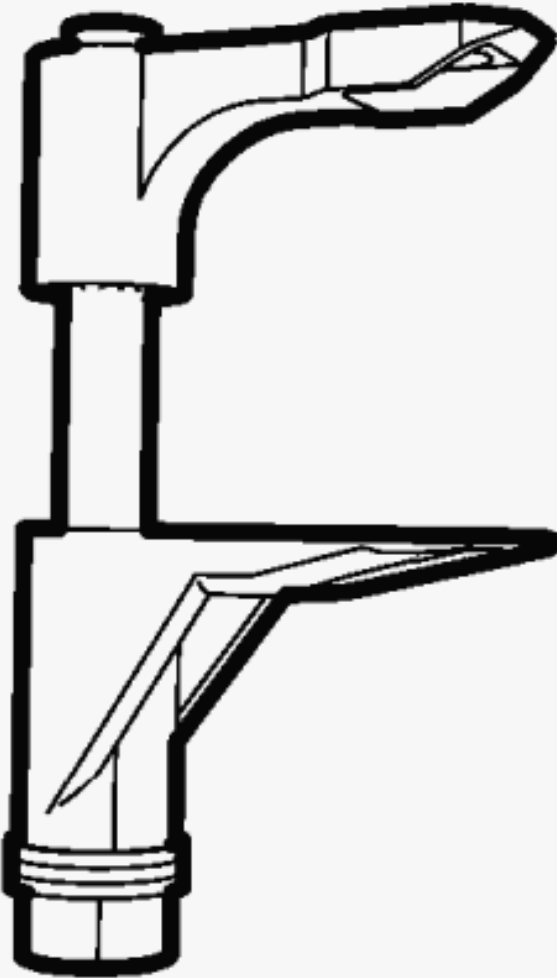
Illustration	Tool Number/Description
	CH-42188-B J-42188-B Ball Joint Separator cardiagn.com

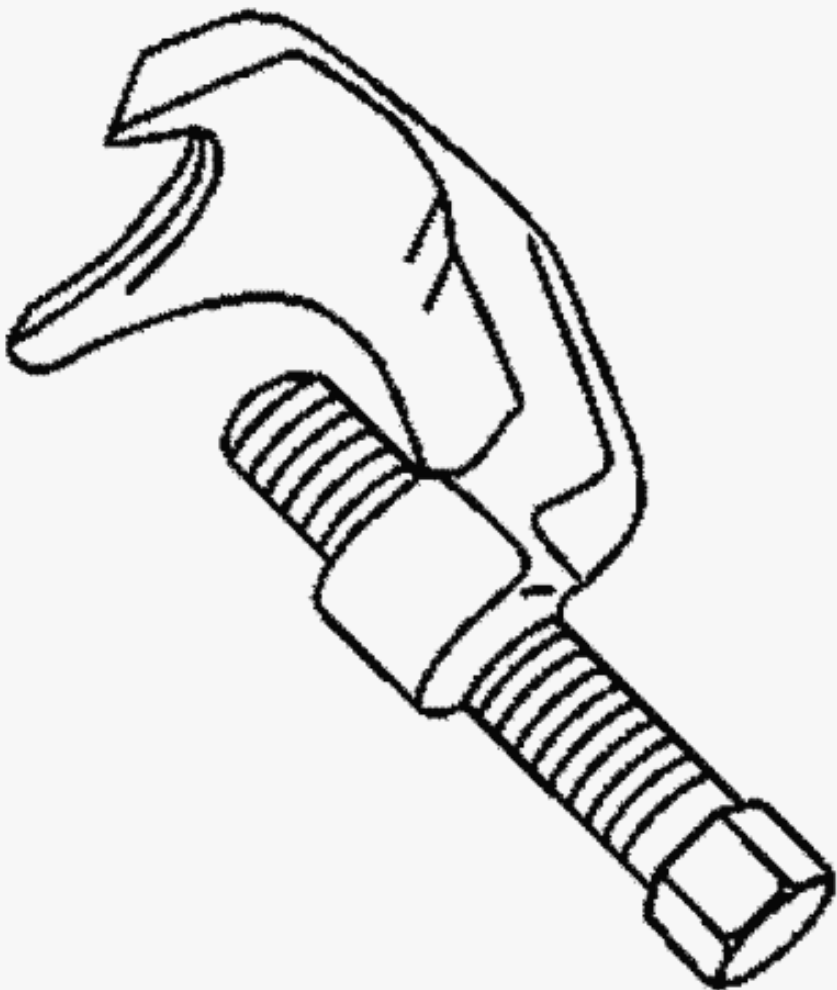
Illustration	Tool Number/Description
	CH-43631 KM-507-C J-43631 Ball Joint Separator cardiagn.com

Illustration	Tool Number/Description
	J-42991 Strut Rod Nut Socket