

2018 SUSPENSION**CHEVROLET WHEEL ALIGNMENT SPECIFICATIONS - EQUINOX****WHEEL ALIGNMENT SPECIFICATIONS****EQUINOX AWD MODELS****EQUINOX AWD Models**

Measurement	Minimum	Preferred	Maximum
Left Front Caster ($\hat{A}^\circ$)	3.7	4.5	5.3
Right Front Caster ($\hat{A}^\circ$)	3.7	4.5	5.3
Left Front Camber ($\hat{A}^\circ$)	-1.05	-0.35	0.35
Right Front Camber ($\hat{A}^\circ$)	-1.05	-0.35	0.35
Front Toe ($\hat{A}^\circ$)	0	0.2	0.4
Left SAI ($\hat{A}^\circ$)	0	0	0
Right SAI ($\hat{A}^\circ$)	0	0	0
Left Rear Camber ($\hat{A}^\circ$)	-1.3	-0.5	0.3
Right Rear Camber ($\hat{A}^\circ$)	-1.3	-0.5	0.3
Rear Toe ($\hat{A}^\circ$)	-0.1	0.1	0.3
Thrust Angle	0.3	0	0
Left Toe Out, Inward ($\hat{A}^\circ$)	0	0	0
Right Toe Out, Inward ($\hat{A}^\circ$)	0	0	0
Left Toe Out, Outward ($\hat{A}^\circ$)	0	0	0
Right Toe Out, Outward ($\hat{A}^\circ$)	0	0	0
Left Max Turn, Inward ($\hat{A}^\circ$)	0	0	0
Right Max Turn, Inward ($\hat{A}^\circ$)	0	0	0
Left Max Turn, Outward ($\hat{A}^\circ$)	0	0	0
Right Max Turn, Outward ($\hat{A}^\circ$)	0	-	-

EQUINOX FWD MODELS**EQUINOX FWD Models**

Measurement	Minimum	Preferred	Maximum
Left Front Caster ($\hat{A}^\circ$)	3.7	4.5	5.3
Right Front Caster ($\hat{A}^\circ$)	3.7	4.5	5.3
Left Front Camber ($\hat{A}^\circ$)	-1.2	-0.5	0.2
Right Front Camber ($\hat{A}^\circ$)	-1.2	-0.5	0.2
Front Toe ($\hat{A}^\circ$)	0	0.2	0.4
Left SAI ($\hat{A}^\circ$)	0	0	0
Right SAI ($\hat{A}^\circ$)	0	0	0
Left Rear Camber ($\hat{A}^\circ$)	-1.3	-0.5	0.3
Right Rear Camber ($\hat{A}^\circ$)	-1.3	-0.5	0.3
Rear Toe ($\hat{A}^\circ$)	-0.1	0.1	0.3
Thrust Angle	0.3	0	0
Left Toe Out, Inward ($\hat{A}^\circ$)	0	0	0
Right Toe Out, Inward ($\hat{A}^\circ$)	0	0	0
Left Toe Out, Outward ($\hat{A}^\circ$)	0	0	0
Right Toe Out, Outward ($\hat{A}^\circ$)	0	0	0
Left Max Turn, Inward ($\hat{A}^\circ$)	0	0	0
Right Max Turn, Inward ($\hat{A}^\circ$)	0	0	0
Left Max Turn, Outward ($\hat{A}^\circ$)	0	0	0

Measurement	Minimum	Preferred	Maximum
Right Max Turn, Outward (Â°)	0	-	-

mcx30.com

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 \(Terrain\)](#).

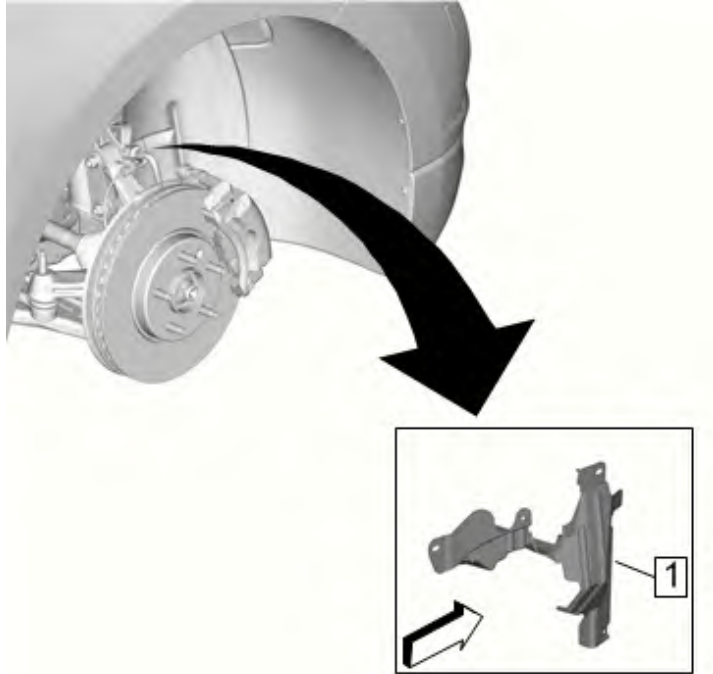


Fig. 1: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

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

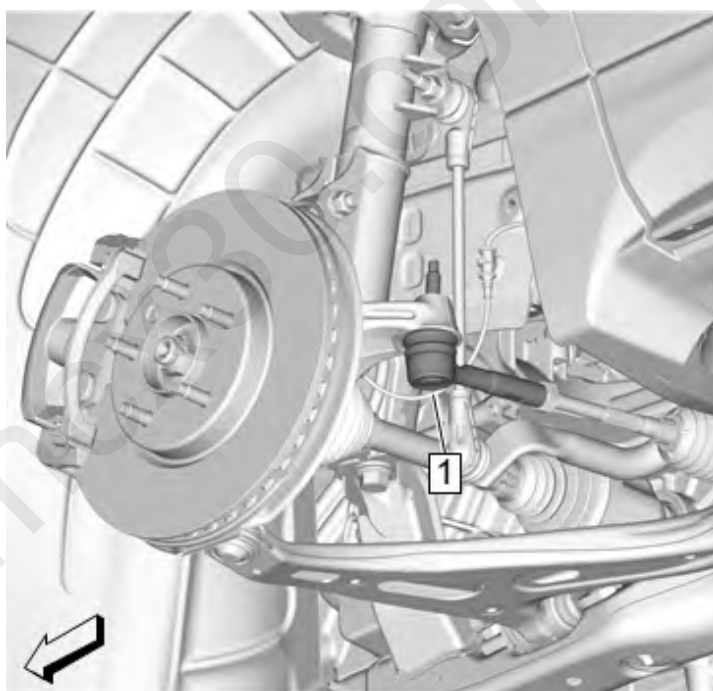


Fig. 2: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

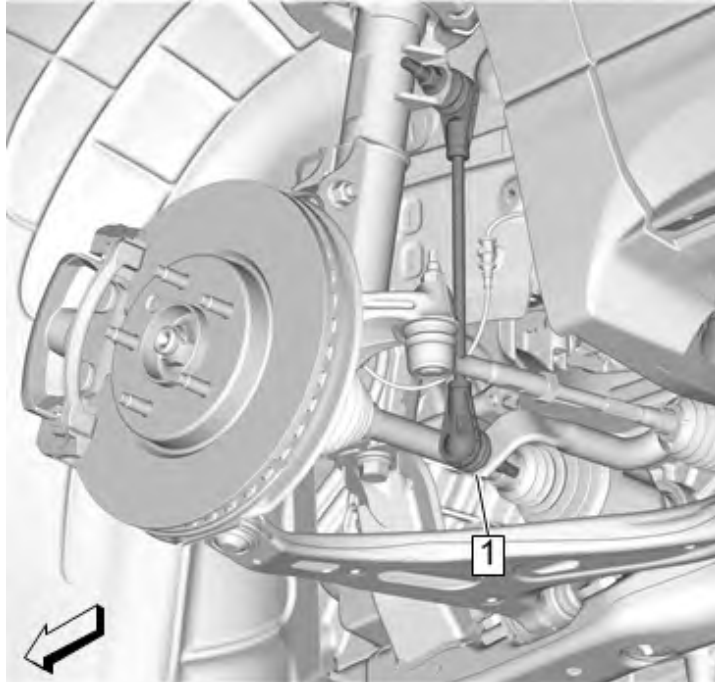


Fig. 3: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

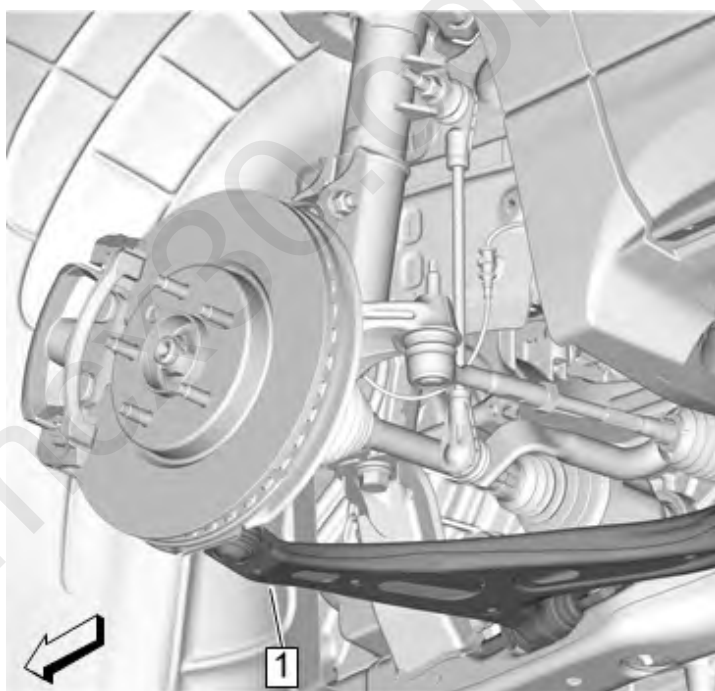


Fig. 4: Front Lower Control Arm

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 \(Terrain\)](#).

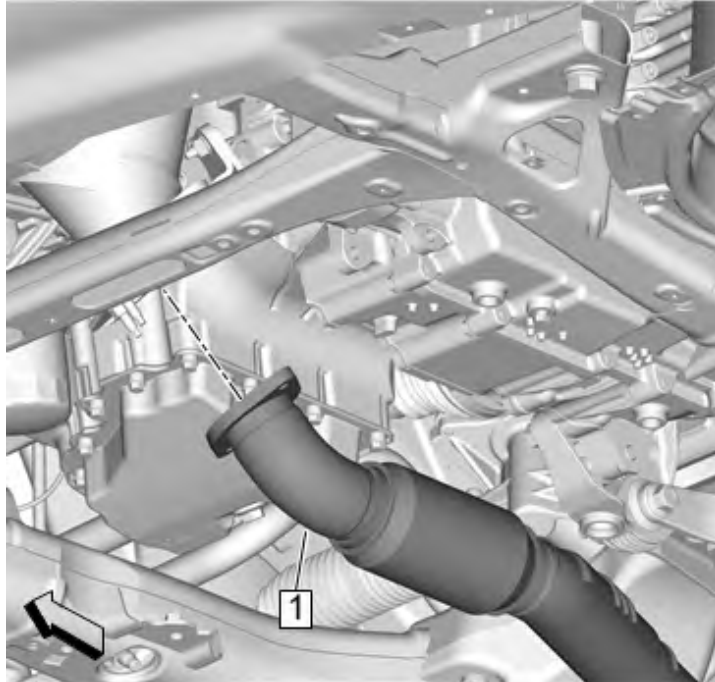


Fig. 5: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

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

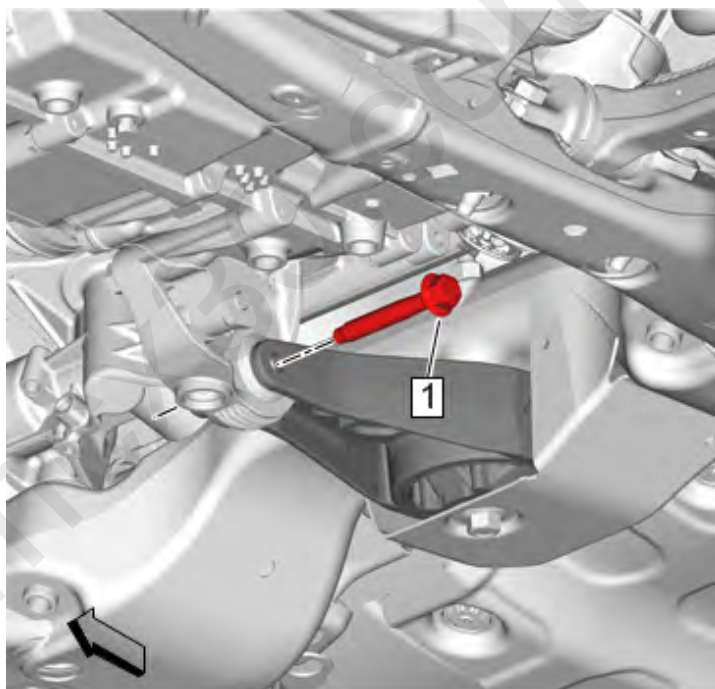


Fig. 6: Rear Transmission Mount Through Bolt

Courtesy of GENERAL MOTORS COMPANY

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

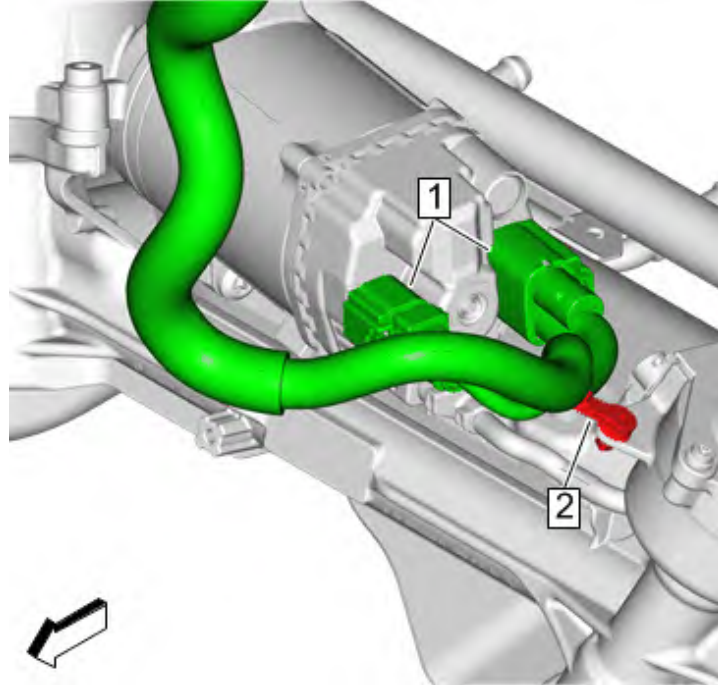


Fig. 7: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

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 \(Front Wheel Drive\)](#).

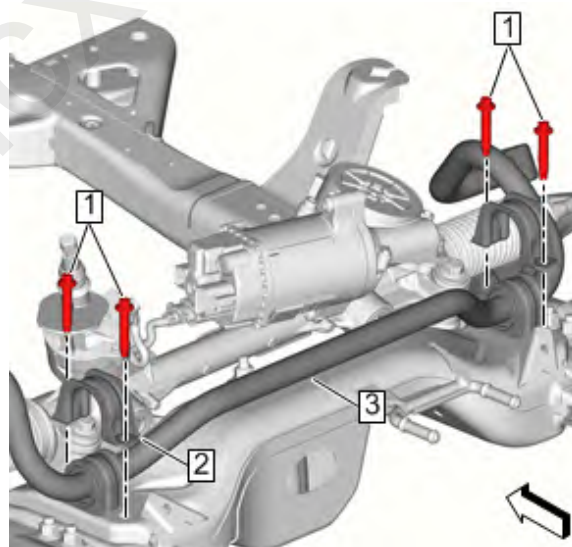


Fig. 8: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

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

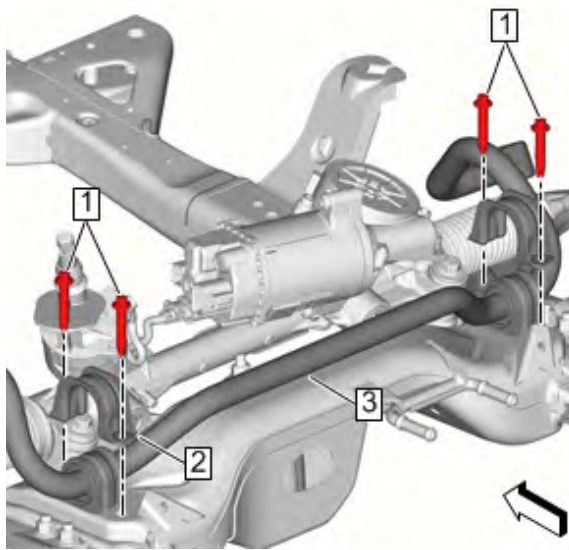


Fig. 9: Front Stabilizer Shaft, Clamps And Bolts

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.

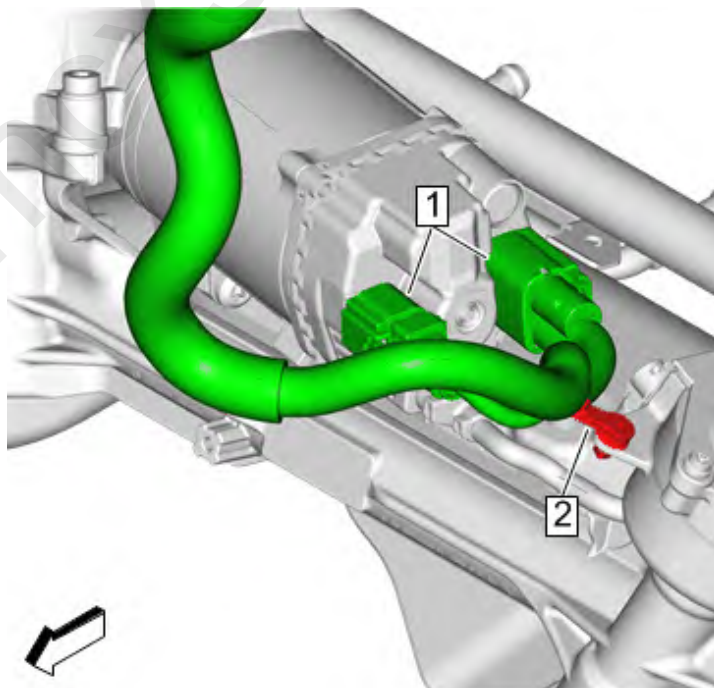


Fig. 10: Steering Gear Electrical Connectors And Wiring Harness Clip

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.

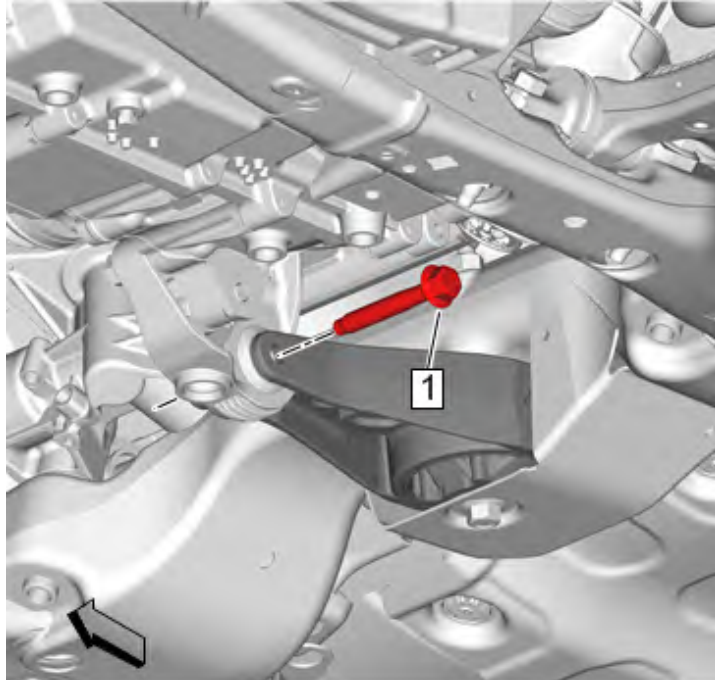


Fig. 11: Rear Transmission Mount Through Bolt
Courtesy of GENERAL MOTORS COMPANY

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

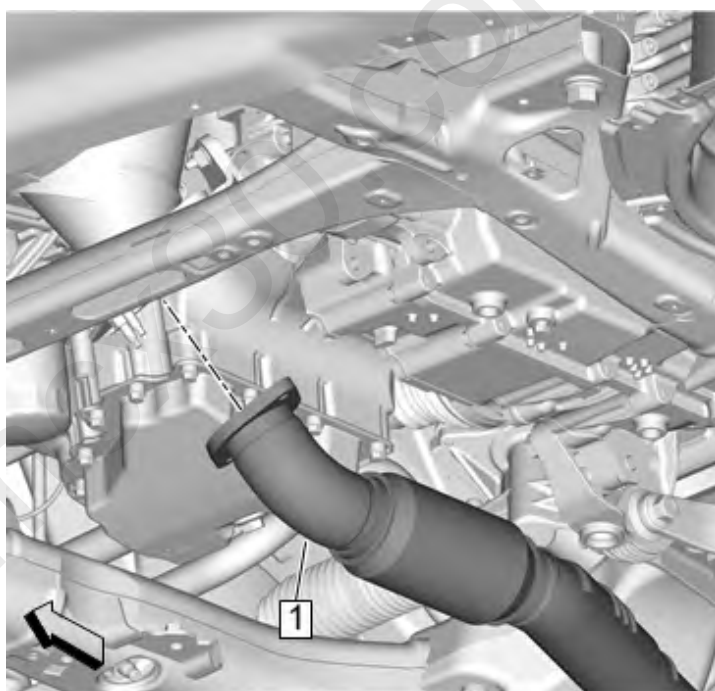


Fig. 12: Exhaust Front Pipe
Courtesy of GENERAL MOTORS COMPANY

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

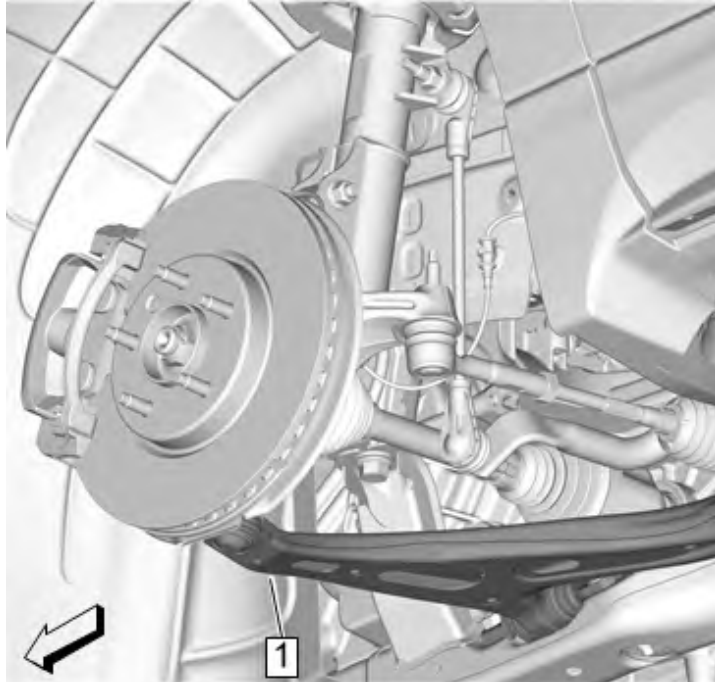


Fig. 13: Front Lower Control Arm
 Courtesy of GENERAL MOTORS COMPANY

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

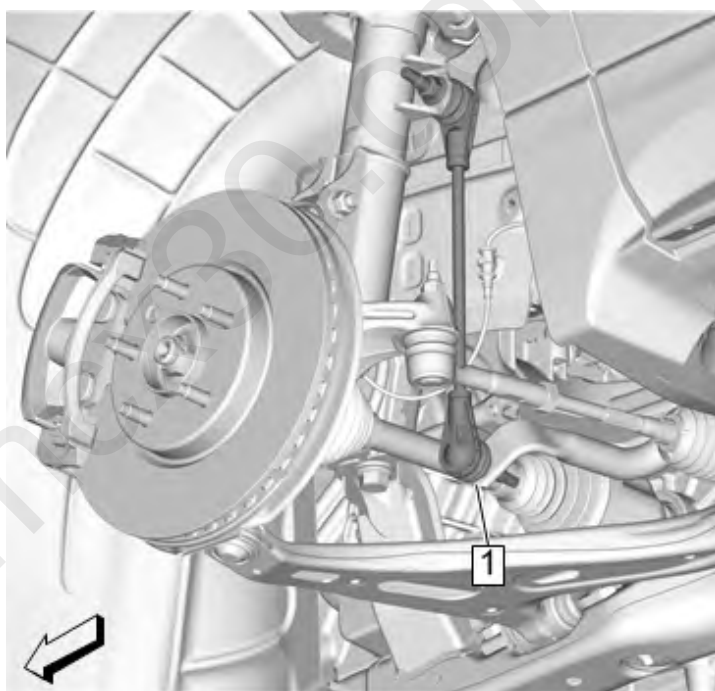


Fig. 14: Front Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

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

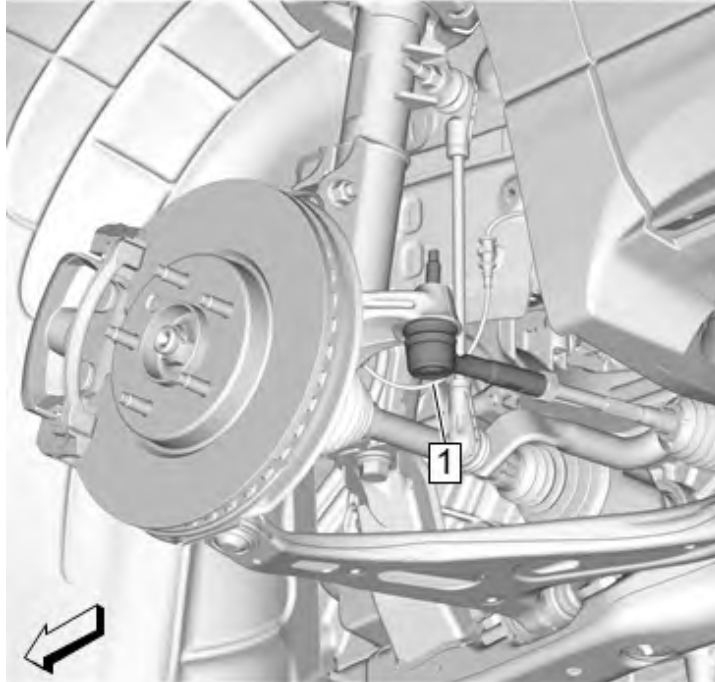


Fig. 15: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

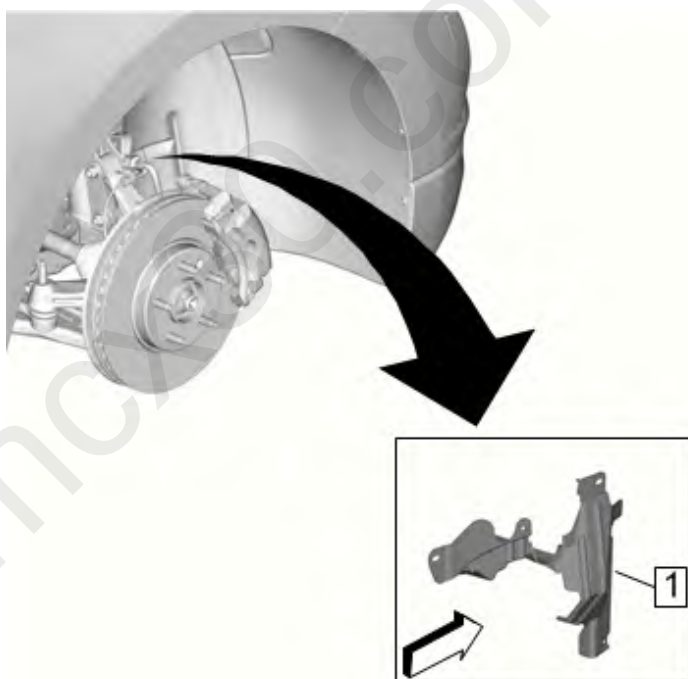


Fig. 16: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

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 \(Terrain\)](#).

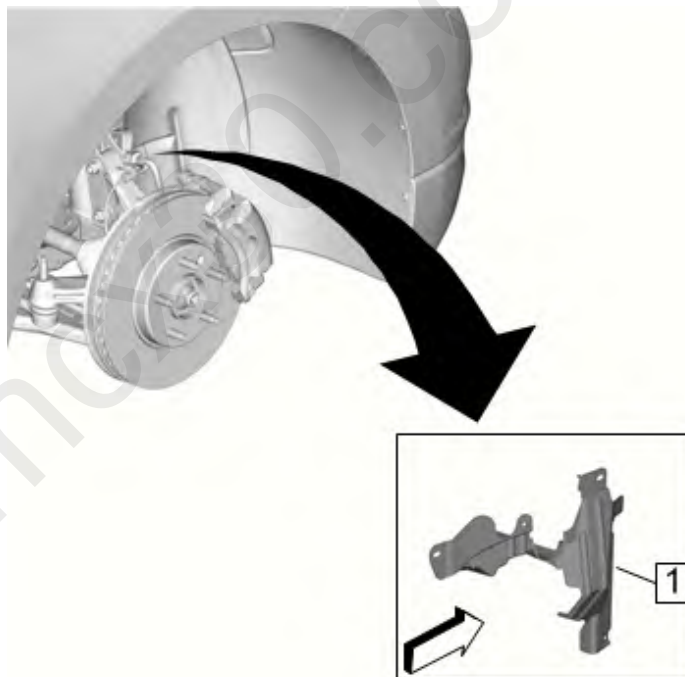


Fig. 17: Right Side Front Wheelhouse Splash Shield

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 \(Terrain\)](#).

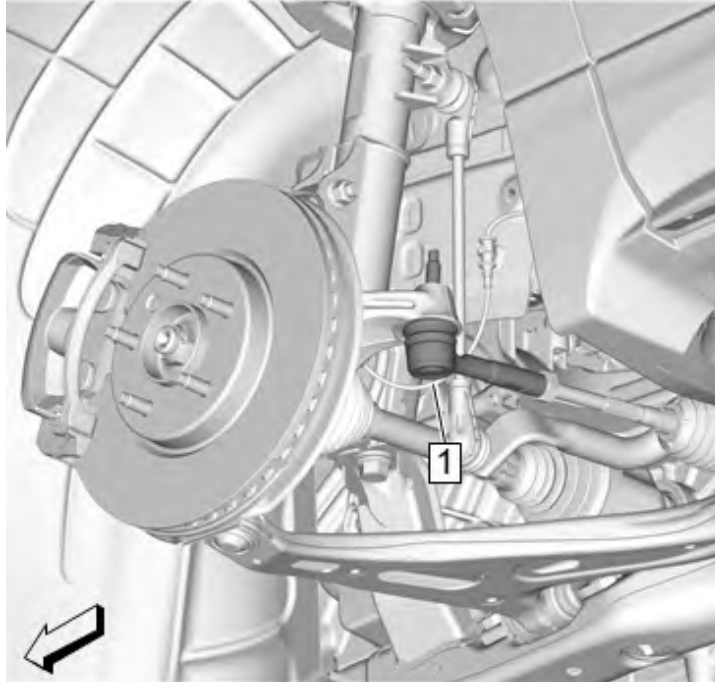


Fig. 18: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

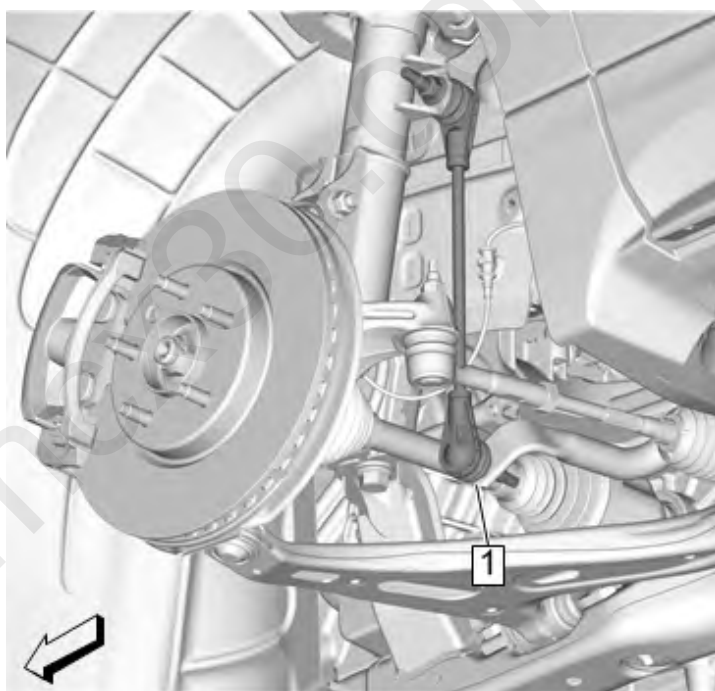


Fig. 19: Front Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

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

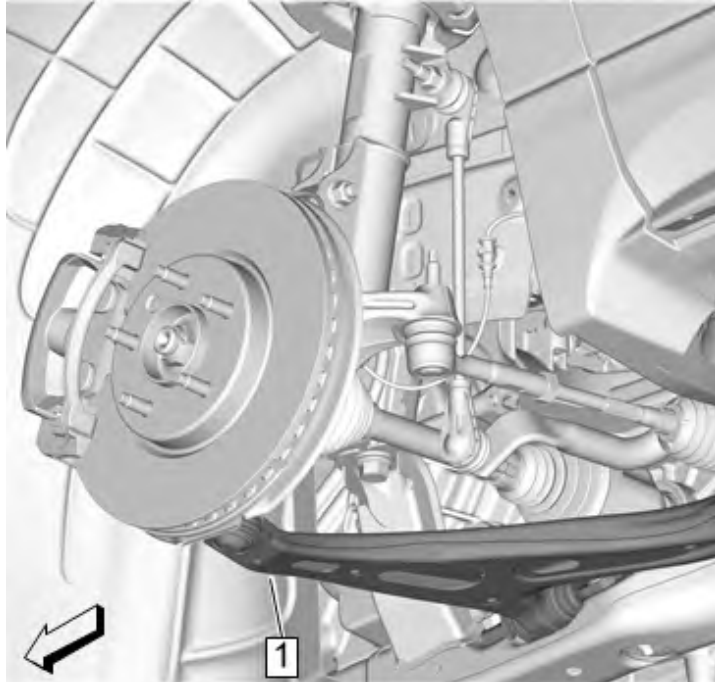


Fig. 20: Front Lower Control Arm

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 \(Terrain\)](#).

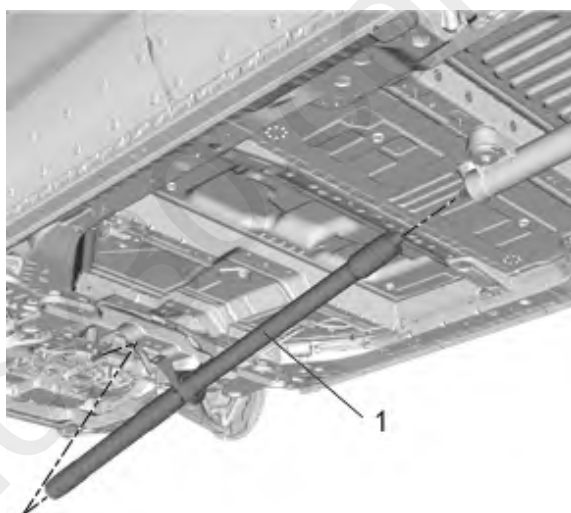


Fig. 21: Propeller Shaft

Courtesy of GENERAL MOTORS COMPANY

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

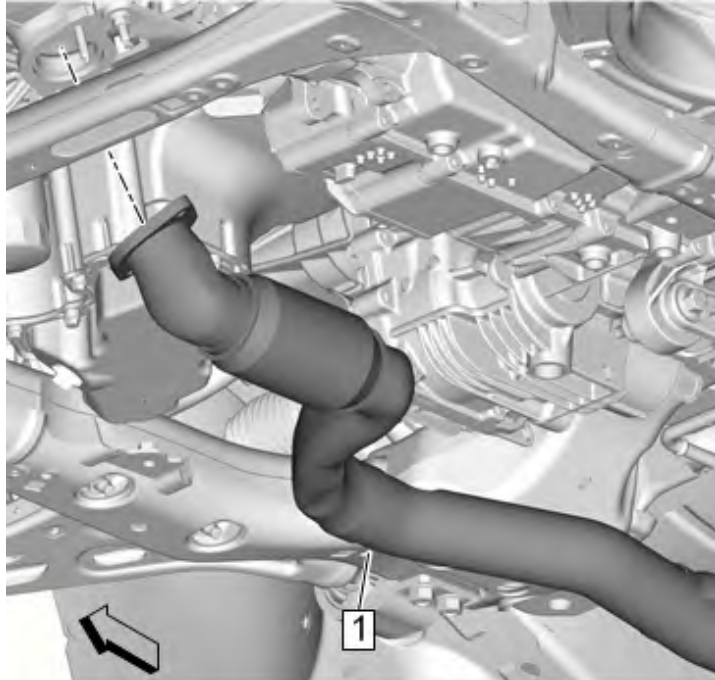


Fig. 22: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

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

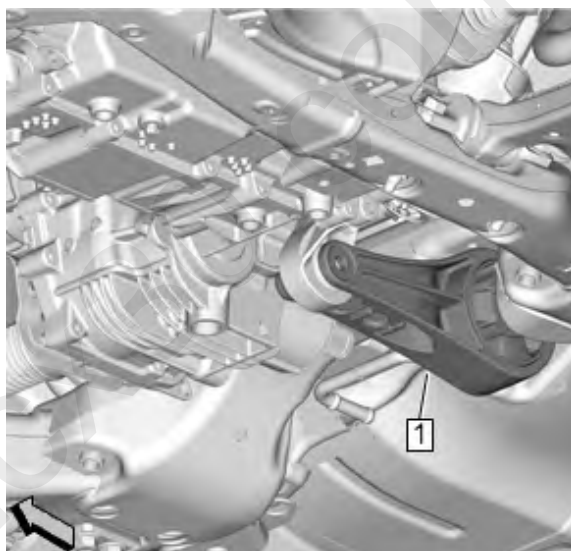


Fig. 23: Transmission Mount Strut

Courtesy of GENERAL MOTORS COMPANY

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

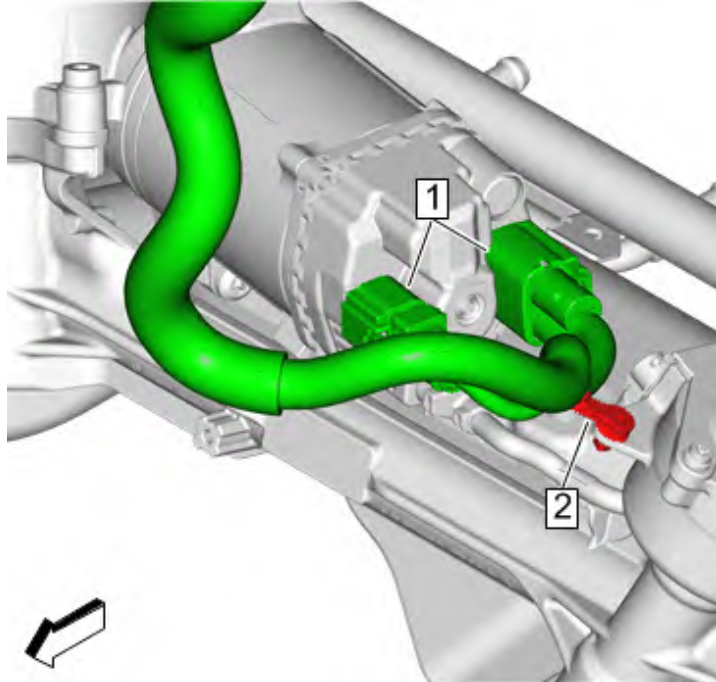


Fig. 24: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

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 \(All Wheel Drive\)](#).

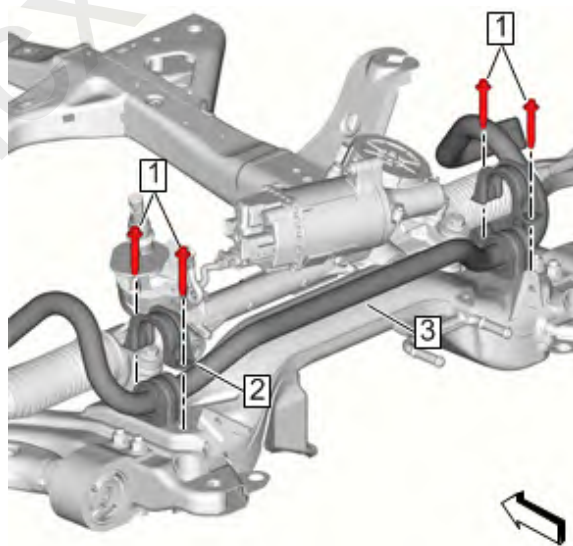


Fig. 25: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

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

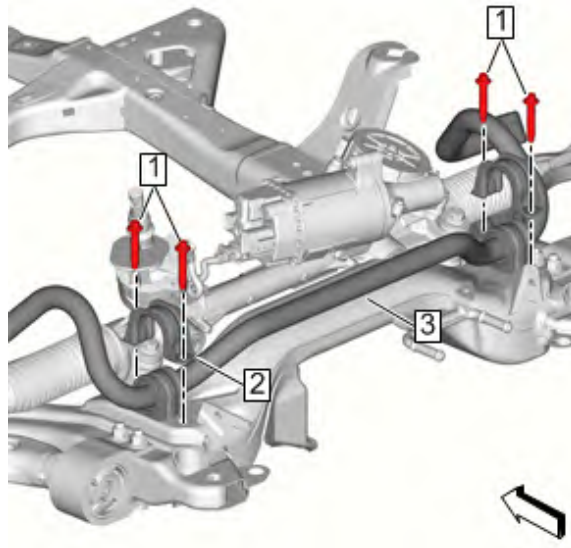


Fig. 26: Front Stabilizer Shaft, Clamps And Bolts
 Courtesy of GENERAL MOTORS COMPANY

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.

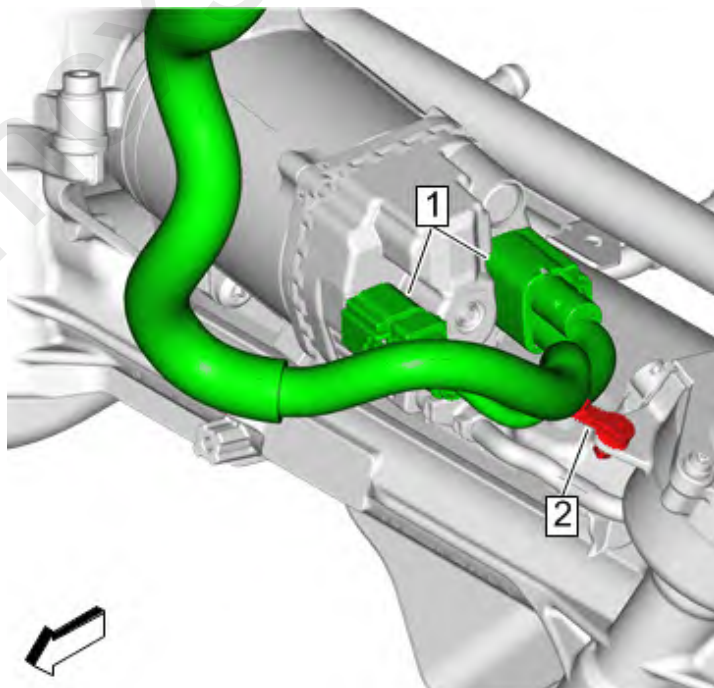


Fig. 27: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

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.

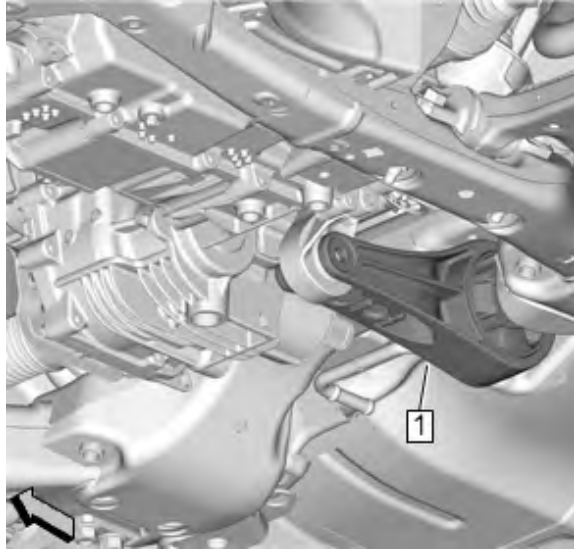


Fig. 28: Transmission Mount Strut
 Courtesy of GENERAL MOTORS COMPANY

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

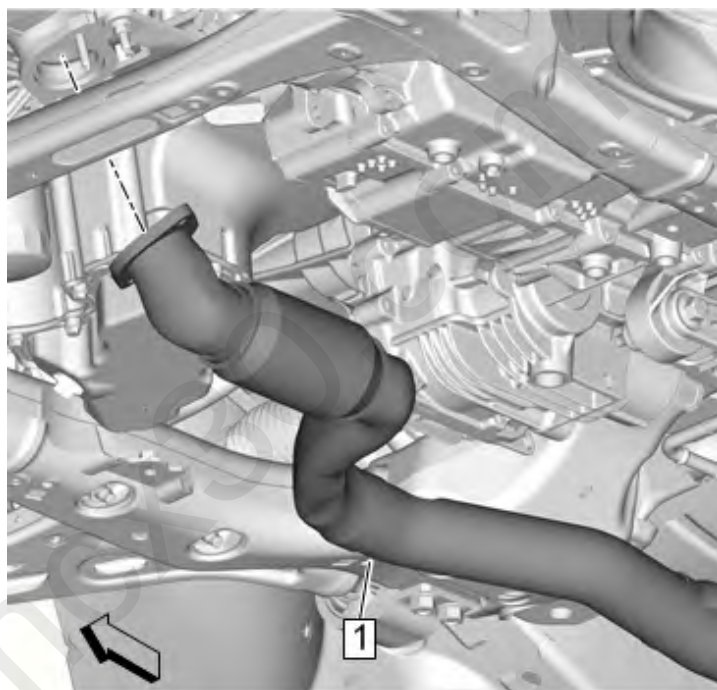
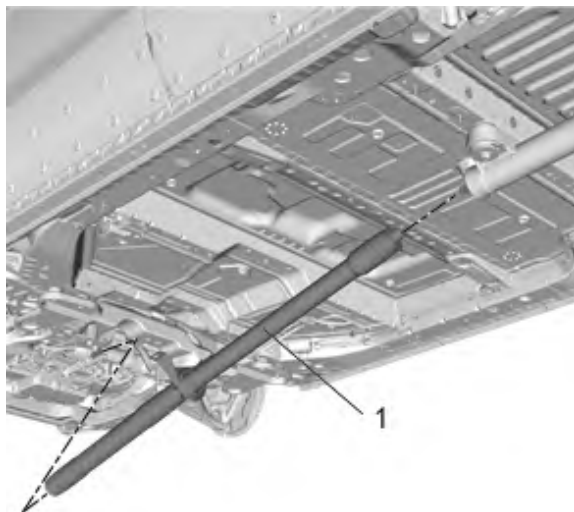


Fig. 29: Exhaust Front Pipe
 Courtesy of GENERAL MOTORS COMPANY

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](#)

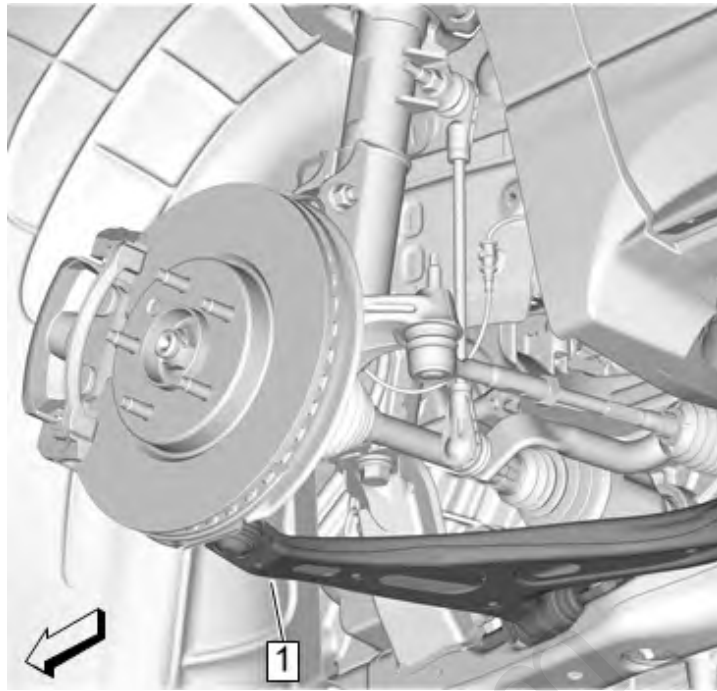


Fig. 31: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

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

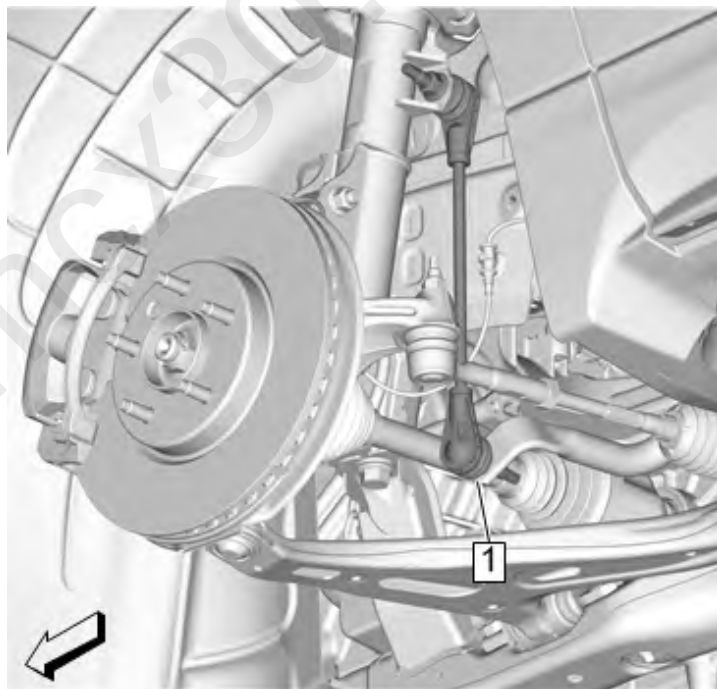


Fig. 32: Front Stabilizer Shaft Link
Courtesy of GENERAL MOTORS COMPANY

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

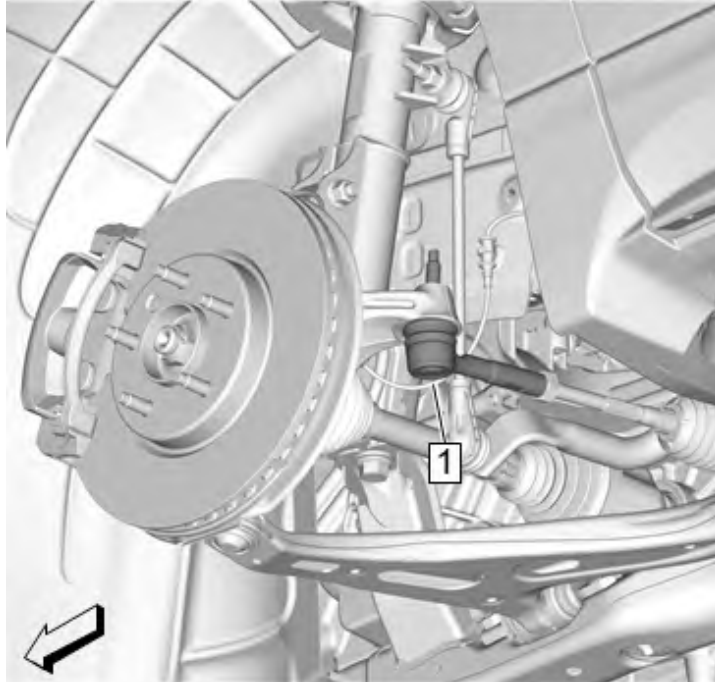


Fig. 33: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

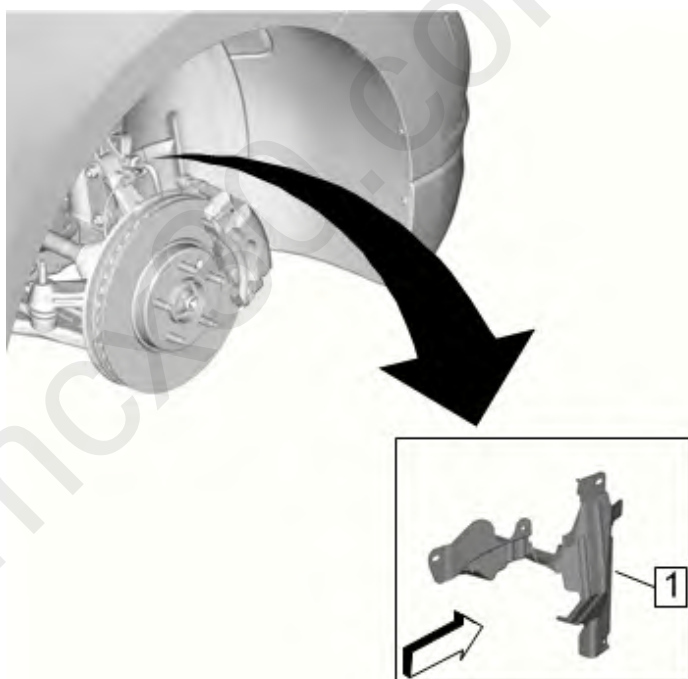


Fig. 34: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

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 \(Terrain\)](#).

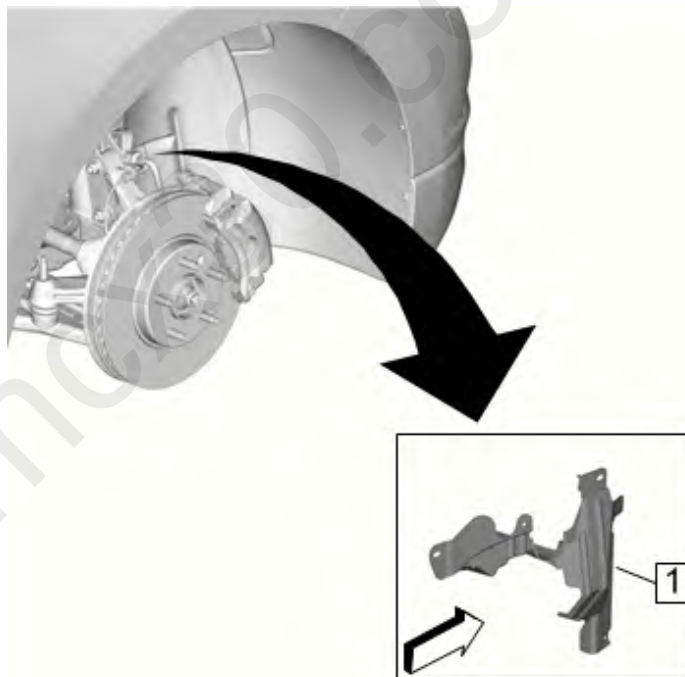


Fig. 35: Right Side Front Wheelhouse Splash Shield

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 \(Terrain\)](#).

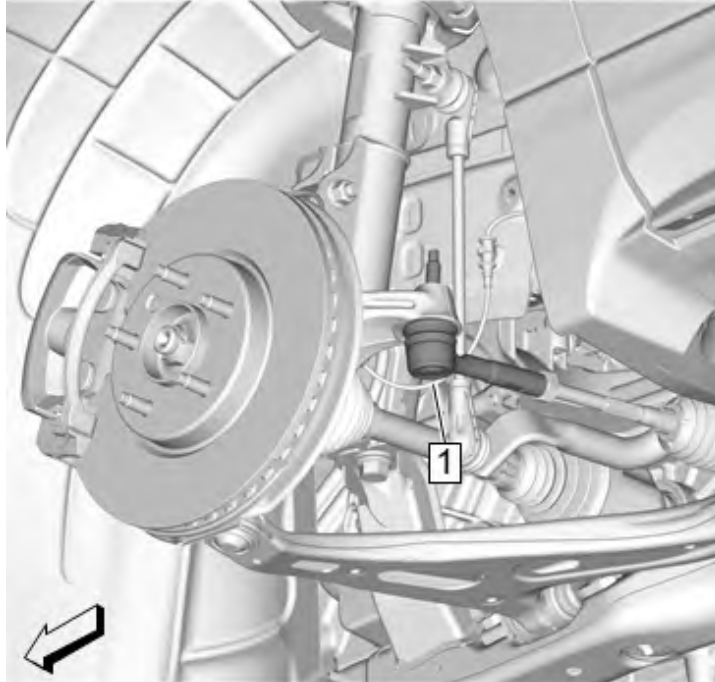


Fig. 36: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

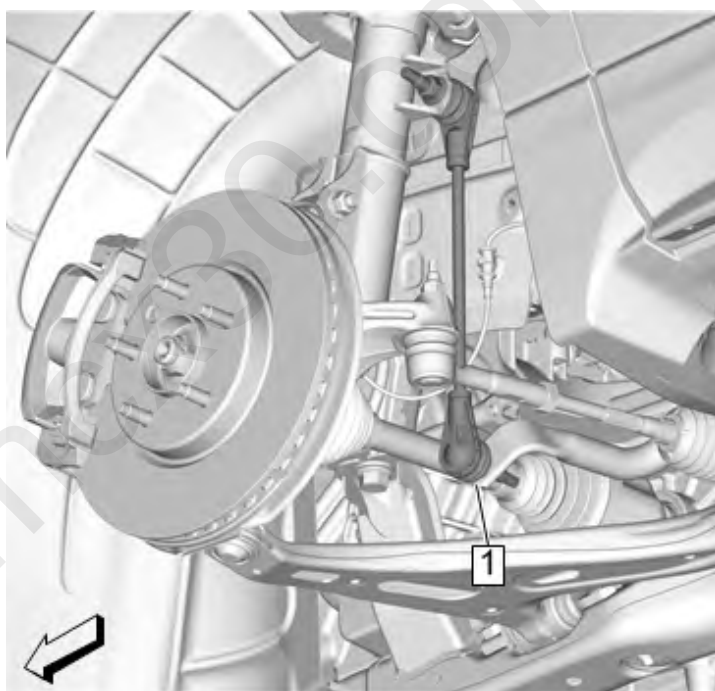


Fig. 37: Front Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

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

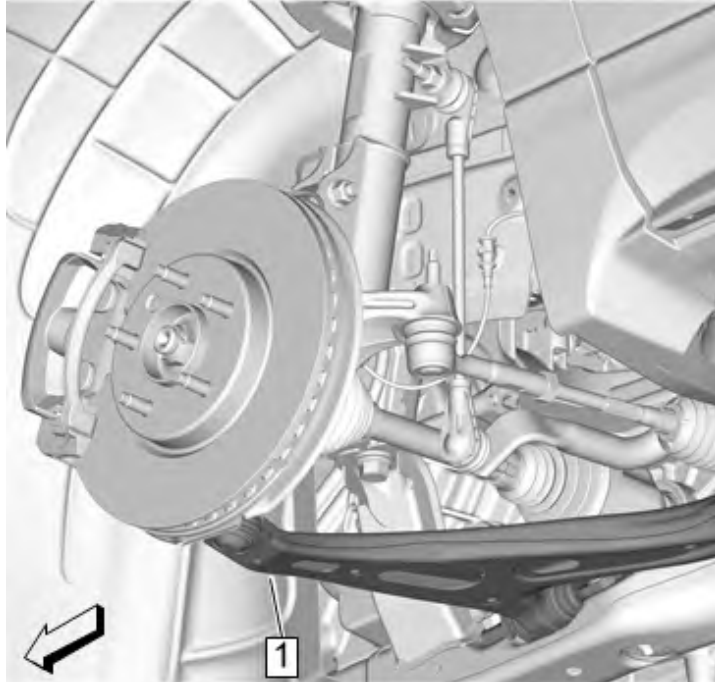


Fig. 38: Front Lower Control Arm

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 \(Terrain\)](#).

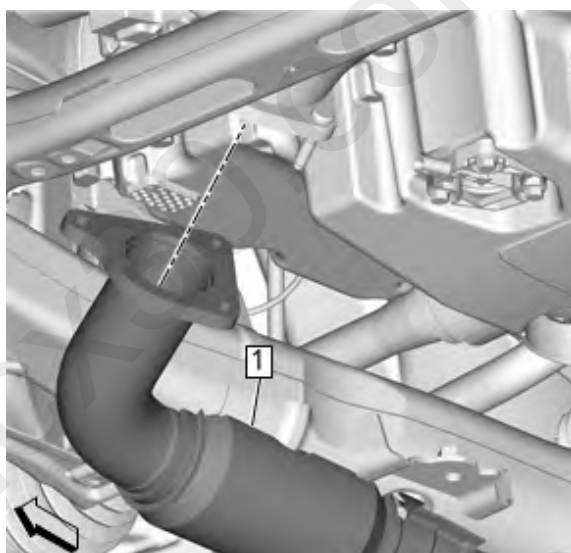
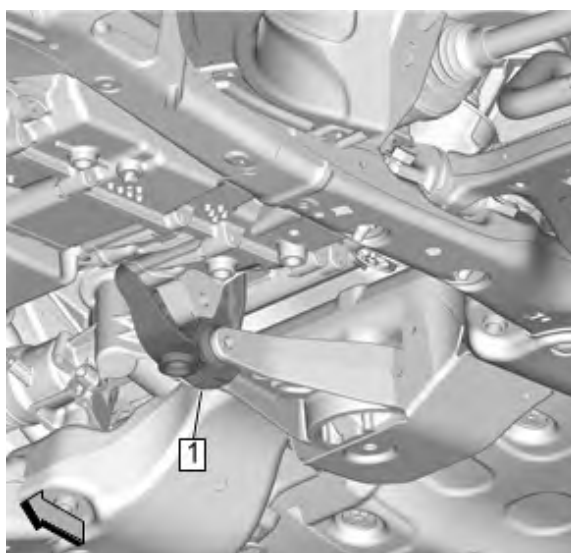


Fig. 39: Exhaust Front Pipe

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 \(Front Wheel Drive\)](#)

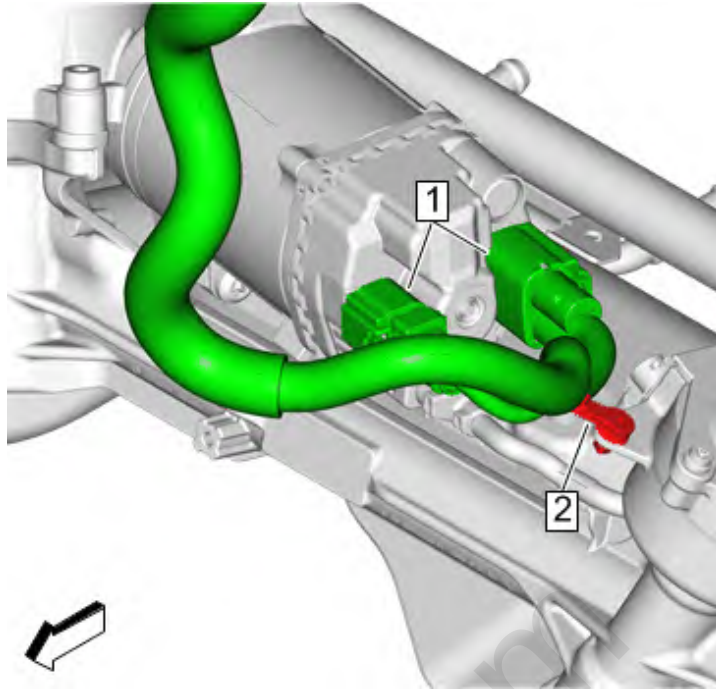


Fig. 41: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

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 \(Front Wheel Drive\)](#)

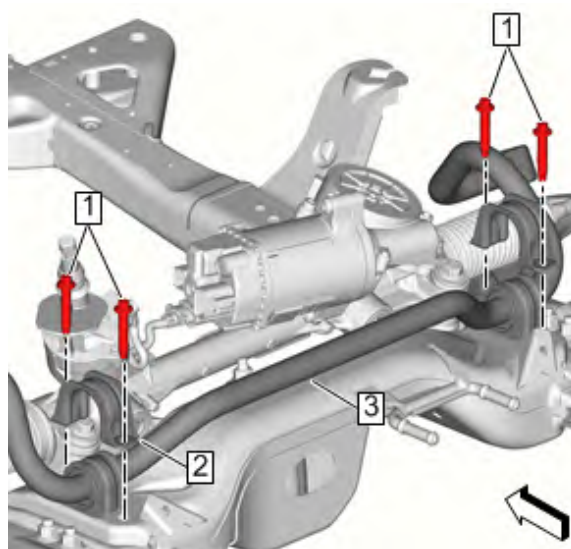


Fig. 42: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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

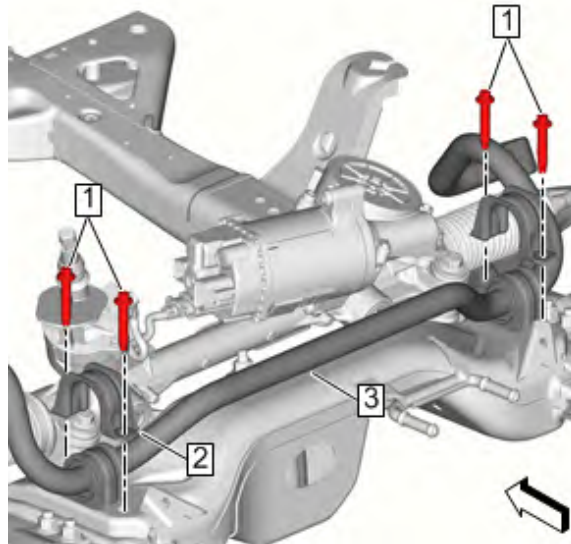


Fig. 43: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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.

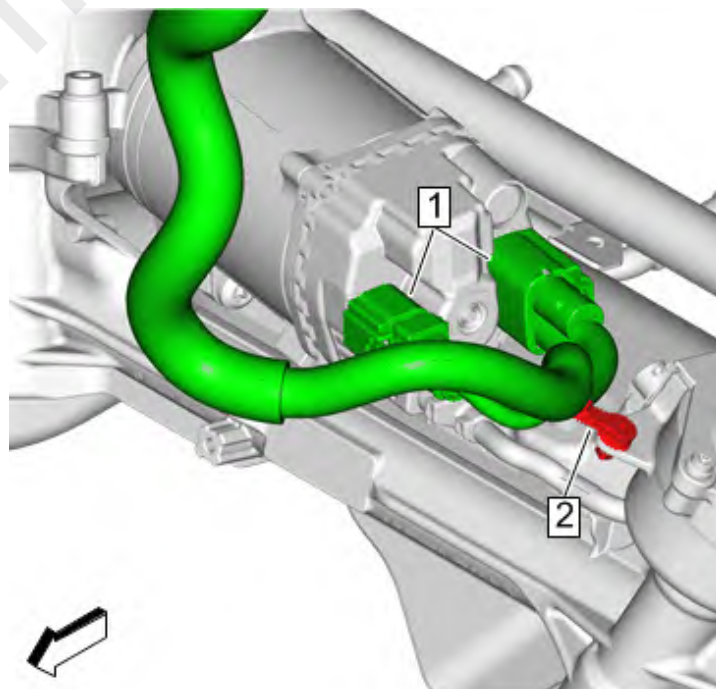


Fig. 44: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

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.

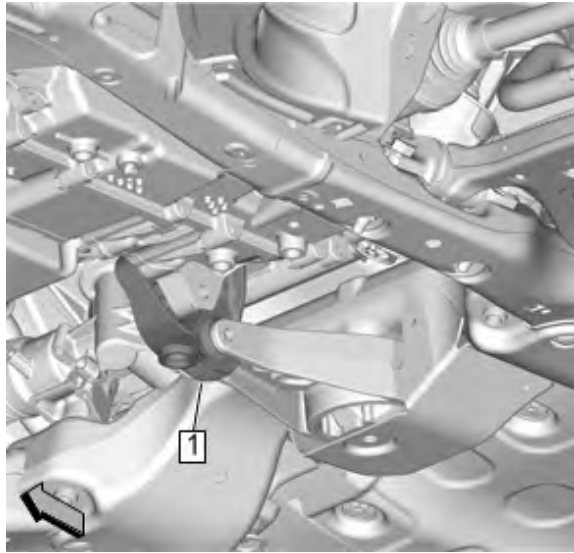


Fig. 45: Transmission Mount Strut Bracket
Courtesy of GENERAL MOTORS COMPANY

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

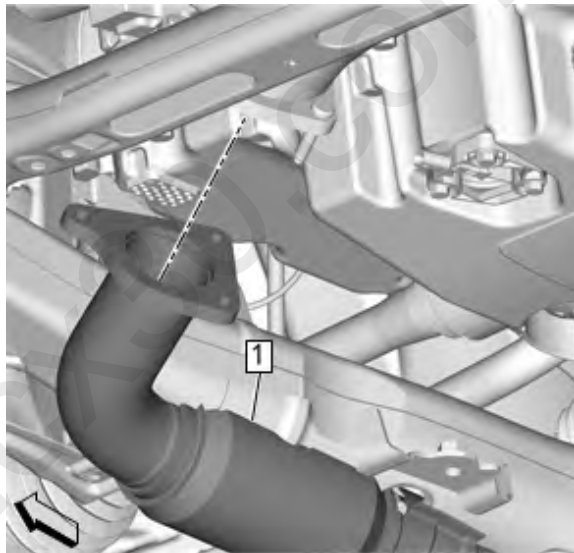


Fig. 46: Exhaust Front Pipe
Courtesy of GENERAL MOTORS COMPANY

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

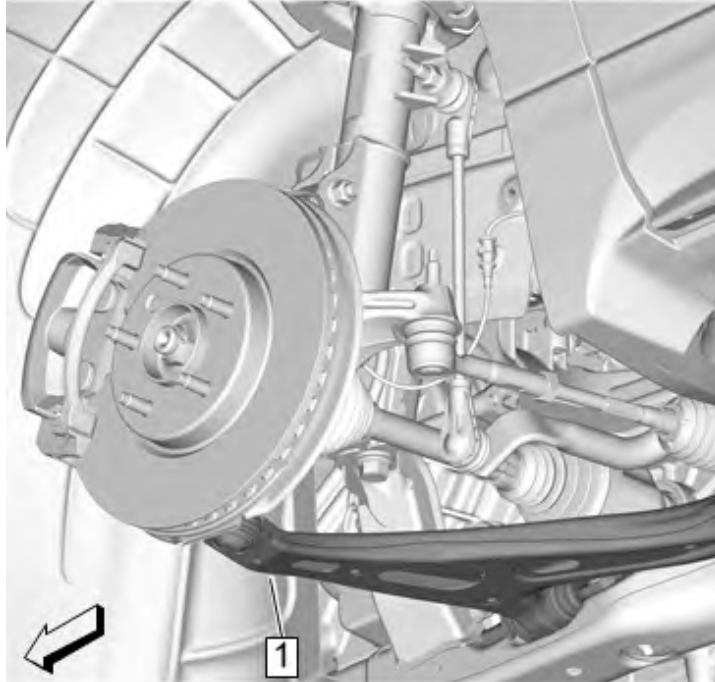


Fig. 47: Front Lower Control Arm

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 \(Terrain\)](#).

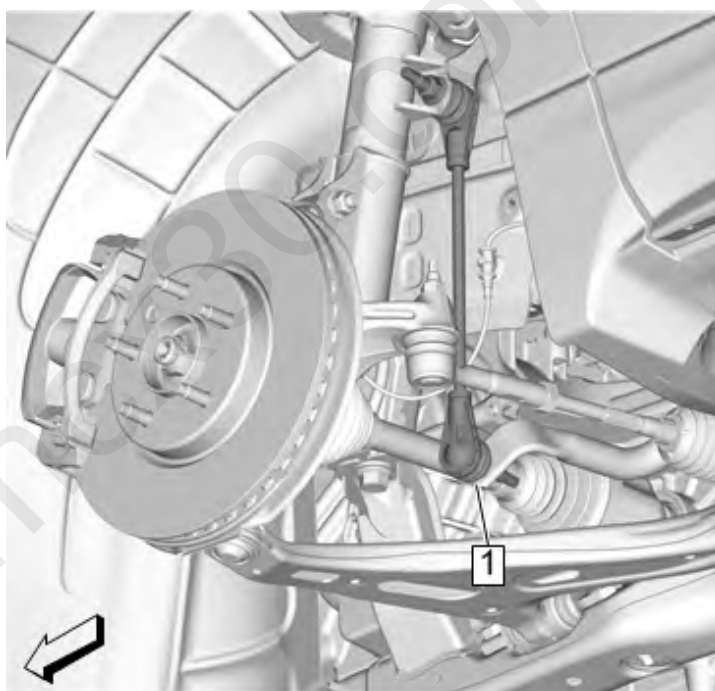


Fig. 48: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

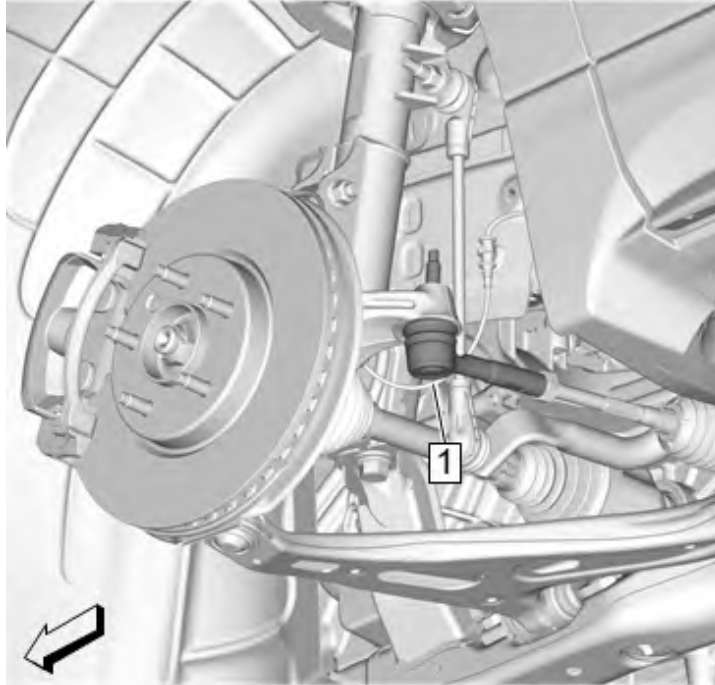


Fig. 49: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

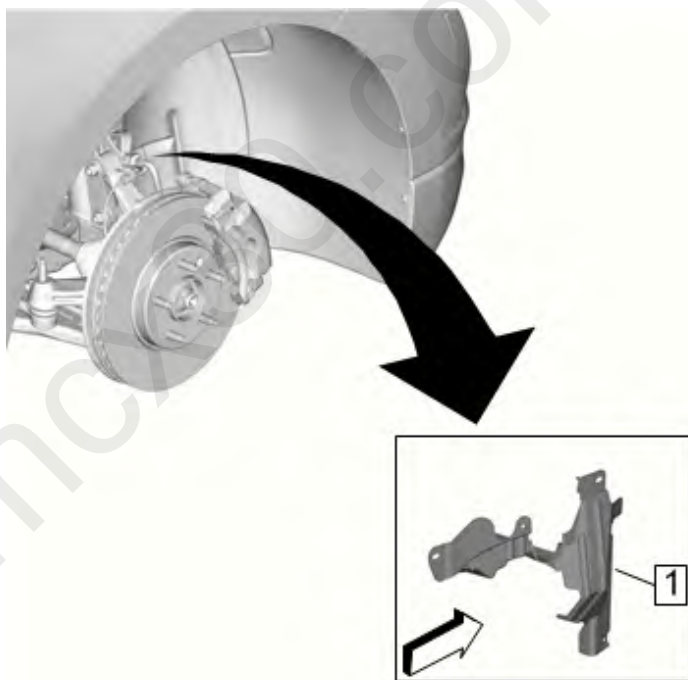


Fig. 50: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

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 \(Terrain\)](#).

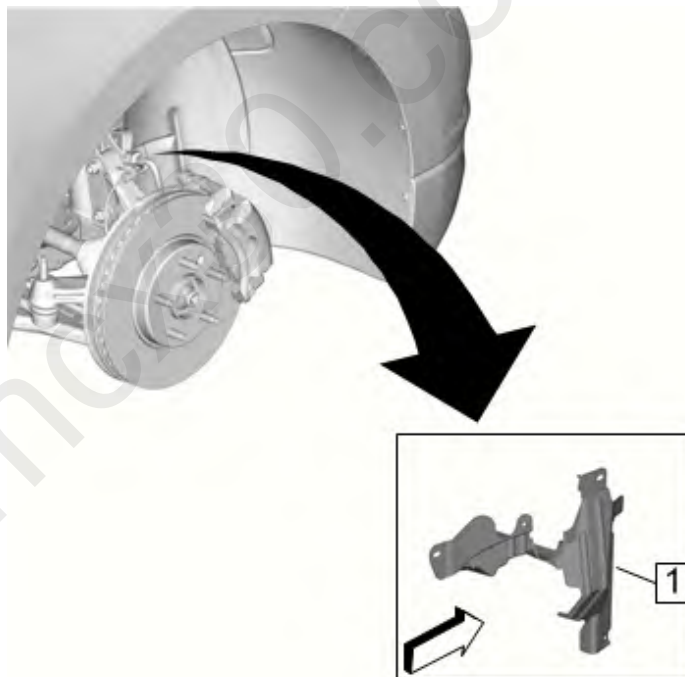


Fig. 51: Right Side Front Wheelhouse Splash Shield

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 \(Terrain\)](#).

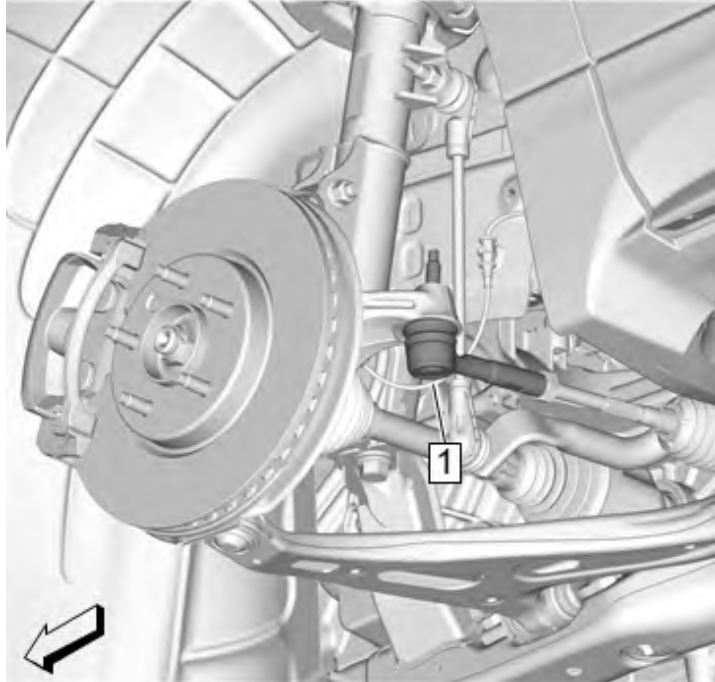


Fig. 52: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

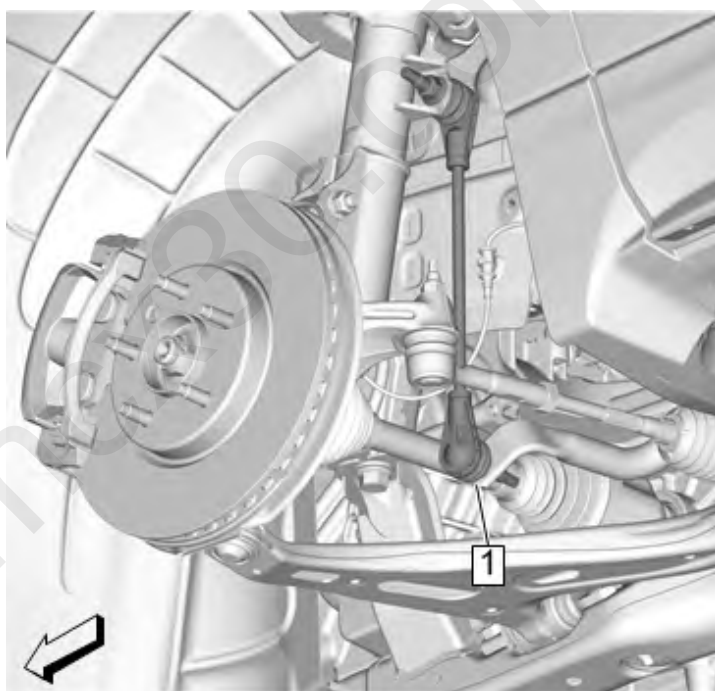


Fig. 53: Front Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

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

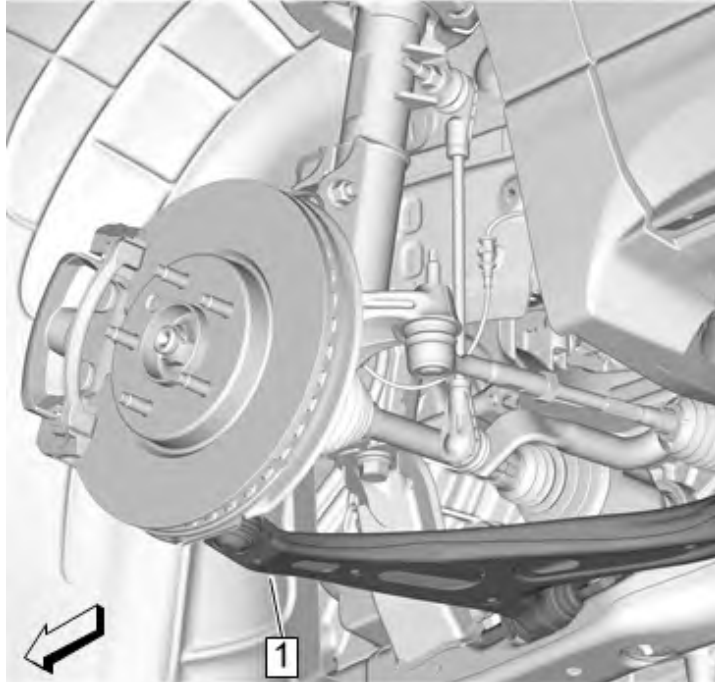


Fig. 54: Front Lower Control Arm

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 \(Terrain\)](#).

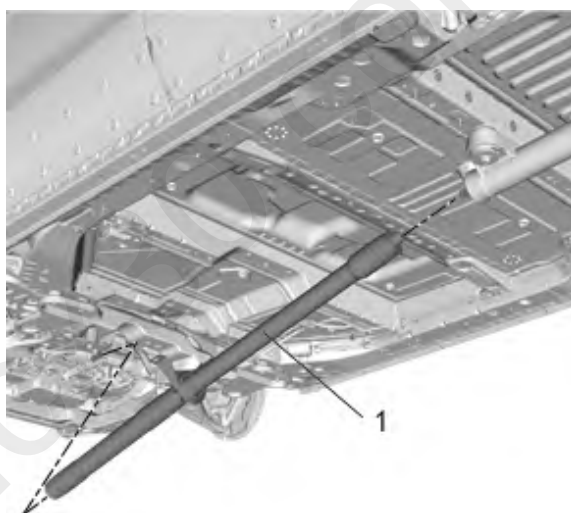
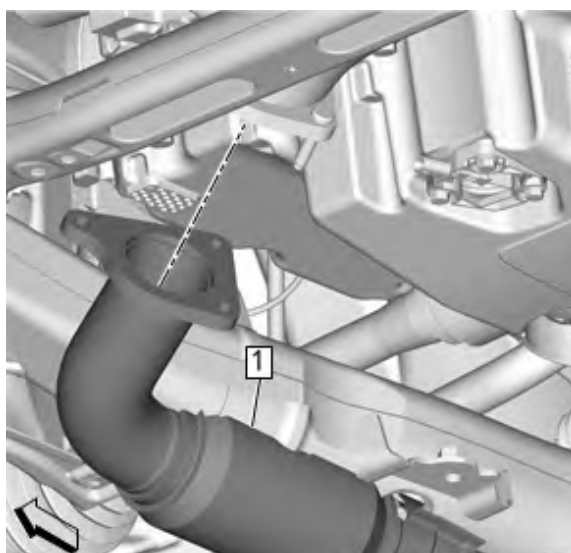


Fig. 55: Propeller Shaft

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 \(LH7\)](#).

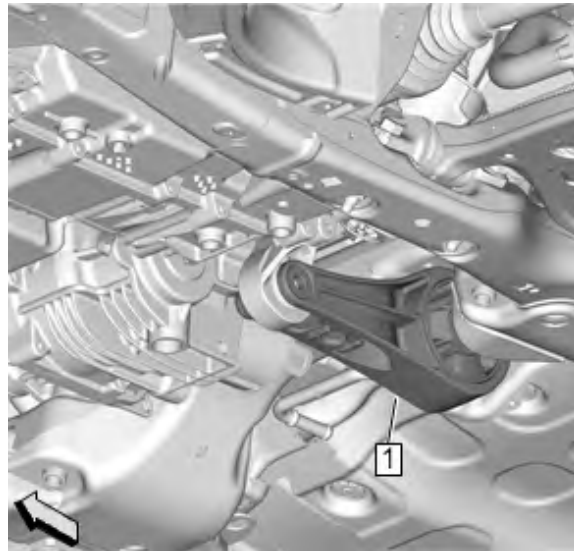


Fig. 57: Transmission Mount Strut
Courtesy of GENERAL MOTORS COMPANY

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

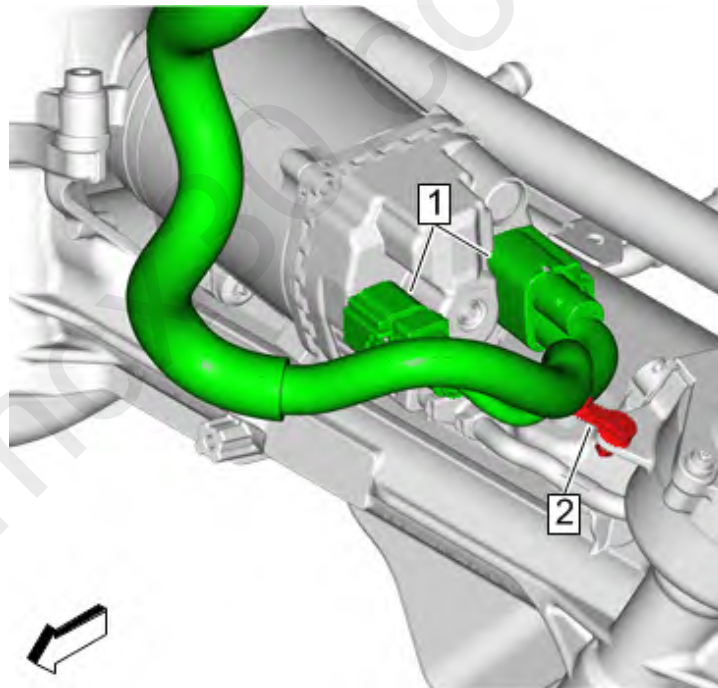


Fig. 58: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

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 \(All Wheel Drive\)](#).

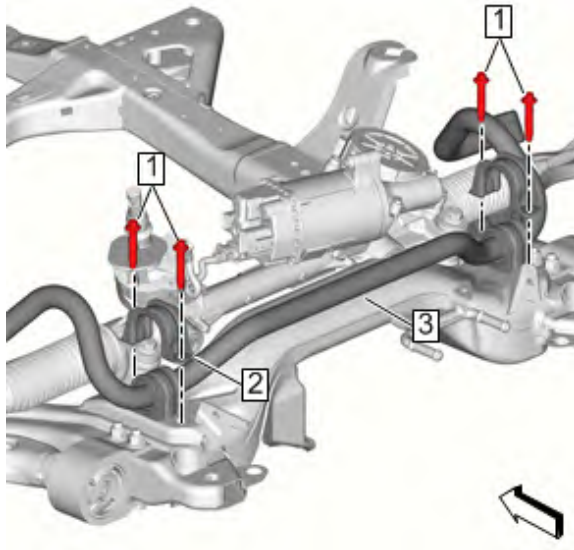


Fig. 59: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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

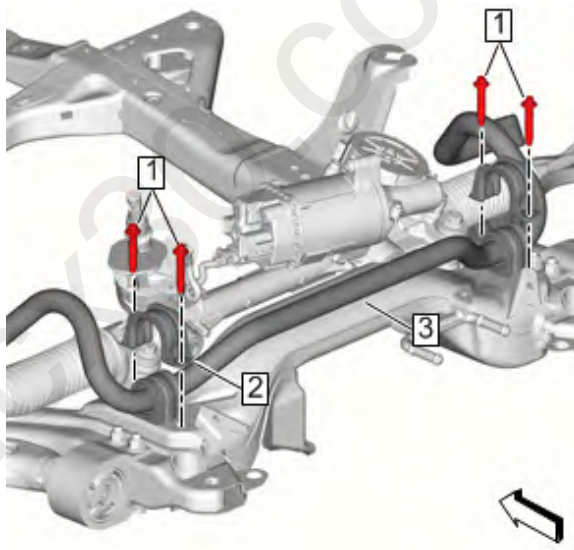


Fig. 60: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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.

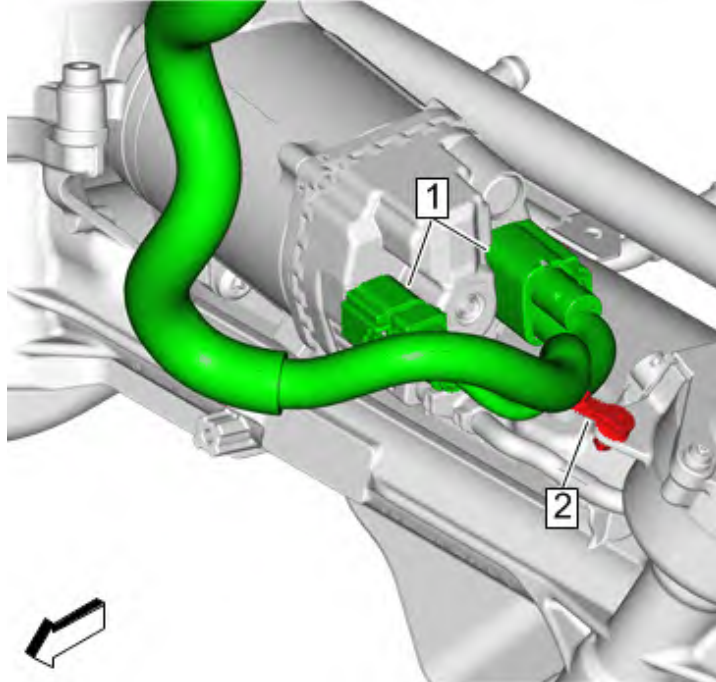


Fig. 61: Steering Gear Electrical Connectors And Wiring Harness Clip
 Courtesy of GENERAL MOTORS COMPANY

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.

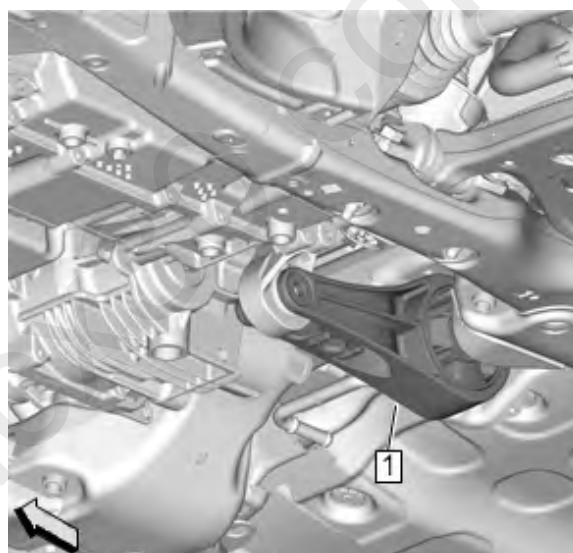


Fig. 62: Transmission Mount Strut
 Courtesy of GENERAL MOTORS COMPANY

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

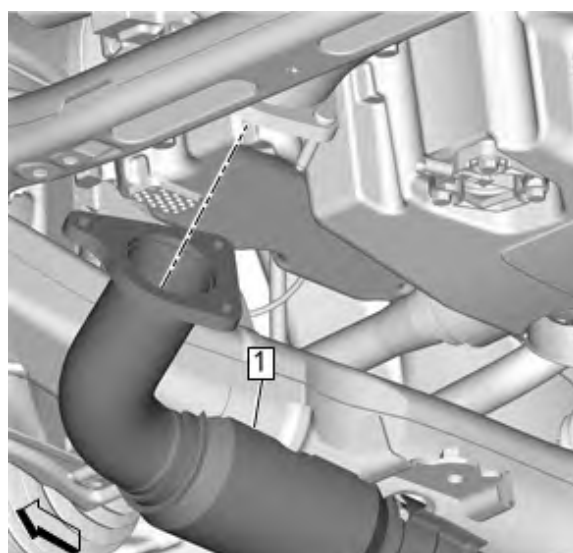


Fig. 63: Exhaust Front Pipe
Courtesy of GENERAL MOTORS COMPANY

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

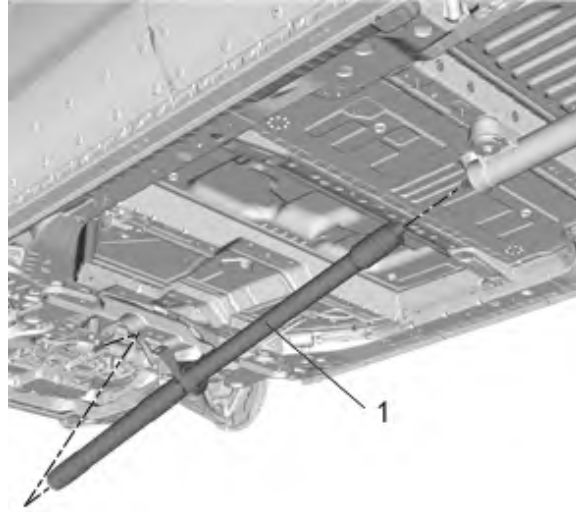


Fig. 64: Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

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

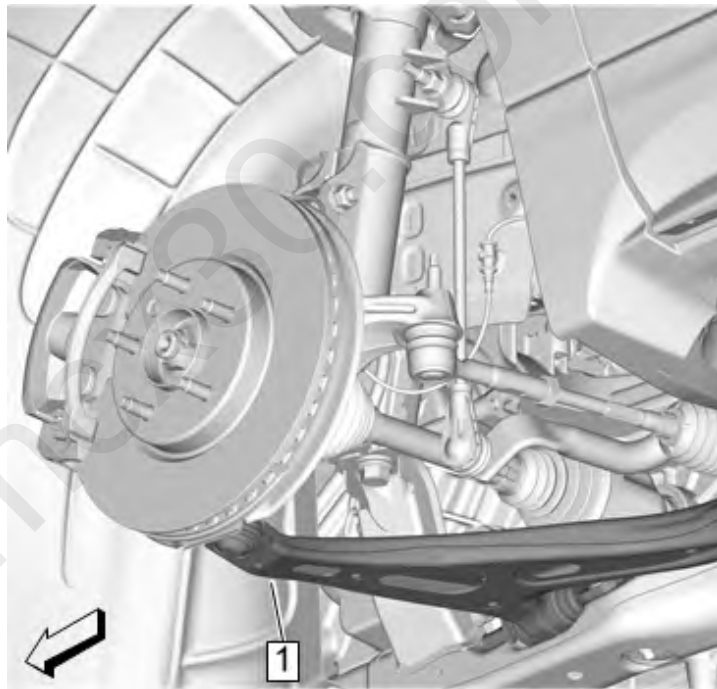


Fig. 65: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

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

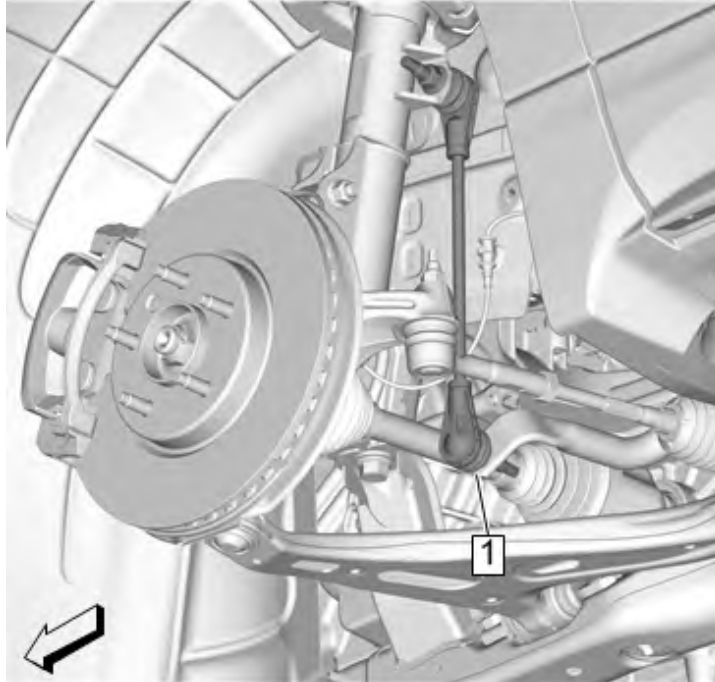


Fig. 66: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

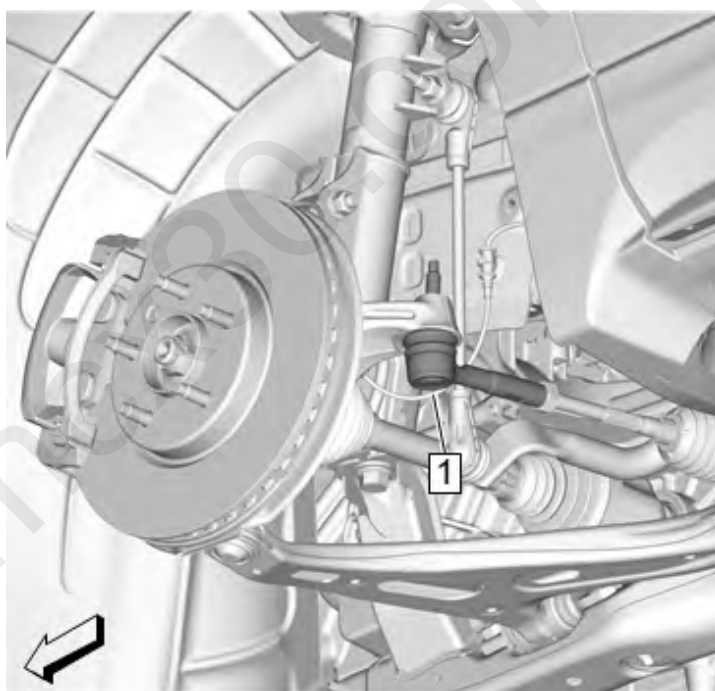


Fig. 67: Steering Linkage Outer Tie Rod

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](#)

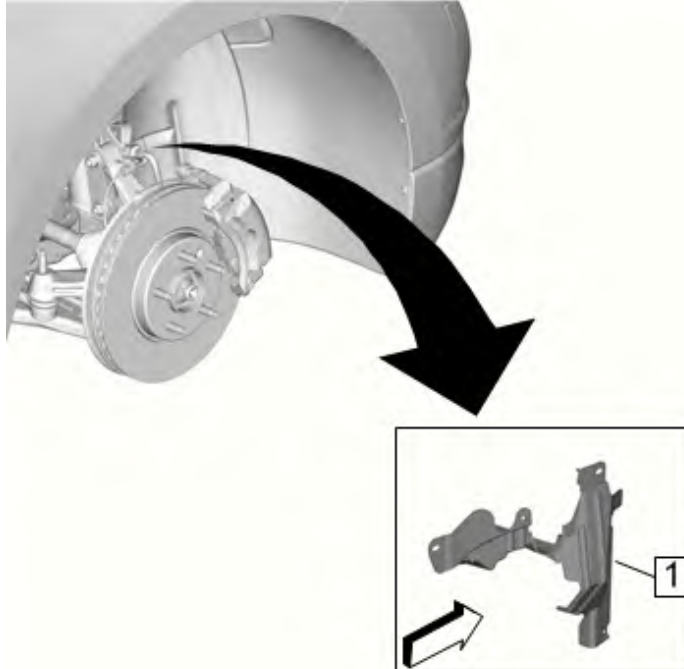


Fig. 68: Right Side Front Wheelhouse Splash Shield

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 \(Terrain\)](#)

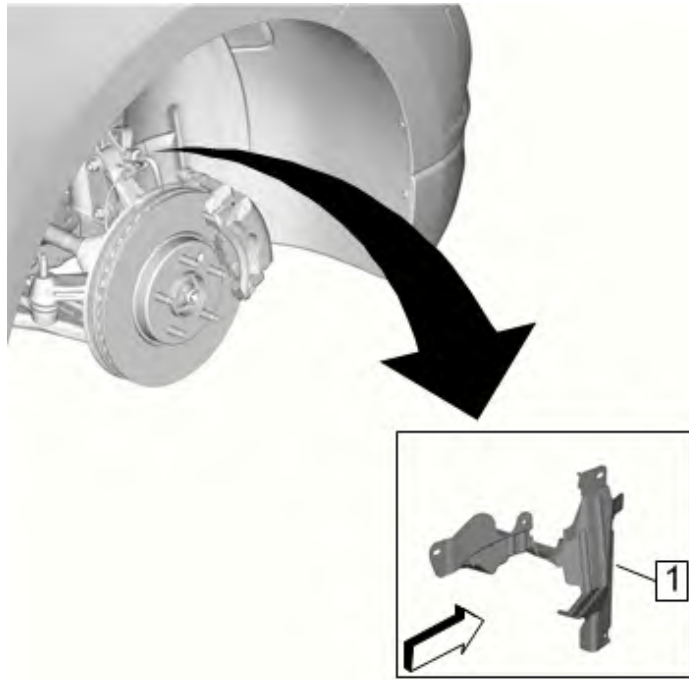


Fig. 69: Right Side Front Wheelhouse Splash Shield
Courtesy of GENERAL MOTORS COMPANY

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

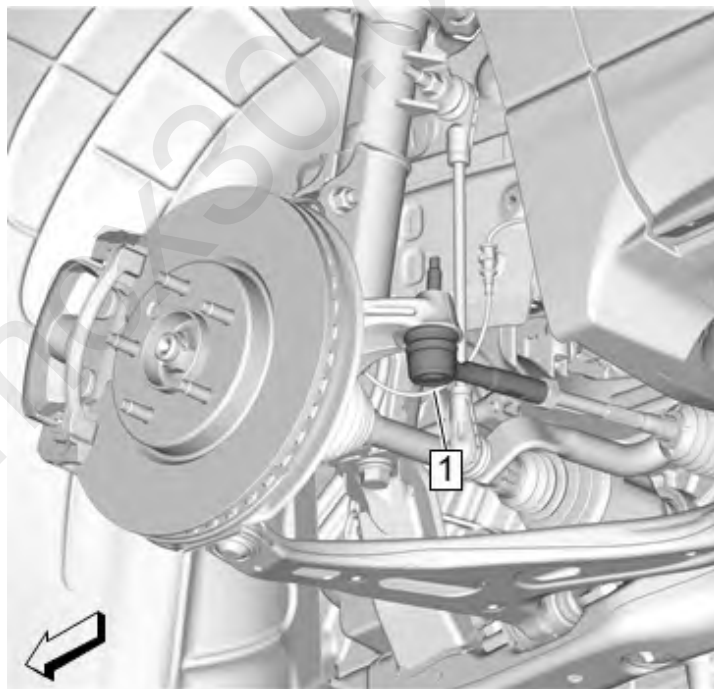


Fig. 70: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

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

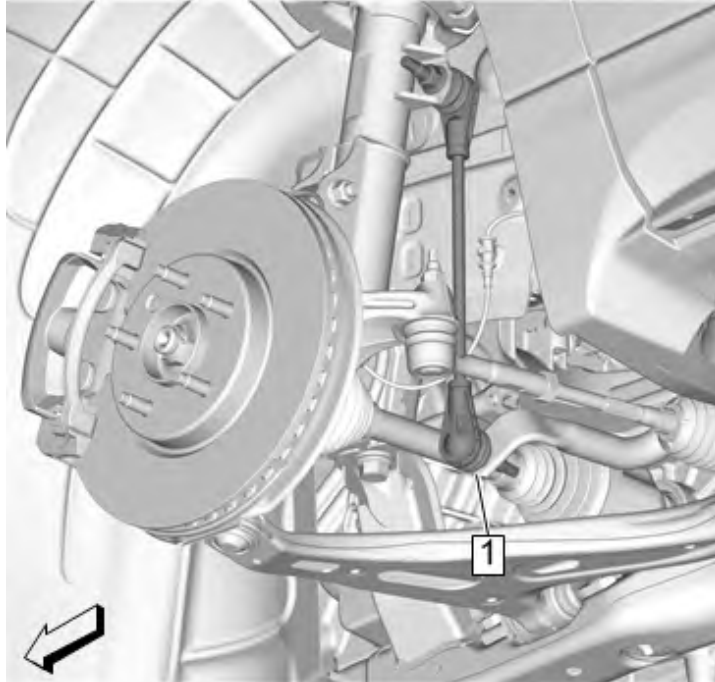


Fig. 71: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

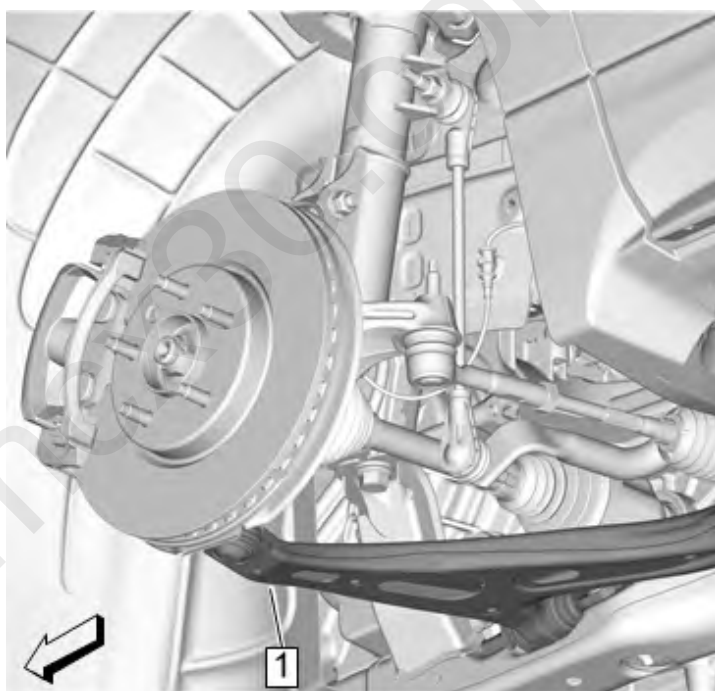


Fig. 72: Front Lower Control Arm

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 \(Terrain\)](#).

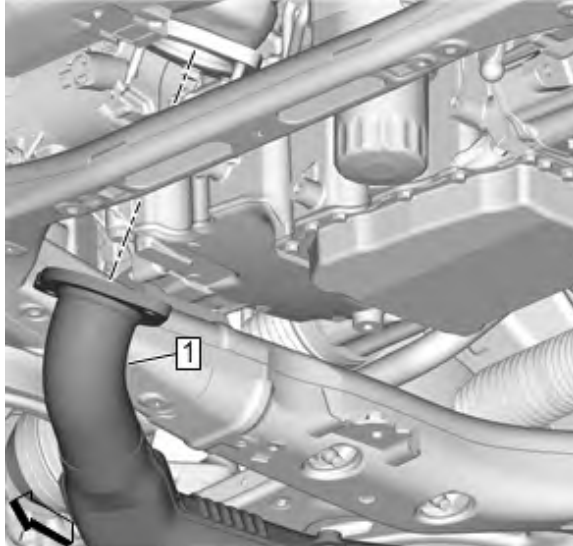


Fig. 73: Exhaust Front Pipe

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 \(Front Wheel Drive\)](#)

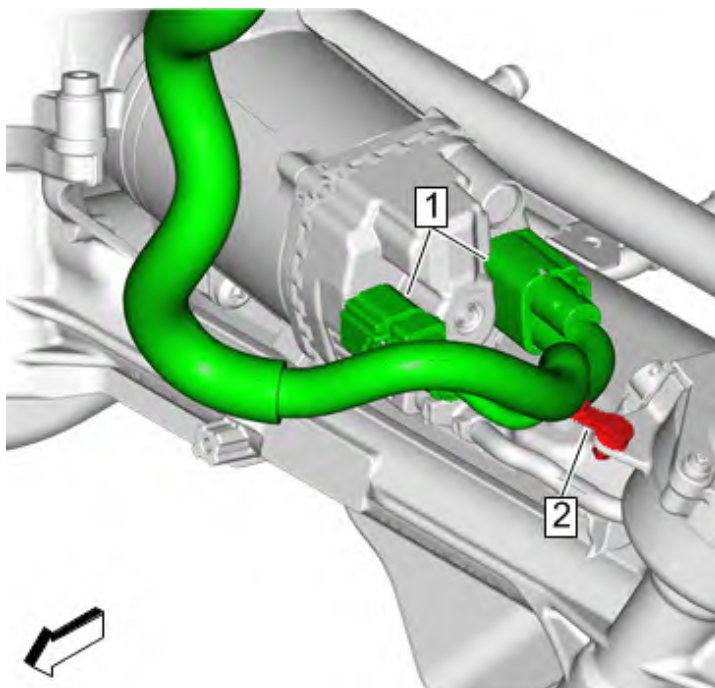


Fig. 75: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

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 \(Front Wheel Drive\)**](#).

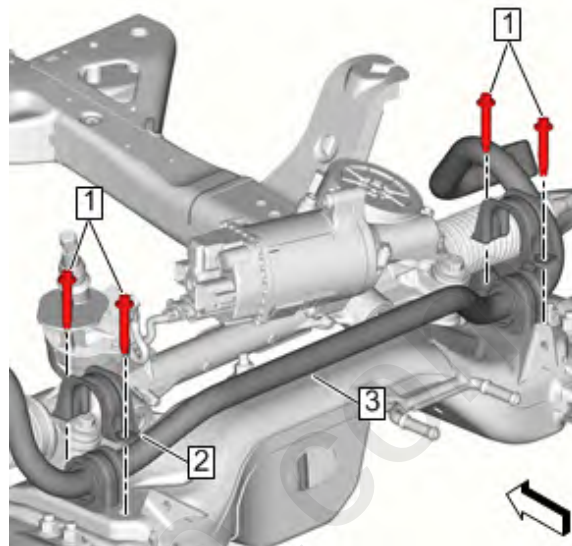


Fig. 76: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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

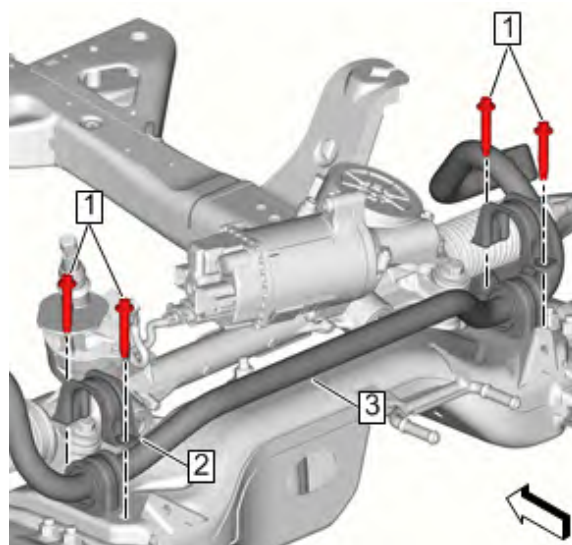


Fig. 77: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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.

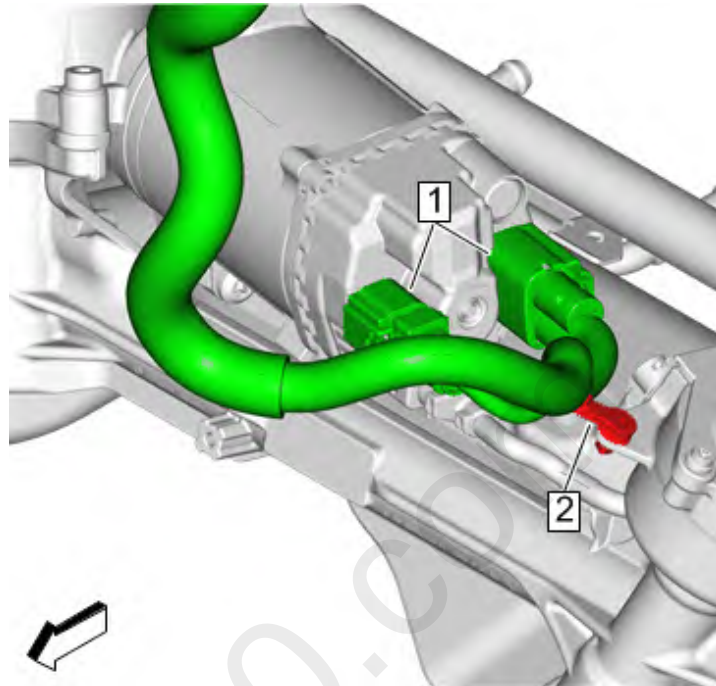


Fig. 78: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

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.

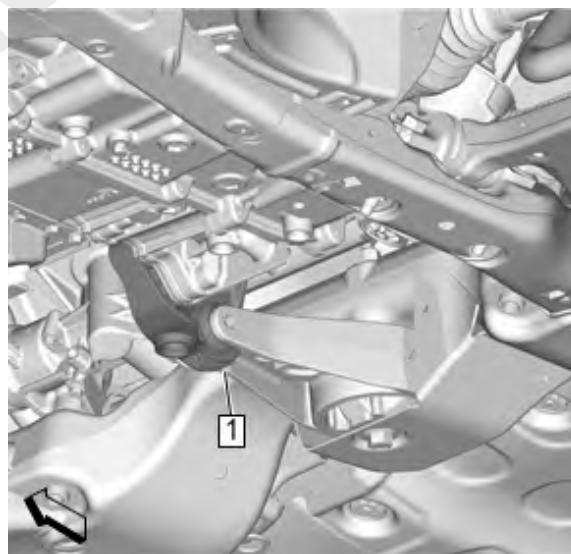


Fig. 79: Transmission Mount Strut Bracket
Courtesy of GENERAL MOTORS COMPANY

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

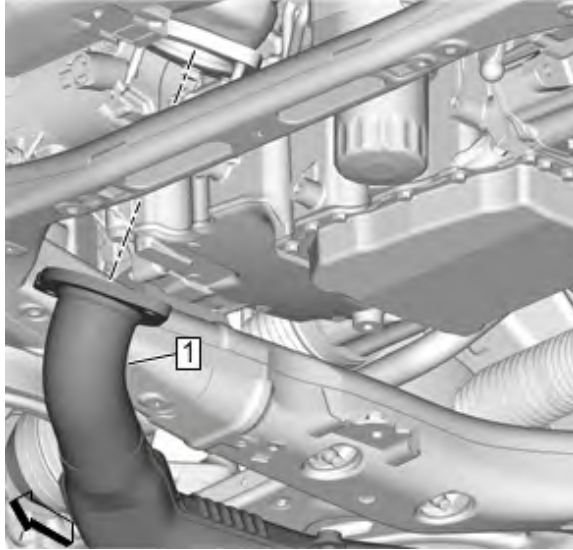


Fig. 80: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

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

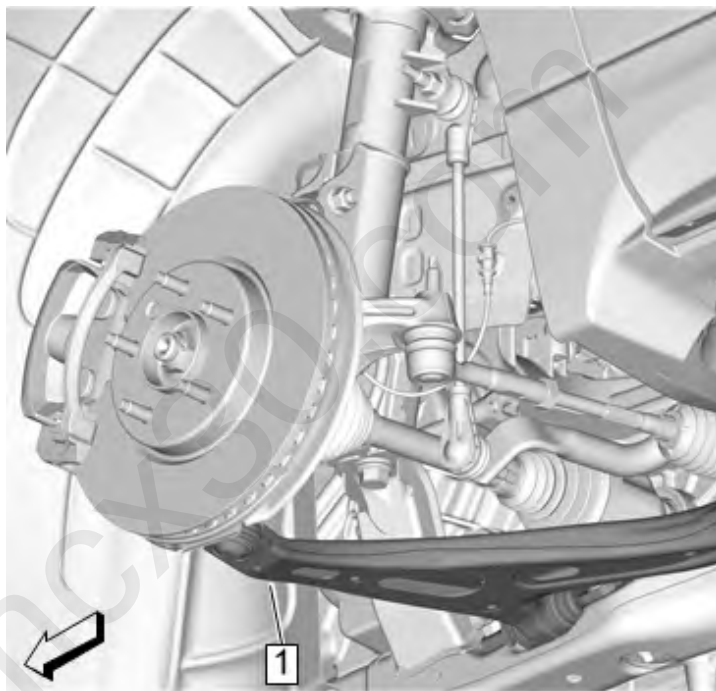


Fig. 81: Front Lower Control Arm

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 \(Terrain\)](#)

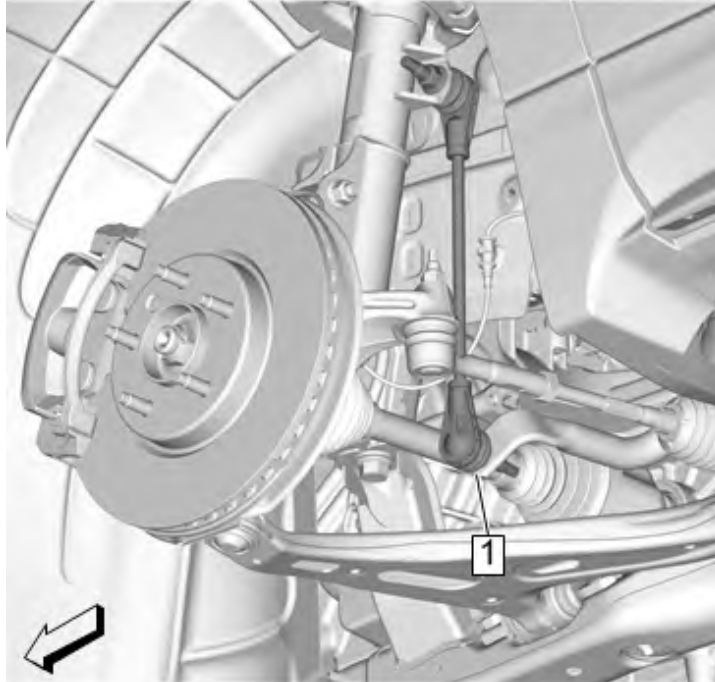


Fig. 82: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

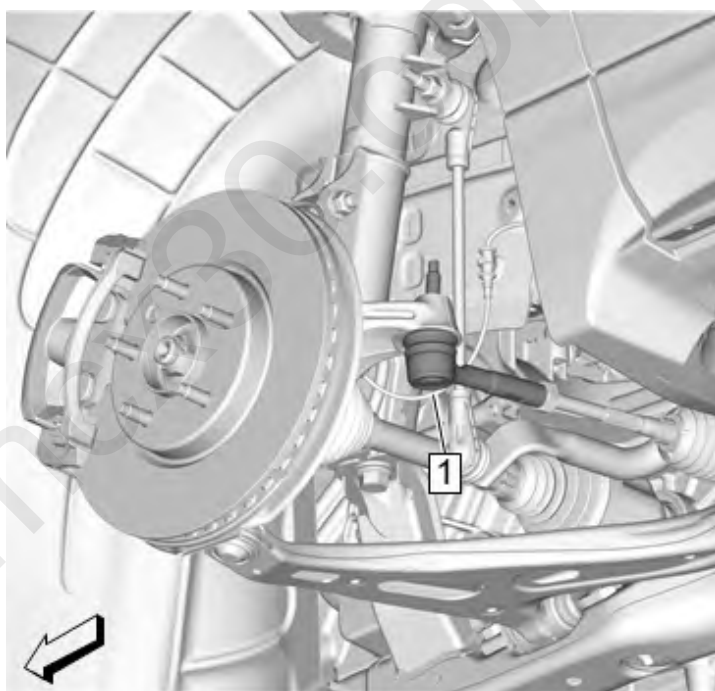


Fig. 83: Steering Linkage Outer Tie Rod

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](#)

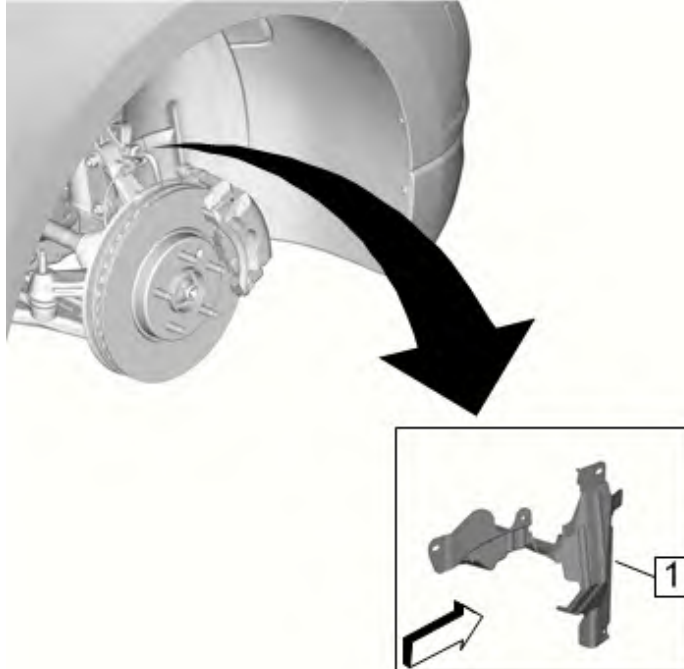


Fig. 84: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

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 \(Terrain\)](#)

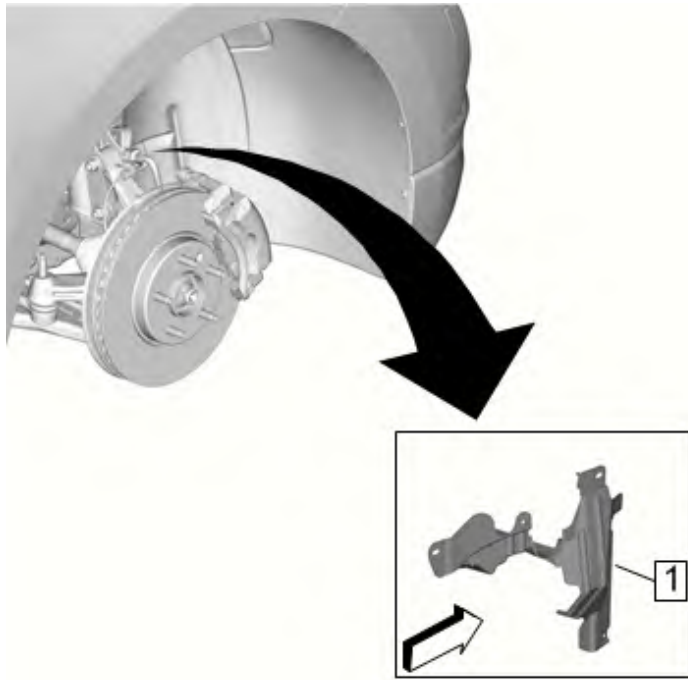


Fig. 85: Right Side Front Wheelhouse Splash Shield
Courtesy of GENERAL MOTORS COMPANY

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

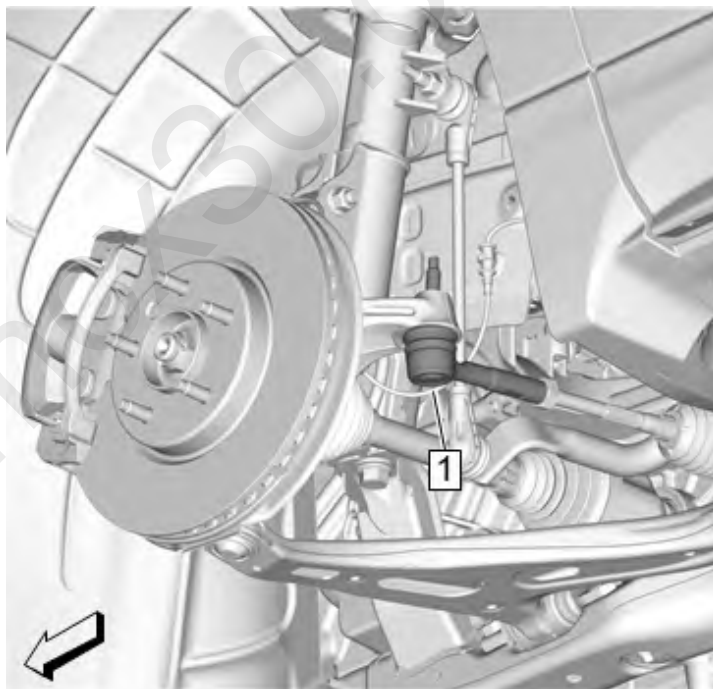


Fig. 86: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

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

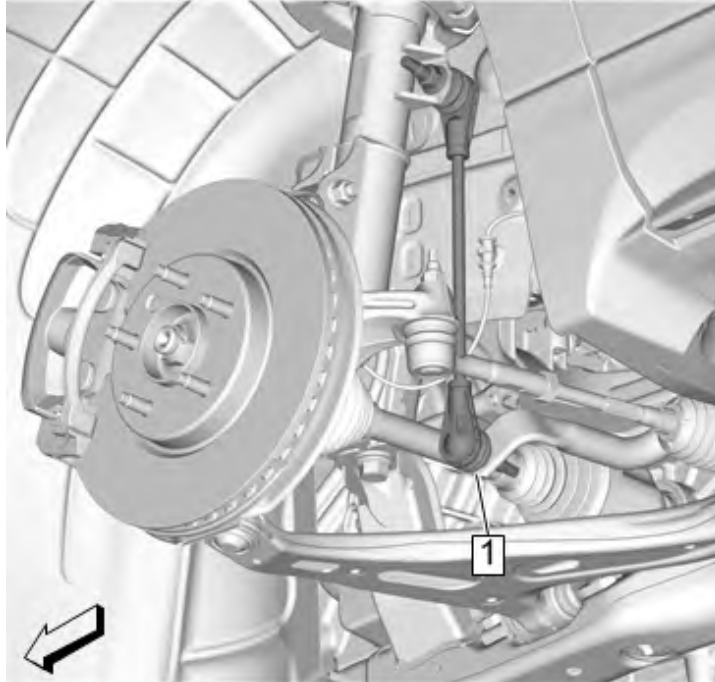


Fig. 87: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

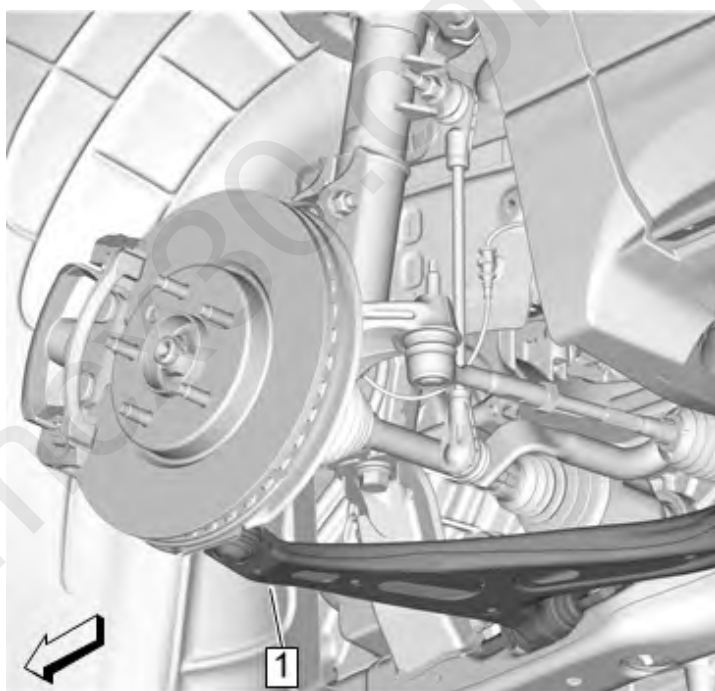


Fig. 88: Front Lower Control Arm

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 \(Terrain\)](#).

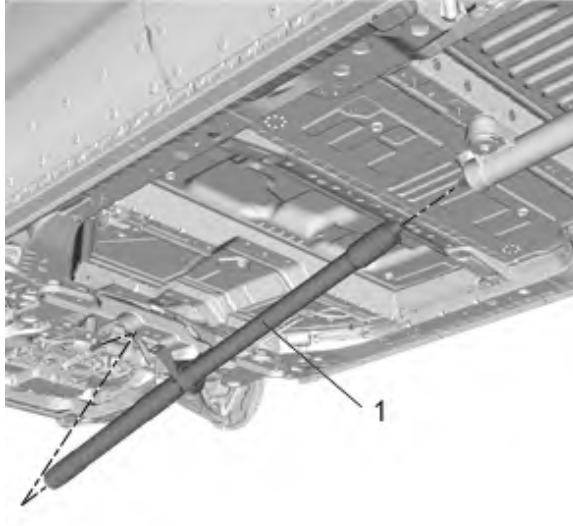


Fig. 89: Propeller Shaft

Courtesy of GENERAL MOTORS COMPANY

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

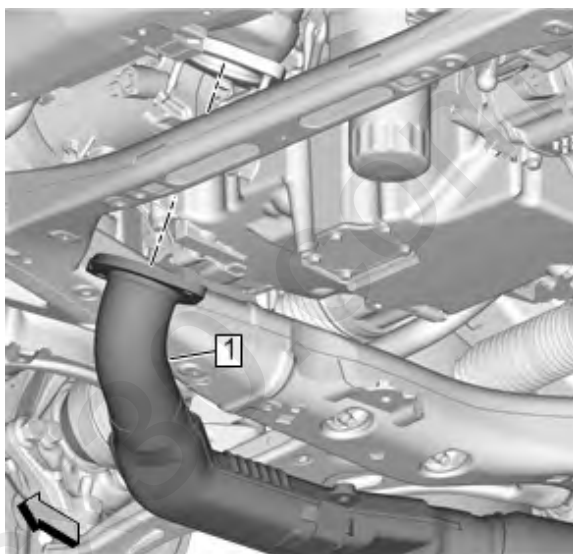


Fig. 90: Exhaust Front Pipe

Courtesy of GENERAL MOTORS COMPANY

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

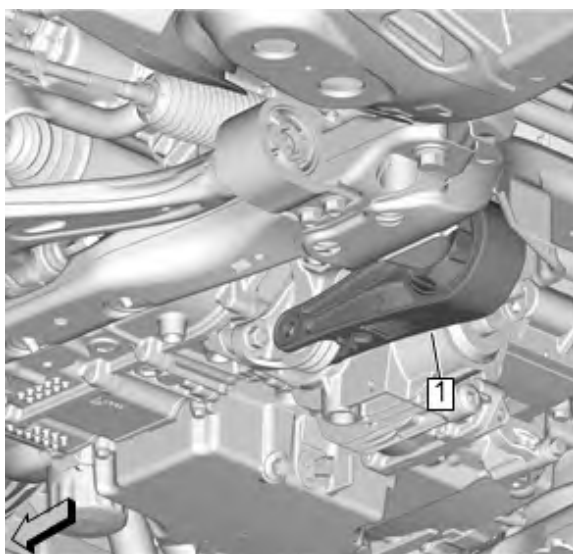


Fig. 91: Transmission Mount Strut

Courtesy of GENERAL MOTORS COMPANY

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

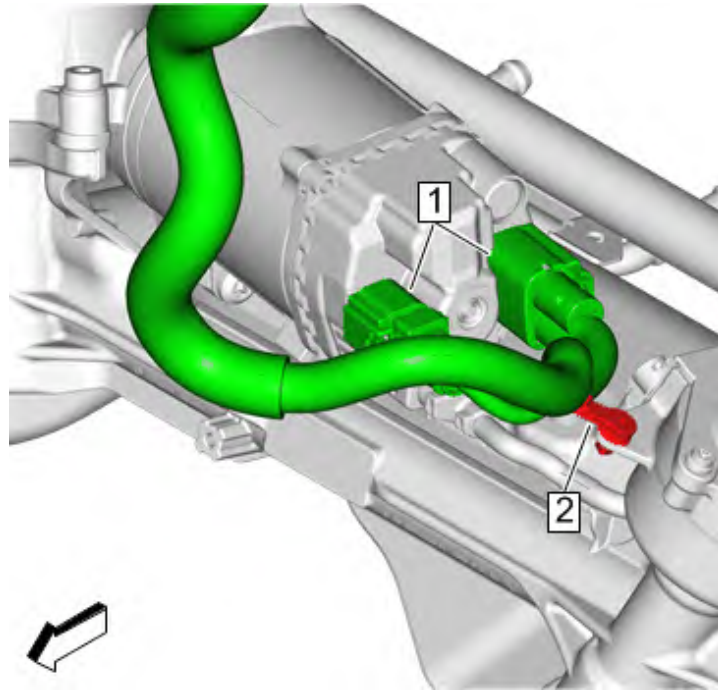


Fig. 92: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

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 \(All Wheel Drive\)](#).

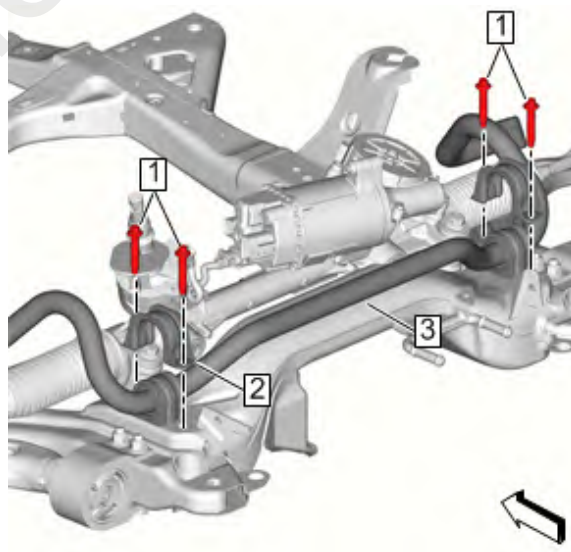


Fig. 93: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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.

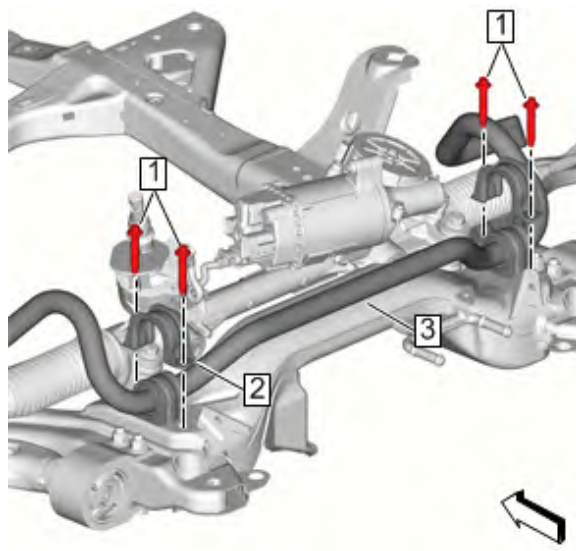


Fig. 94: Front Stabilizer Shaft, Clamps And Bolts
Courtesy of GENERAL MOTORS COMPANY

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.

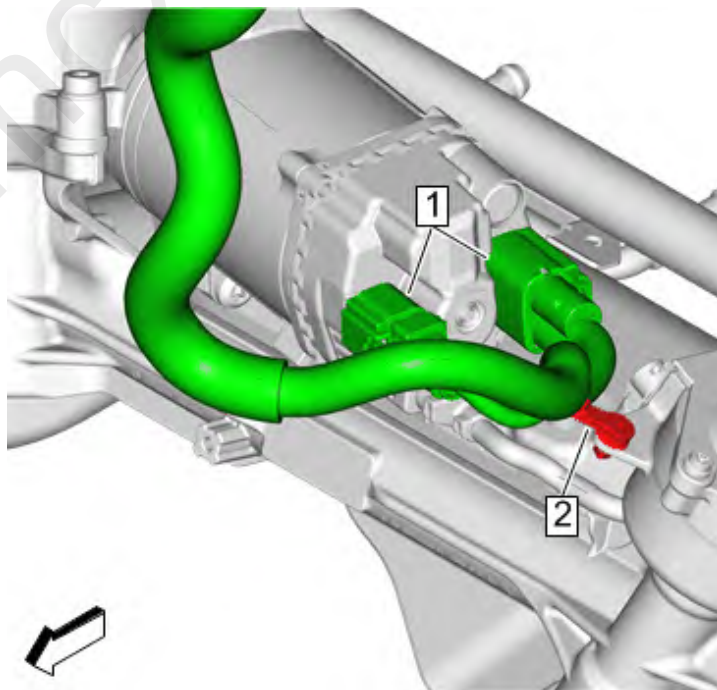


Fig. 95: Steering Gear Electrical Connectors And Wiring Harness Clip
Courtesy of GENERAL MOTORS COMPANY

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.

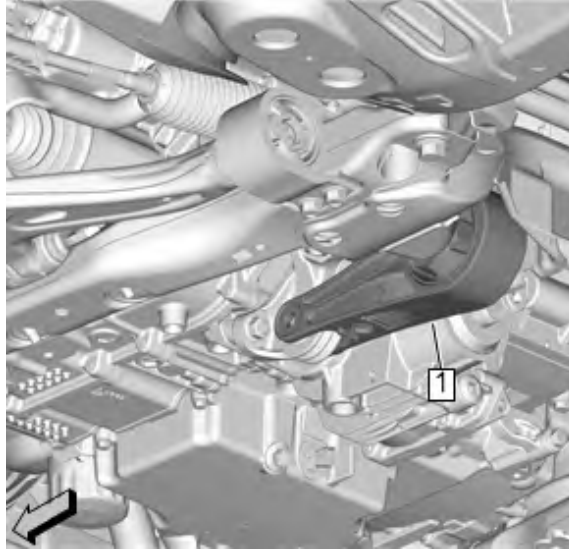


Fig. 96: Transmission Mount Strut
Courtesy of GENERAL MOTORS COMPANY

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

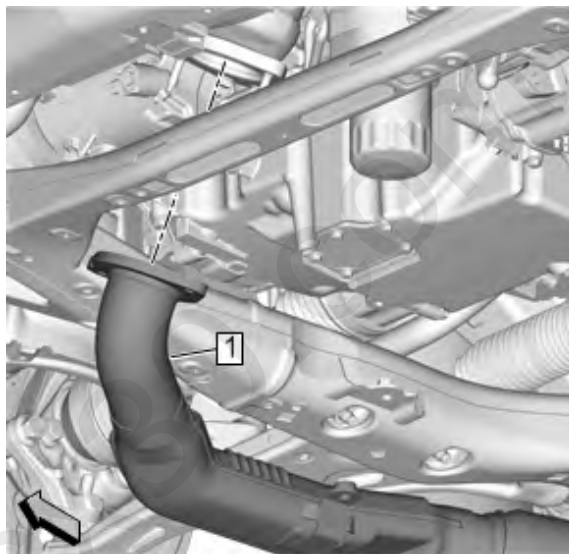


Fig. 97: Exhaust Front Pipe
Courtesy of GENERAL MOTORS COMPANY

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

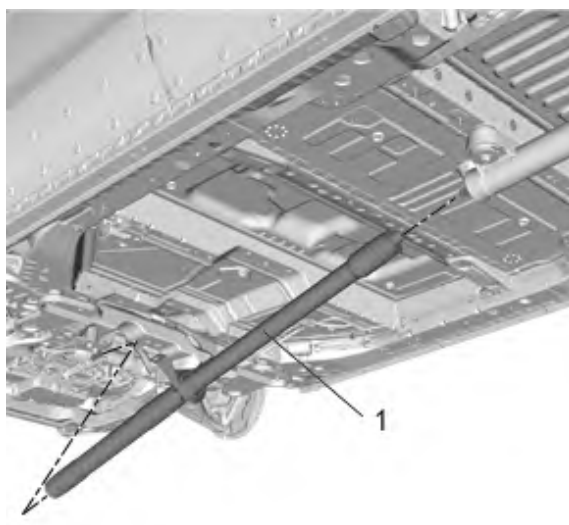


Fig. 98: Propeller Shaft
Courtesy of GENERAL MOTORS COMPANY

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

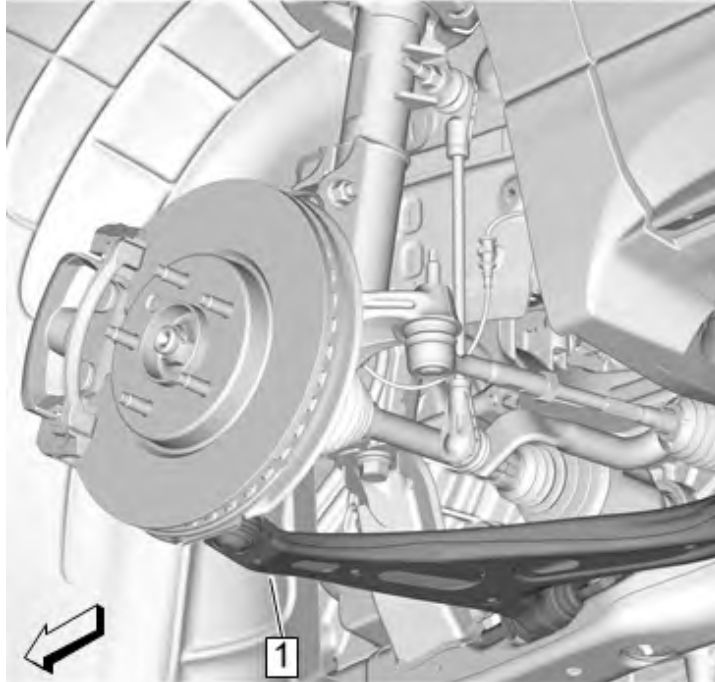


Fig. 99: Front Lower Control Arm

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 \(Terrain\)](#).

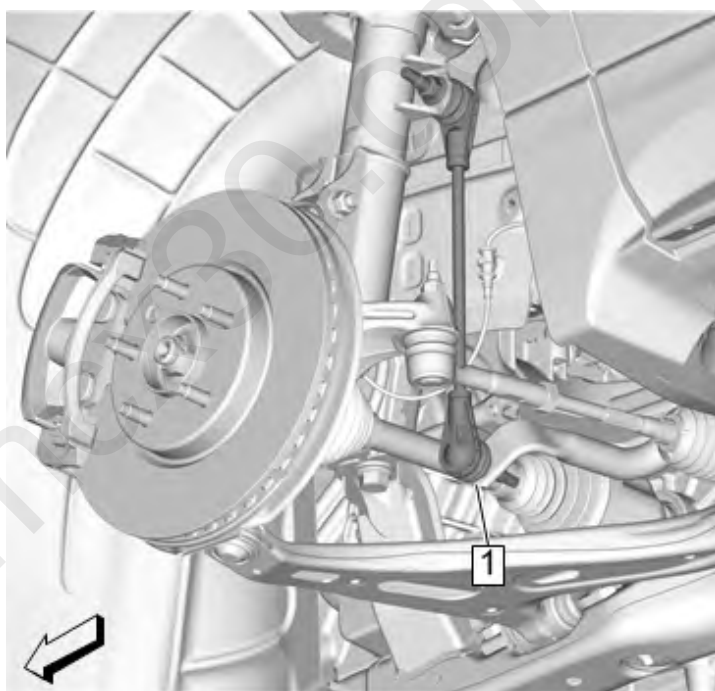


Fig. 100: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

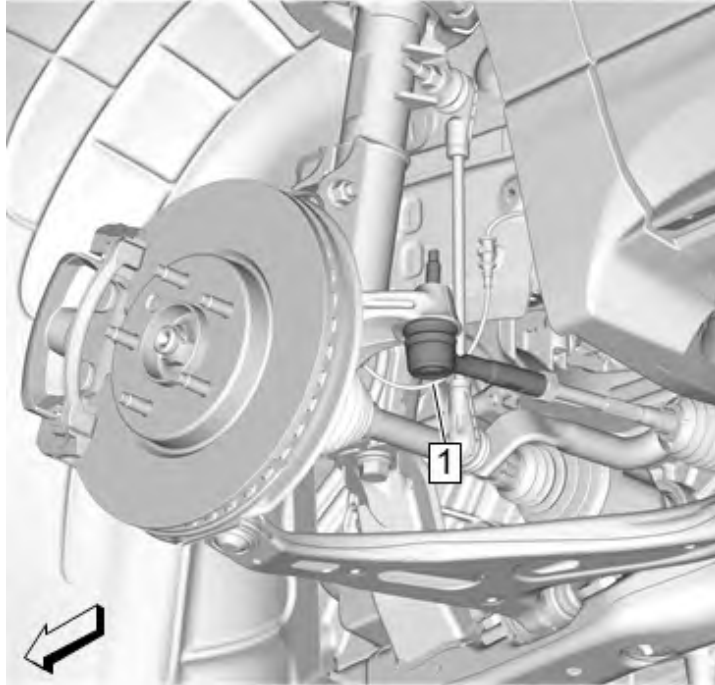


Fig. 101: Steering Linkage Outer Tie Rod
 Courtesy of GENERAL MOTORS COMPANY

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

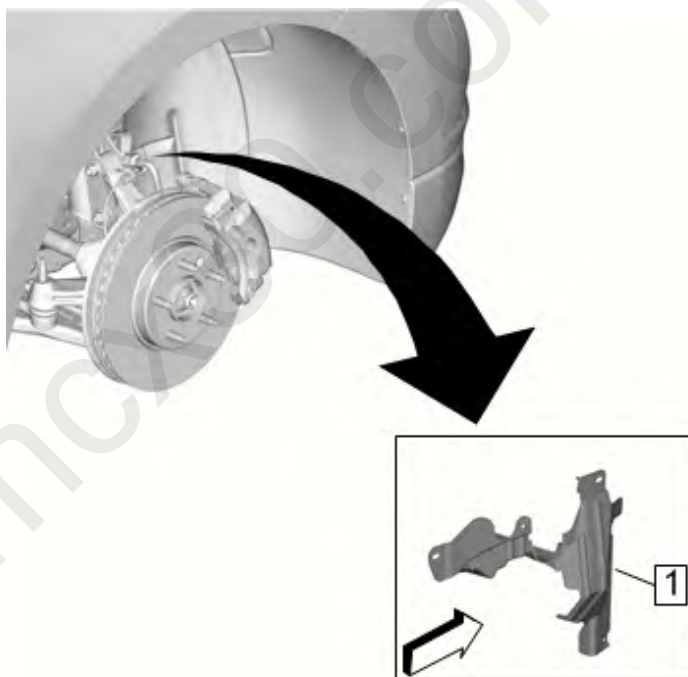


Fig. 102: Right Side Front Wheelhouse Splash Shield
 Courtesy of GENERAL MOTORS COMPANY

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)

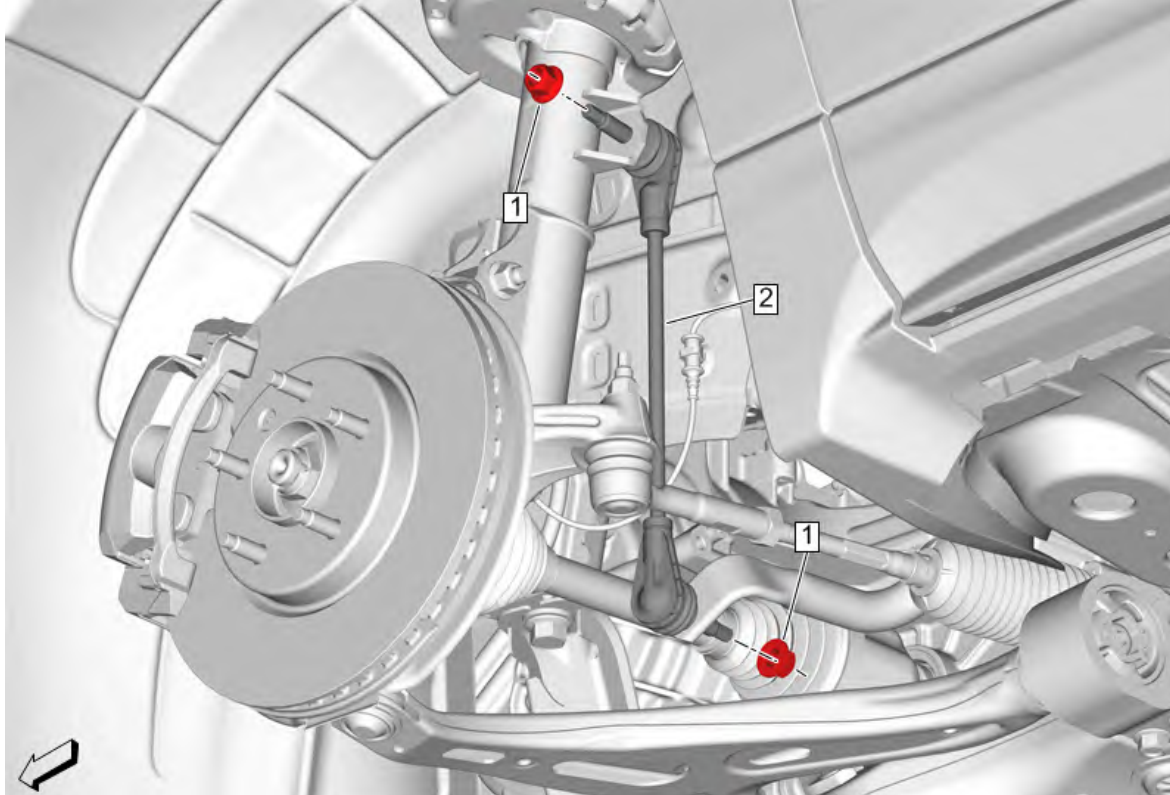


Fig. 103: Stabilizer Shaft Link (Equinox)

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)

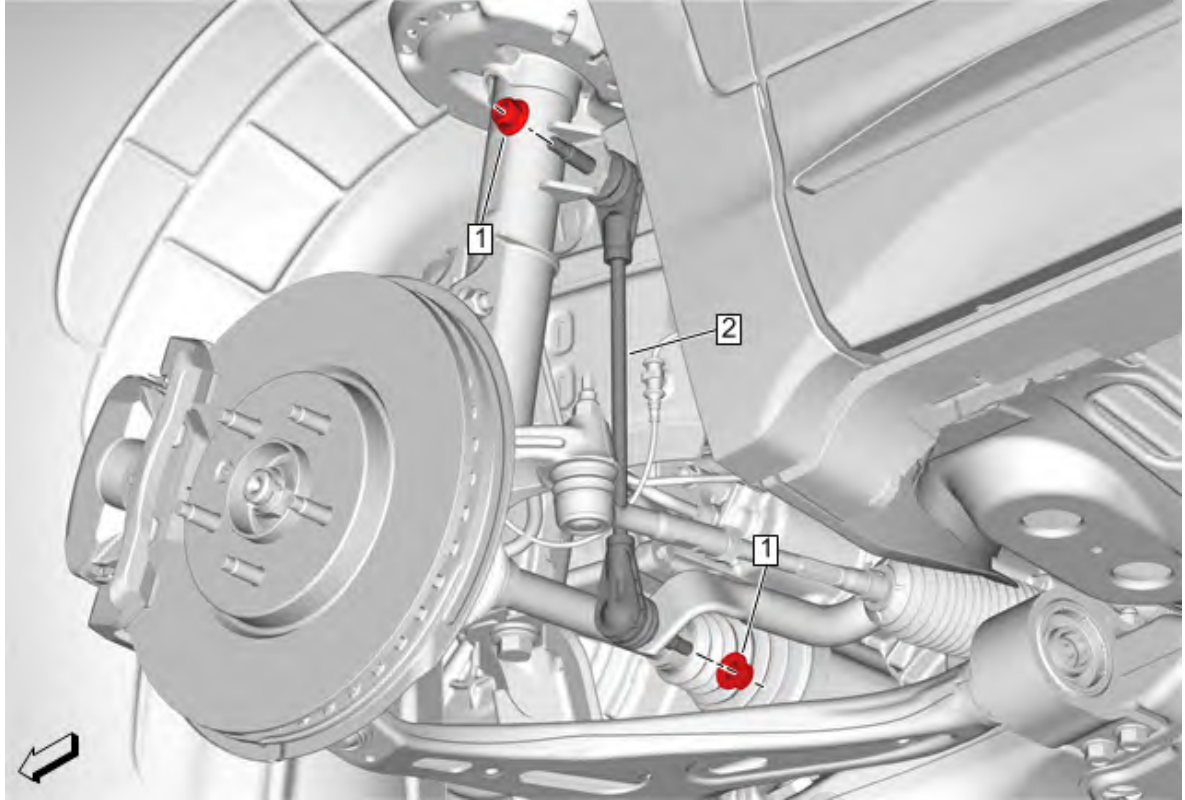


Fig. 104: Stabilizer Shaft Link (Terrain)
Courtesy of GENERAL MOTORS COMPANY

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)

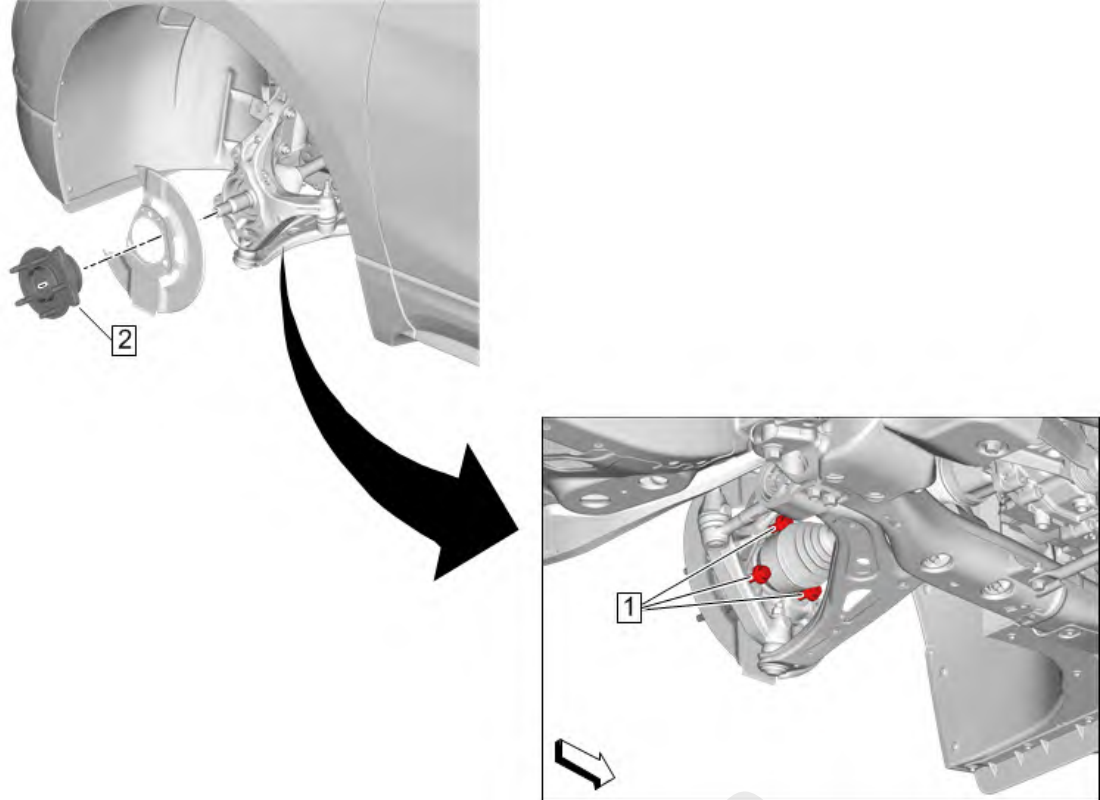


Fig. 105: Front Wheel Bearing And Hub (Equinox)

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)

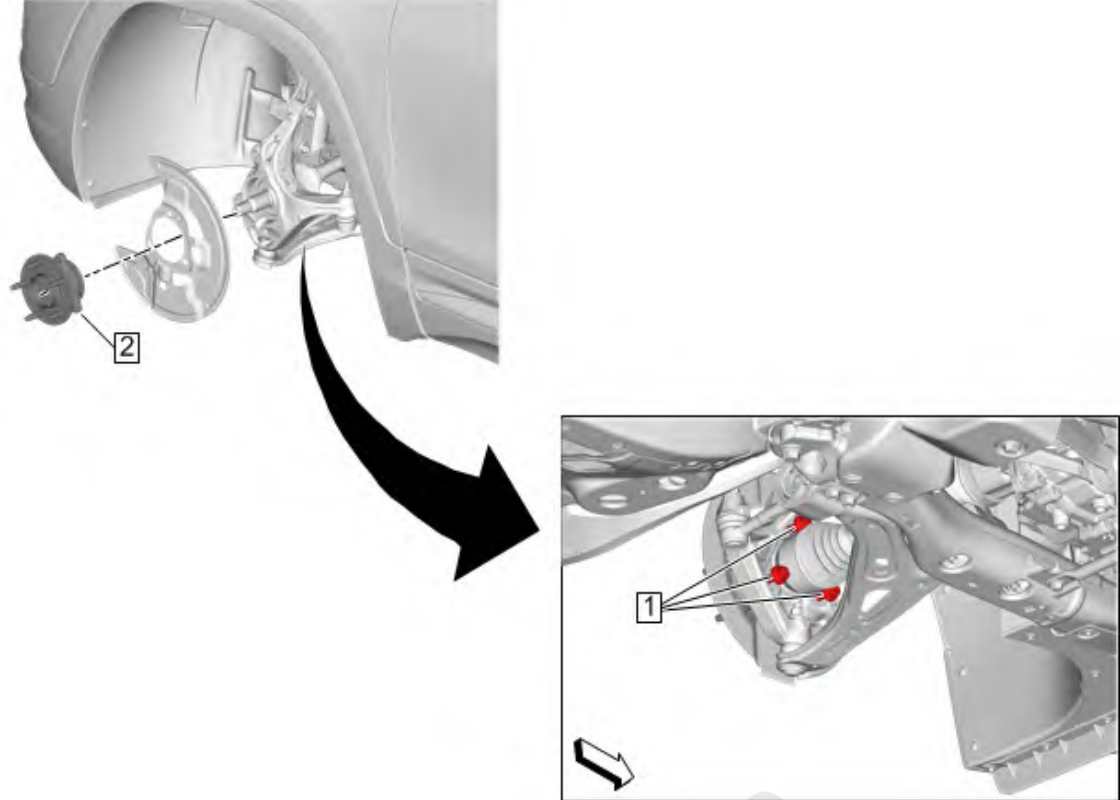


Fig. 106: Front Wheel Bearing And Hub (Terrain)

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

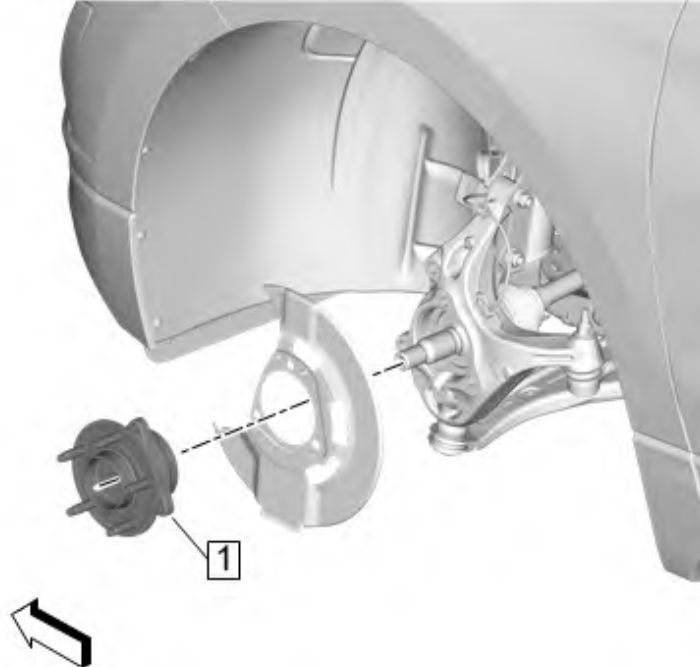


Fig. 107: Front Wheel Bearing And Hub Assembly
 Courtesy of GENERAL MOTORS COMPANY

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

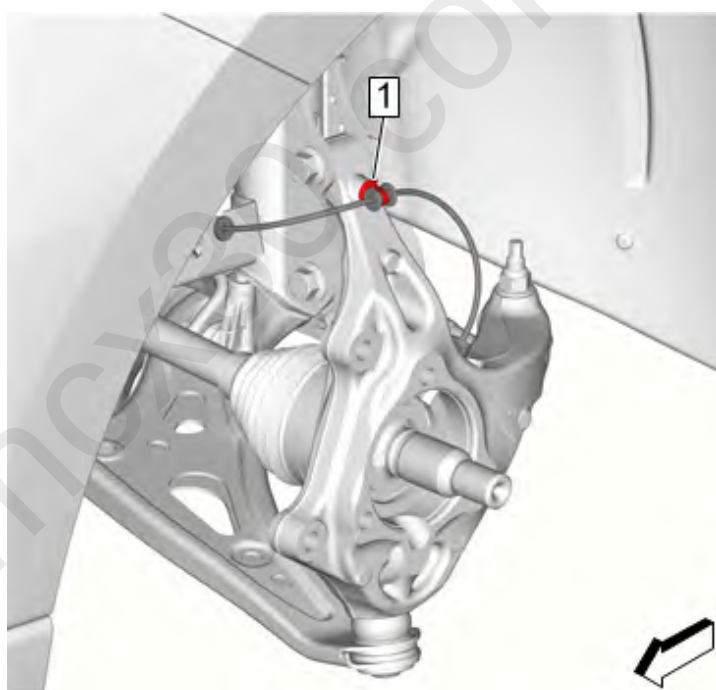


Fig. 108: Front Wheel Speed Sensor Retainer
 Courtesy of GENERAL MOTORS COMPANY

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

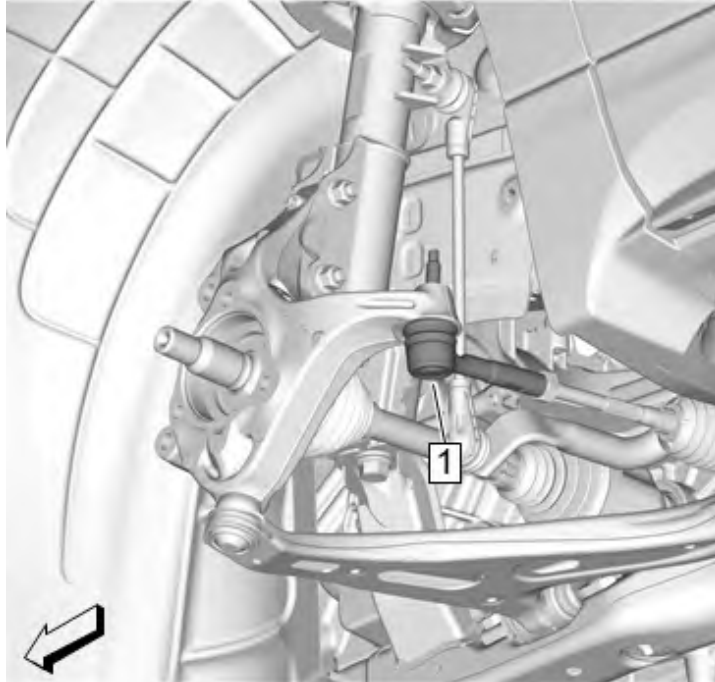


Fig. 109: Steering Linkage Outer Tie Rod
Courtesy of GENERAL MOTORS COMPANY

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

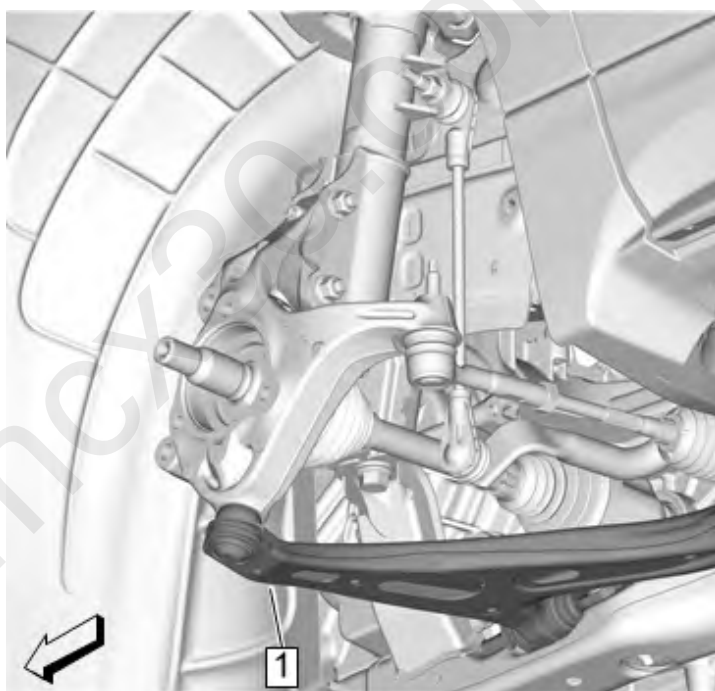


Fig. 110: Front Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

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

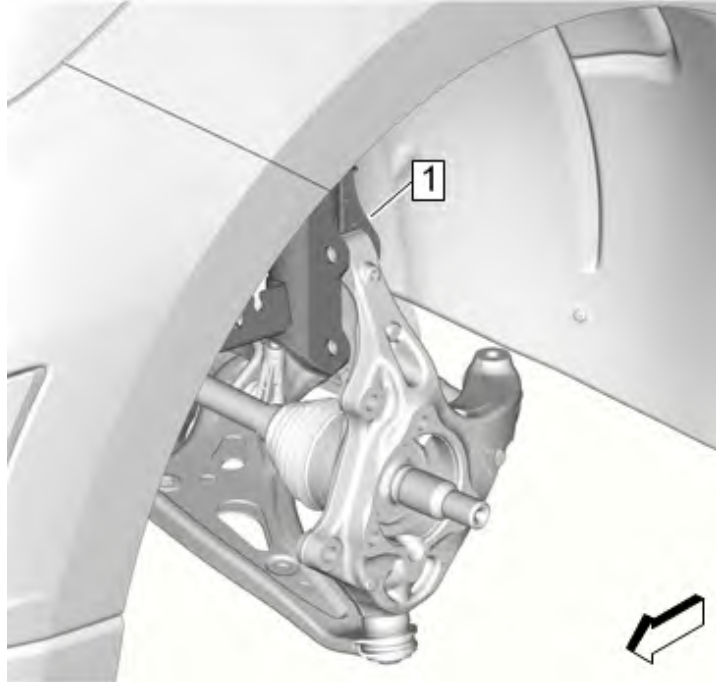


Fig. 111: Strut Assembly

Courtesy of GENERAL MOTORS COMPANY

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

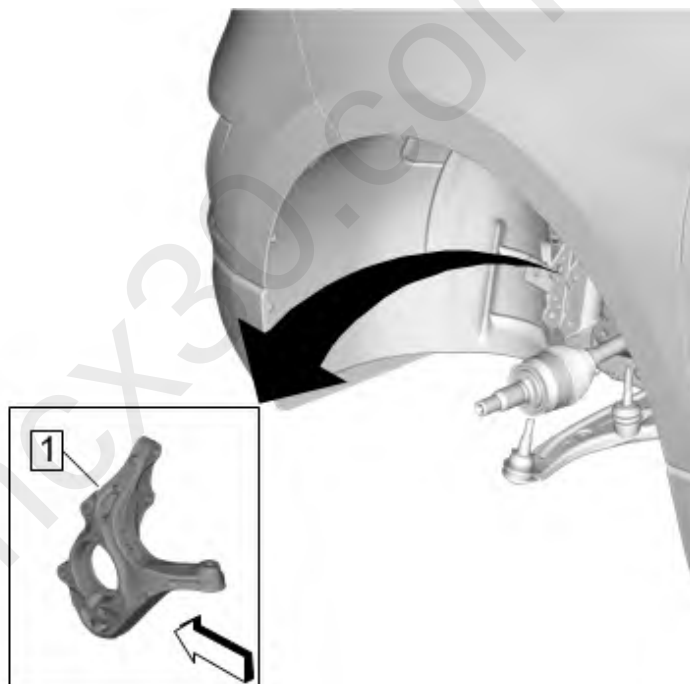


Fig. 112: Steering Knuckle

Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

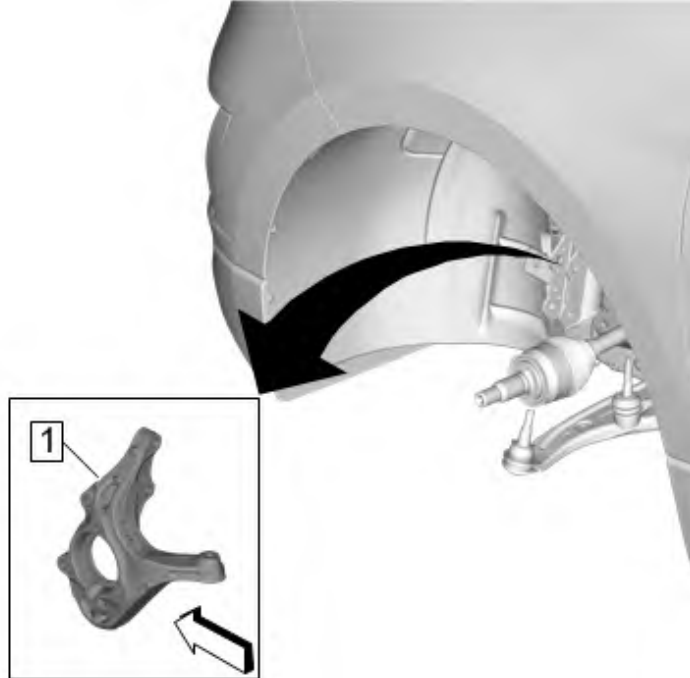


Fig. 113: Steering Knuckle

Courtesy of GENERAL MOTORS COMPANY

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

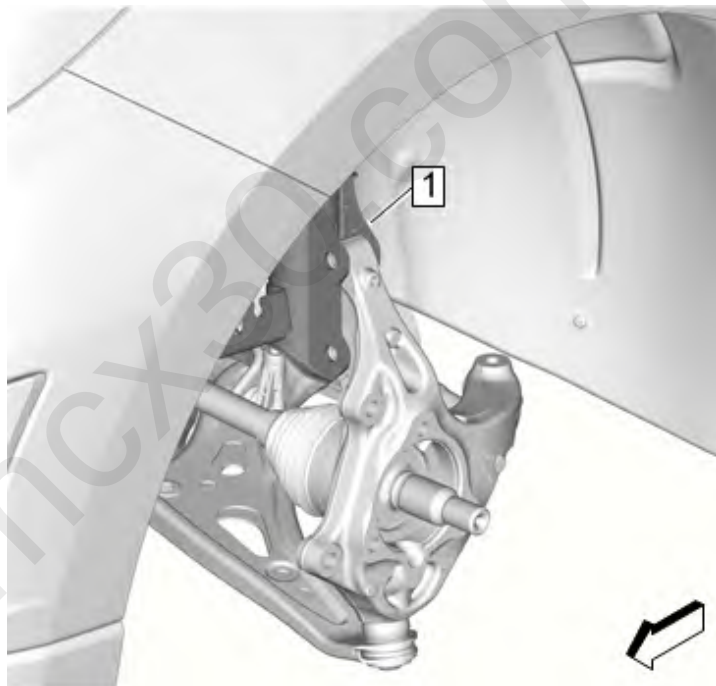


Fig. 114: Strut Assembly

Courtesy of GENERAL MOTORS COMPANY

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

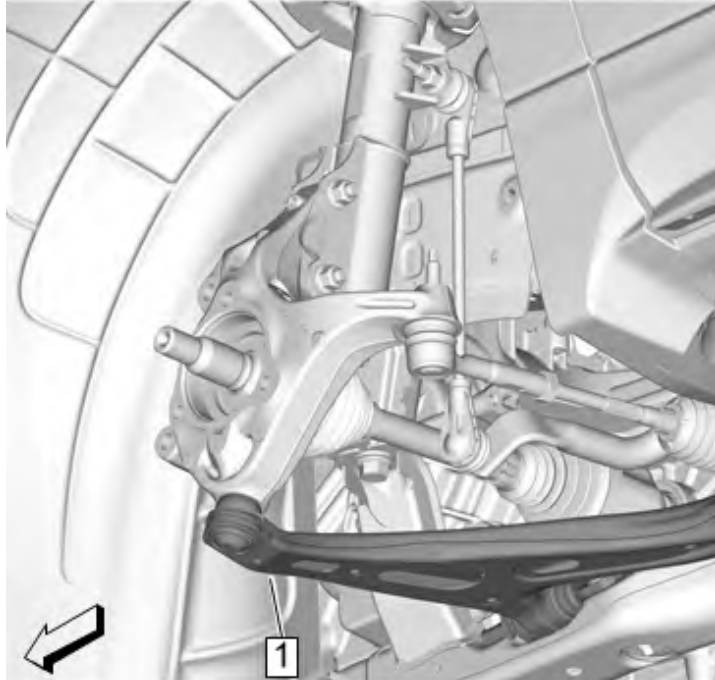


Fig. 115: Front Lower Control Arm

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 \(Terrain\)](#).

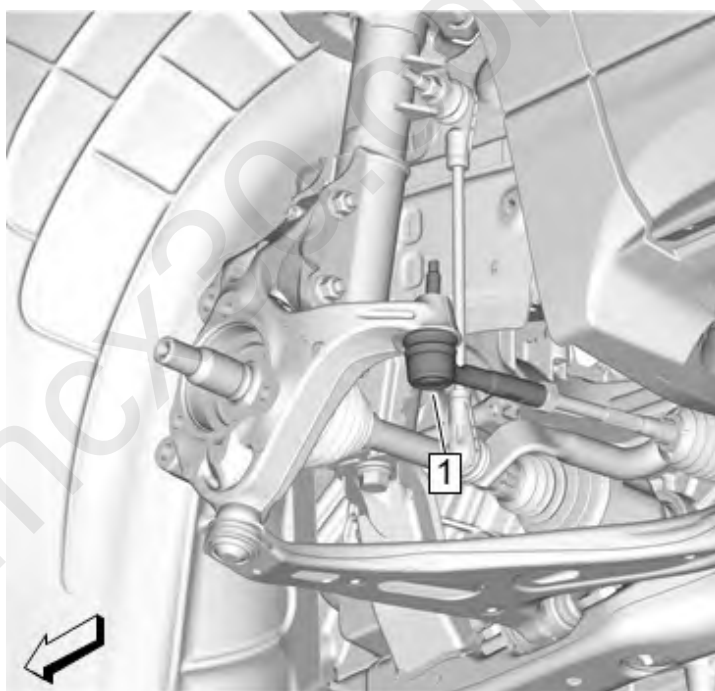


Fig. 116: Steering Linkage Outer Tie Rod

Courtesy of GENERAL MOTORS COMPANY

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

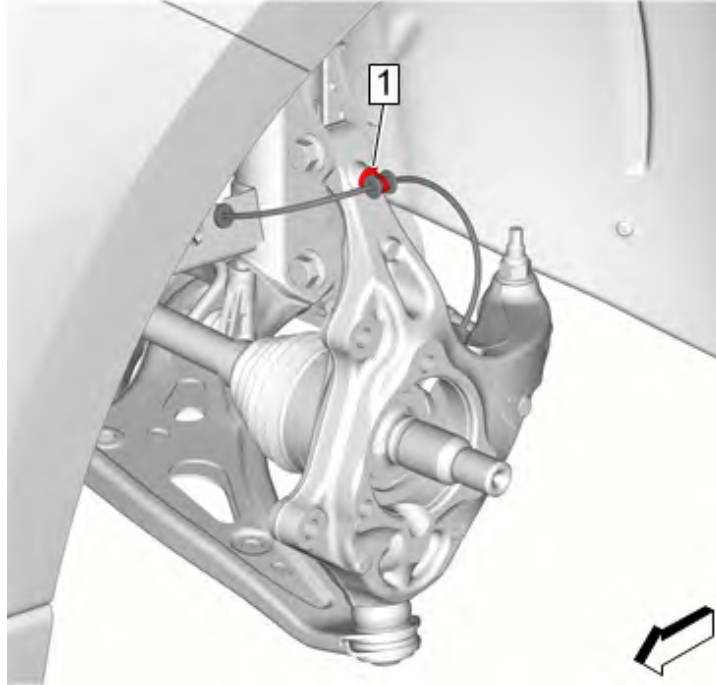


Fig. 117: Front Wheel Speed Sensor Retainer
 Courtesy of GENERAL MOTORS COMPANY

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

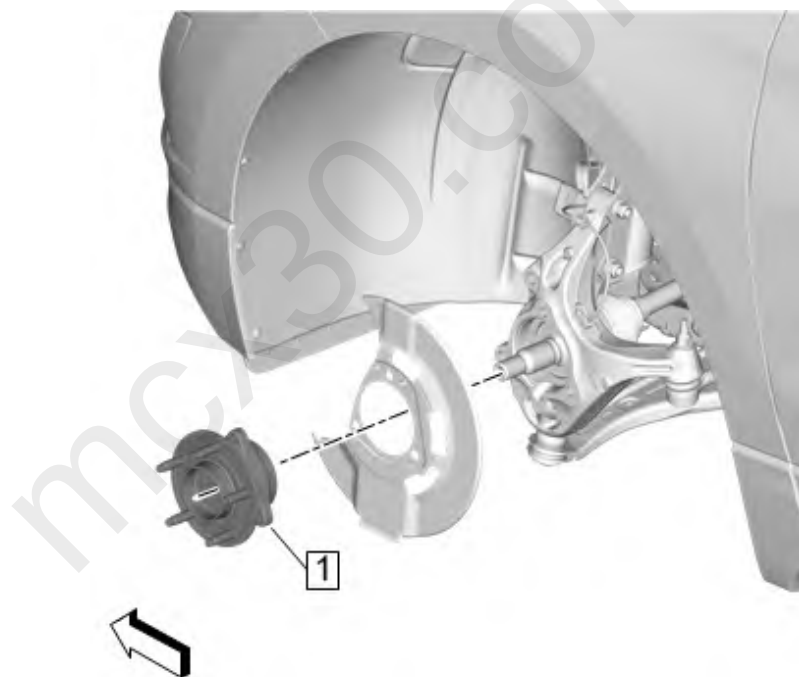


Fig. 118: Front Wheel Bearing And Hub Assembly.
 Courtesy of GENERAL MOTORS COMPANY

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](#)

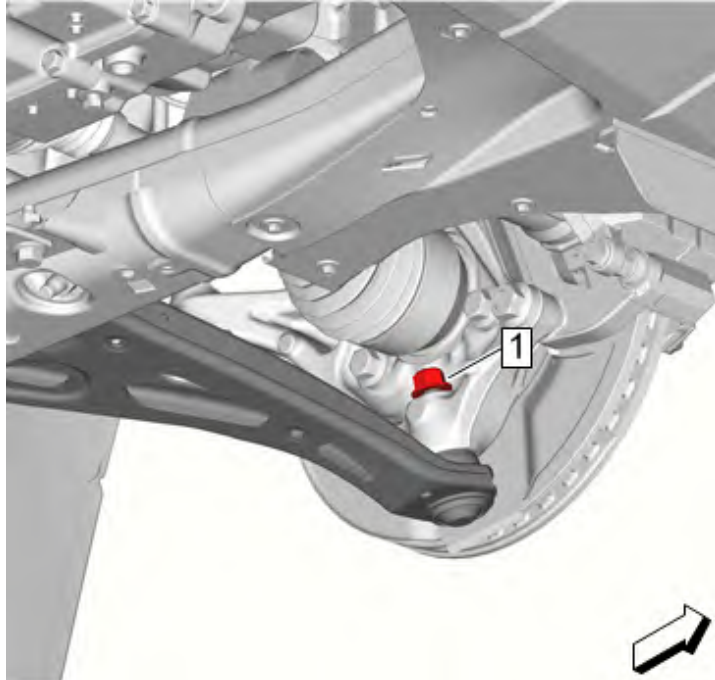


Fig. 119: Front Lower Control Arm Ball Stud Nut
 Courtesy of GENERAL MOTORS COMPANY

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).

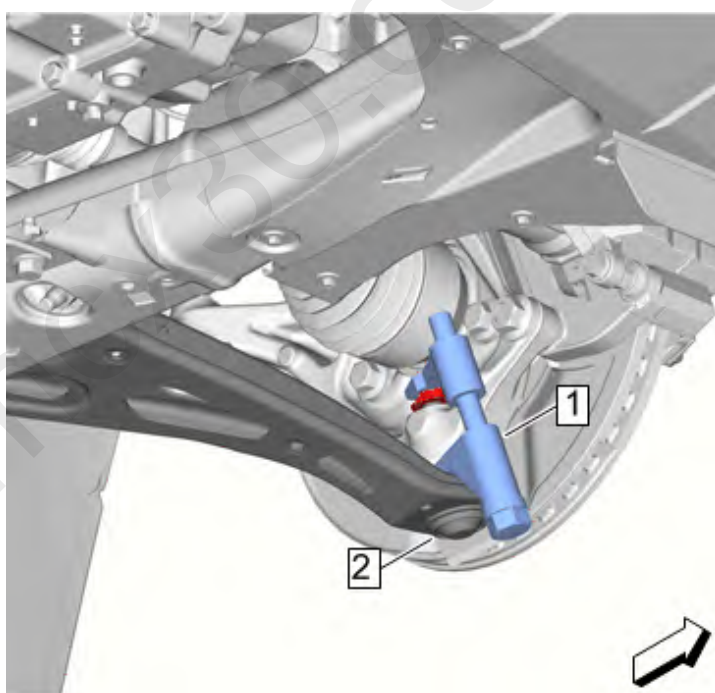


Fig. 120: Front Lower Control Arm And Ball Joint Separator
 Courtesy of GENERAL MOTORS COMPANY

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.

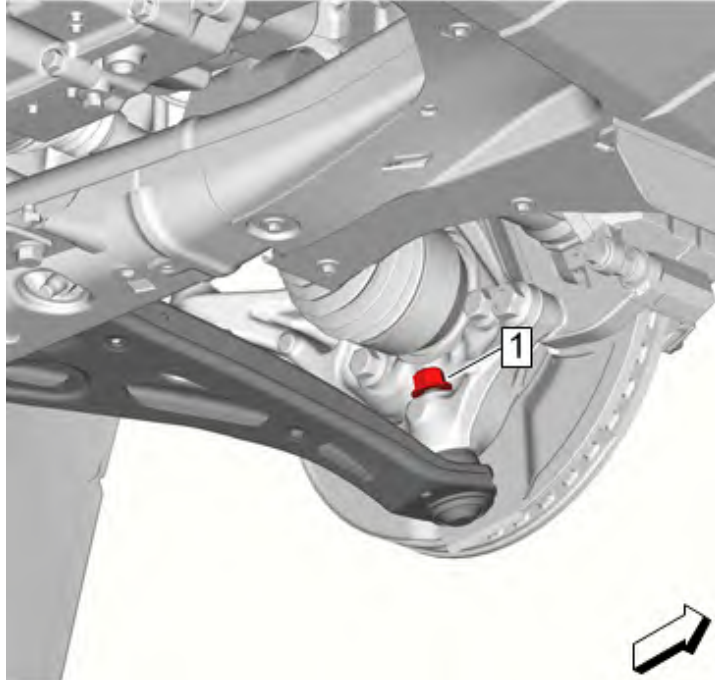


Fig. 121: Front Lower Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

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

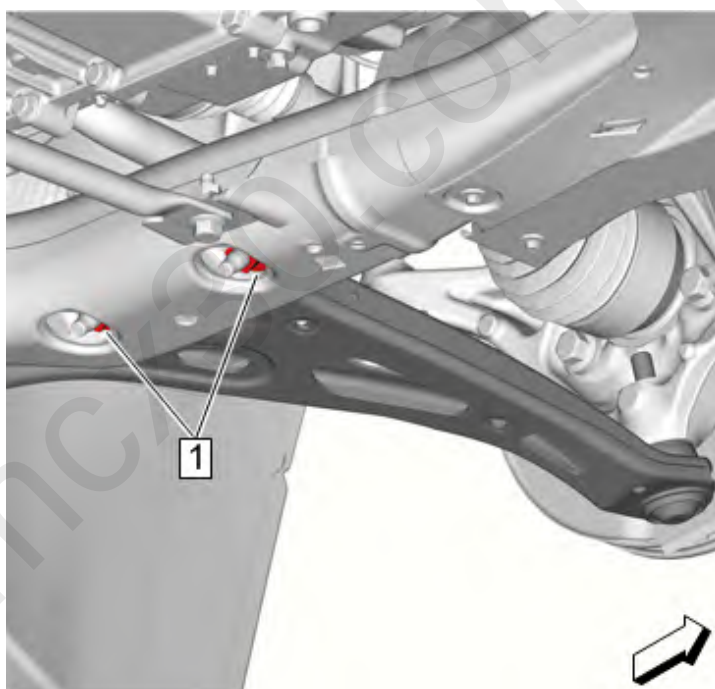


Fig. 122: Welded Front Lower Control Arm Front Nuts
Courtesy of GENERAL MOTORS COMPANY

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

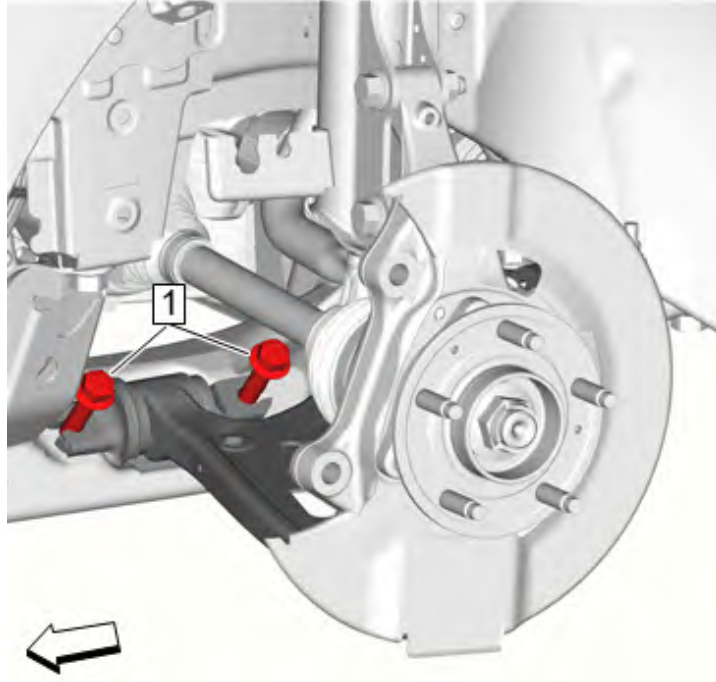


Fig. 123: Front Lower Control Arm Front Bolts
 Courtesy of GENERAL MOTORS COMPANY

NOTE: Some components not shown for graphic clarity.

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

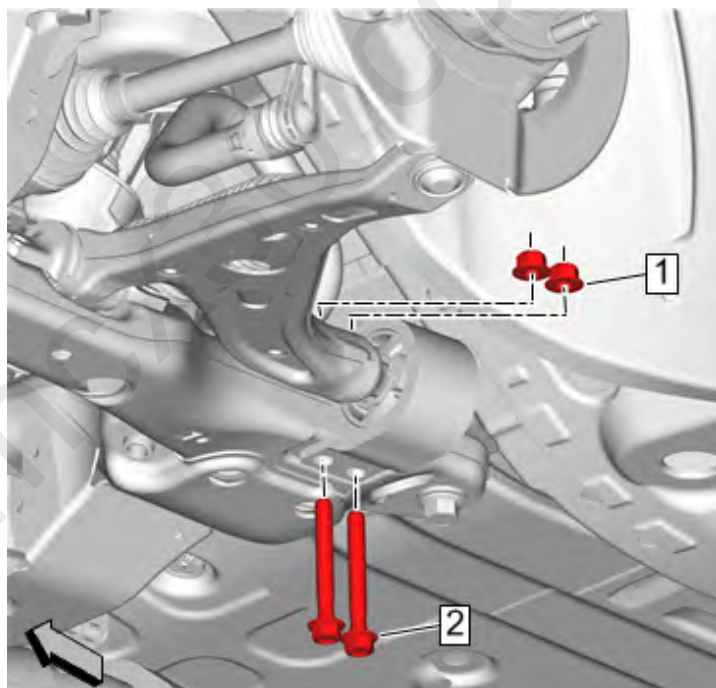


Fig. 124: Front Lower Control Arm Rear Nuts And Rear Bolts
 Courtesy of GENERAL MOTORS COMPANY

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

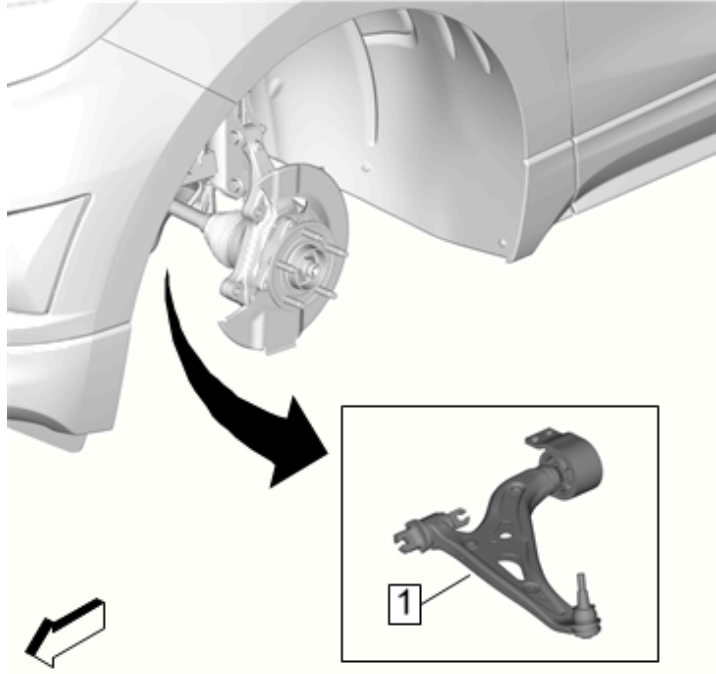


Fig. 125: Front Lower Control Arm
 Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

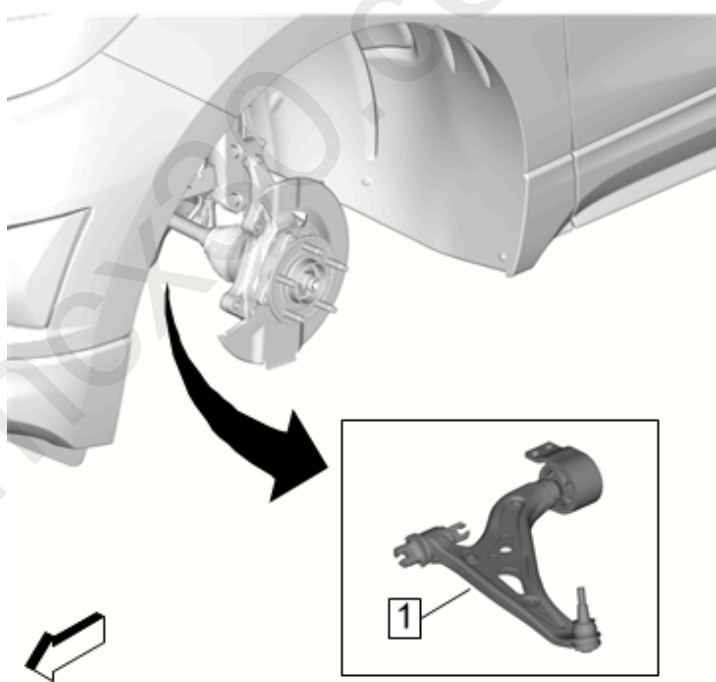


Fig. 126: Front Lower Control Arm
 Courtesy of GENERAL MOTORS COMPANY

1. Install Front Lower Control Arm (1)

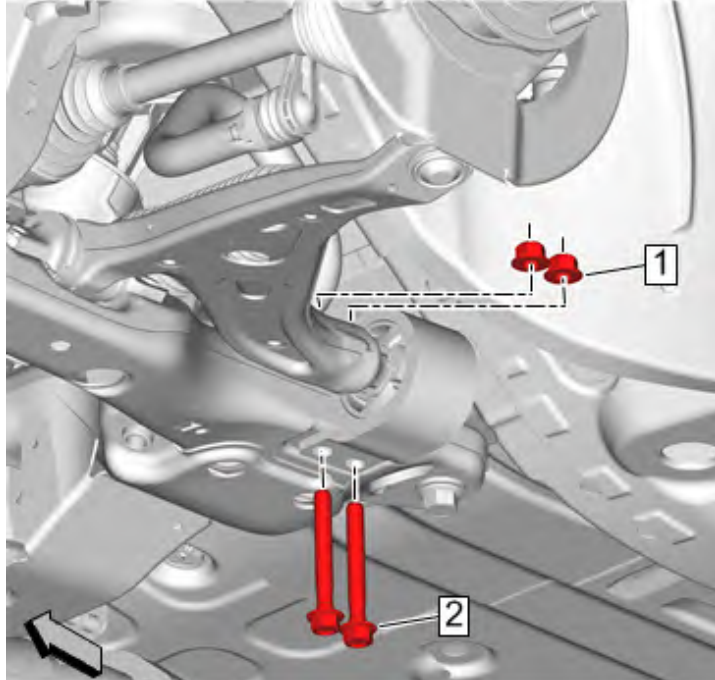


Fig. 127: Front Lower Control Arm Rear Nuts And Rear Bolts

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)

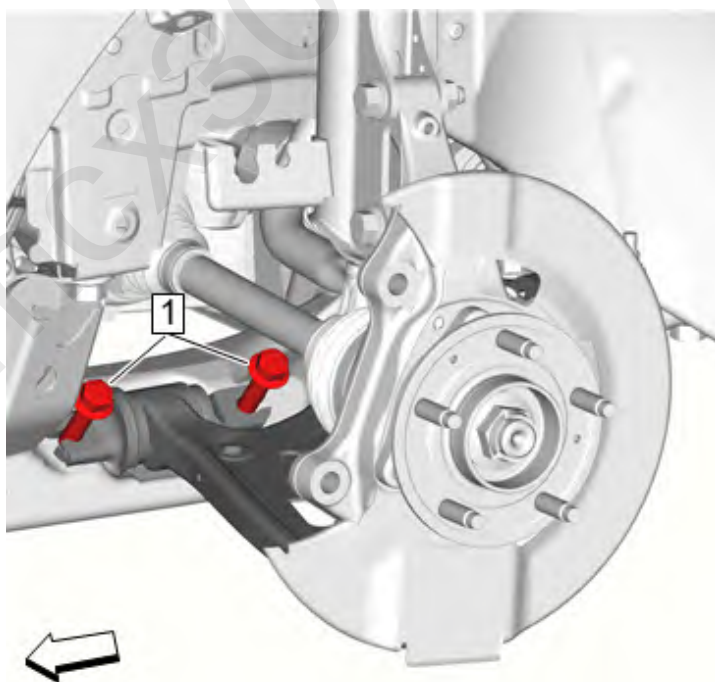


Fig. 128: Front Lower Control Arm Front Bolts

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)

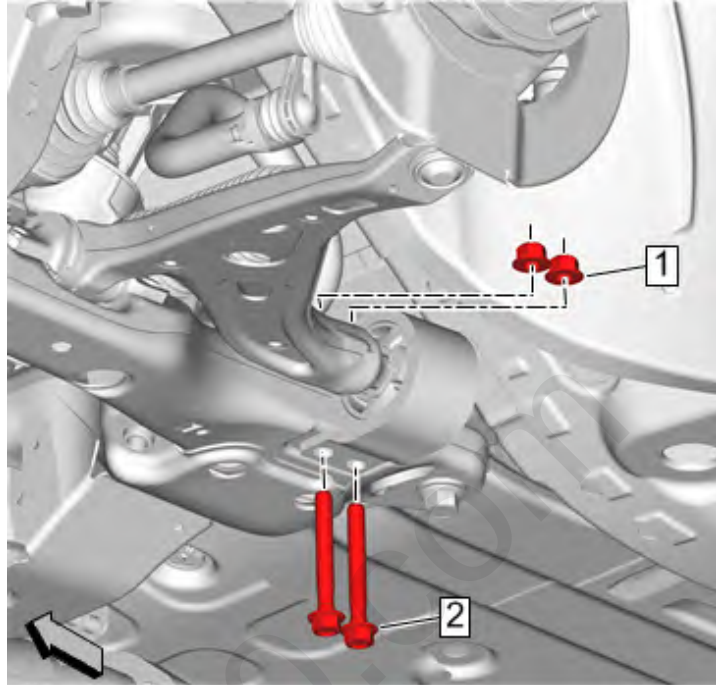


Fig. 129: Front Lower Control Arm Rear Nuts And Rear Bolts
Courtesy of GENERAL MOTORS COMPANY

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)

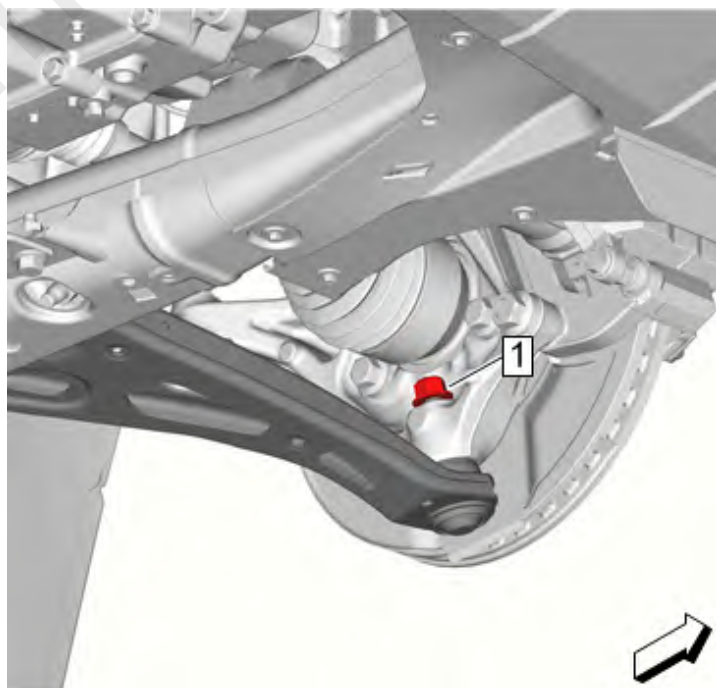


Fig. 130: Front Lower Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

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](#)

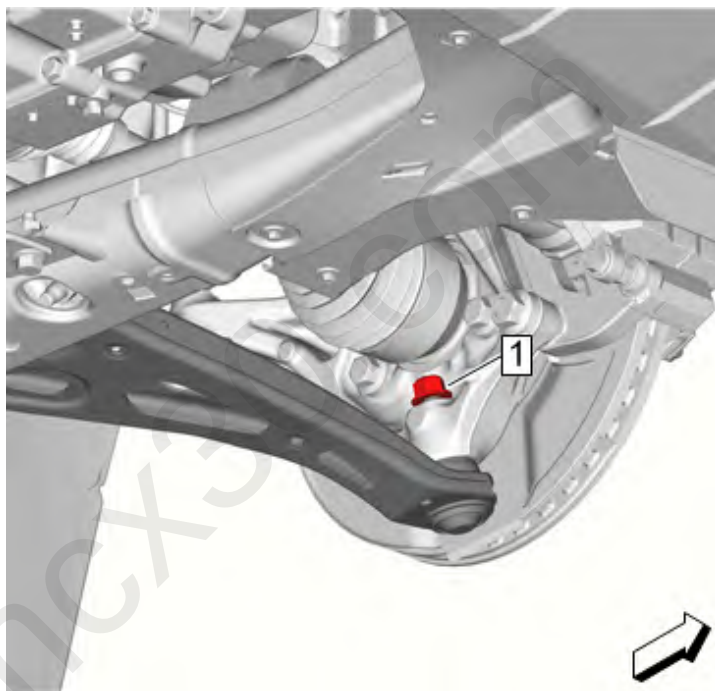


Fig. 131: Front Lower Control Arm Ball Stud Nut

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)

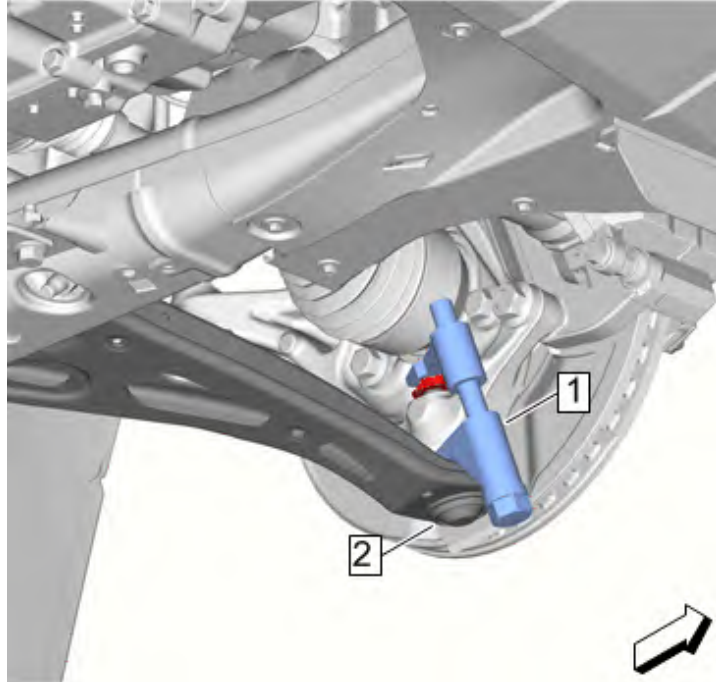


Fig. 132: Front Lower Control Arm And Ball Joint Separator
 Courtesy of GENERAL MOTORS COMPANY

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.

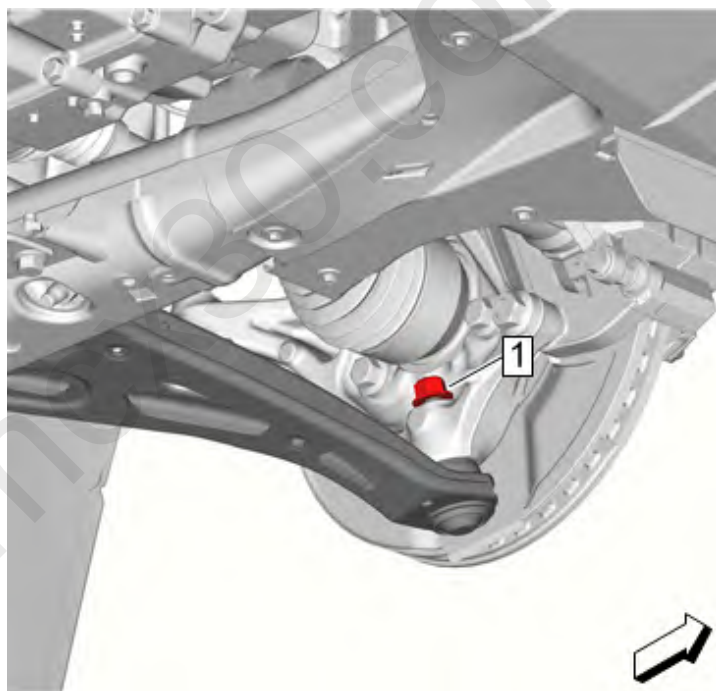


Fig. 133: Front Lower Control Arm Ball Stud Nut
 Courtesy of GENERAL MOTORS COMPANY

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

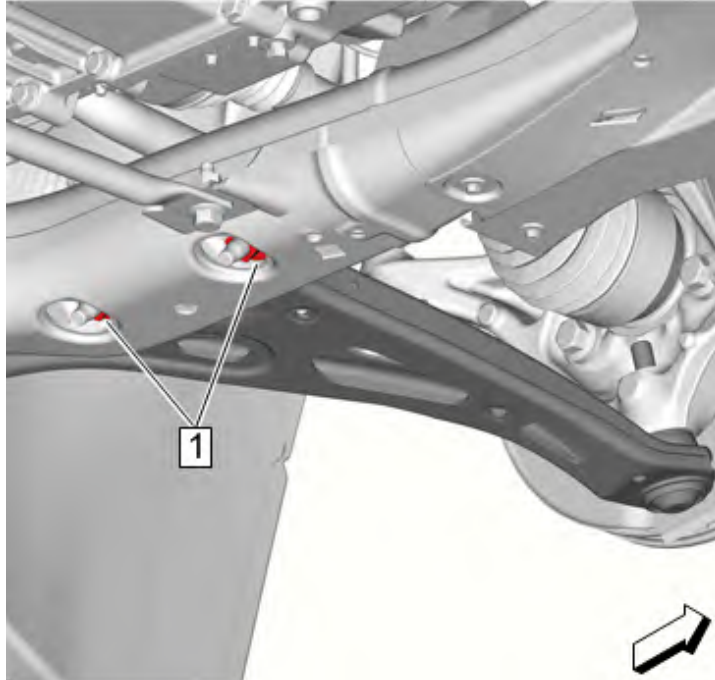


Fig. 134: Welded Front Lower Control Arm Front Nuts

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).

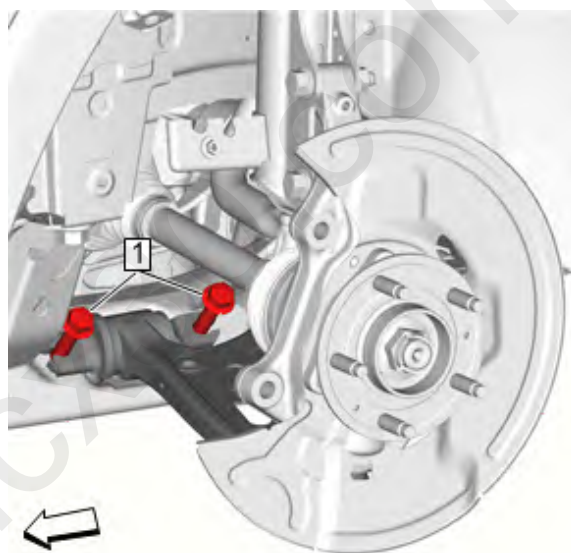


Fig. 135: Front Lower Control Arm Front Bolts

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)

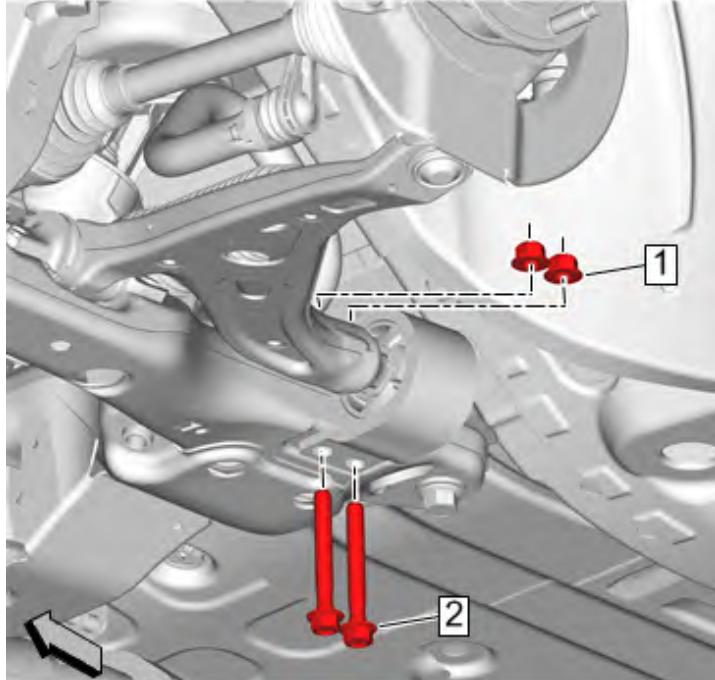


Fig. 136: Front Lower Control Arm Rear Nuts And Rear Bolts
 Courtesy of GENERAL MOTORS COMPANY

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)

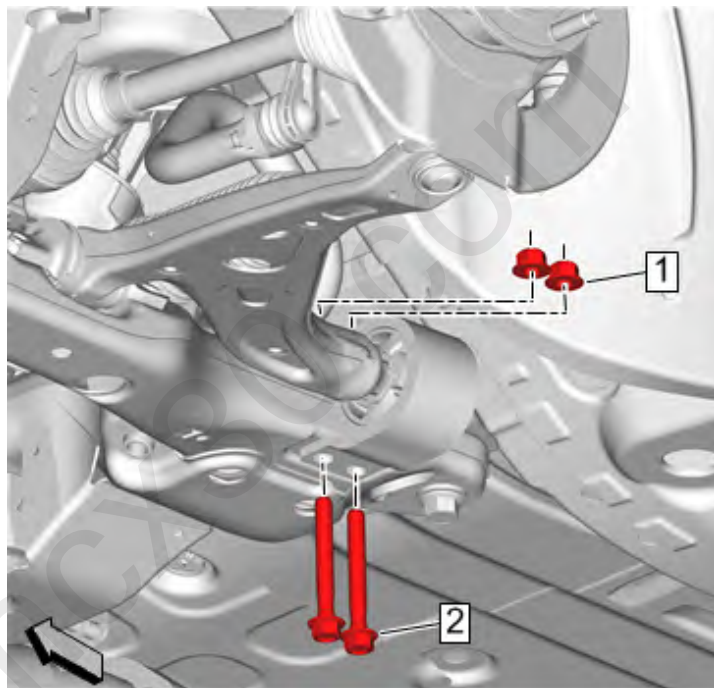


Fig. 139: Front Lower Control Arm Rear Nuts And Rear Bolts

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)

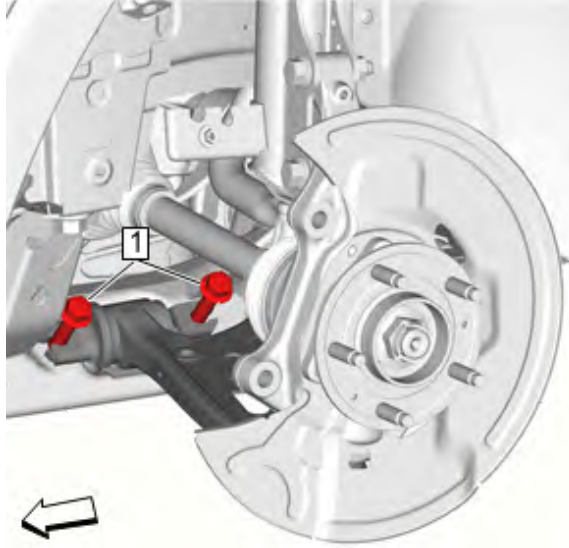


Fig. 140: Front Lower Control Arm Front Bolts
Courtesy of GENERAL MOTORS COMPANY

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)

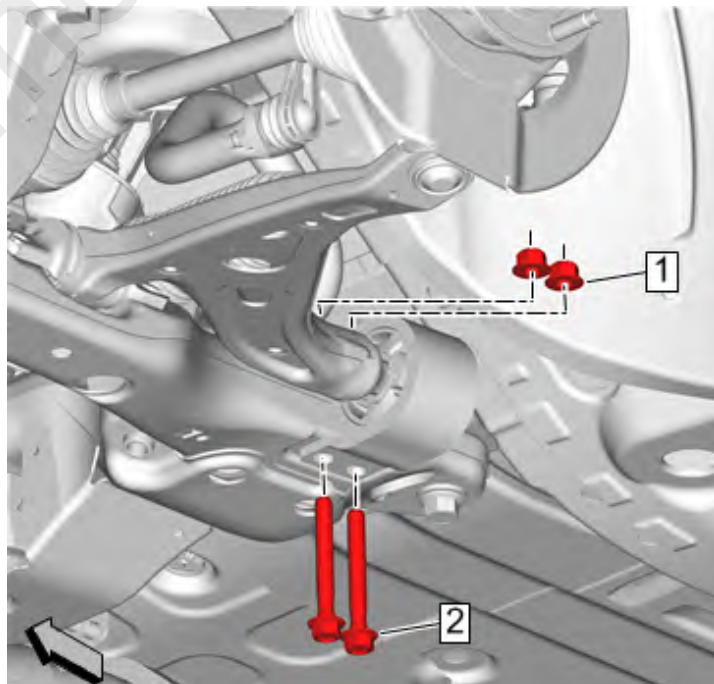


Fig. 141: Front Lower Control Arm Rear Nuts And Rear Bolts
Courtesy of GENERAL MOTORS COMPANY

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)

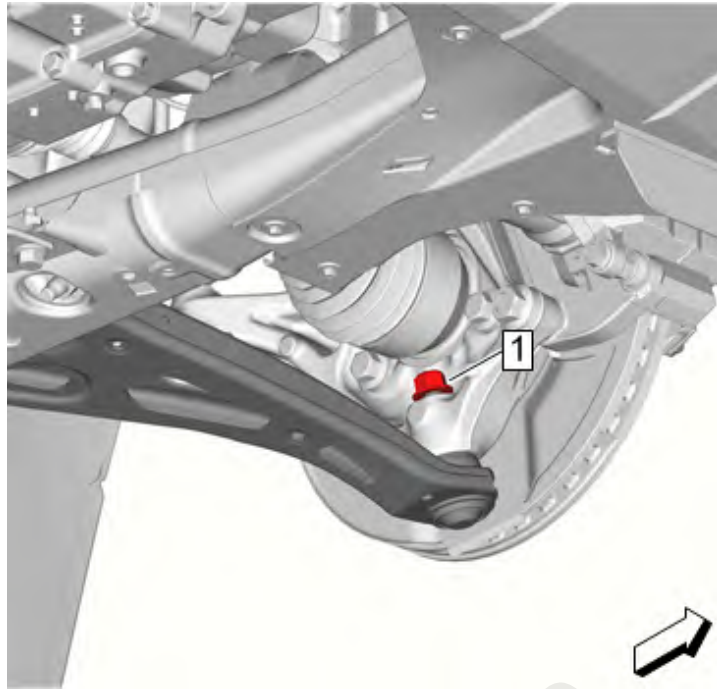


Fig. 142: Front Lower Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

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)

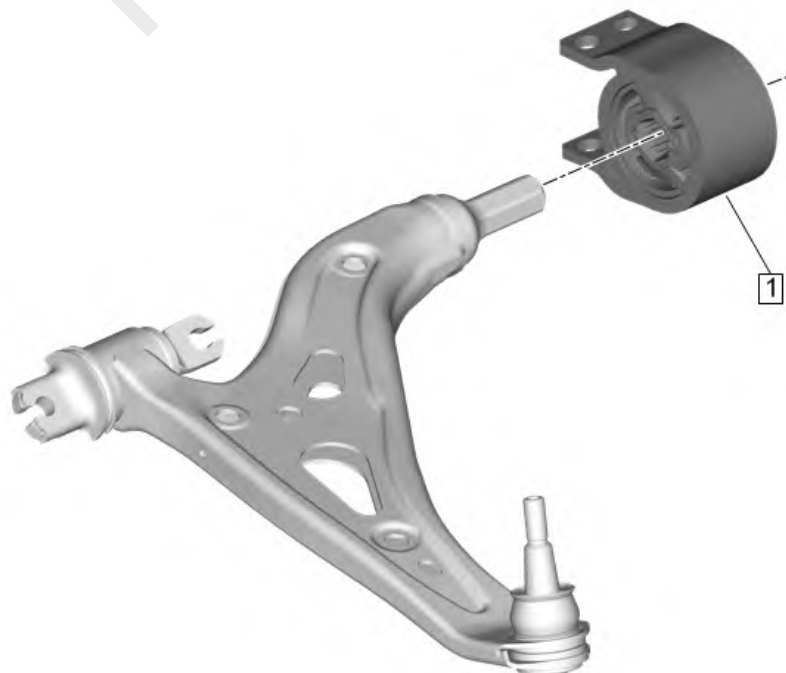


Fig. 143: Front Lower Control Arm Rear Bushing (Equinox, Terrain)
 Courtesy of GENERAL MOTORS COMPANY

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 \(Terrain\)](#).

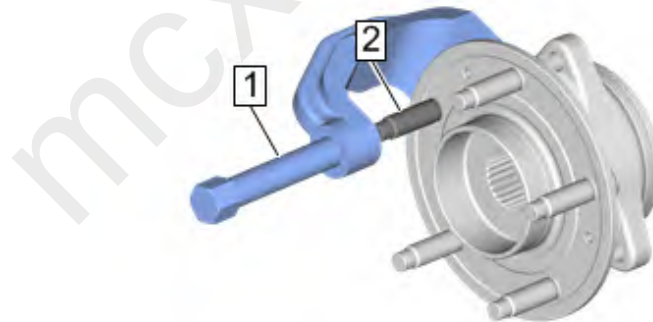


Fig. 144: Wheel Stud And Separator

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

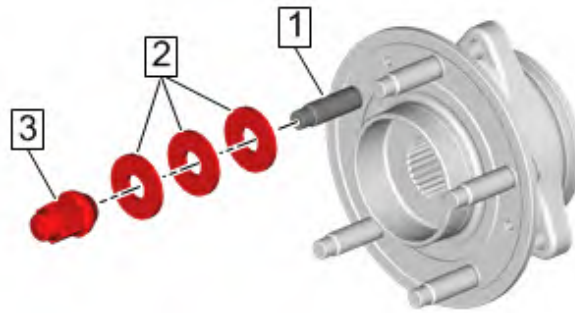


Fig. 145: Wheel Stud, Nut And Washers

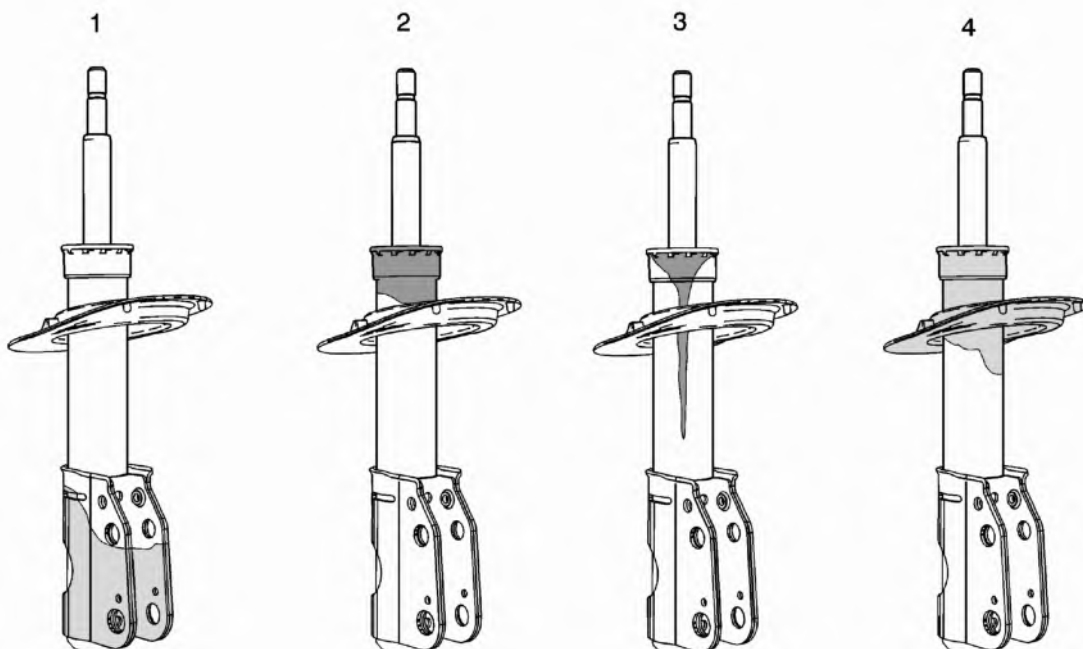
Courtesy of GENERAL MOTORS COMPANY

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 \(After December 2016\)](#)

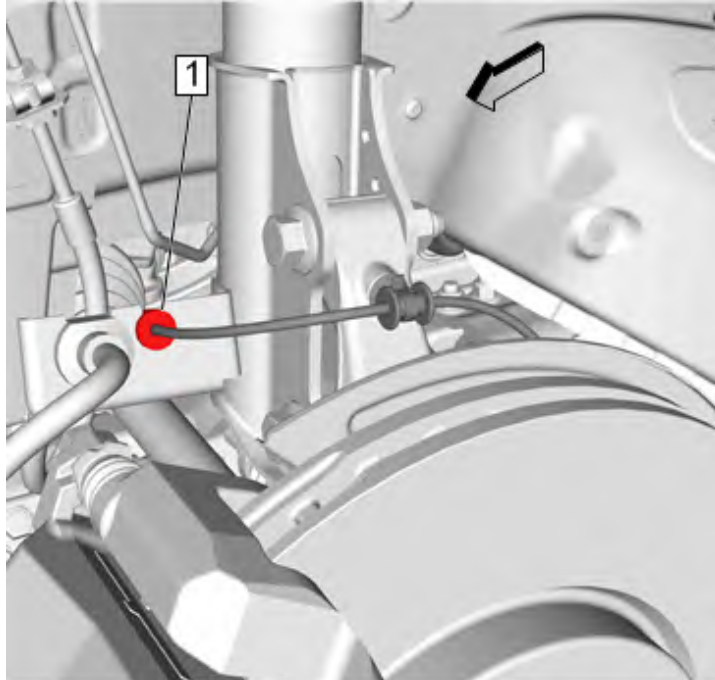


Fig. 147: Front Wheel Speed Sensor Harness Grommet
Courtesy of GENERAL MOTORS COMPANY

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

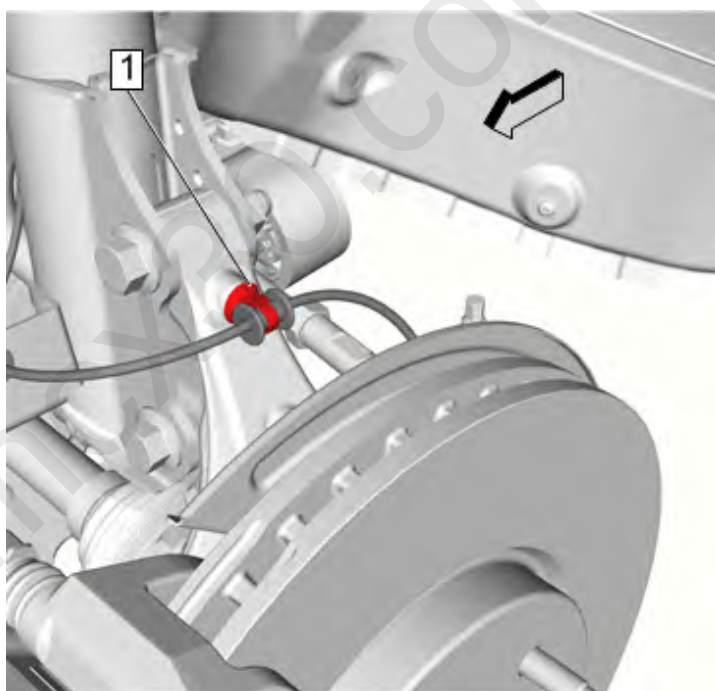


Fig. 148: Front Wheel Speed Sensor Harness Retainer
Courtesy of GENERAL MOTORS COMPANY

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

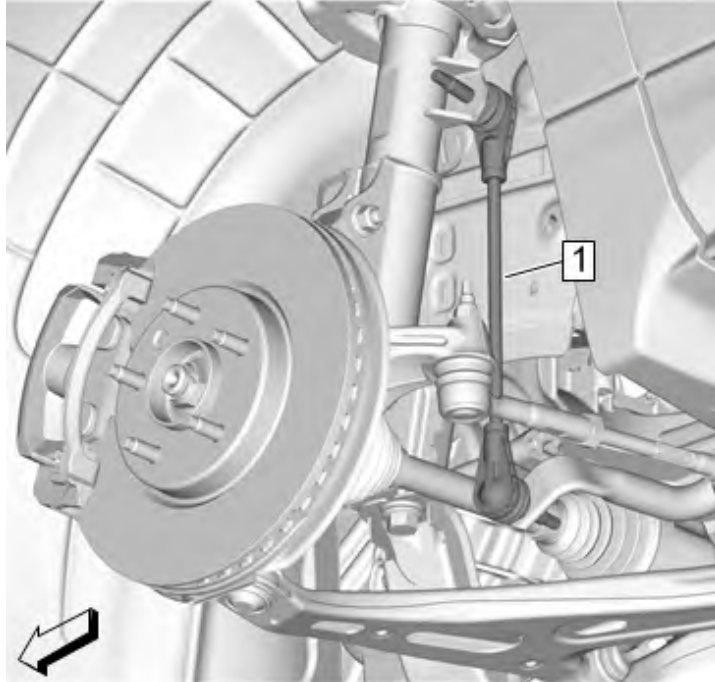


Fig. 149: Front Stabilizer Shaft Link

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 \(Terrain\)](#).

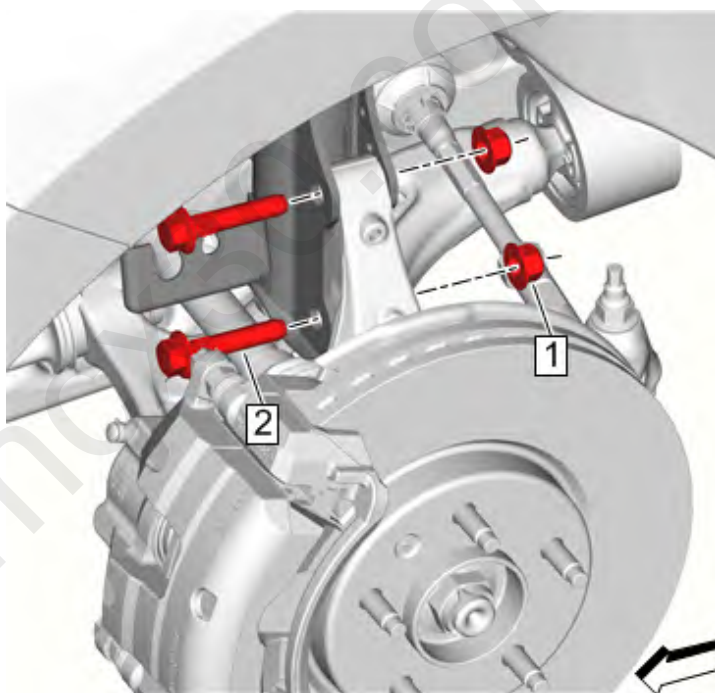


Fig. 150: Steering Knuckle Nuts And Bolts

Courtesy of GENERAL MOTORS COMPANY

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

DISCARD the bolts.

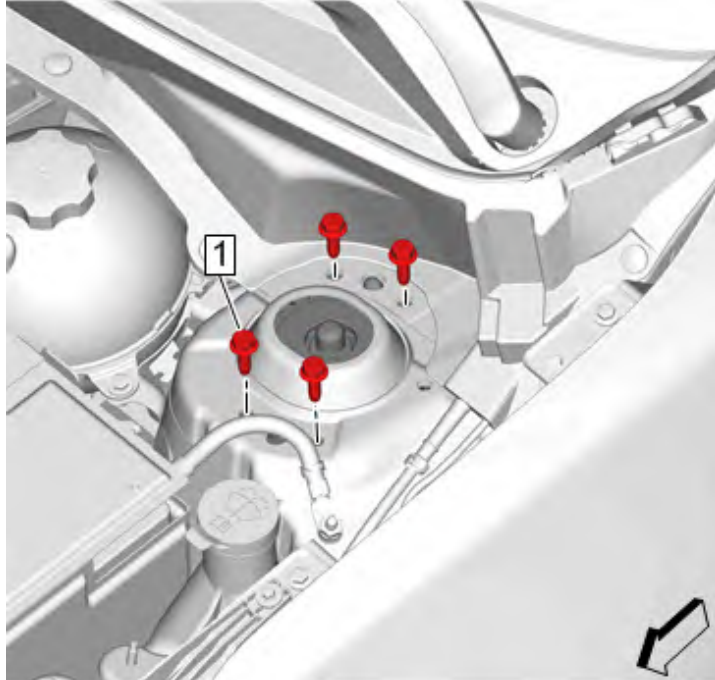


Fig. 151: Front Suspension Mount Upper Bolts
Courtesy of GENERAL MOTORS COMPANY

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

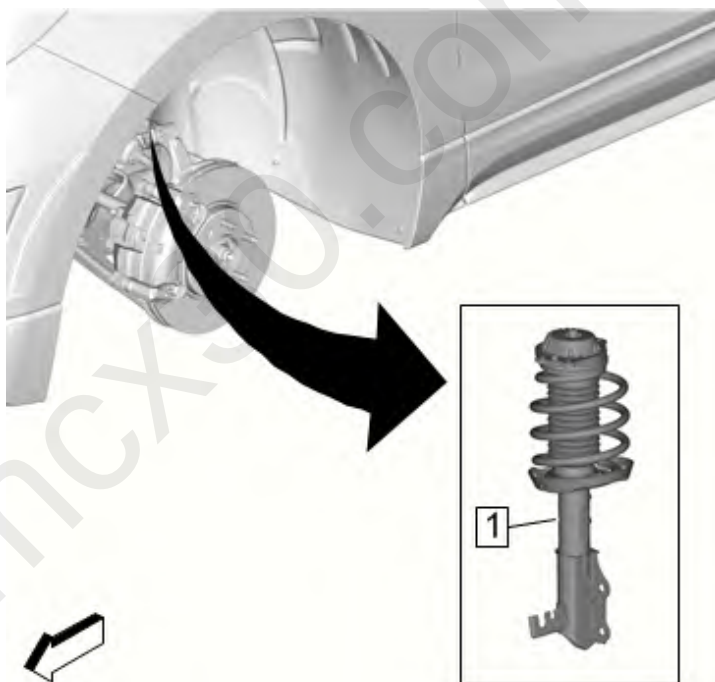


Fig. 152: Front Suspension Strut Assembly
Courtesy of GENERAL MOTORS COMPANY

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

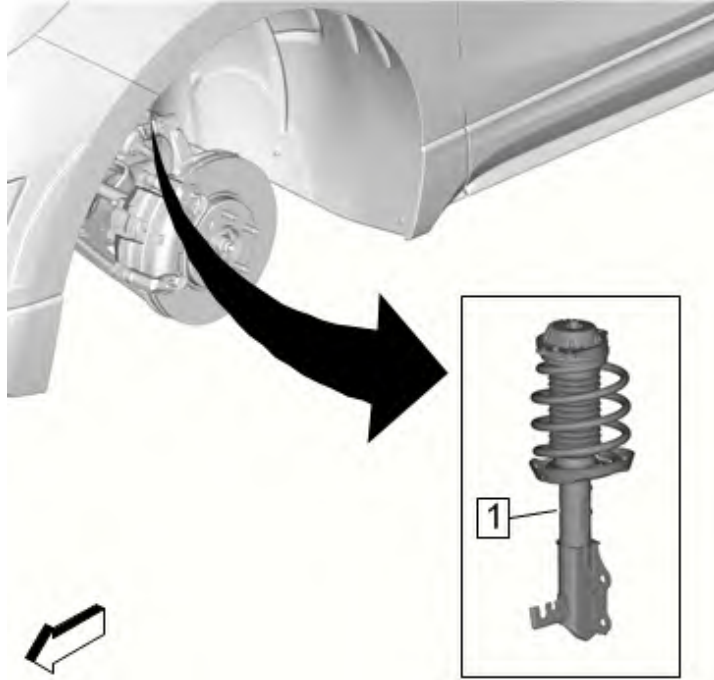


Fig. 153: Front Suspension Strut Assembly
 Courtesy of GENERAL MOTORS COMPANY

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.

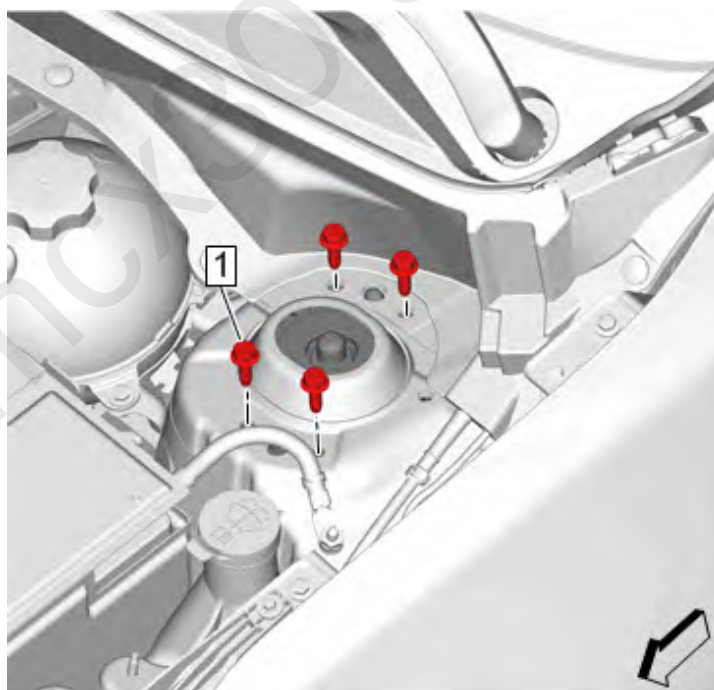


Fig. 154: Front Suspension Mount Upper Bolts
 Courtesy of GENERAL MOTORS COMPANY

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

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

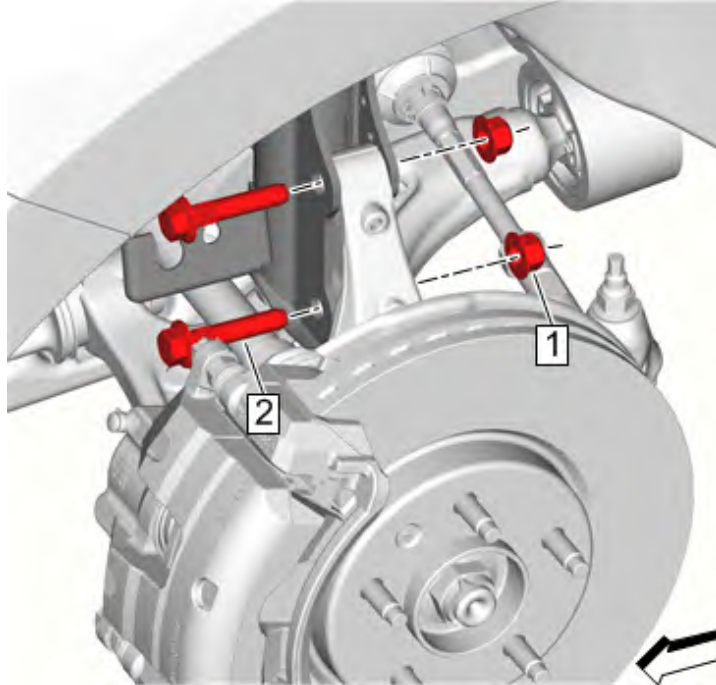


Fig. 155: Steering Knuckle Nuts And Bolts
Courtesy of GENERAL MOTORS COMPANY

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)

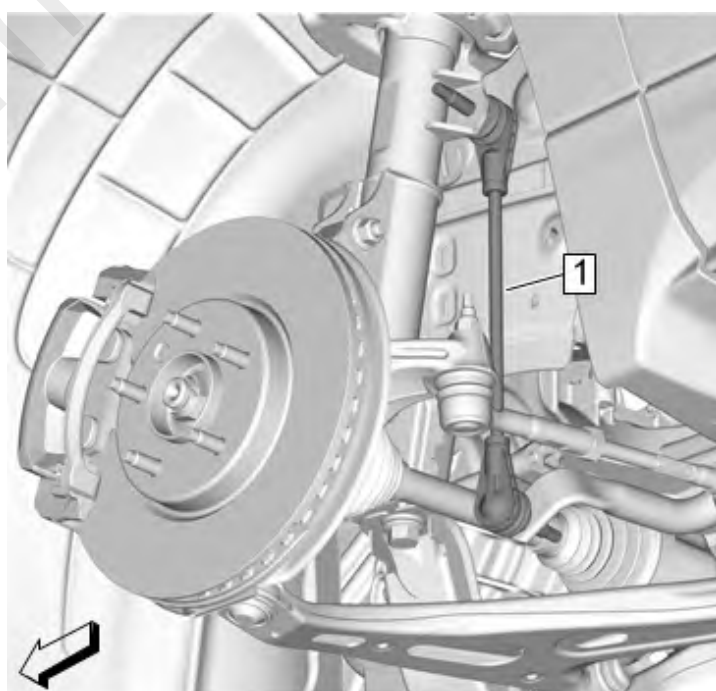


Fig. 156: Front Stabilizer Shaft Link
Courtesy of GENERAL MOTORS COMPANY

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

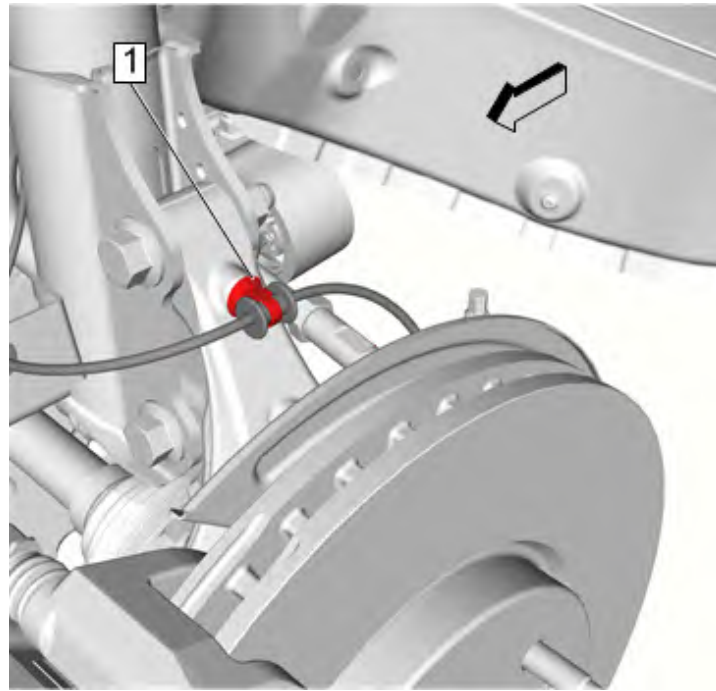


Fig. 157: Front Wheel Speed Sensor Harness Retainer
Courtesy of GENERAL MOTORS COMPANY

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

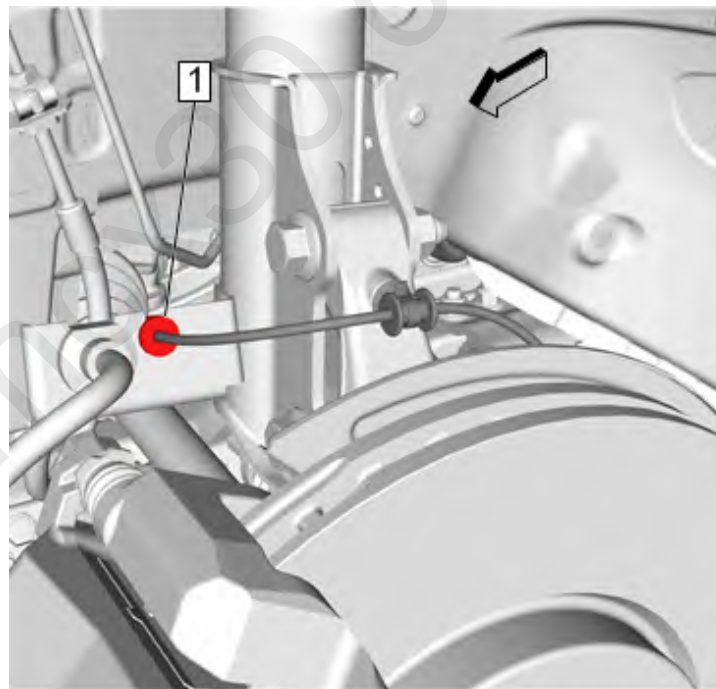


Fig. 158: Front Wheel Speed Sensor Harness Grommet
Courtesy of GENERAL MOTORS COMPANY

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

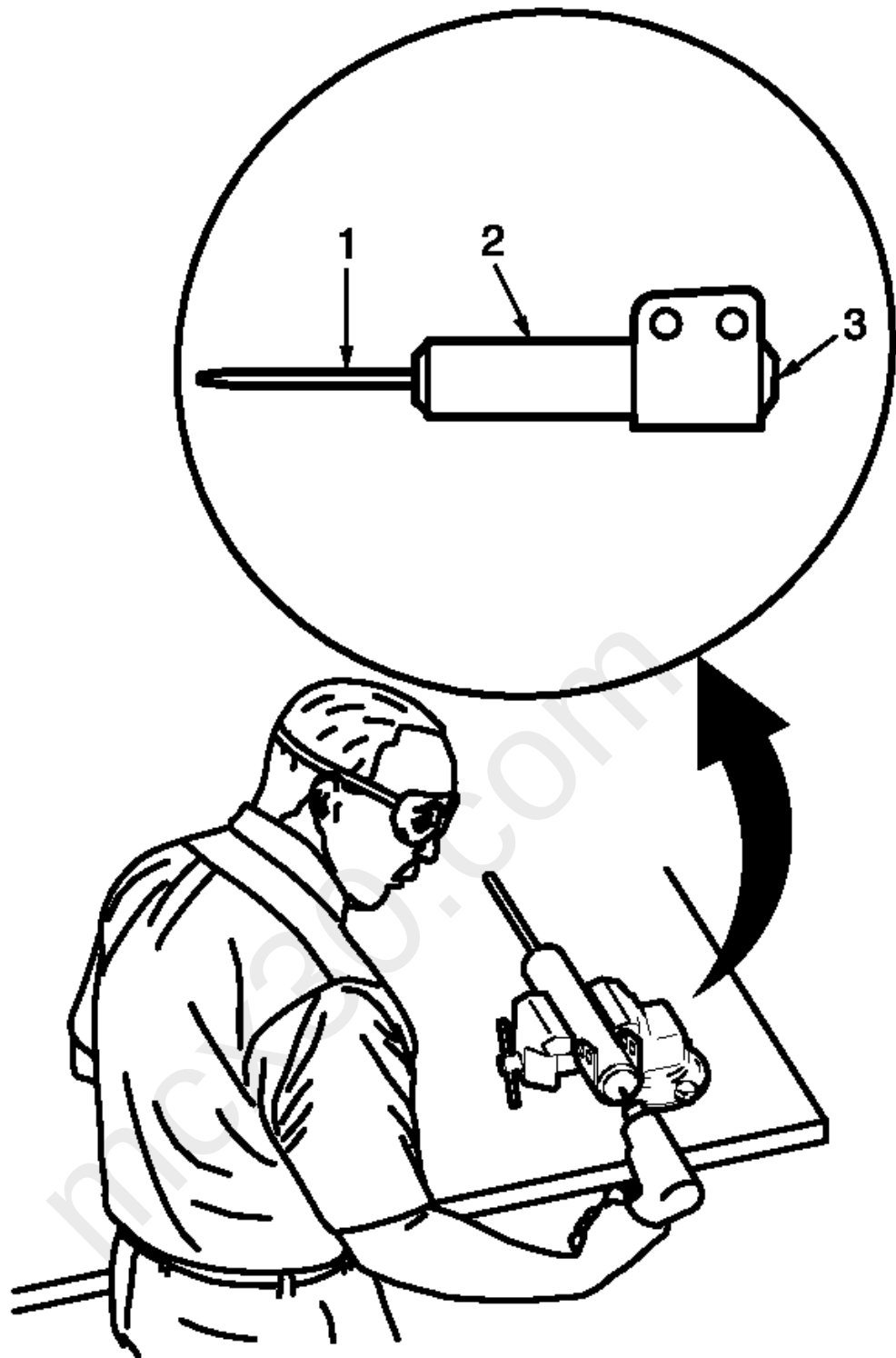


Fig. 159: Drilling Hole In Strut At Center Of End Cap
Courtesy of GENERAL MOTORS COMPANY

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)

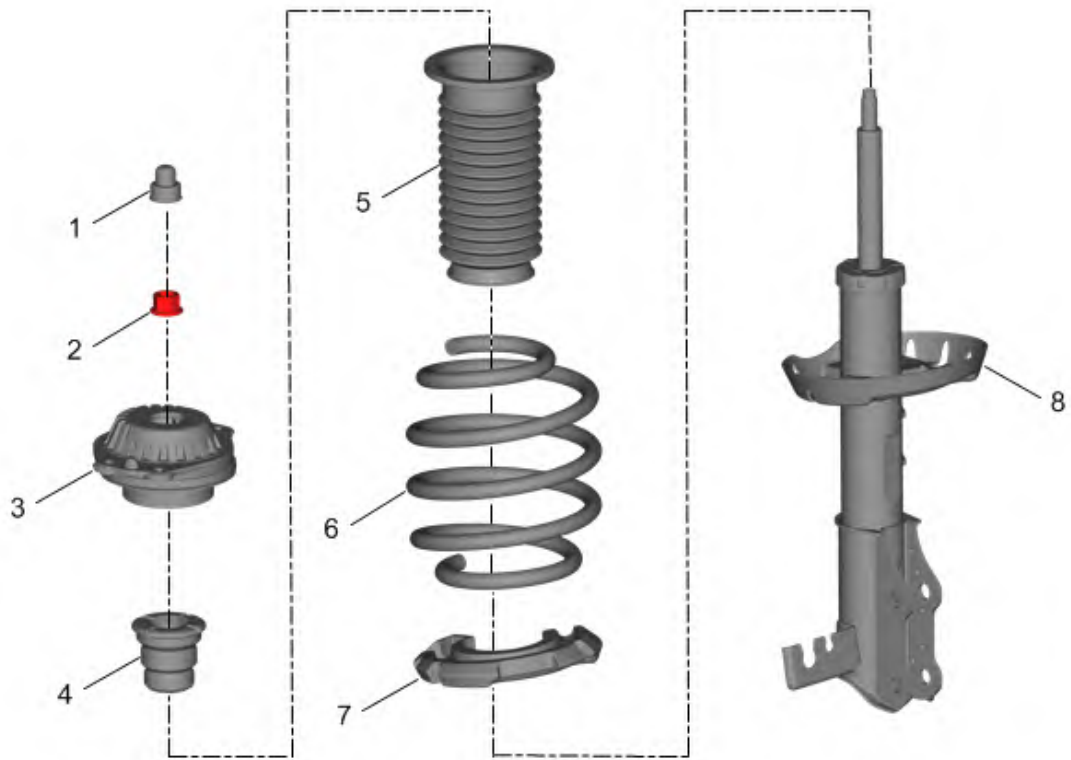


Fig. 160: Strut, Strut Component Or Spring.(Equinox, Terrain)

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

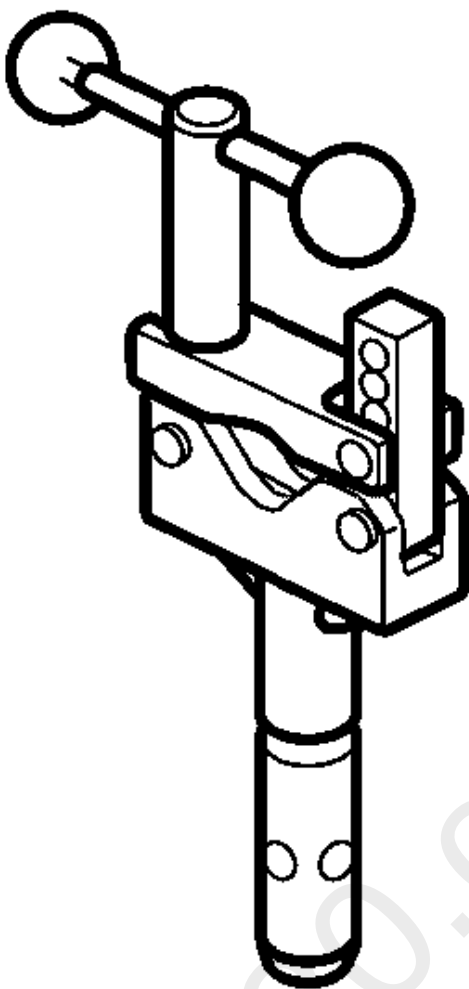
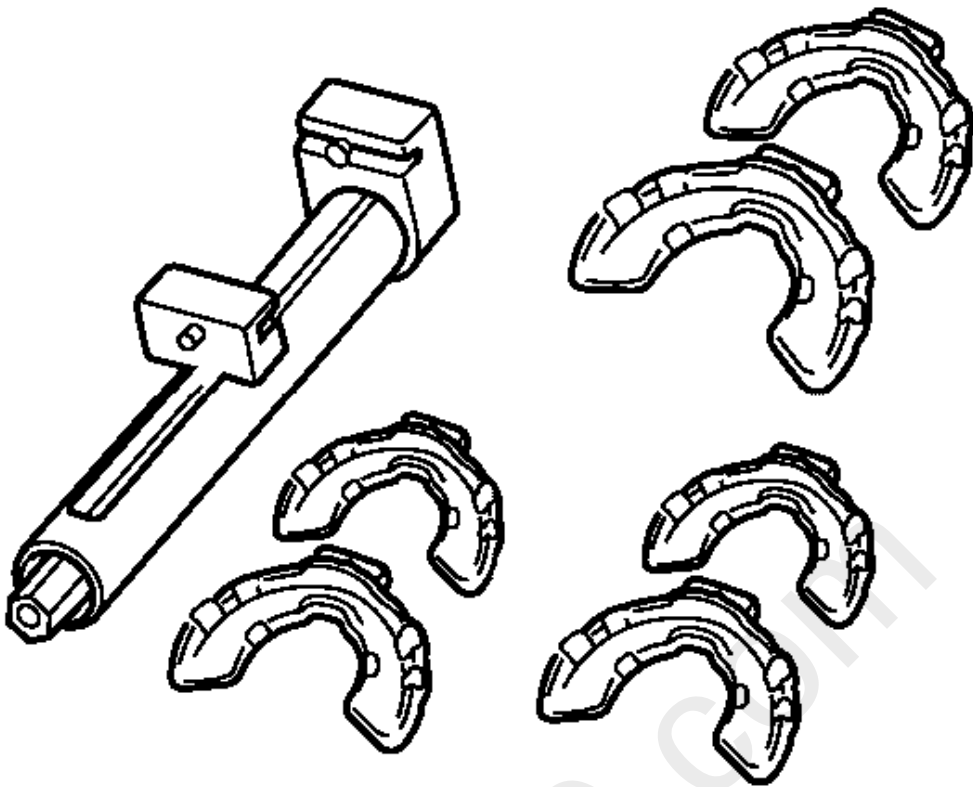
Illustration	Tool Number/Description
	CH-6066 KM-6066 Holder

Illustration	Tool Number/Description
 The illustration shows a mechanical spring tensioner tool and its associated components. The tool consists of a long, cylindrical handle with a threaded end. Two rectangular blocks are mounted on the handle, one near each end. To the right of the handle are six curved, C-shaped components, likely springs or guides, arranged in two groups of three. A large, faint watermark 'mcx30.com' is visible across the bottom half of the illustration area.	CH-6068 MKM-6068 Spring Tensioner

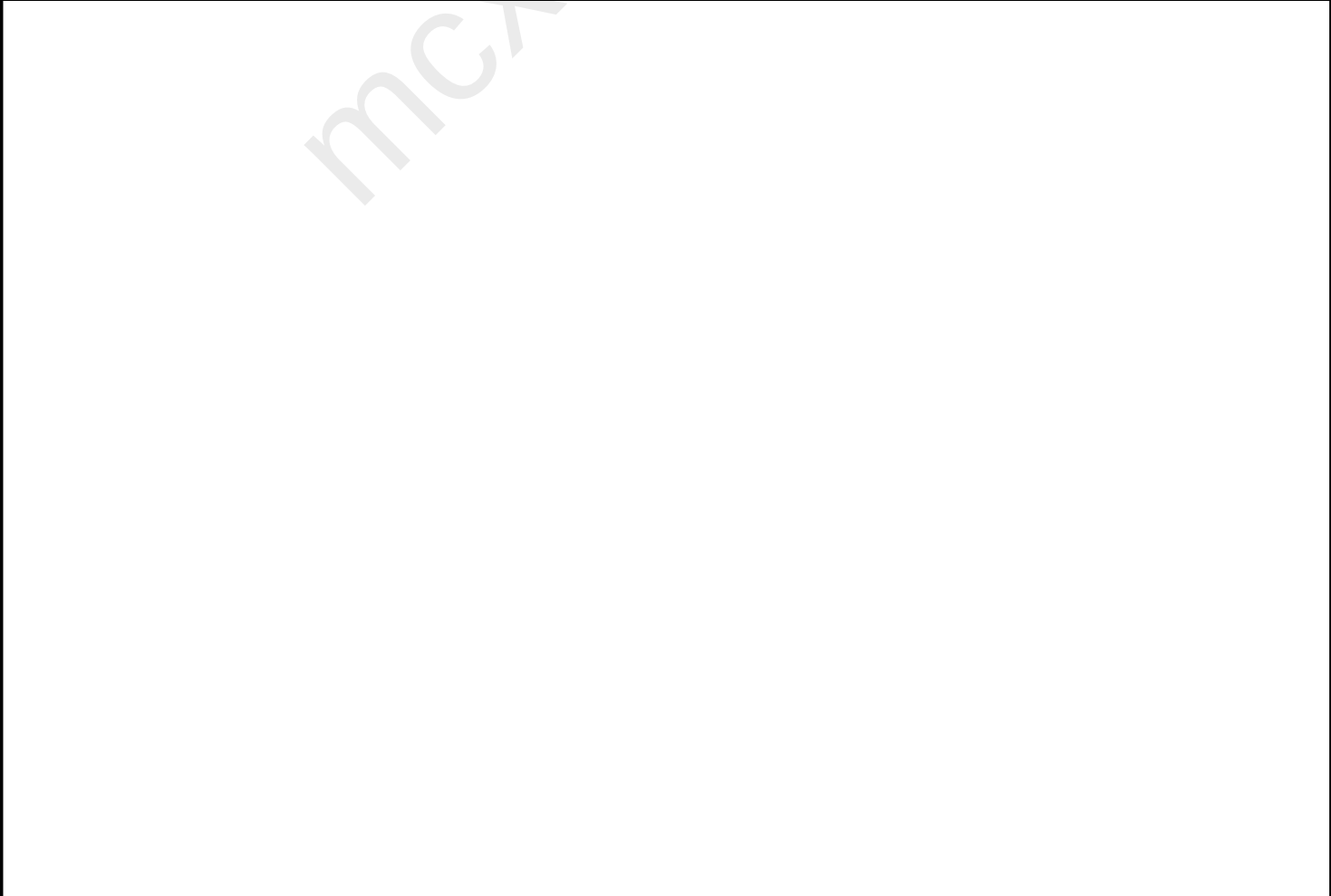
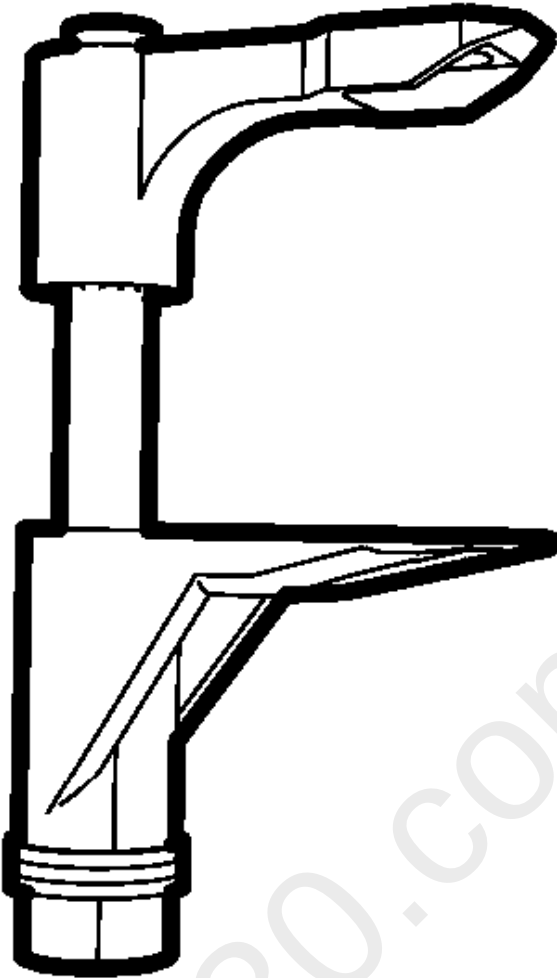


Illustration	Tool Number/Description
	CH-42188-B J-42188-B Ball Joint Separator

--

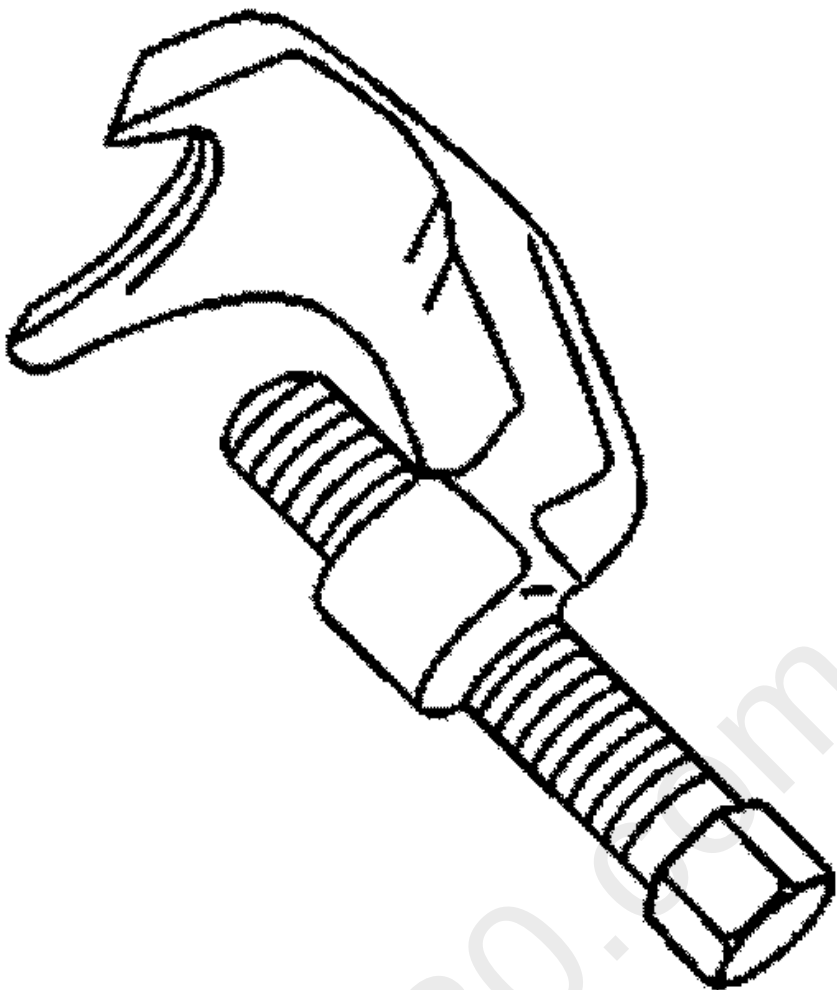
Illustration	Tool Number/Description
	CH-43631 KM-507-C J-43631 Ball Joint Separator

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

2018 SUSPENSION**Rear 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)
Rear Shock Absorber Bolt (at Lower Control Arm)	
First Pass:	160 N.m (118 lb ft)
Final Pass:	90 - 105 degrees
Rear Suspension Lateral Link Inner Bolt	Torque mating fastener
Rear Suspension Lateral Link Outer Bolt	
First Pass:	100 N.m (74 lb ft)
Final Pass:	90 - 105 degrees
Rear Suspension Link Outer Bolt	
First Pass:	100 N.m (74 lb ft)
Final Pass:	90 - 105 degrees
Rear Suspension Lower Control Arm Outer Bolt	
First Pass:	100 N.m (74 lb ft)
Final Pass:	90 - 105 degrees
Rear Suspension Trailing Arm Bolt (At Body)	
First Pass:	160 N.m (118 lb ft)
Final Pass:	90 - 105 degrees
Rear Suspension Trailing Arm Bolt (At Knuckle)	
First Pass:	160 N.m (118 lb ft)
Final Pass:	60 - 75 degrees

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Rear Shock Absorber Bolt (at Body)	58 N.m (43 lb ft)
Rear Shock Absorber Mount Nut	25 N.m (18 lb ft)
Rear Stabilizer Shaft Bracket Bolt	30 N.m (22 lb ft)
Rear Stabilizer Shaft Link Bolt (at Knuckle)	58 N.m (43 lb ft)
Rear Stabilizer Shaft Link Nut (at Stabilizer Shaft)	58 N.m (43 lb ft)
Rear Suspension Lateral Link Inner Nut	
First Pass:	100 N.m (74 lb ft)
Final Pass:	90 - 105 degrees
Rear Suspension Link Inner Nut	100 N.m (74 lb ft)
Rear Suspension Lower Control Arm Inner Nut	160 N.m (118 lb ft)
Rear Wheel Bearing and Hub Assembly Bolt	

NOTE:

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

Application	Specification
	Metric (English)
First Pass:	100 N.m (74 lb ft)
Final Pass:	15 - 30 degrees

ADHESIVES, FLUIDS, LUBRICANTS AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
Knuckle Bearing Pilot Bore	Grease	12345996	10953501
Rear Wheel Bearing and Hub Bolt	Threadlocker	89021297	10953488
Trailing Arm to Knuckle Bolt	Threadlocker	89021297	10953488

REPAIR INSTRUCTIONS**REAR WHEEL BEARING AND HUB REPLACEMENT (AWD)****Removal Procedure**

1. Remove the rear tire and wheel assembly. - [Tire and Wheel Removal and Installation](#)

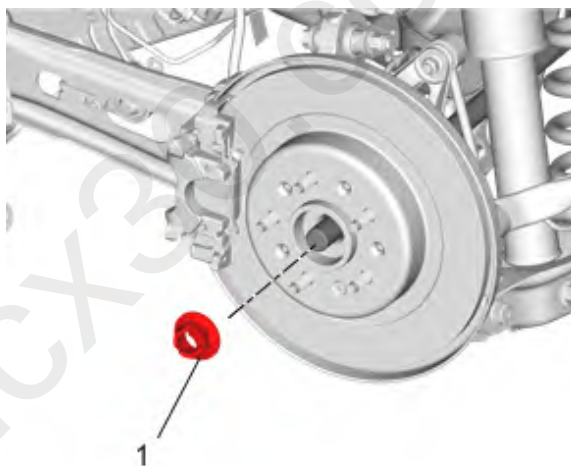


Fig. 1: Wheel Drive Shaft Nut

Courtesy of GENERAL MOTORS COMPANY

2. Remove Wheel Drive Shaft Nut (1) and DISCARD - [Rear Wheel Drive Shaft Replacement - Left Side](#) , or [Rear Wheel Drive Shaft Replacement - Right Side](#)
3. Remove Rear Brake Rotor - [Rear Brake Rotor Replacement](#)

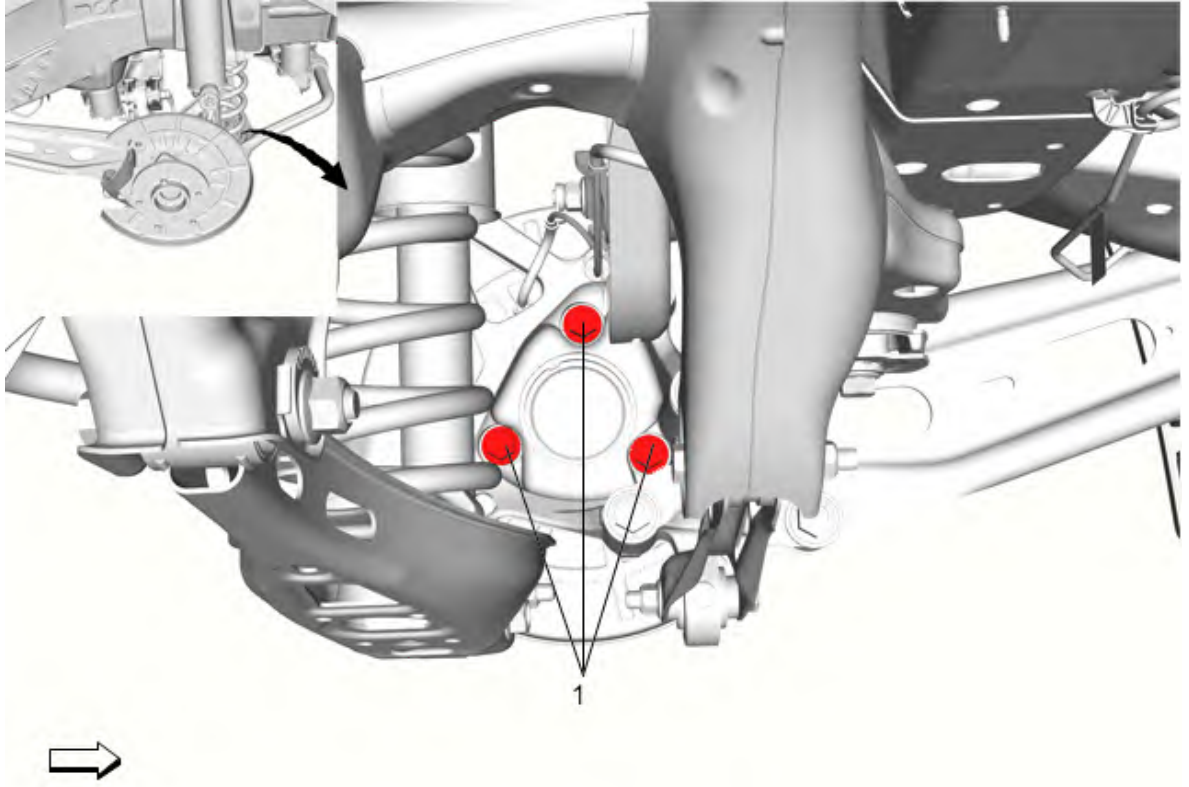


Fig. 2: Rear Wheel Bearing and Hub Assembly Bolts And Knuckle
 Courtesy of GENERAL MOTORS COMPANY

4. Remove Rear Wheel Bearing and Hub Assembly Bolt (1) @ Knuckle - [3x]

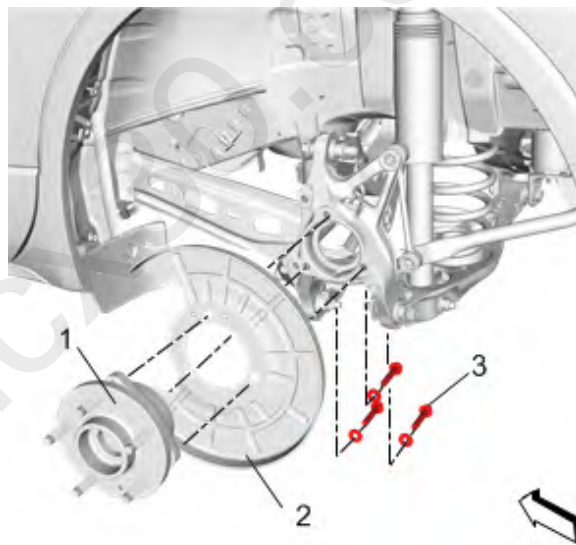


Fig. 3: Rear Wheel Bearing and Hub Assembly
 Courtesy of GENERAL MOTORS COMPANY

5. Remove Rear Wheel Bearing and Hub Assembly (1)

Installation Procedure

NOTE: Avoid applying grease to any other machined surface, holes, or threads. Ensure the drain channel at the bottom of the bore is not blocked with grease or debris.

1. Apply grease evenly and ensure complete coverage to the knuckle bearing pilot bore only. Refer to [Adhesives, Fluids, Lubricants and Sealers](#)

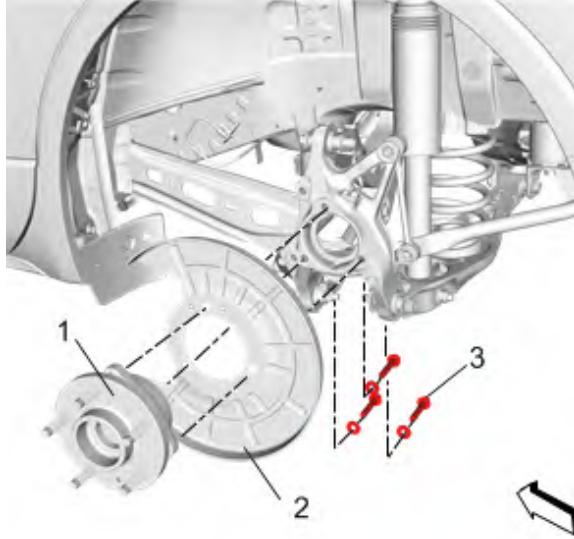


Fig. 4: Rear Wheel Bearing and Hub Assembly
 Courtesy of GENERAL MOTORS COMPANY

2. Install Rear Wheel Bearing and Hub Assembly (2).

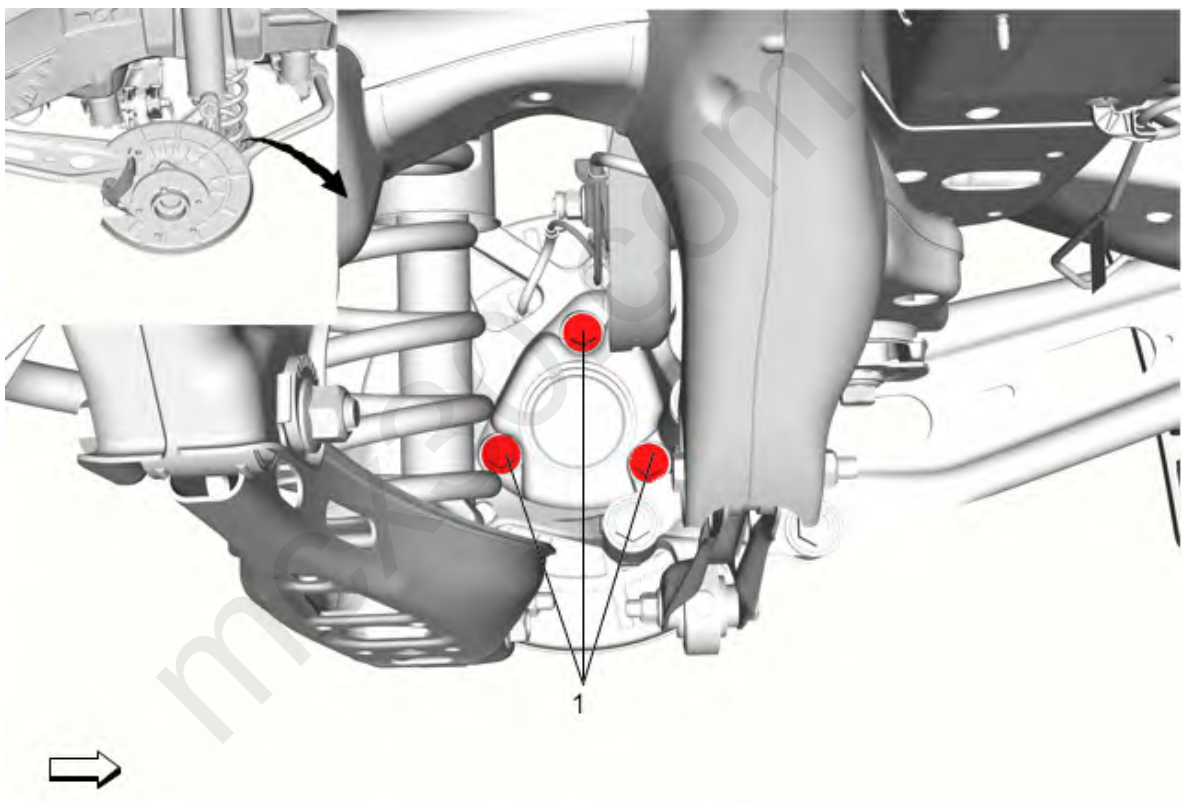


Fig. 5: Rear Wheel Bearing and Hub Assembly Bolts And Knuckle
 Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

3. Install Rear Wheel Bearing and Hub Assembly Bolt (1) @ Knuckle and tighten [3x]

Tighten

- First Pass: 100 N.m (74 lb ft)
- Final Pass: (15 - 30 degrees)

4. Install Rear Brake Rotor - **Rear Brake Rotor Replacement**

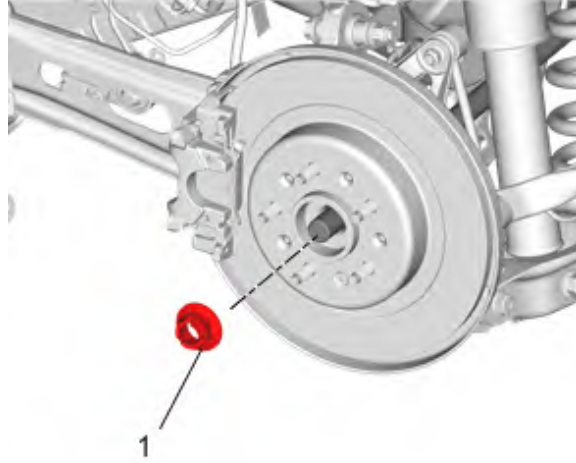


Fig. 6: Wheel Drive Shaft Nut

Courtesy of GENERAL MOTORS COMPANY

5. Install Wheel Drive Shaft Nut (1) - [Rear Wheel Drive Shaft Replacement - Left Side](#) , or [Rear Wheel Drive Shaft Replacement - Right Side](#)
6. Install the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)

REAR WHEEL BEARING AND HUB REPLACEMENT (FWD)

Removal Procedure

1. Remove the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
2. Remove Rear Brake Rotor - [Rear Brake Rotor Replacement](#)

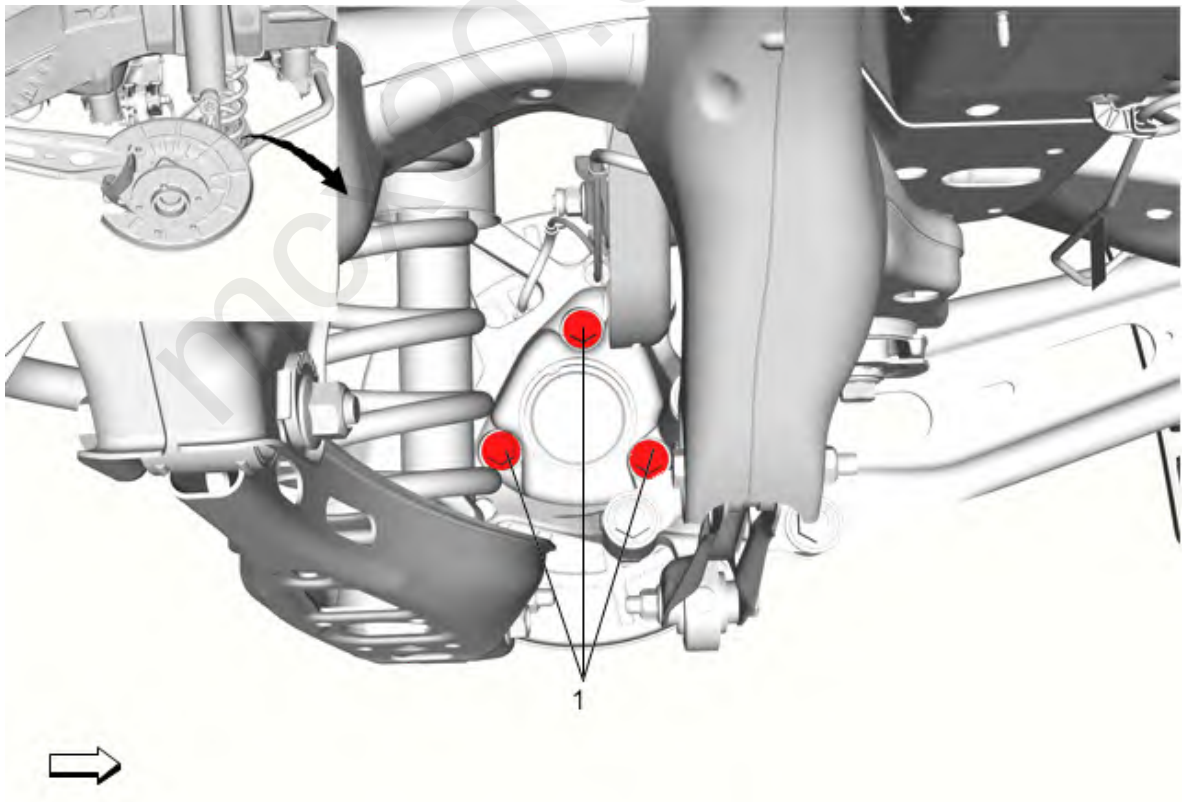


Fig. 7: Rear Wheel Bearing and Hub Assembly Bolts And Knuckle

Courtesy of GENERAL MOTORS COMPANY

3. Remove Rear Wheel Bearing and Hub Assembly Bolt (1) @ Knuckle - [3x]

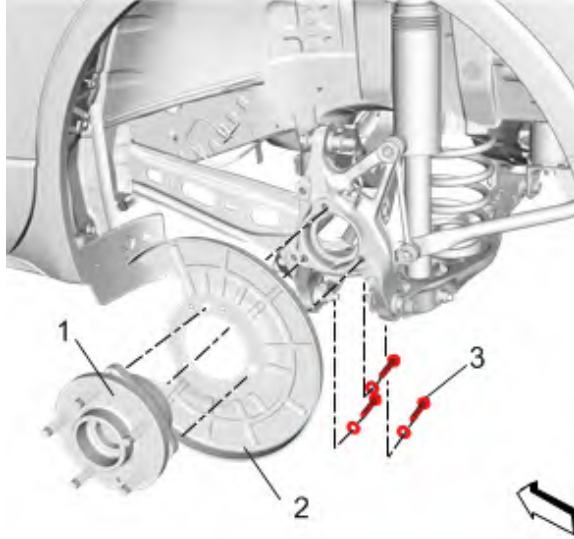


Fig. 8: Rear Wheel Bearing and Hub Assembly

Courtesy of GENERAL MOTORS COMPANY

4. Remove Rear Wheel Bearing and Hub Assembly (1)

Installation Procedure

NOTE: Avoid applying grease to any other machined surface, holes, or threads. Ensure the drain channel at the bottom of the bore is not blocked with grease or debris.

1. Apply grease evenly and ensure complete coverage to the knuckle bearing pilot bore only. Refer to [Adhesives, Fluids, Lubricants and Sealers](#)

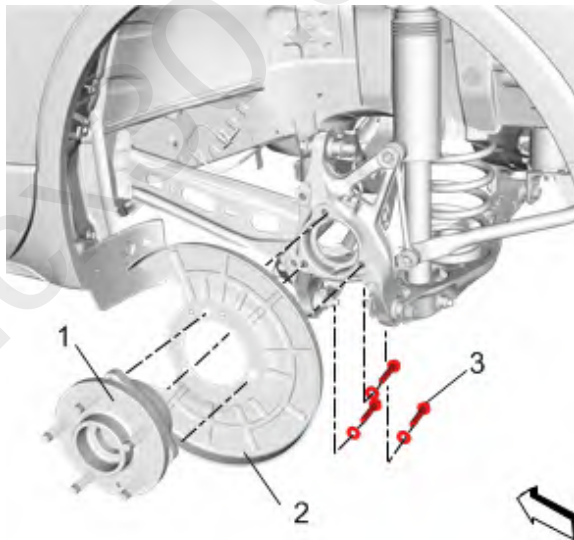


Fig. 9: Rear Wheel Bearing and Hub Assembly

Courtesy of GENERAL MOTORS COMPANY

2. Install Rear Wheel Bearing and Hub Assembly (1).

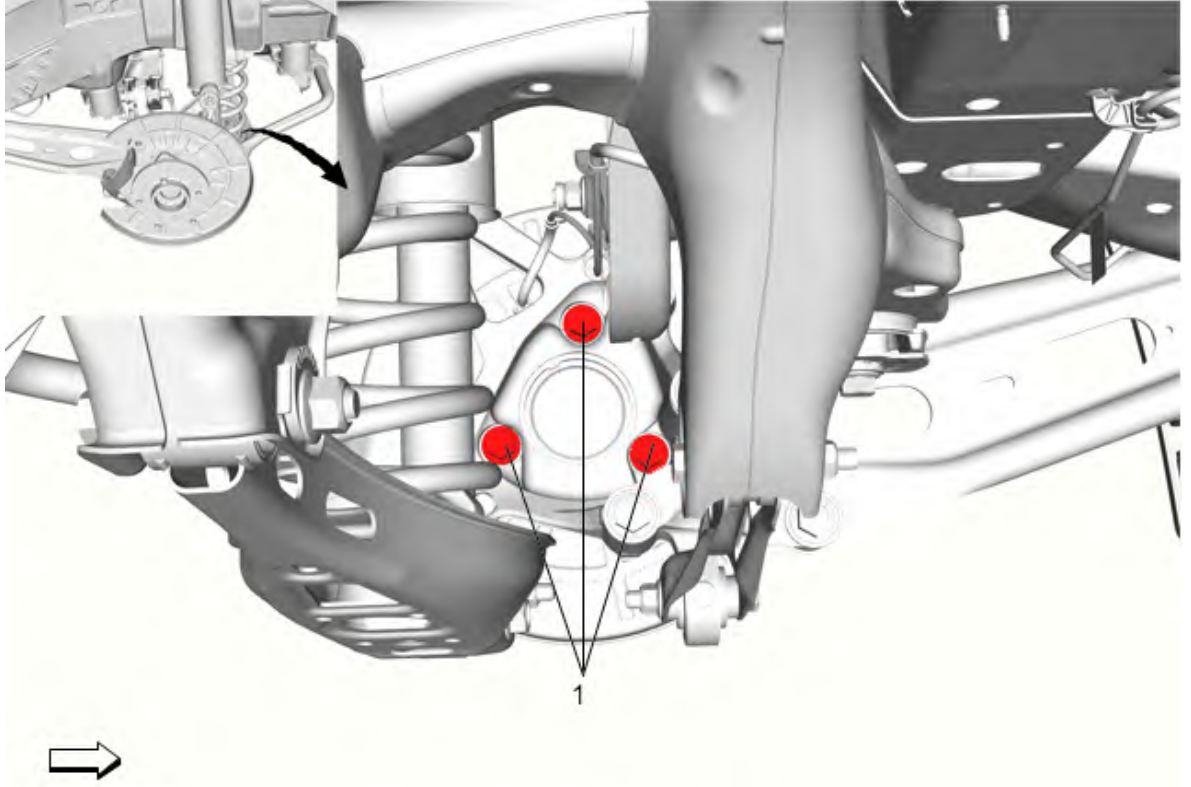


Fig. 10: Rear Wheel Bearing and Hub Assembly Bolts And Knuckle
 Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

3. Install Rear Wheel Bearing and Hub Assembly Bolt (1) @ Knuckle [3x]

Tighten

- First Pass: 100 N.m (74 lb ft)
 - Final Pass: (15 - 30 degrees)
4. Install Rear Brake Rotor - **Rear Brake Rotor Replacement**
 5. Install the rear tire and wheel assembly. **Tire and Wheel Removal and Installation**

REAR WHEEL BEARING DIRT DEFLECTOR REPLACEMENT

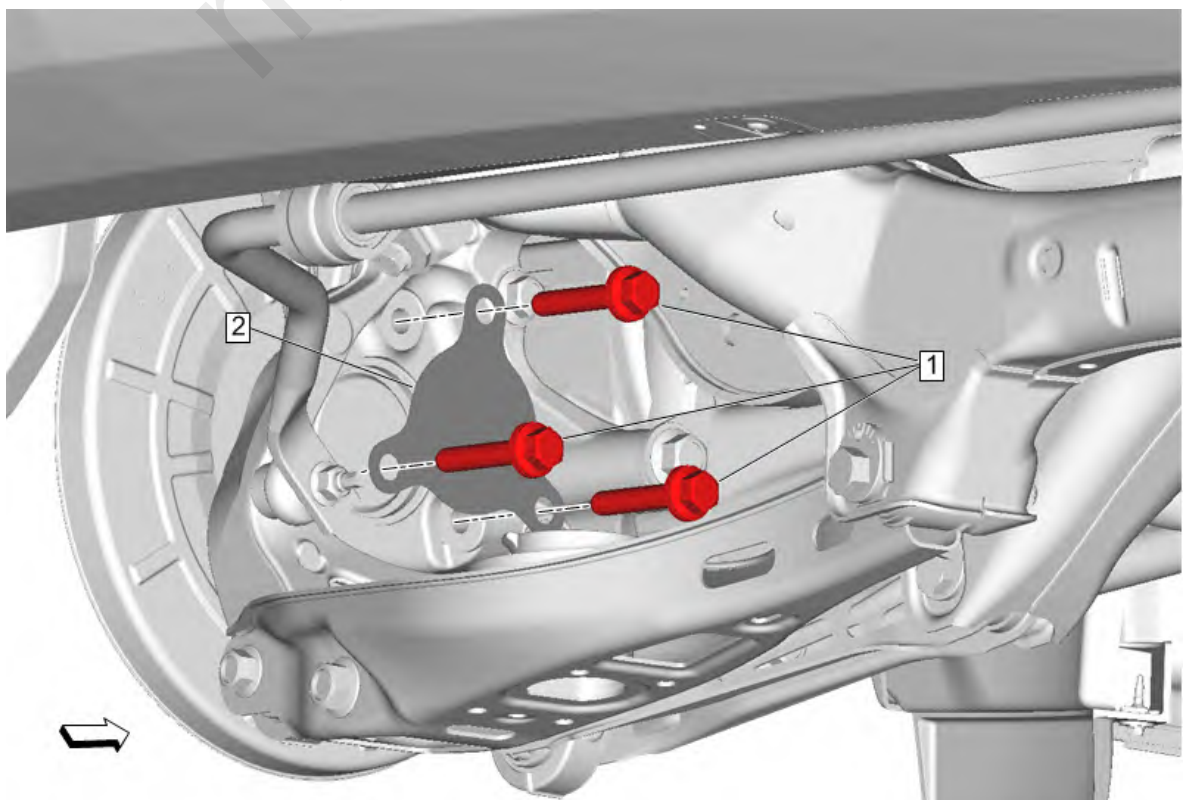


Fig. 11: Rear Wheel Bearing Dirt Deflector
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
1. Remove the rear tire and wheel assembly. Tire and Wheel Removal and Installation	
1	Rear Wheel Bearing and Hub Assembly Bolt [3x] CAUTION: Refer to Fastener Caution . Tighten • First Pass: 100 N.m (74 lb ft) • Final Pass: 15-30 degrees
2	Rear Wheel Bearing Dirt Deflector

KNUCKLE REPLACEMENT

Removal Procedure

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

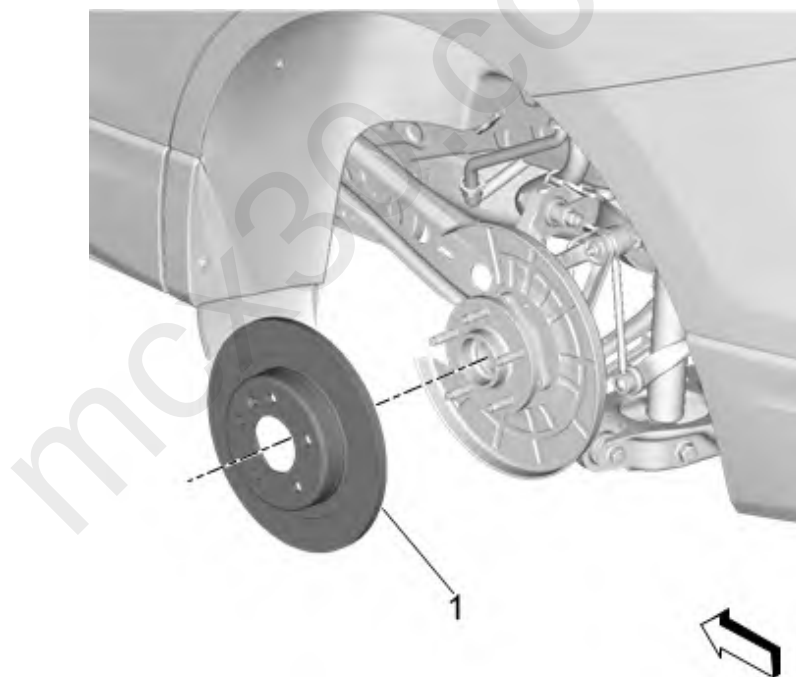


Fig. 12: Rear Brake Rotor
 Courtesy of GENERAL MOTORS COMPANY

2. Remove Rear Brake Rotor (1) - [Rear Brake Rotor Replacement](#)
3. Remove Rear Wheel Speed Sensor @ Knuckle - [Rear Wheel Speed Sensor Replacement](#)

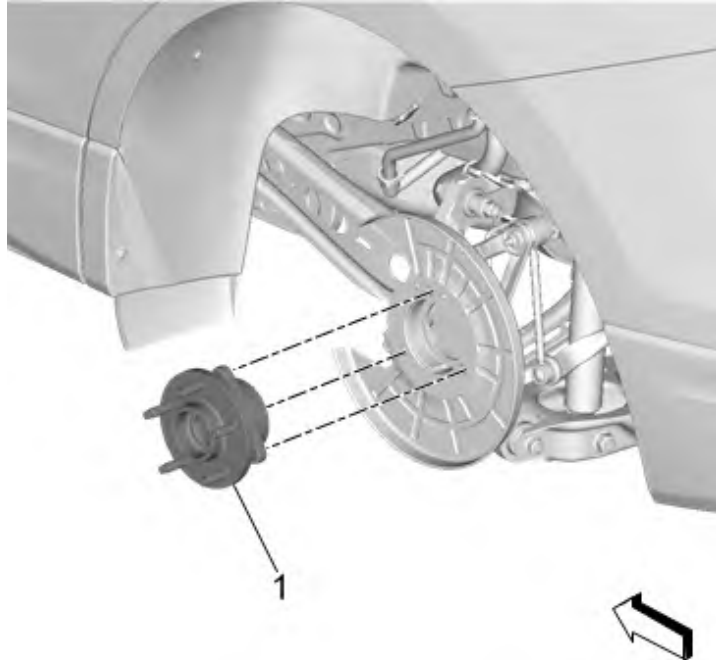


Fig. 13: Rear Wheel Bearing and Hub Assembly
Courtesy of GENERAL MOTORS COMPANY

4. Remove Rear Wheel Bearing and Hub Assembly (1) - [Rear Wheel Bearing and Hub Replacement \(AWD\)](#)[Rear Wheel Bearing and Hub Replacement \(FWD\)](#)

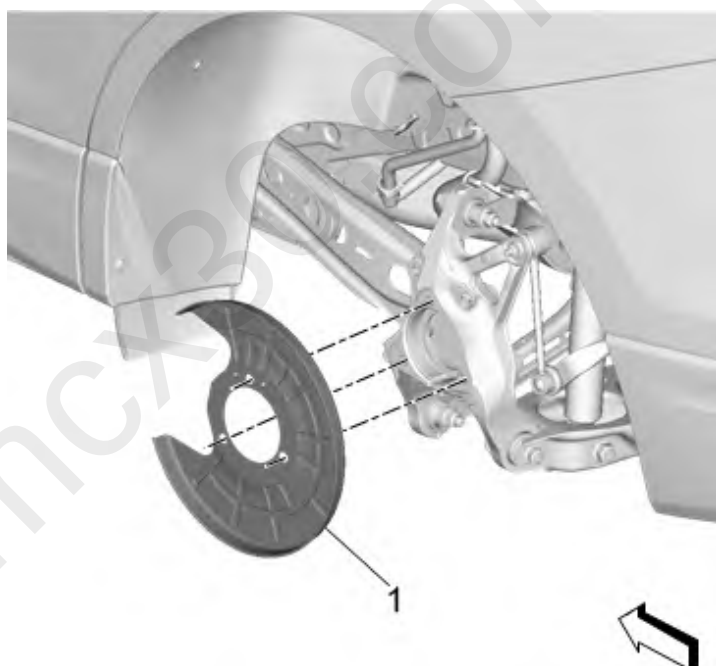


Fig. 14: Rear Brake Shield
Courtesy of GENERAL MOTORS COMPANY

5. Remove Rear Brake Shield (1) - [Rear Brake Shield Replacement](#)

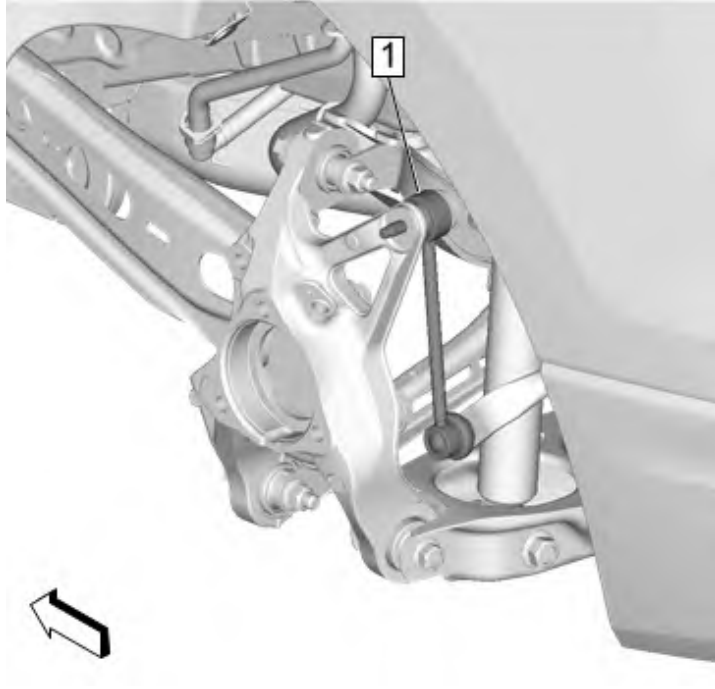


Fig. 15: Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

6. Separate Stabilizer Shaft Link (1) @ Knuckle - [Stabilizer Shaft Link Replacement](#)

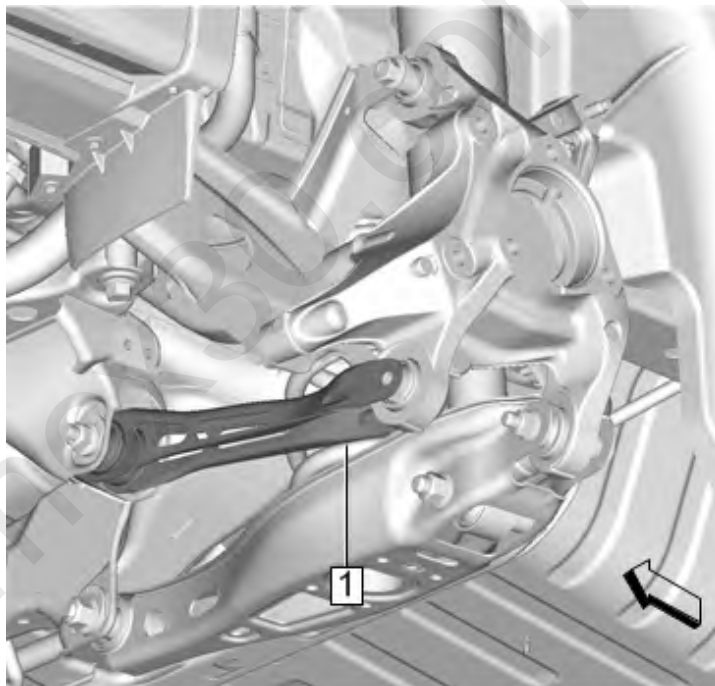


Fig. 16: Rear Suspension Adjust Link

Courtesy of GENERAL MOTORS COMPANY

7. Separate Rear Suspension Adjust Link (1) @ Knuckle - [Adjust Link Replacement](#)

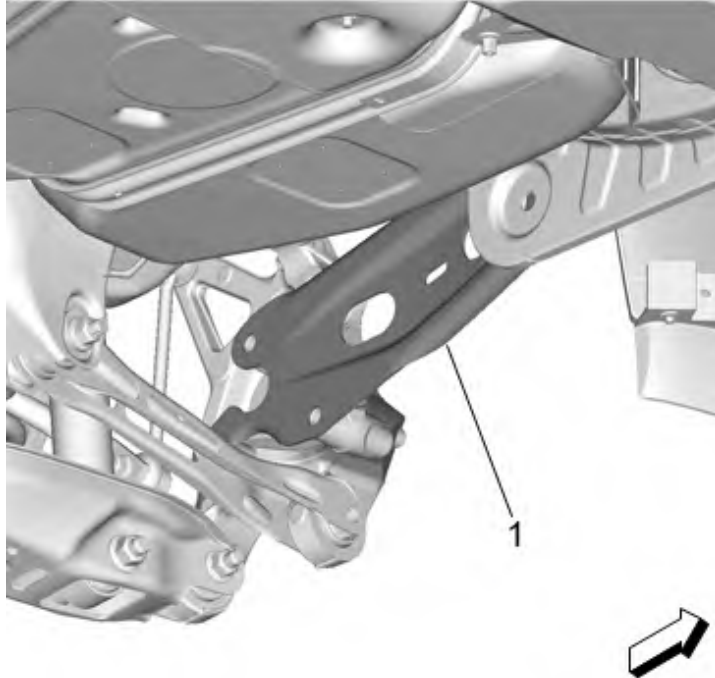


Fig. 17: Rear Suspension Trailing Arm
Courtesy of GENERAL MOTORS COMPANY

8. Separate Rear Suspension Trailing Arm (1) @ Knuckle - **Trailing Arm Replacement**
9. Separate Rear Suspension Lower Control Arm (1) @ Knuckle - **Lower Control Arm Replacement**

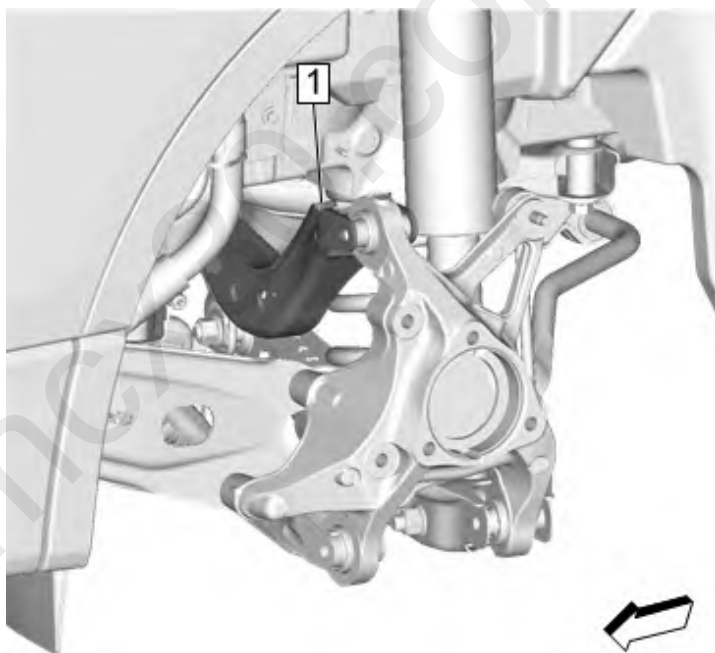


Fig. 18: Rear Suspension Upper Lateral Link
Courtesy of GENERAL MOTORS COMPANY

10. Separate Rear Suspension Upper Lateral Link (1) @ Knuckle - **Rear Suspension Upper Lateral Link Replacement**

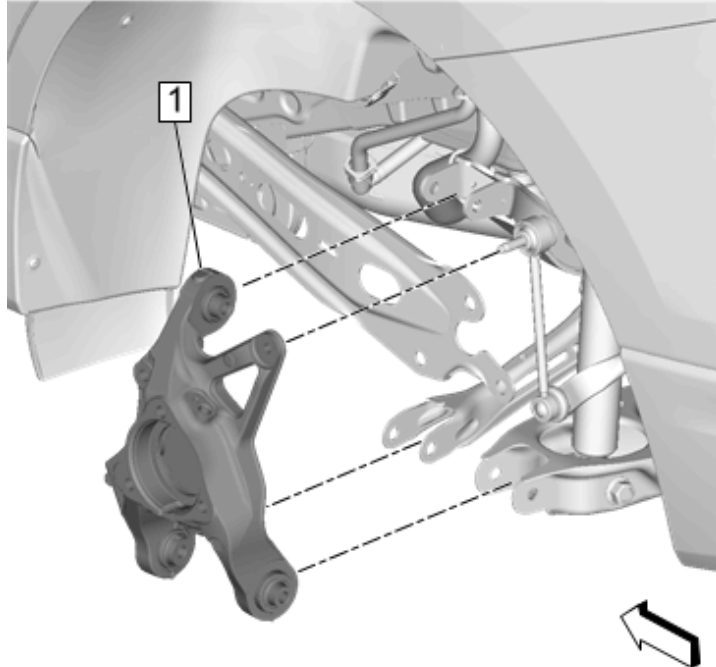


Fig. 19: Knuckle

Courtesy of GENERAL MOTORS COMPANY

11. Remove Knuckle (1)

Installation Procedure

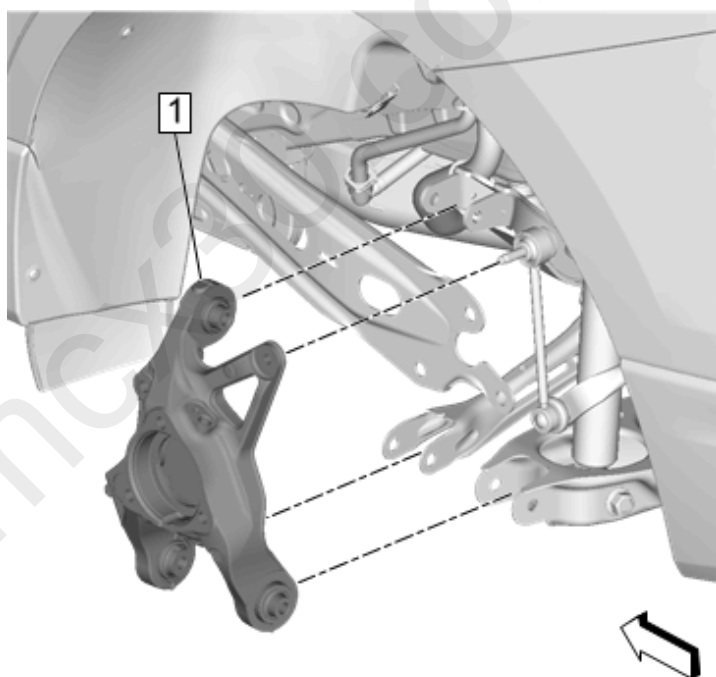


Fig. 20: Knuckle

Courtesy of GENERAL MOTORS COMPANY

1. Install Knuckle (1)

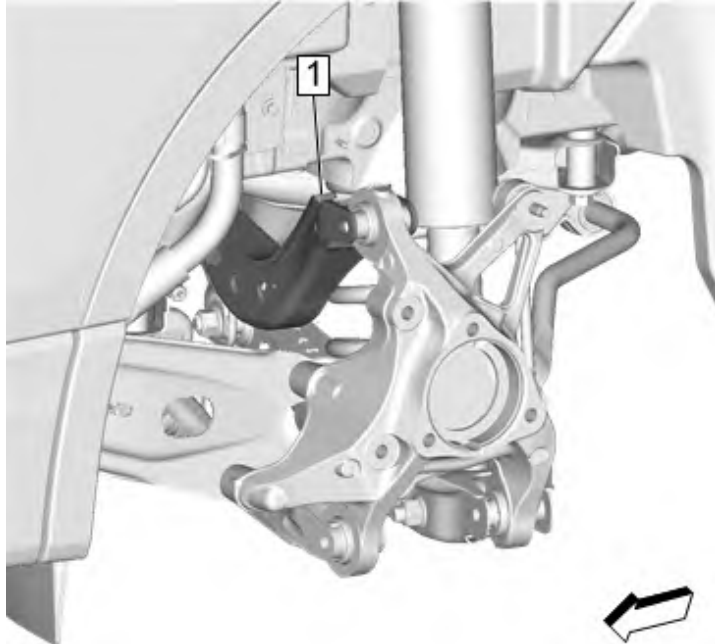


Fig. 21: Rear Suspension Upper Lateral Link
 Courtesy of GENERAL MOTORS COMPANY

2. Install Rear Suspension Upper Lateral Link (1) @ Knuckle - [Rear Suspension Upper Lateral Link Replacement](#)

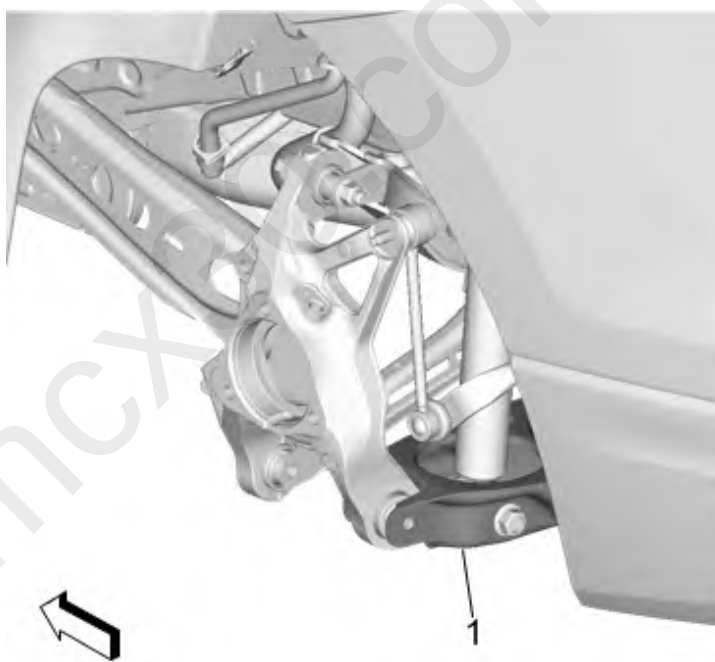


Fig. 22: Rear Suspension Lower Control Arm
 Courtesy of GENERAL MOTORS COMPANY

3. Install Rear Suspension Lower Control Arm (1) @ Knuckle - [Lower Control Arm Replacement](#)
4. Install Rear Suspension Trailing Arm (1) @ Knuckle - [Trailing Arm Replacement](#)

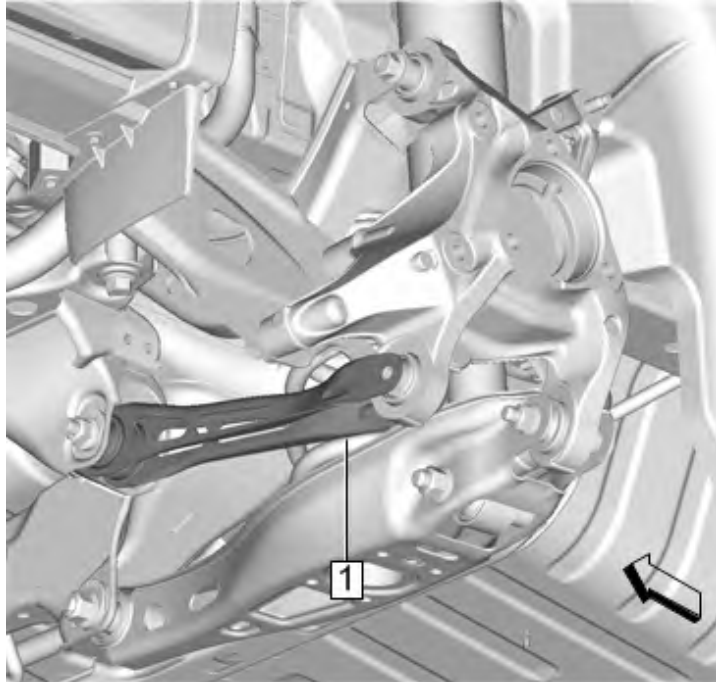


Fig. 23: Rear Suspension Adjust Link
Courtesy of GENERAL MOTORS COMPANY

5. Install Rear Suspension Adjust Link (1) @ Knuckle - [Adjust Link Replacement](#)

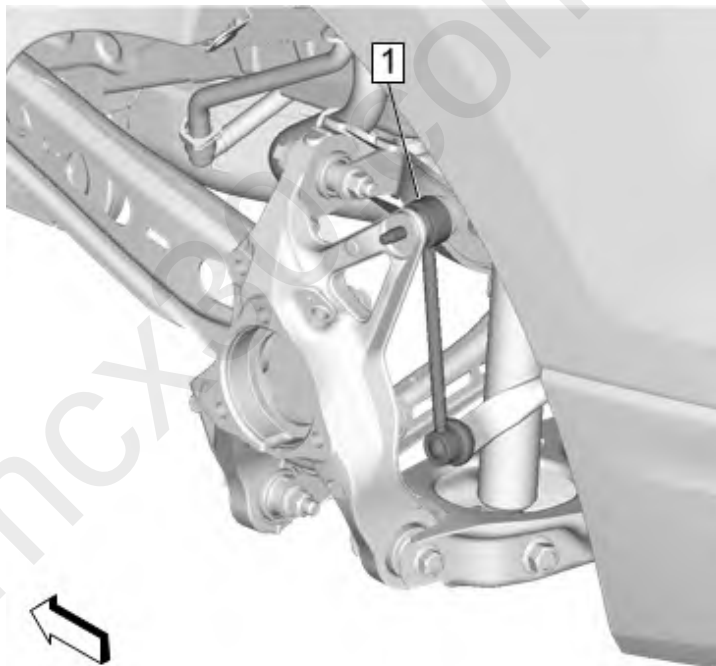


Fig. 24: Stabilizer Shaft Link
Courtesy of GENERAL MOTORS COMPANY

6. Install Stabilizer Shaft Link (1) @ Knuckle - [Stabilizer Shaft Link Replacement](#)

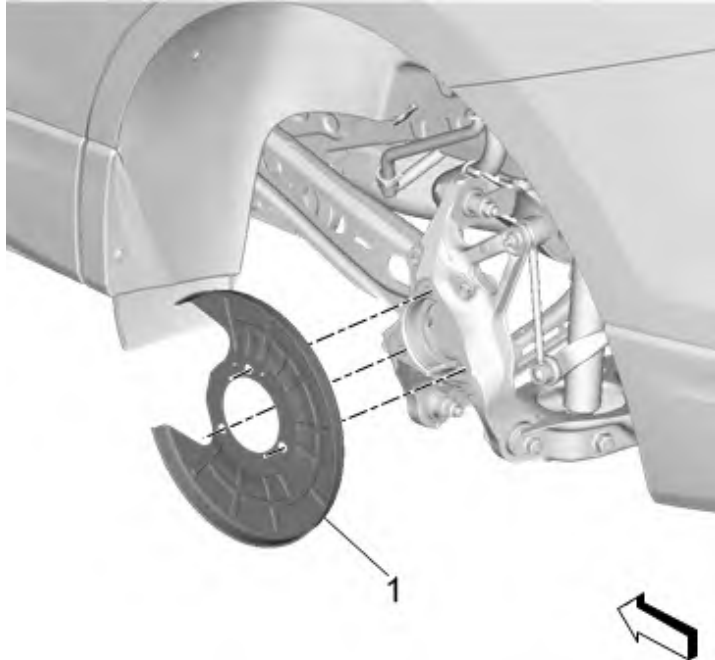


Fig. 25: Rear Brake Shield

Courtesy of GENERAL MOTORS COMPANY

7. Install Rear Brake Shield (1) - [Rear Brake Shield Replacement](#)

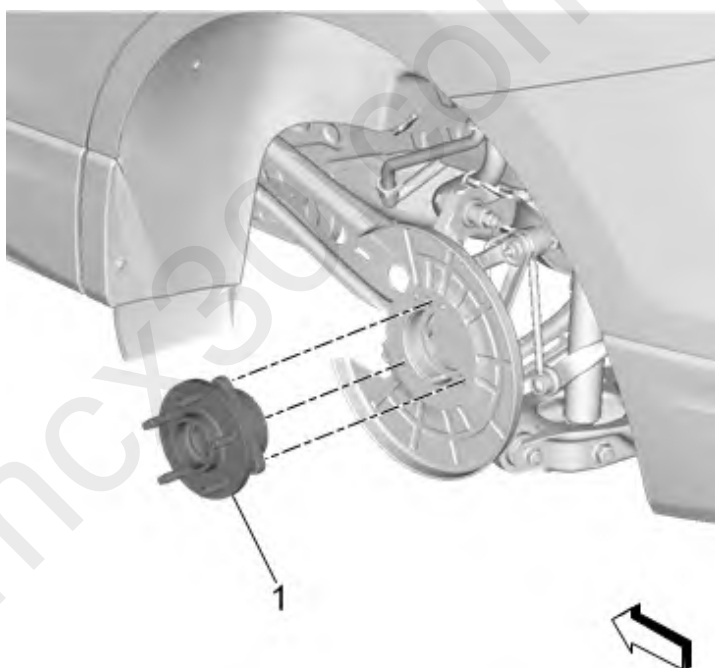


Fig. 26: Rear Wheel Bearing and Hub Assembly

Courtesy of GENERAL MOTORS COMPANY

8. Install Rear Wheel Bearing and Hub Assembly (1) - [Rear Wheel Bearing and Hub Replacement \(AWD\)](#)[Rear Wheel Bearing and Hub Replacement \(FWD\)](#)
9. Install Rear Wheel Speed Sensor @ Knuckle - [Rear Wheel Speed Sensor Replacement](#)

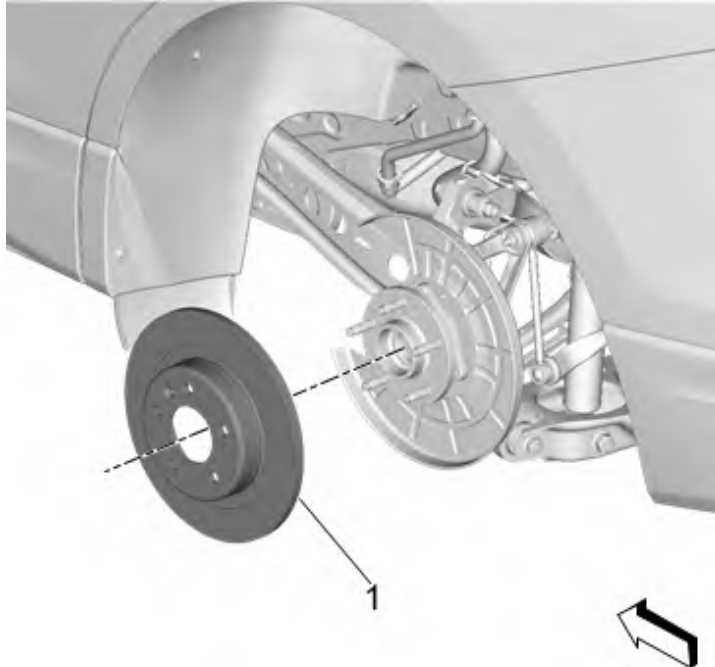


Fig. 27: Rear Brake Rotor

Courtesy of GENERAL MOTORS COMPANY

10. Install Rear Brake Rotor (1) - [Rear Brake Rotor Replacement](#)
11. Install the rear tire and wheel assembly. [Tire and Wheel Removal and Installation](#)

STABILIZER SHAFT REPLACEMENT

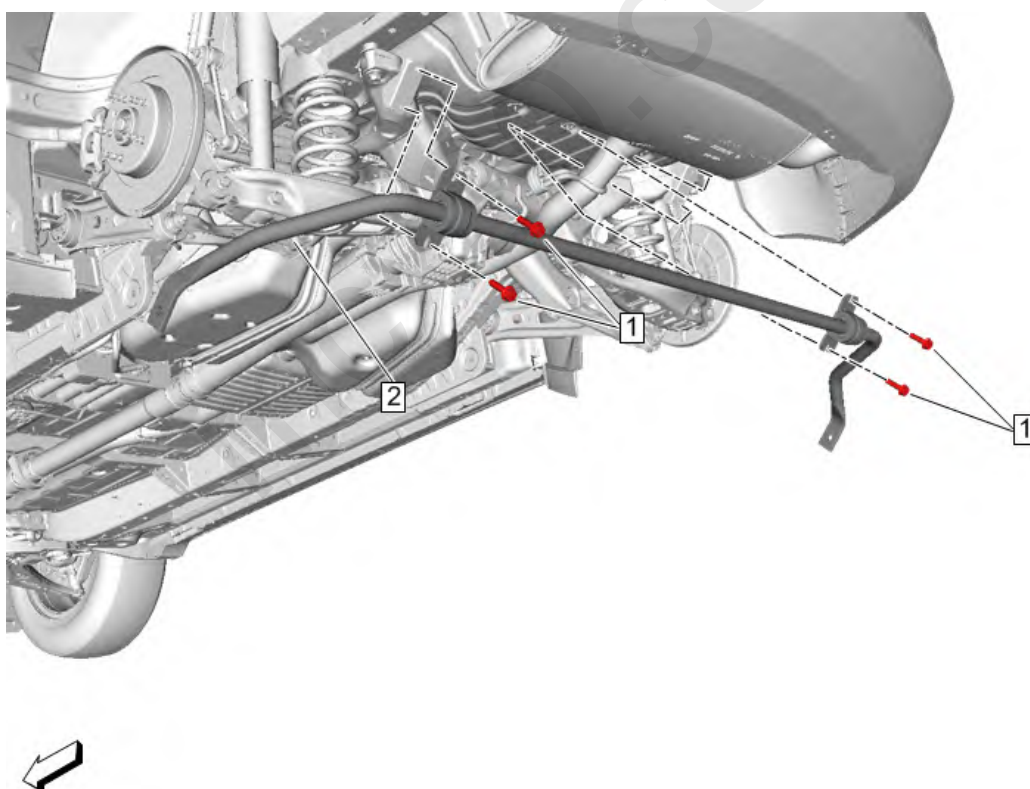


Fig. 28: Stabilizer Shaft

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Lifting and Jacking the Vehicle	
Tire and Wheel Removal and Installation	
Disconnect Rear Stabilizer Shaft Link@Rear Stabilizer Shaft Stabilizer Shaft Link Replacement	

Callout	Component Name
1	Rear Stabilizer Shaft Bracket Bolt [4x] CAUTION: Refer to Fastener Caution . Tighten 30 N.m (22 lb ft)
2	Rear Stabilizer Shaft NOTE: The rear stabilizer shaft insulators and rear stabilizer shaft brackets are not serviceable.

STABILIZER SHAFT LINK REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)

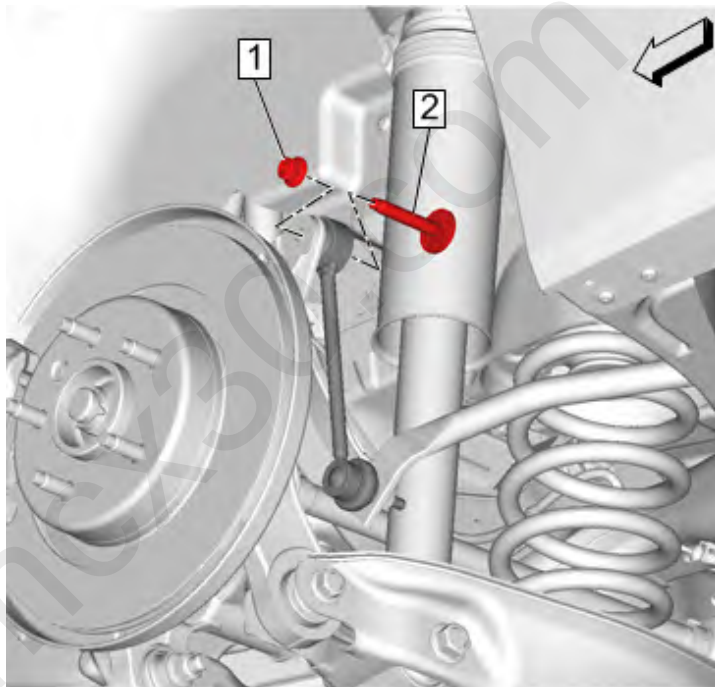


Fig. 29: Stabilizer Shaft Link Nut, Bolt

Courtesy of GENERAL MOTORS COMPANY

NOTE: The tire and wheel assembly is removed for illustration purposes only.

2. Remove Stabilizer Shaft Link Nut (1) @ Knuckle
3. Remove Stabilizer Shaft Link Bolt (2) @ Knuckle

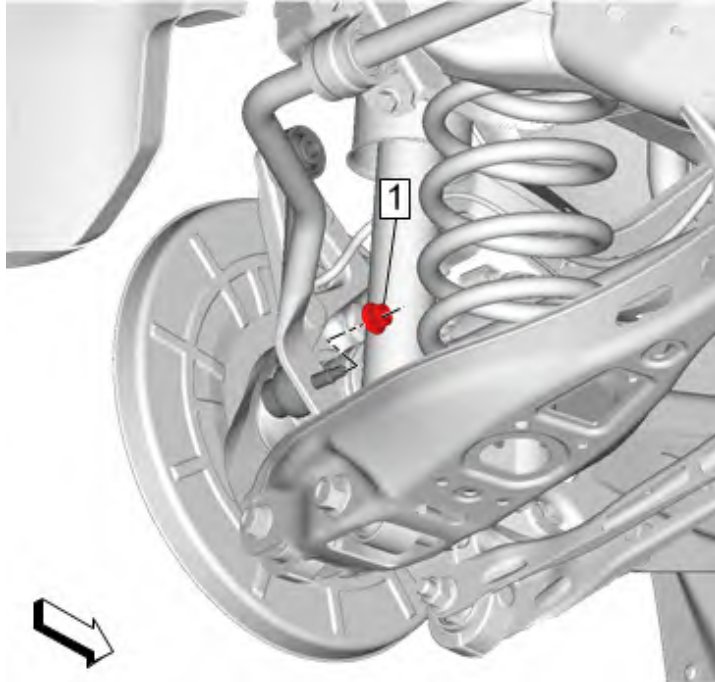


Fig. 30: Stabilizer Shaft Link Nut
 Courtesy of GENERAL MOTORS COMPANY

4. Remove Stabilizer Shaft Link Nut (1) @ Stabilizer Shaft

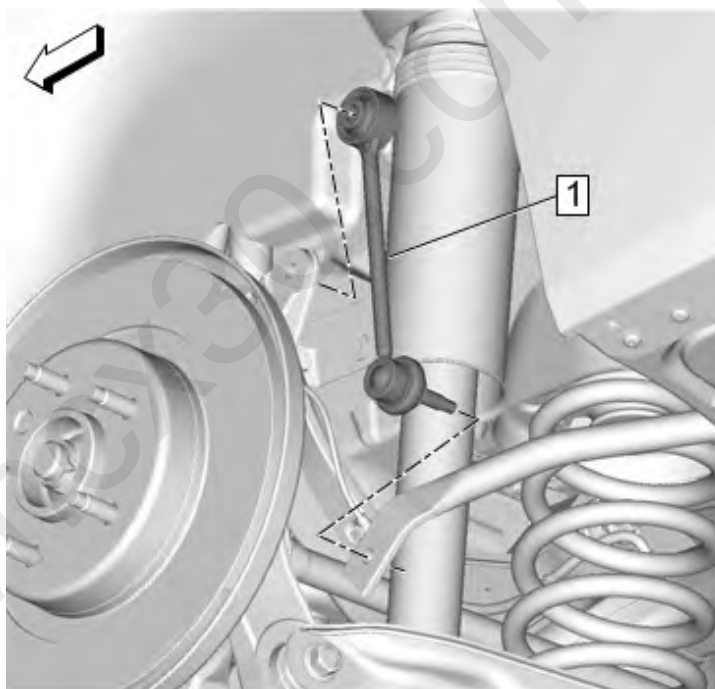


Fig. 31: Stabilizer Shaft Link
 Courtesy of GENERAL MOTORS COMPANY

5. Remove Stabilizer Shaft Link (1)

Installation Procedure

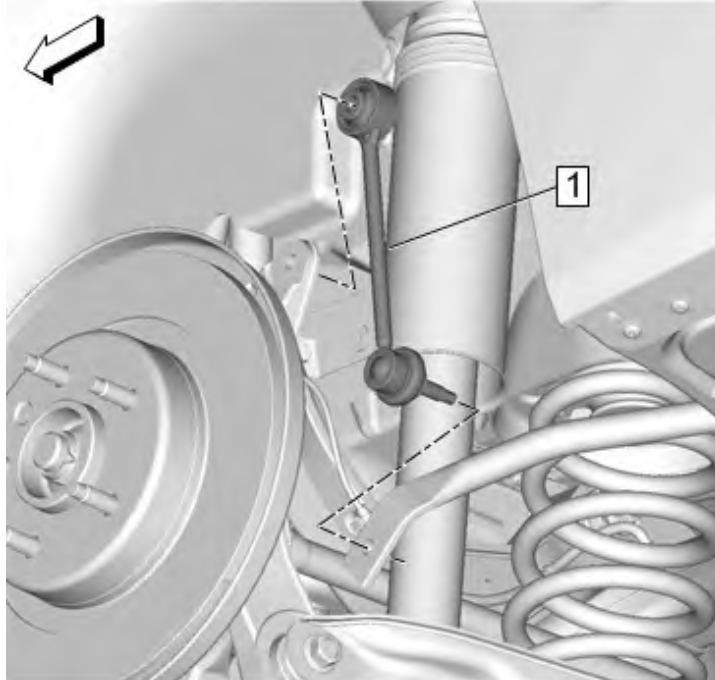


Fig. 32: Stabilizer Shaft Link

Courtesy of GENERAL MOTORS COMPANY

1. Install Stabilizer Shaft Link (1)

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

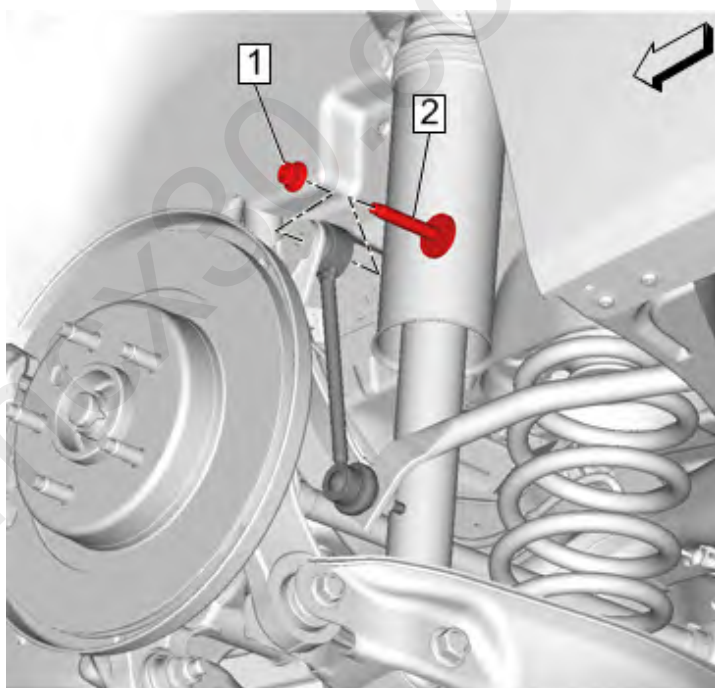


Fig. 33: Stabilizer Shaft Link Nut, Bolt

Courtesy of GENERAL MOTORS COMPANY

2. Install Stabilizer Shaft Link Bolt (2) @ Knuckle
3. Install Stabilizer Shaft Link Nut (1) @ Knuckle
4. Stabilizer Shaft Link Bolt (2) @ Knuckle - Tighten 58 N.m (43 lb ft)

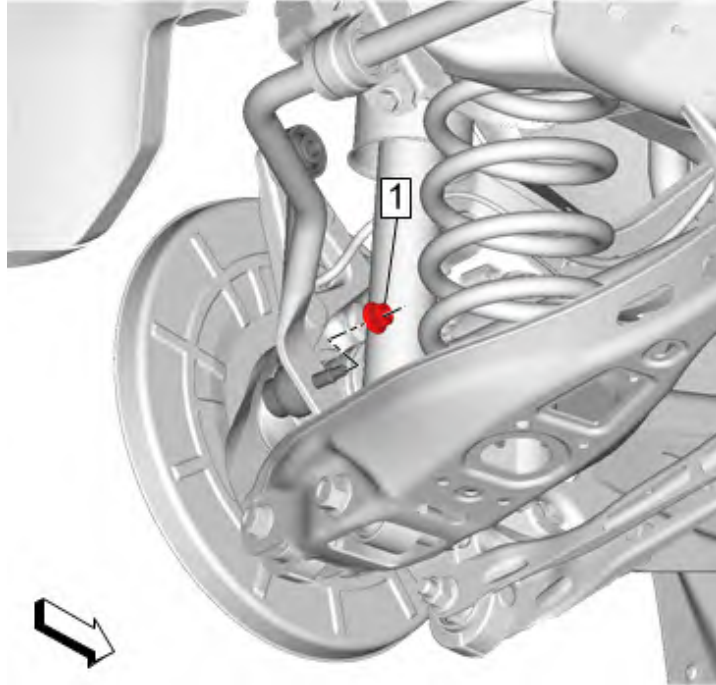


Fig. 34: Stabilizer Shaft Link Nut
 Courtesy of GENERAL MOTORS COMPANY

5. Install Stabilizer Shaft Link Nut (1) @ Stabilizer Shaft and tighten 58 N.m (43 lb ft)
6. Lower the vehicle.

STRUT AND SHOCK ABSORBER INSPECTION

NOTE: The shock absorber 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 lower shock absorber tube is normal. **DO NOT** replace the shock absorber for this condition.

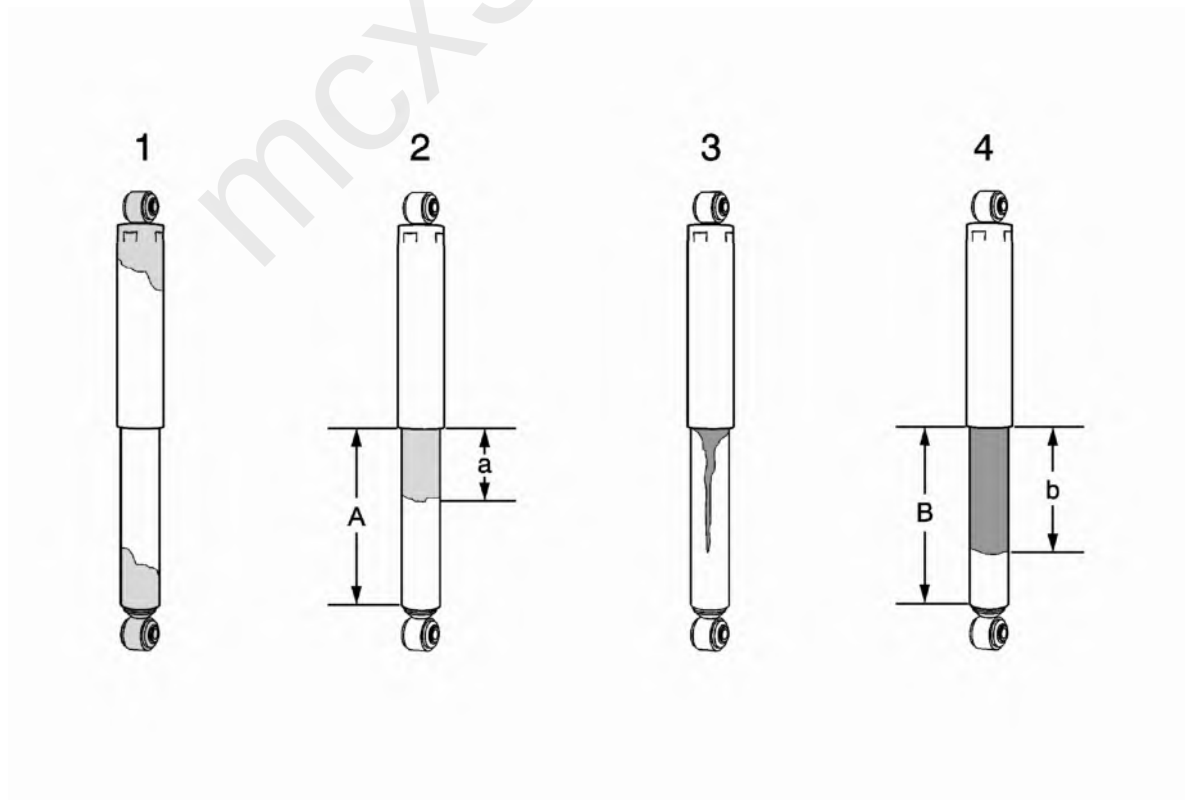


Fig. 35: Identifying Shock Absorber Conditions
 Courtesy of GENERAL MOTORS COMPANY

Condition 1

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

Condition 2

Light film/residue on approximately 1/3 (a) or less of the lower shock tube (A) and originating from the shaft seal, is a NORMAL condition. DO NOT replace the shock absorber.

Condition 3

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

Condition 4

An extreme wet film of oil covering more than 1/3 (b) of the lower shock tube and originating from the shaft seal (B), is an ABNORMAL condition. Replace the shock absorber. Refer to [Shock Absorber Replacement](#).

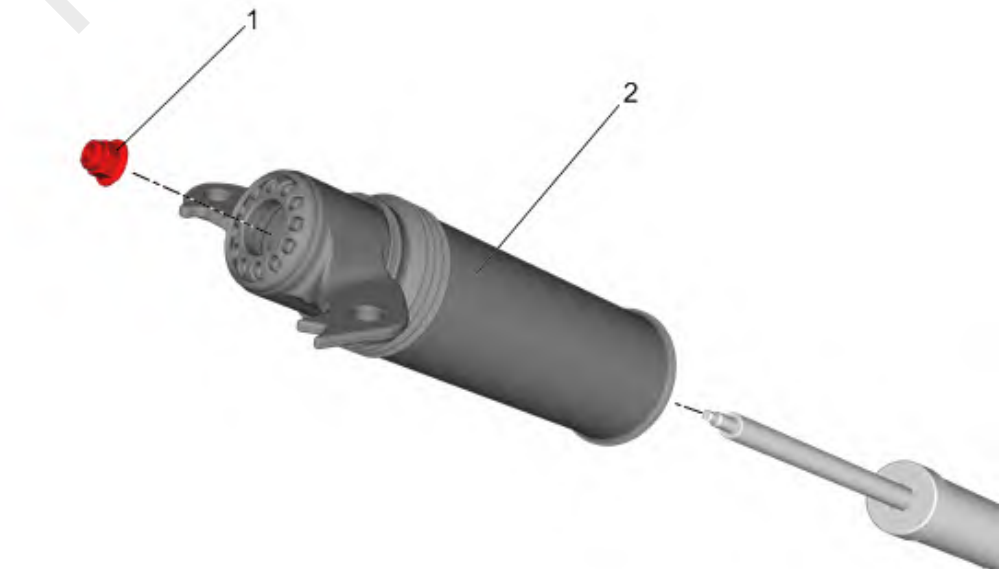
Inspection

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 shock absorber 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 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 shock absorber. Refer to [Shock Absorber 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 shock absorber. If the shock absorber does not exceed 2 cycles, NO repair is necessary.

REAR SHOCK ABSORBER MOUNT REPLACEMENT



Callout	Component Name
Preliminary Procedure Shock Absorber Replacement.	
1	Rear Shock Absorber Mount Nut CAUTION: Refer to <u>Fastener Caution</u> . Tighten 25 N.m (18 lb ft)
2	Rear Shock Absorber Upper Mount

SHOCK ABSORBER REPLACEMENT

Removal Procedure

1. Remove the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
2. Remove Rear Wheelhouse Liner - [Rear Wheelhouse Liner Replacement - Right Side \(Terrain\)](#), [Rear Wheelhouse Liner Replacement - Right Side \(Equinox\)](#) , or [Rear Wheelhouse Liner Replacement- Left Side \(Equinox\)](#), [Rear Wheelhouse Liner Replacement- Left Side \(Terrain\)](#).
3. Support the lower control arm with a tall jack stand.

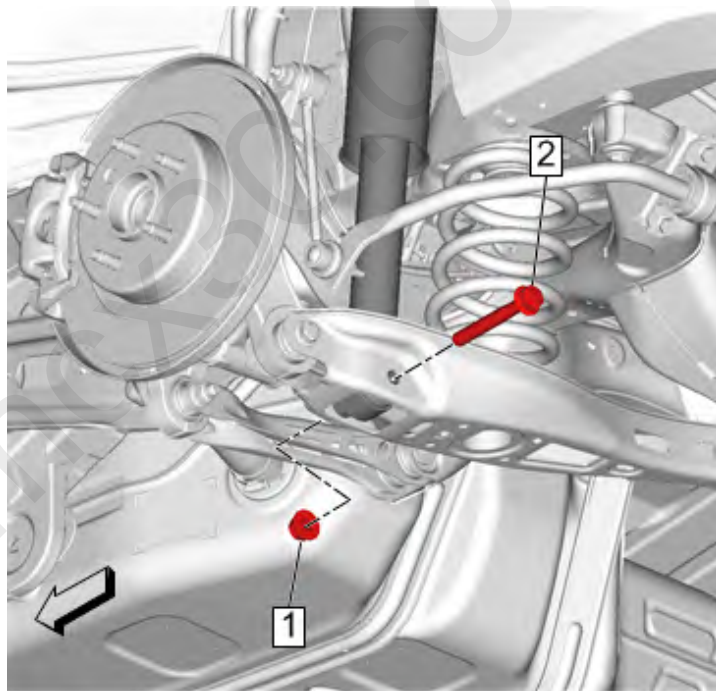


Fig. 37: Rear Shock Absorber Nut, Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Remove Rear Shock Absorber Nut (1) @ Lower Control Arm
5. Remove Rear Shock Absorber Bolt (2) @ Lower Control Arm and DISCARD

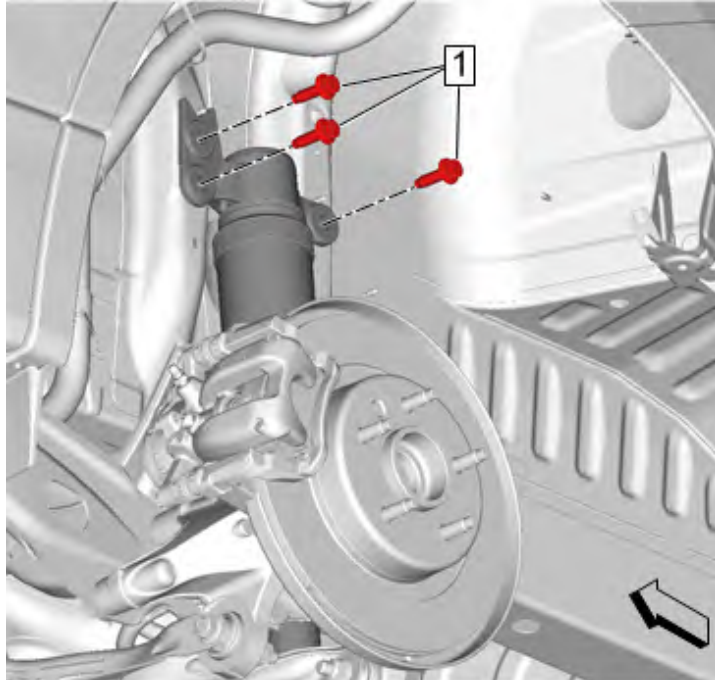


Fig. 38: Rear Shock Absorber Bolt
 Courtesy of GENERAL MOTORS COMPANY

6. Remove Rear Shock Absorber Bolt @ Body (1) [3x]

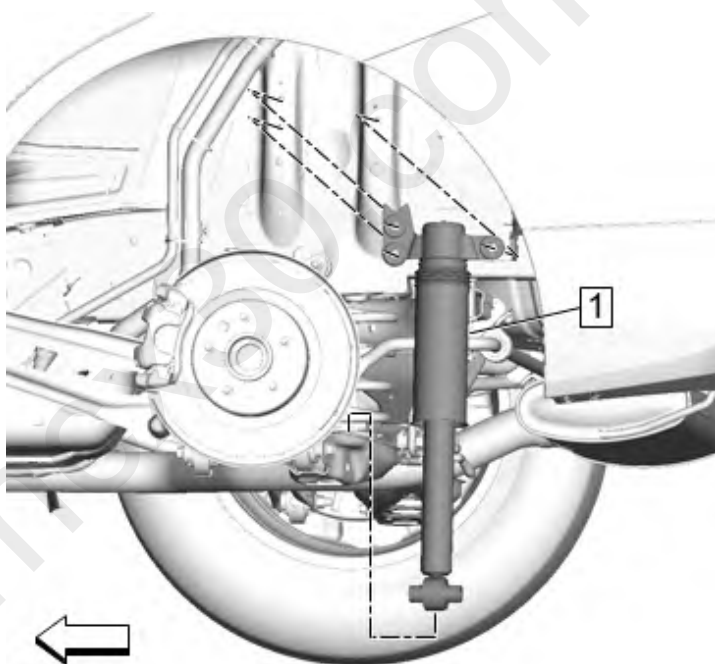


Fig. 39: Rear Shock Absorber
 Courtesy of GENERAL MOTORS COMPANY

7. Remove Rear Shock Absorber (1)

Installation Procedure

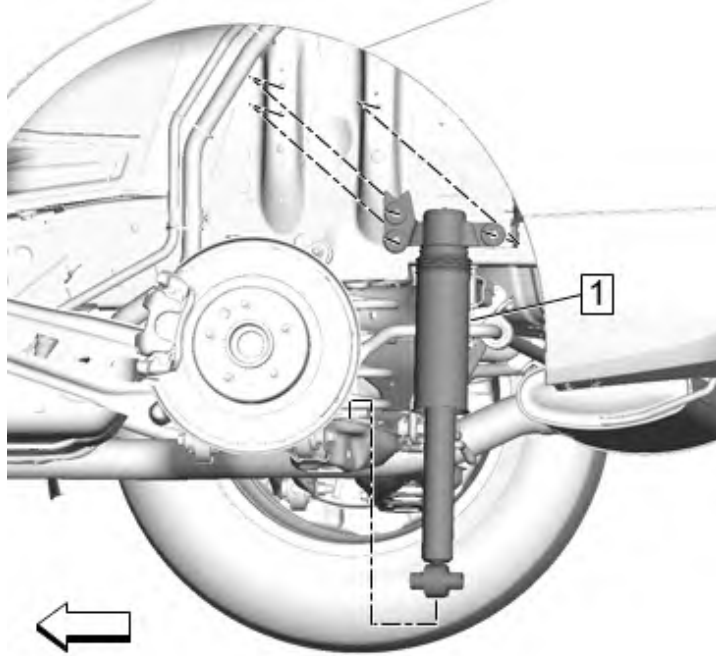


Fig. 40: Rear Shock Absorber

Courtesy of GENERAL MOTORS COMPANY

1. Install Rear Shock Absorber (1)

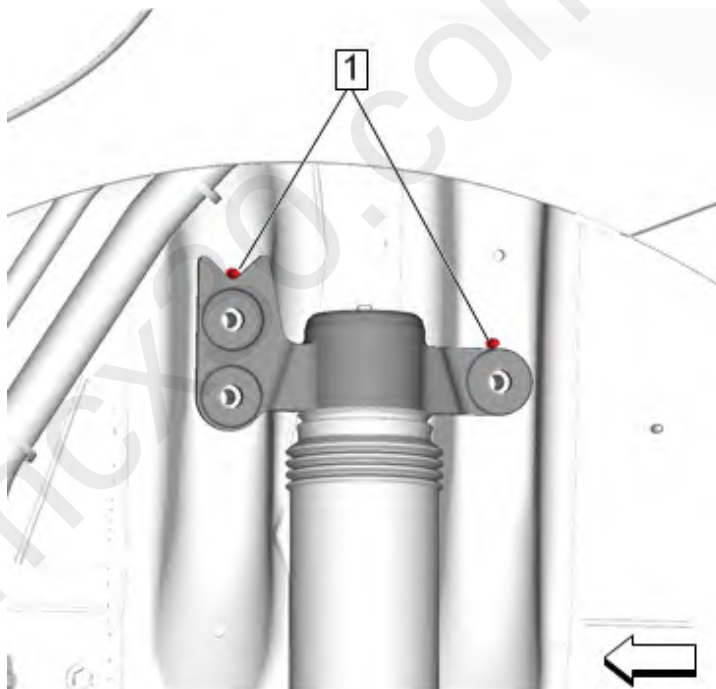


Fig. 41: Locator Pins

Courtesy of GENERAL MOTORS COMPANY

2. Inspect the condition of the locator pins (1). If the pins are bent upward or blocking the bolting surface, the pins should be removed and the surface ground flat.
3. Ensure that the shock absorber is seated against the locator pins (1).

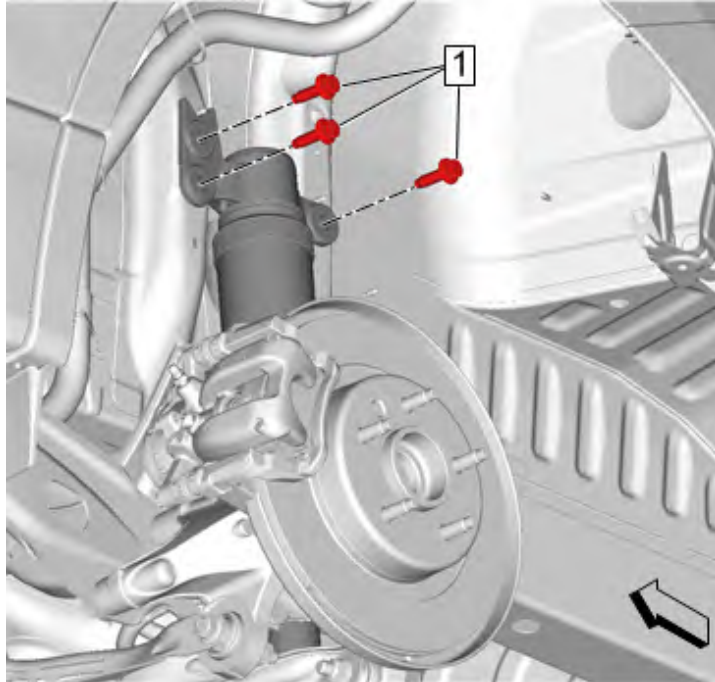


Fig. 42: Rear Shock Absorber Bolt

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

4. Install Rear Shock Absorber Bolt @ Body (1) and tighten [3x] 58 N.m (43 lb ft)

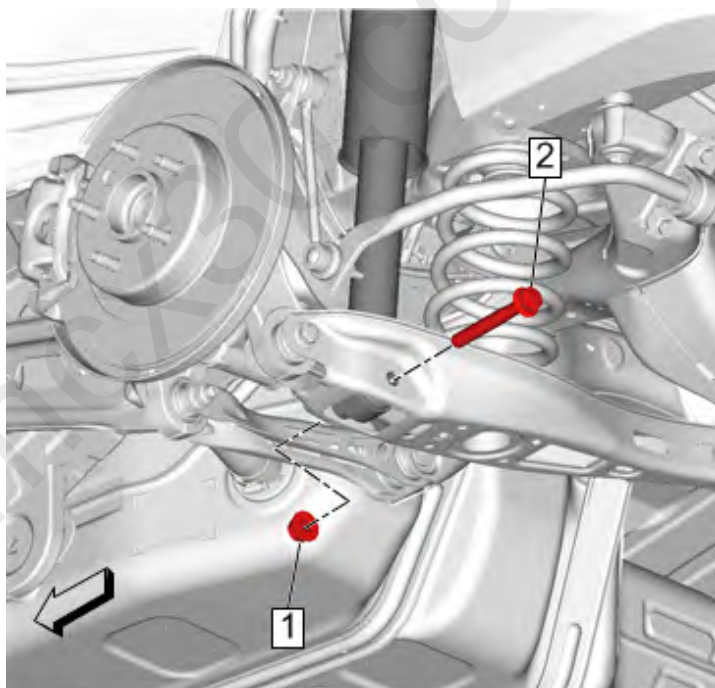


Fig. 43: Rear Shock Absorber Nut, Bolt

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.

5. Install Rear Shock Absorber Bolt (2) @ Lower Control Arm.
6. Install Rear Shock Absorber Nut (1) @ Lower Control Arm.

Tighten the Bolt

1. First Pass: 160 N.m (118 lb ft)
2. Final Pass: (90 - 105 degrees)

7. Remove the jack stand support from the lower control arm.
8. Install Rear Wheelhouse Liner - [Rear Wheelhouse Liner Replacement - Right Side \(Terrain\)](#), [Rear Wheelhouse Liner Replacement - Right Side \(Equinox\)](#), or [Rear Wheelhouse Liner Replacement- Left Side \(Equinox\)](#), [Rear Wheelhouse Liner Replacement- Left Side \(Terrain\)](#).
9. Install the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)

SHOCK ABSORBER DISPOSAL

WARNING: Gas charged shock absorbers contain high pressure gas. Do not remove the snap ring from inside the top of the tube. If the snap ring is removed, the contents of the shock absorber will come out with extreme force which may result in personal injury.

WARNING: To prevent personal injury, wear safety glasses when centerpunching and drilling the shock absorber. Use care not to puncture the shock absorber tube with the centerpunch.

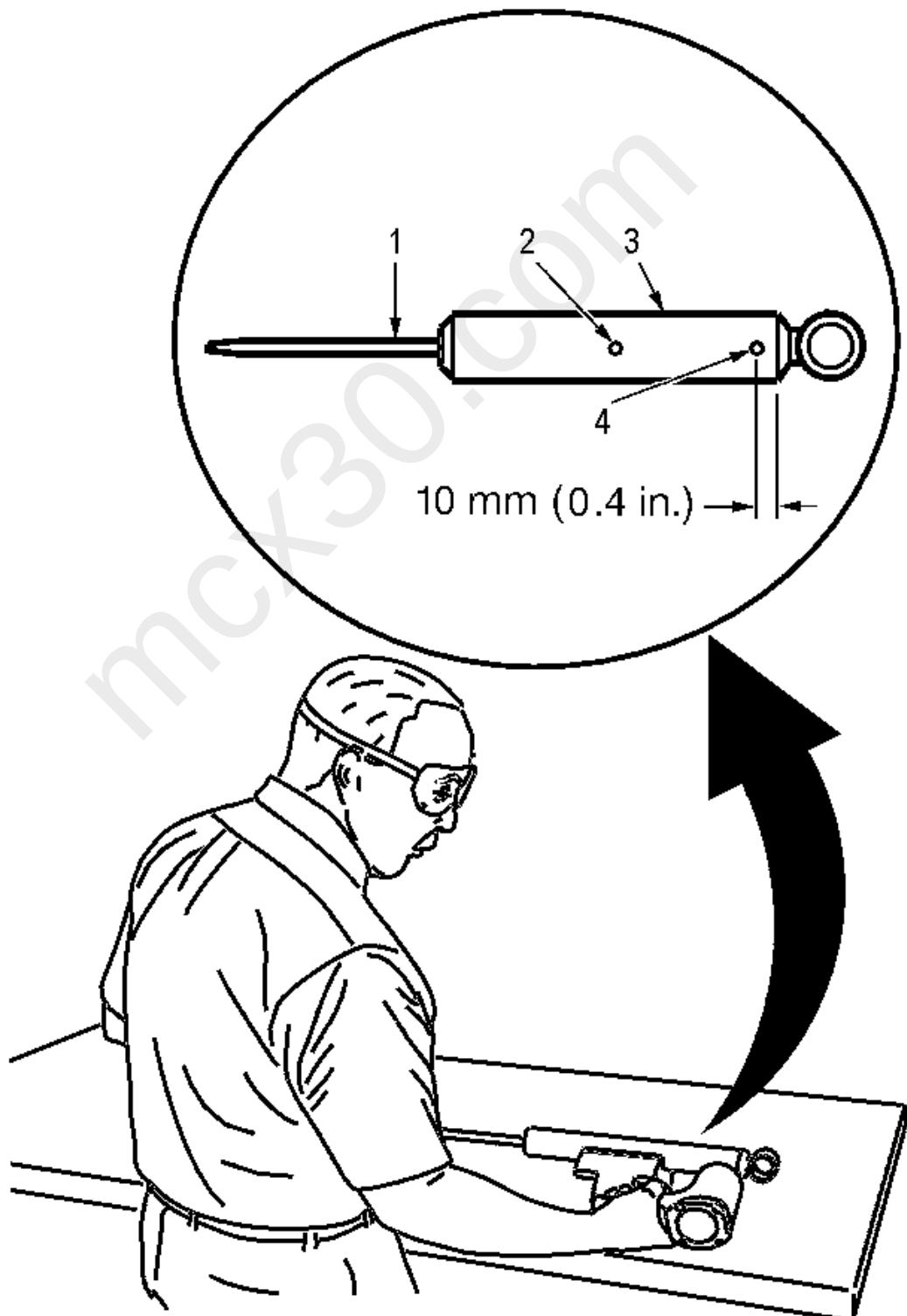


Fig. 44: Drilling Hole In Shock Absorber At Centerpunched Locations
 Courtesy of GENERAL MOTORS COMPANY

1. Make an indentation 10 mm (0.4 in) from the bottom of the tube (3) using a centerpunch.
2. Clamp the shock absorber in a vise horizontally with the shock absorber rod (1) completely extended.
3. Drill a hole in the shock absorber at the centerpunch (4) using a 5 mm (3/16 in) drill bit. Gas or a gas/oil mixture will exhaust when the drill bit penetrates the shock absorber. Use shop towels in order to contain the escaping oil.
4. Make an indentation in the middle (2) of the tube (3) with a centerpunch.
5. Drill a second hole in the shock absorber at the centerpunch (2) using a 5 mm (3/16 in) drill bit. Oil will exhaust when the drill bit penetrates the shock absorber. Use shop towels in order to contain the escaping oil.
6. Remove the shock absorber from the vise. Hold the shock absorber over a drain pan horizontally with the holes down. Move the rod (1) in and out of the tube (3) to completely drain the oil from the shock absorber.

REAR COIL SPRING REPLACEMENT

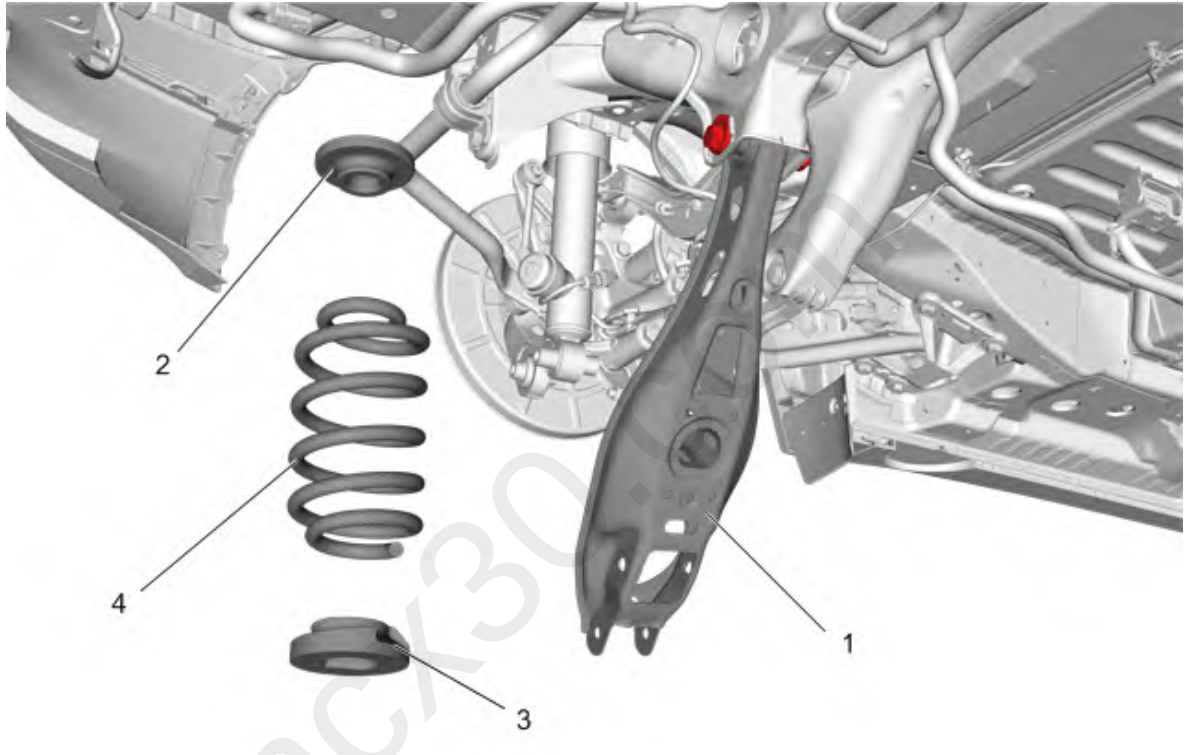


Fig. 45: Rear Coil Spring
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Lifting and Jacking the Vehicle 2. Tire and Wheel Removal and Installation	
1	Lower Control Arm Lower Control Arm Procedure Using a transmission jack lower the lower control arm. Lower Control Arm Replacement
2	Rear Coil Spring Upper Insulator NOTE: Inspect the insulator for damage and replace if necessary.

Callout	Component Name
3	Rear Coil Spring Lower Insulator NOTE: Inspect the insulator for damage and replace if necessary.
4	Rear Coil Spring NOTE: Mark the orientation of the spring to insure its assembled correctly.

TRAILING ARM REPLACEMENT

Removal Procedure

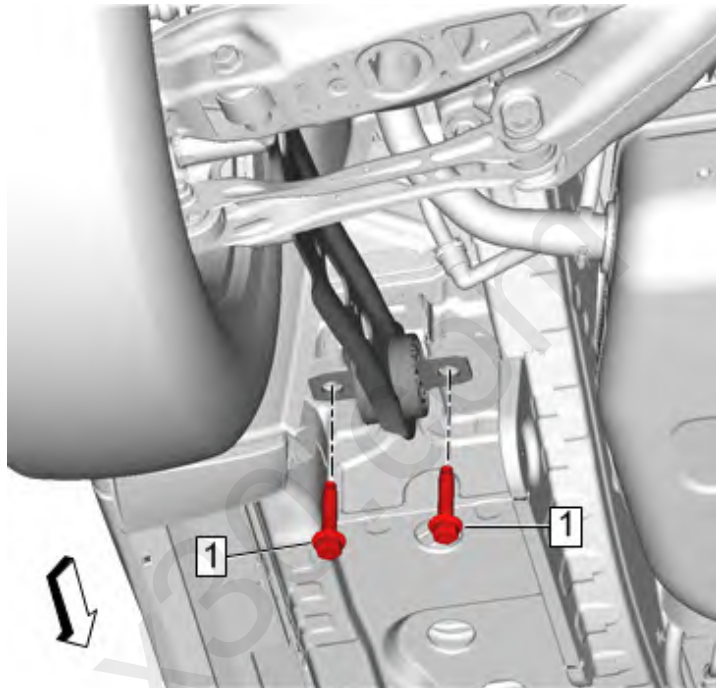


Fig. 46: Left And Right Rear Suspension Trailing Arm Bolts
Courtesy of GENERAL MOTORS COMPANY

1. Remove Rear Suspension Trailing Arm Bolt (1) @ Body and DISCARD [2x]

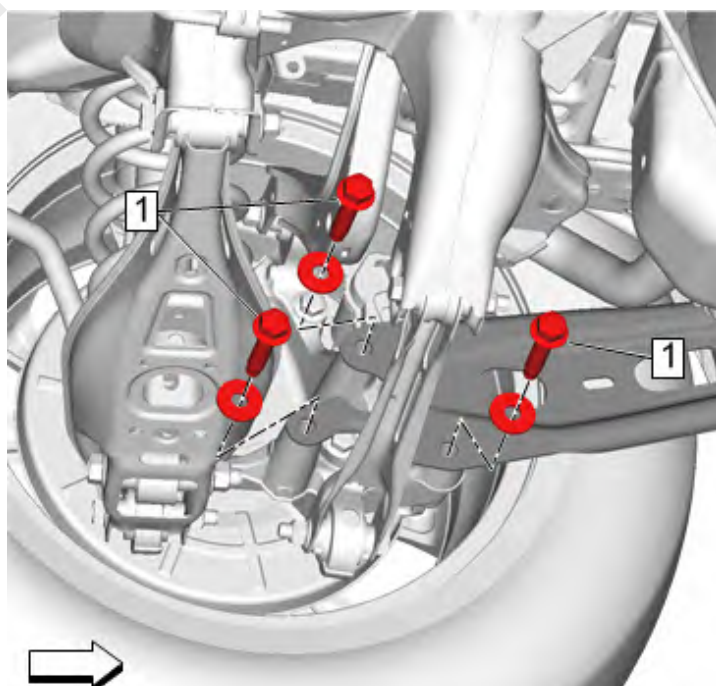


Fig. 47: Rear Suspension Trailing Arm Bolt
Courtesy of GENERAL MOTORS COMPANY

2. Remove Rear Suspension Trailing Arm Bolt (1) @ Knuckle and DISCARD [3x]

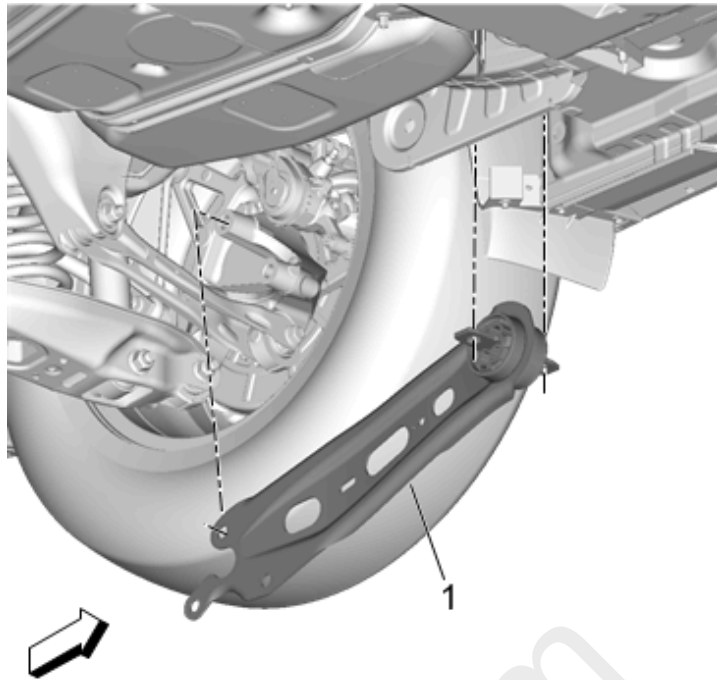


Fig. 48: Rear Suspension Trailing Arm
Courtesy of GENERAL MOTORS COMPANY

3. Remove Rear Suspension Trailing Arm (1)

Installation Procedure

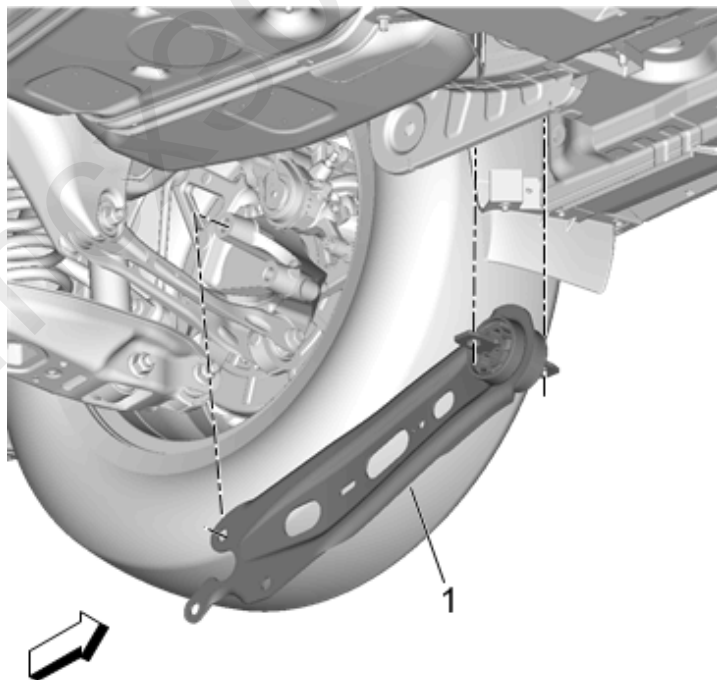


Fig. 49: Rear Suspension Trailing Arm
Courtesy of GENERAL MOTORS COMPANY

1. Install Rear Suspension Trailing Arm (1)

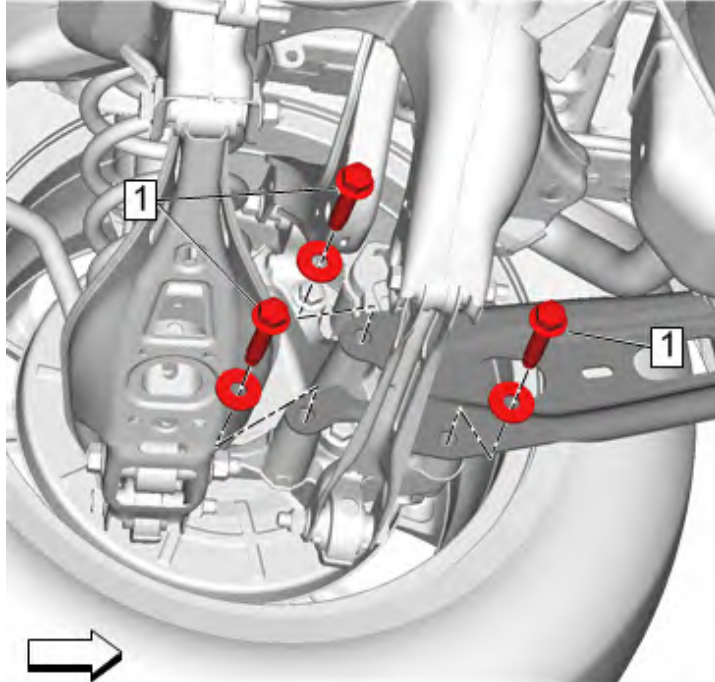


Fig. 50: Rear Suspension Trailing Arm Bolt
Courtesy of GENERAL MOTORS COMPANY

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.

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

NOTE: Apply threadlocker to the rear suspension trailing arm to knuckle bolt threads.
[Adhesives, Fluids, Lubricants, and Sealers](#)

2. Install NEW Rear Suspension Trailing Arm Bolt (1) @ Knuckle [3x]

Tighten

1. First Pass: 160 N.m (118 lb ft)
2. Final Pass: (60 - 75 degrees)

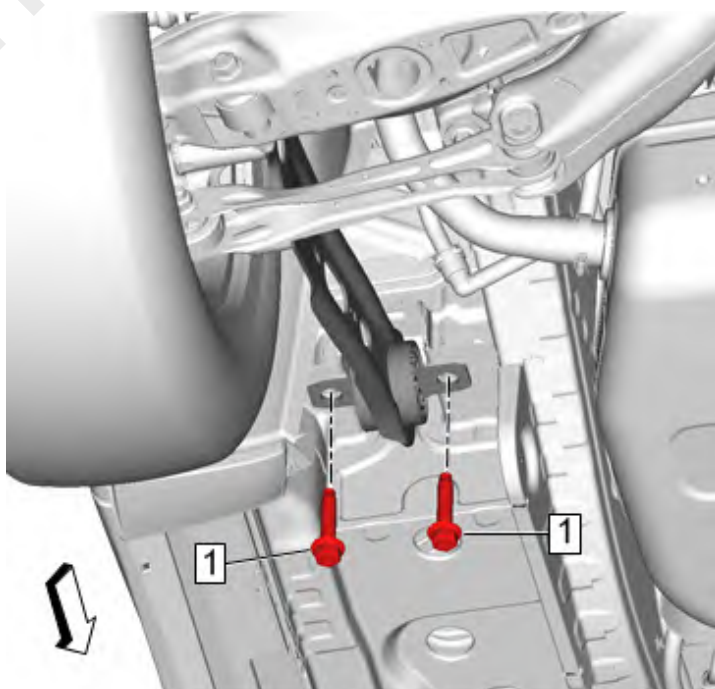


Fig. 51: Left And Right Rear Suspension Trailing Arm Bolts
Courtesy of GENERAL MOTORS COMPANY

3. Install NEW Rear Suspension Trailing Arm Bolt (1) @ Body [2x]

Tighten

1. First Pass: 160 N.m (118 lb ft)
2. Final Pass: (90 - 105 degrees)
4. Install the rear tire and wheel assembly. [Tire and Wheel Removal and Installation](#)

ADJUST LINK REPLACEMENT

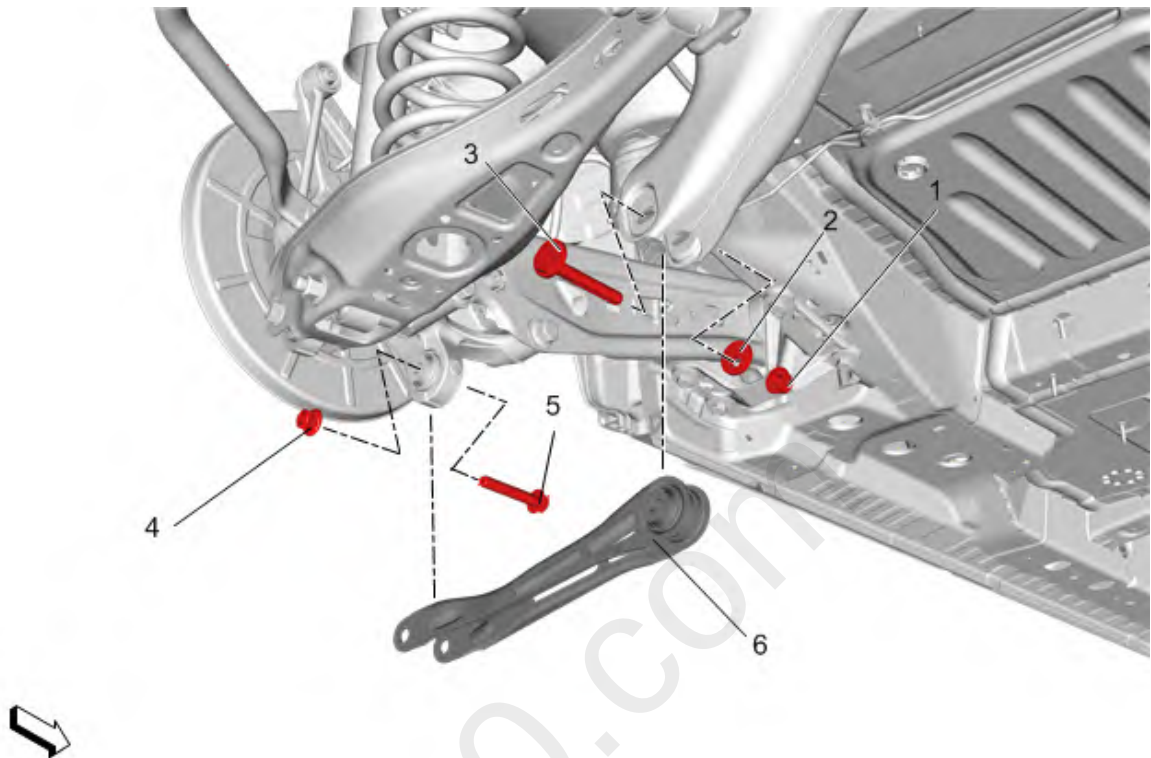


Fig. 52: Adjust Link

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure 1. Lifting and Jacking the Vehicle 2. Tire and Wheel Removal and Installation	
1	Rear Suspension Link Inner Nut CAUTION: Refer to Fastener Caution . Tighten 100 N.m (74 lb ft)
2	Rear Suspension Link Inner Washer
3	Rear Suspension Link Inner Cam Bolt
4	Rear Suspension Link Outer Nut

Callout	Component Name
5	Rear Suspension Link Outer Bolt 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. Tighten • First Pass 100 N.m (74 lb ft) • Final Pass Plus 90 to 105 Degrees
6	Rear Suspension Link Procedure <u>Rear Toe Adjustment</u>

REAR SUSPENSION UPPER LATERAL LINK REPLACEMENT

Removal Procedure

1. Remove the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
2. Support the lower control arm.
3. Disconnect Wiring Harnesses @ Rear Suspension Lateral Link and reposition harness as necessary.

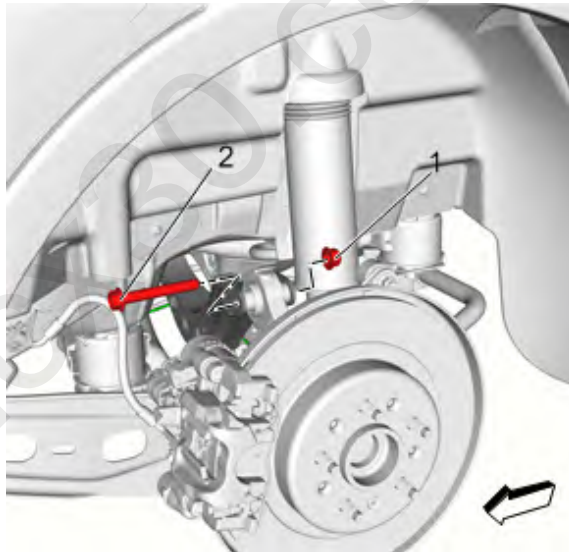


Fig. 53: Rear Suspension Lateral Link Outer Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Remove Rear Suspension Lateral Link Outer Nut (1)
5. Remove Rear Suspension Lateral Link Outer Bolt (2) and DISCARD

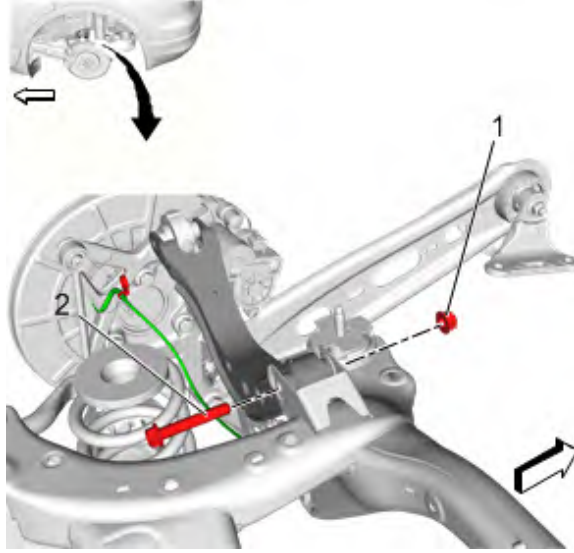


Fig. 54: Rear Suspension Lateral Link Inner Nut And Bolt
 Courtesy of GENERAL MOTORS COMPANY

6. Remove Rear Suspension Lateral Link Inner Nut (1)
7. Remove Rear Suspension Lateral Link Inner Bolt (2) and DISCARD

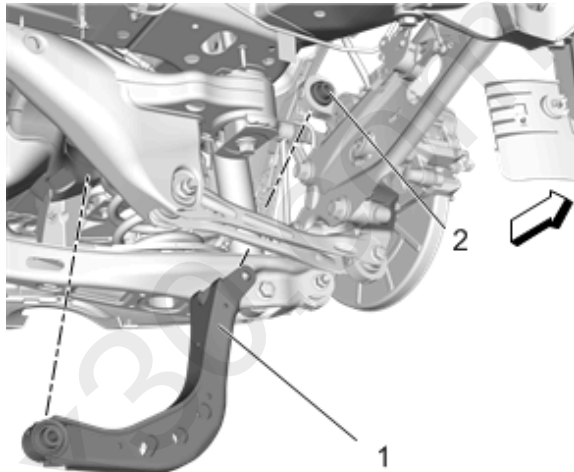
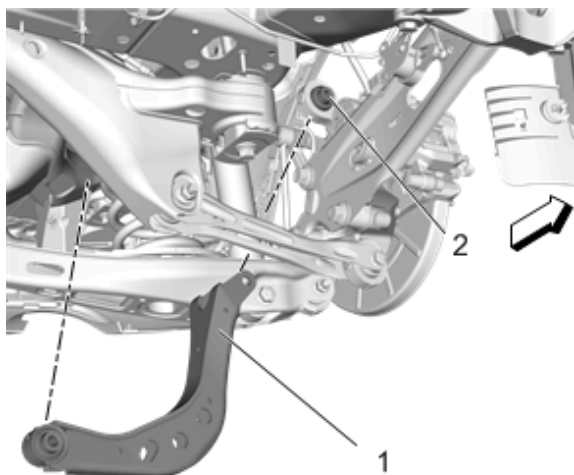


Fig. 55: Rear Suspension Lateral Link
 Courtesy of GENERAL MOTORS COMPANY

8. Remove Rear Suspension Lateral Link (1)

Installation Procedure



1. Install Rear Suspension Lateral Link (1).

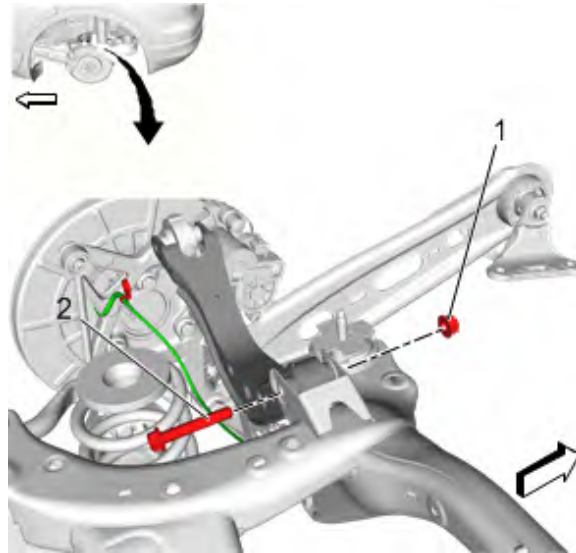


Fig. 57: Rear Suspension Lateral Link Inner Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

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 a NEW Rear Suspension Lateral Link Inner Bolt (2).
3. Rear Suspension Lateral Link Inner Nut (1) - Tighten the nut finger tight.

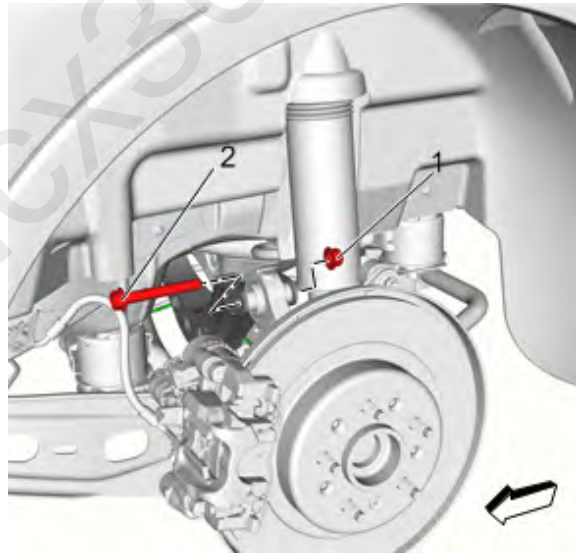


Fig. 58: Rear Suspension Lateral Link Outer Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Install a NEW Rear Suspension Lateral Link Outer Bolt (2)
5. Rear Suspension Lateral Link Outer Nut (1) - Tighten the nut finger tight.
6. Wiring Harnesses @ Rear Suspension Lateral Link - Connect as necessary
7. Install the rear tire and wheel assembly. [Tire and Wheel Removal and Installation](#)
8. Lower the vehicle.
9. Check the trim height. [Trim Height Inspection](#)

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

10. Rear Suspension Lateral Link Inner Nut - Tighten at curb height.

1. First Pass: 100 N.m (74 lb ft)
 2. Final Pass: (90 - 105 degrees)
11. Rear Suspension Lateral Link Outer Bolt - Tighten at curb height.
1. First Pass: 100 N.m (74 lb ft)
 2. Final Pass: (90 - 105 degrees)

LOWER CONTROL ARM REPLACEMENT

Removal Procedure

1. Remove the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
2. Separate {If equipped} Wiring Harness @ Rear Suspension Lower Control Arm
3. Support the rear suspension lower control arm.

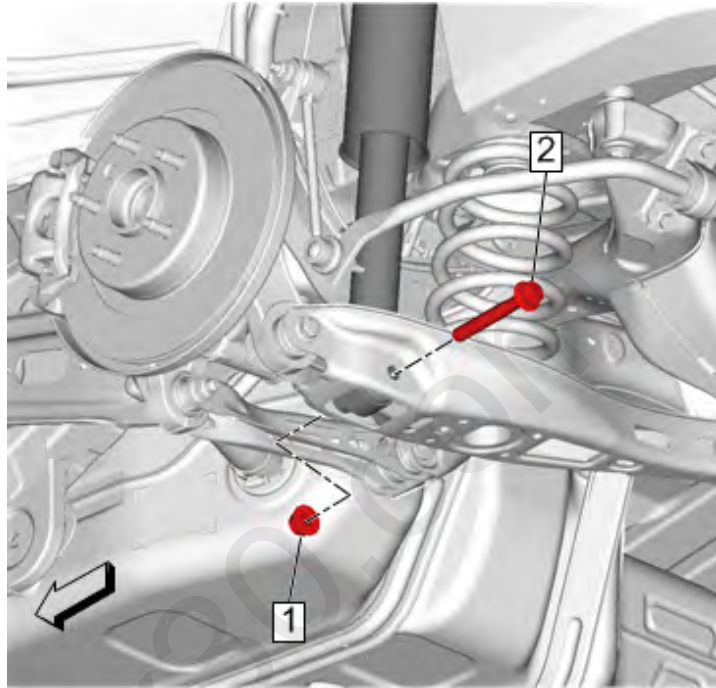


Fig. 59: Rear Shock Absorber Nut, Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Remove Rear Shock Absorber Nut (1)
5. Remove Rear Shock Absorber Bolt (2) and DISCARD

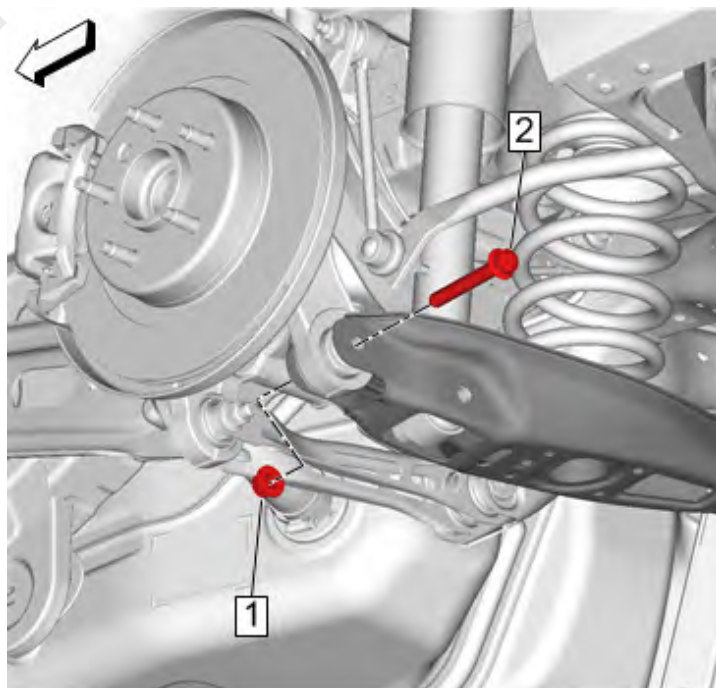


Fig. 60: Rear Suspension Lower Control Arm Outer Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

6. Remove Rear Suspension Lower Control Arm Outer Nut (1)
7. Remove Rear Suspension Lower Control Arm Outer Bolt (2) and DISCARD

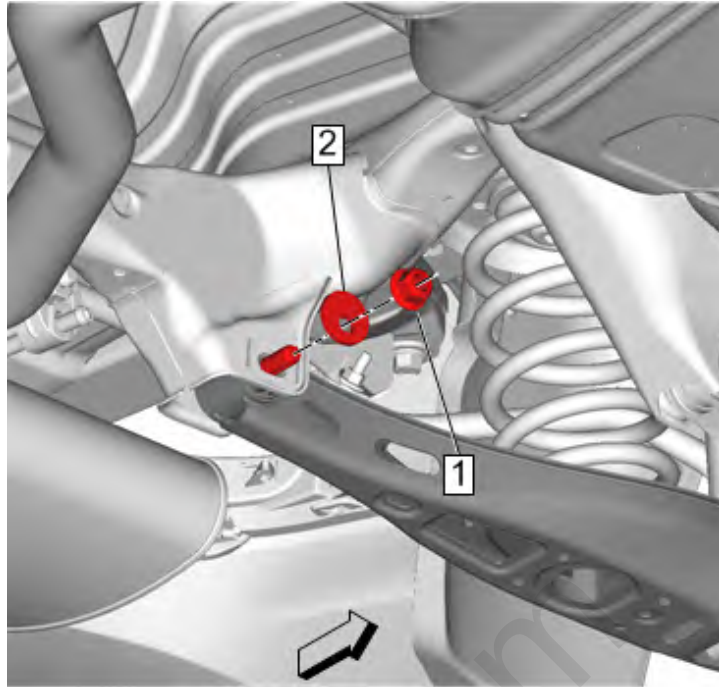


Fig. 61: Rear Suspension Lower Control Arm Adjust Cam And Inner Nut
Courtesy of GENERAL MOTORS COMPANY

8. Remove Rear Suspension Lower Control Arm Inner Nut (1).
9. Remove Rear Suspension Lower Control Arm Adjust Cam (2).

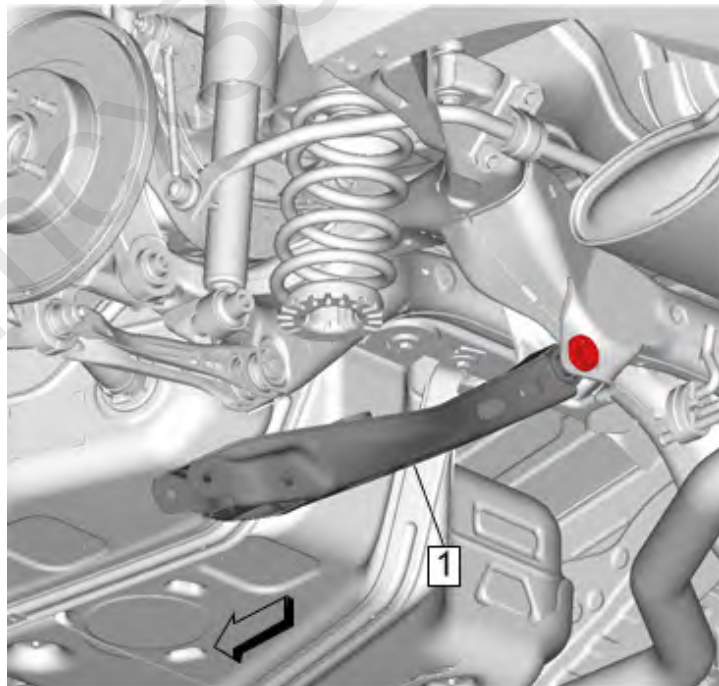


Fig. 62: Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

10. Lower the lower control arm (1) to provide clearance for the rear coil spring.

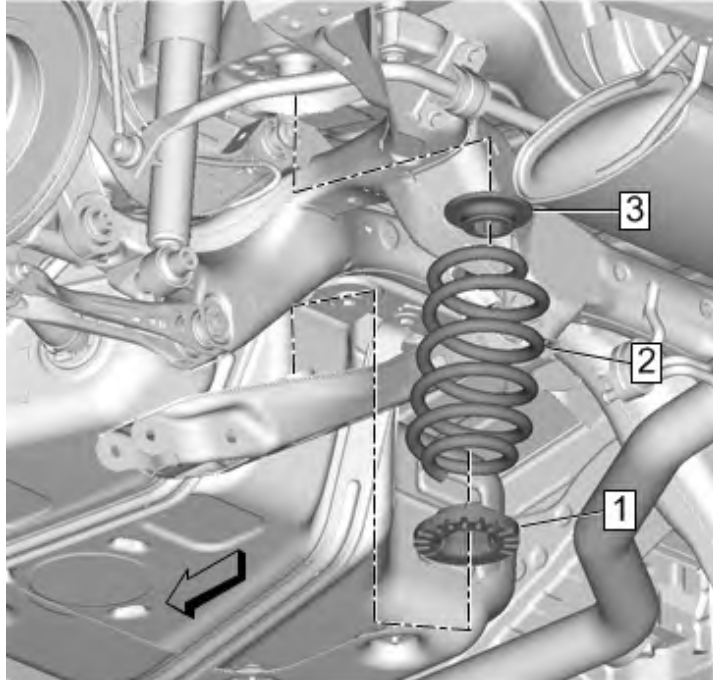


Fig. 63: Rear Coil Spring And Lower Insulator
 Courtesy of GENERAL MOTORS COMPANY

11. Remove Rear Coil Spring Lower Insulator (1)
12. Remove Rear Coil Spring (2)
13. Remove Rear Coil Spring Insulator (3)

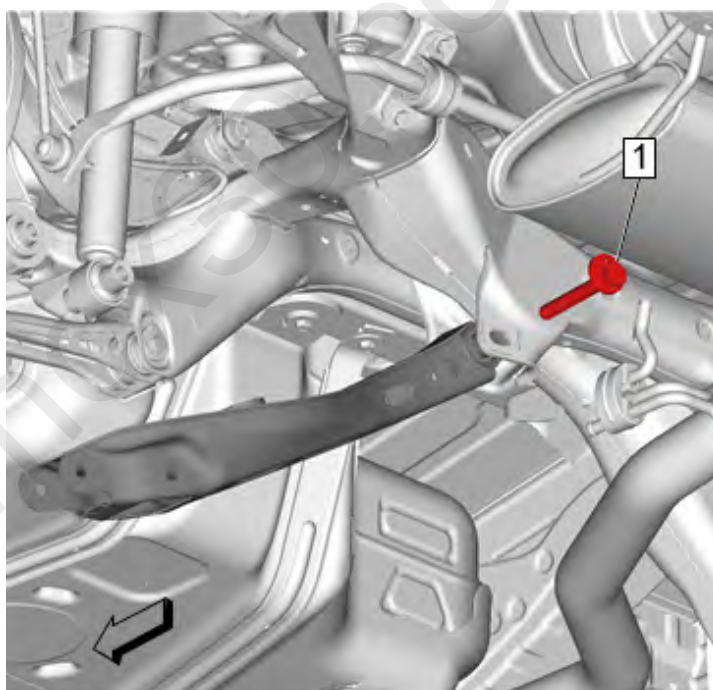


Fig. 64: Rear Suspension Lower Control Arm Inner Bolt
 Courtesy of GENERAL MOTORS COMPANY

14. Remove Rear Suspension Lower Control Arm Inner Bolt (1)

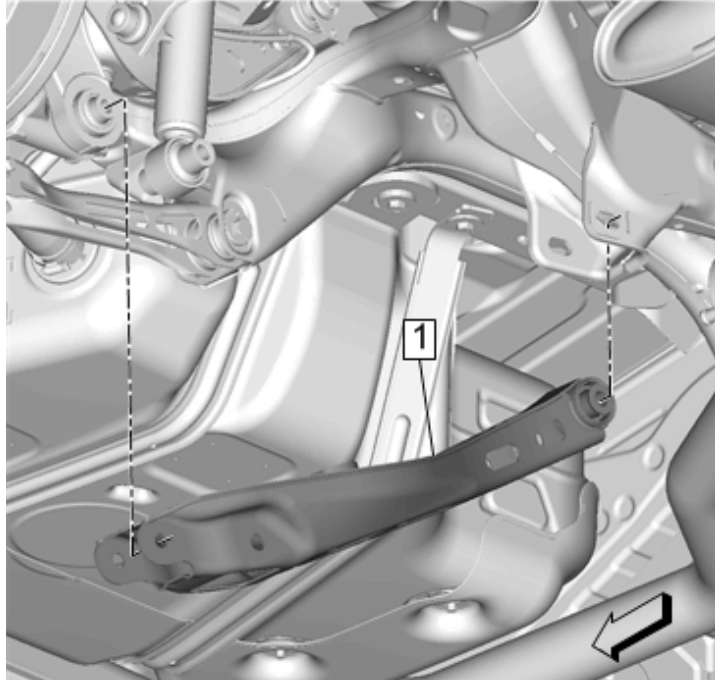


Fig. 65: Rear Suspension Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

15. Remove Rear Suspension Lower Control Arm (1)

Installation Procedure

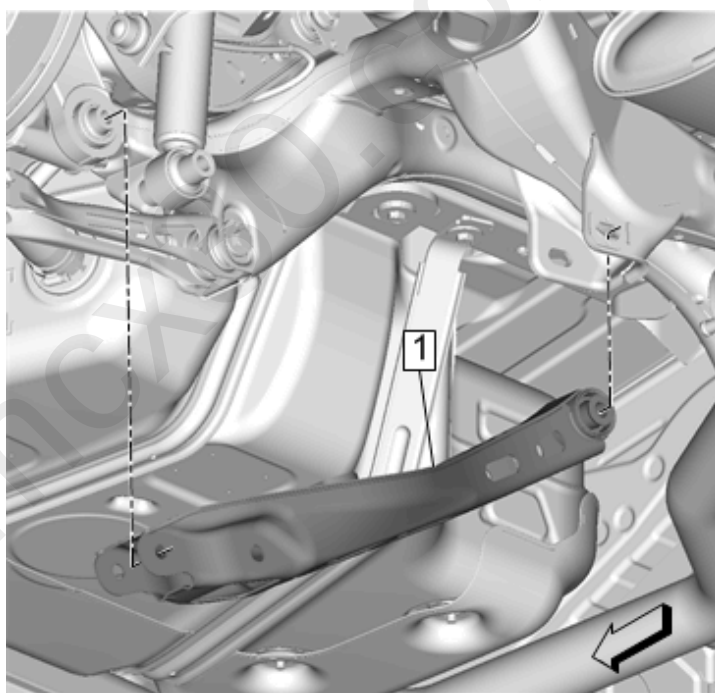


Fig. 66: Rear Suspension Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

1. Install Rear Suspension Lower Control Arm (1)

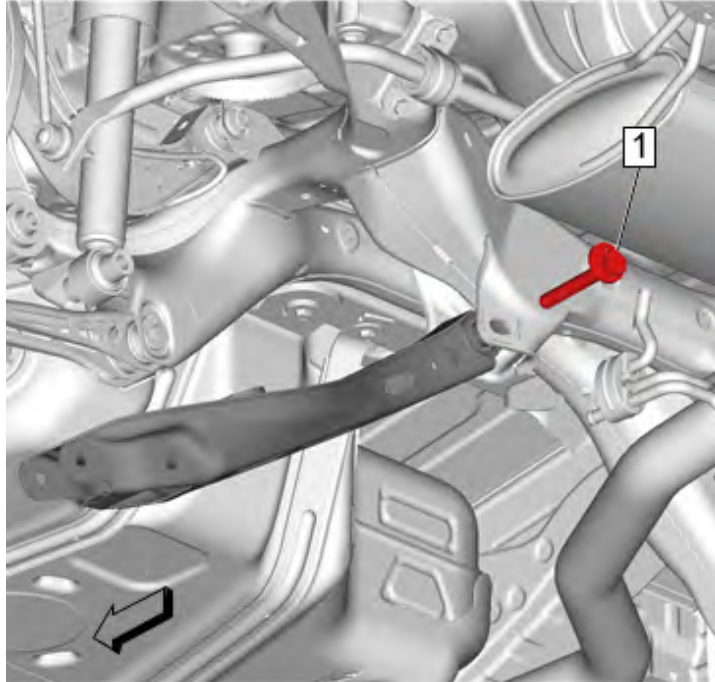


Fig. 67: Rear Suspension Lower Control Arm Inner Bolt
Courtesy of GENERAL MOTORS COMPANY

2. Install Rear Suspension Lower Control Arm Inner Bolt (1)

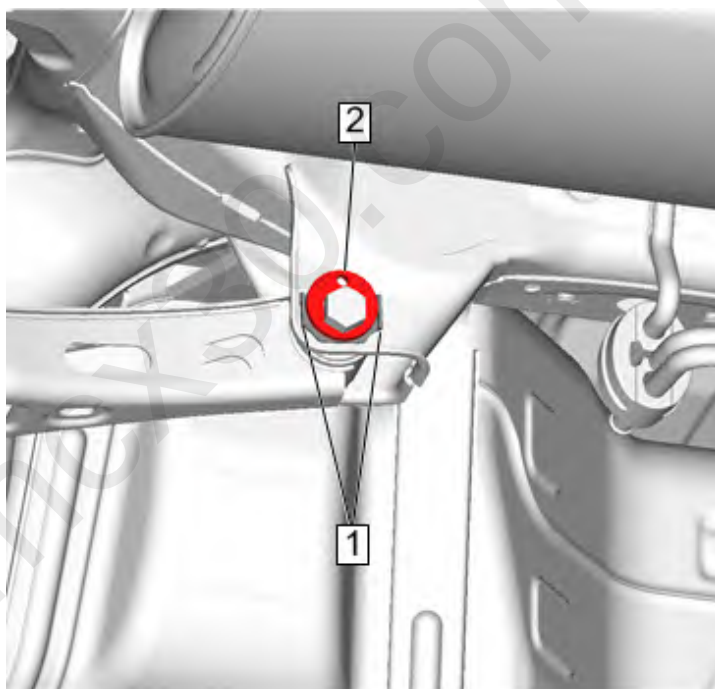


Fig. 68: Cam Washer
Courtesy of GENERAL MOTORS COMPANY

NOTE: Ensure the proper cam bolt and washer installation and orientation.

3. Install the rear suspension lower control arm inner bolt so the cam washer (2) does not overlap the raised structure on the cradle (1), and the cam scribe marks face 9 and 3 o'clock.

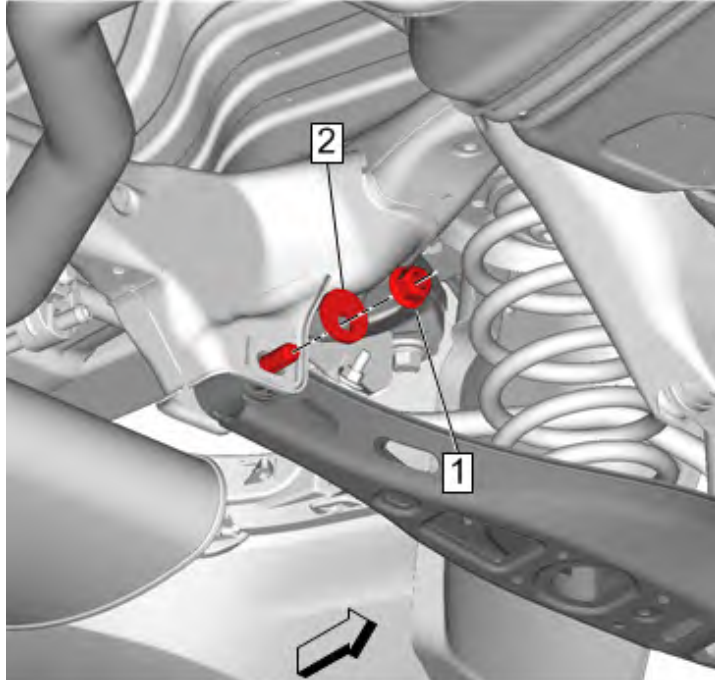


Fig. 69: Rear Suspension Lower Control Arm Adjust Cam And Inner Nut
 Courtesy of GENERAL MOTORS COMPANY

4. Install Rear Suspension Lower Control Arm Adjust Cam (2)
5. Install Rear Suspension Lower Control Arm Inner Nut (1) but do NOT tighten

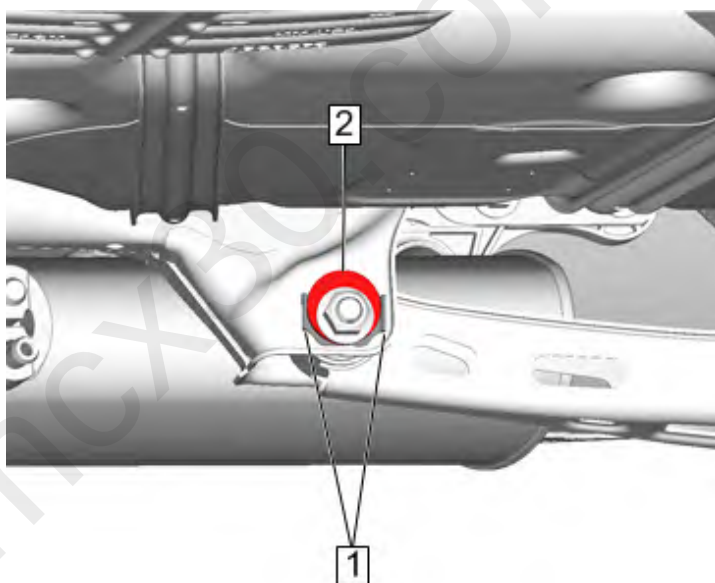


Fig. 70: Cam Washer
 Courtesy of GENERAL MOTORS COMPANY

NOTE: Ensure the proper cam nut and washer installation and orientation.

6. Install the rear suspension lower control arm inner nut so the cam washer (2) does not overlap the raised structure on the cradle (1), and the cam scribe marks face 9 and 3 o'clock.

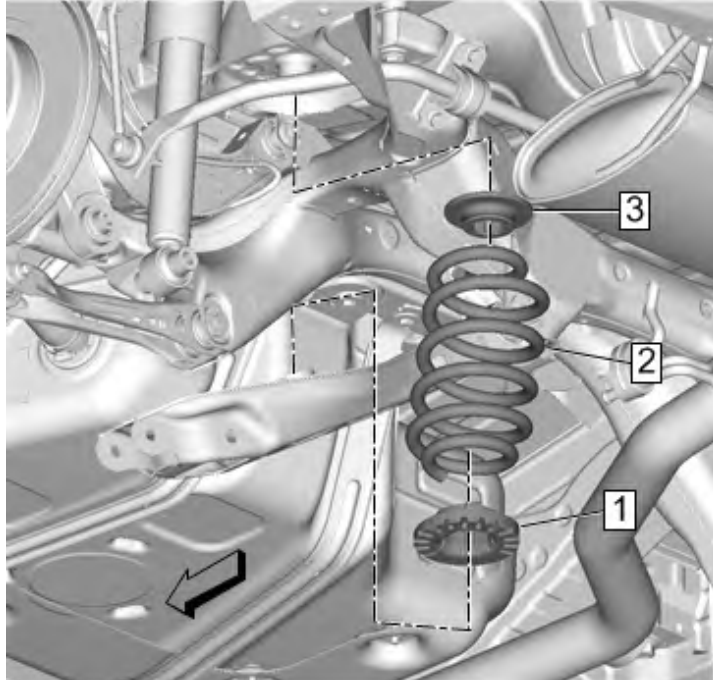


Fig. 71: Rear Coil Spring And Lower Insulator
 Courtesy of GENERAL MOTORS COMPANY

7. Install Rear Coil Spring Insulator (3).
8. Install Rear Coil Spring (2).
9. Install Rear Coil Spring Lower Insulator (1).

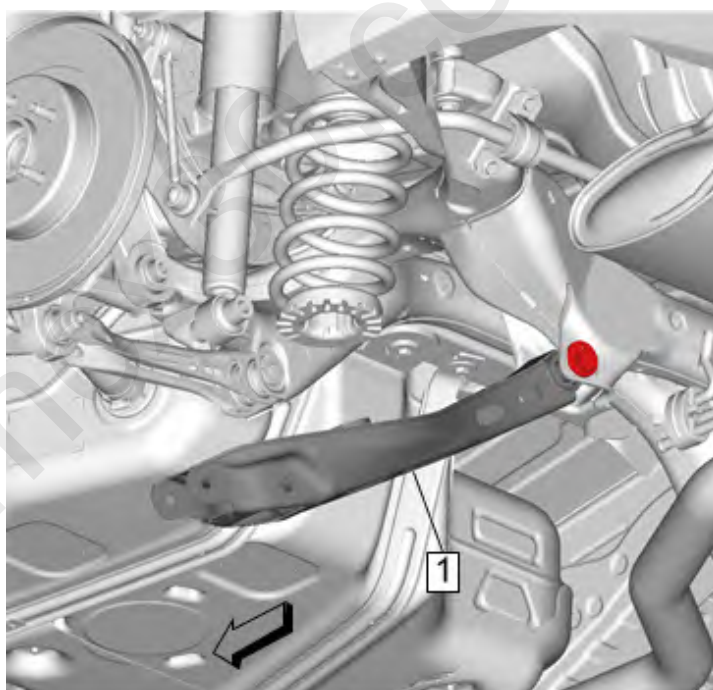


Fig. 72: Lower Control Arm
 Courtesy of GENERAL MOTORS COMPANY

10. Raise the lower control arm (1) back into position.

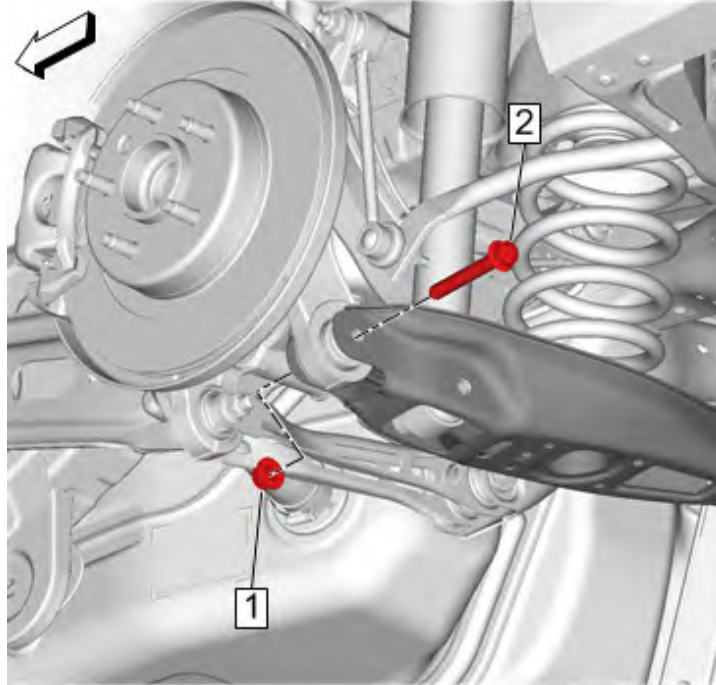


Fig. 73: Rear Suspension Lower Control Arm Outer Nut And Bolt
 Courtesy of GENERAL MOTORS COMPANY

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

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.

11. Install a NEW Rear Suspension Lower Control Arm Outer Bolt (2).
12. Install Rear Suspension Lower Control Arm Outer Nut (1).
13. Tighten Rear Suspension Lower Control Arm Outer Bolt (2).
 1. First Pass: 100 N.m (74 lb ft)
 2. Final Pass: (90-105 degrees)

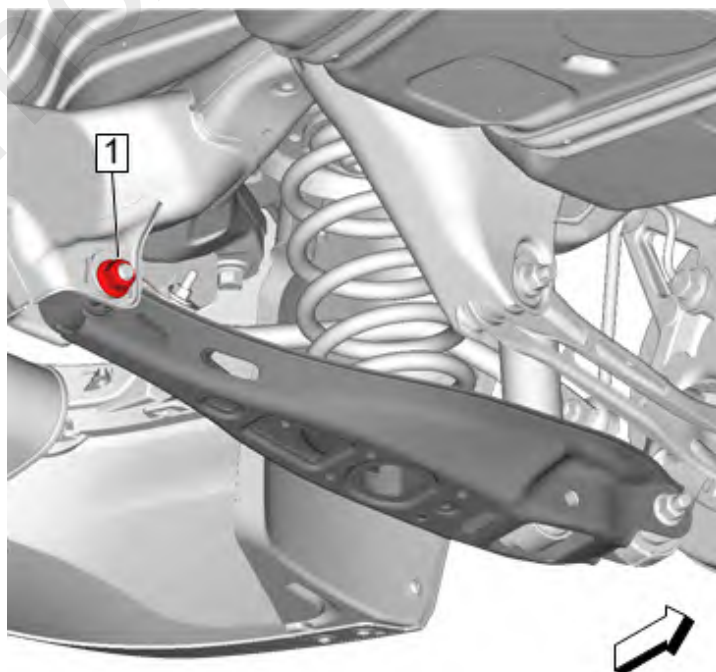


Fig. 74: Rear Suspension Lower Control Arm Inner Nut
 Courtesy of GENERAL MOTORS COMPANY

14. Install Rear Suspension Lower Control Arm Inner Nut (1) - Tighten 160 N.m (118 lb ft)

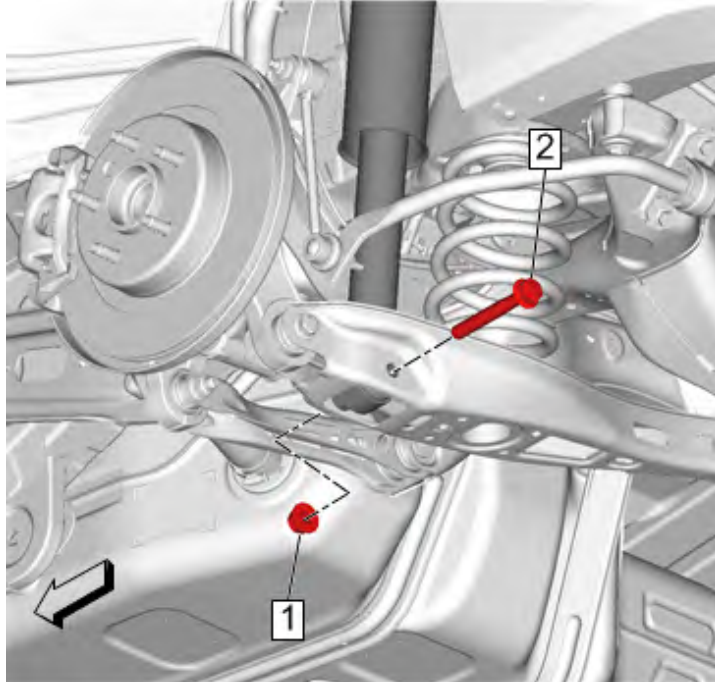


Fig. 75: Rear Shock Absorber Nut, Bolt
 Courtesy of GENERAL MOTORS COMPANY

15. Install a NEW Rear Shock Absorber Bolt (2).
16. Install Rear Shock Absorber Nut (1) - [Shock Absorber Replacement](#)
17. Connect {If equipped} Wiring Harness @ Rear Suspension Lower Control Arm.
18. Remove the support from the rear suspension lower control arm.
19. Install the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
20. Verify the rear camber specifications and adjust as necessary. Refer to [Rear Camber Adjustment](#)

WHEEL STUD REPLACEMENT

Special Tools

CH-43631 Ball Joint Remover

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

Removal Procedure

1. Remove the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
2. Remove Rear Wheel Bearing and Hub Assembly - [Rear Wheel Bearing and Hub Replacement \(AWD\)](#)[Rear Wheel Bearing and Hub Replacement \(FWD\)](#)

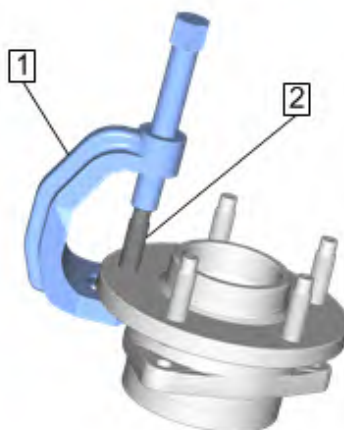


Fig. 76: Wheel Bearing And Hub Assembly
 Courtesy of GENERAL MOTORS COMPANY

3. Position the wheel bearing and hub assembly in a suitable vise.
4. Use the **CH-43631** ball joint remover (1) to remove and discard the wheel stud (2).

Installation Procedure

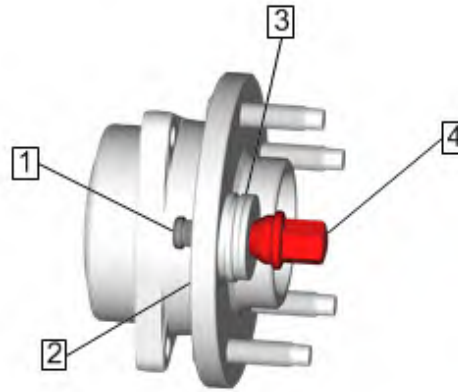


Fig. 77: Wheel Stud, Wheel Nut, Washers And Wheel Bearing Hub Flange
Courtesy of GENERAL MOTORS COMPANY

1. Install the NEW wheel stud (1) into the wheel bearing hub flange (2).
2. Add enough washers (3) in order to draw the stud into the hub flange (2).
3. Install the wheel nut (4) against the washers (3).
4. Tighten the wheel nut (4) until the head of the wheel stud (1) is fully seated against the back of the bearing hub flange (2).
5. Remove the wheel nut (4) and the washers (3).
6. Remove the wheel bearing and hub assembly from the vise.
7. Install Rear Wheel Bearing and Hub Assembly - [Rear Wheel Bearing and Hub Replacement \(AWD\)](#)[Rear Wheel Bearing and Hub Replacement \(FWD\)](#).
8. Install the rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .

DESCRIPTION AND OPERATION

REAR SUSPENSION DESCRIPTION AND OPERATION

The rear suspension system on this vehicle is of the independent link type. Rear suspension adjustment is achieved through adjustable toe links and lower control arms. The rear coil springs are retained between the body and the lower control arm. Rubber insulators isolate the coil spring at both top and bottom. The rear suspension consists of 2 shock absorbers attached to the lower control arm and the reinforced body areas.

The rear suspension system performs the following functions:

- Maintains the relationship of the rear axle to the body
- Controls the torque reaction on acceleration and braking

The suspension system consists of the following components:

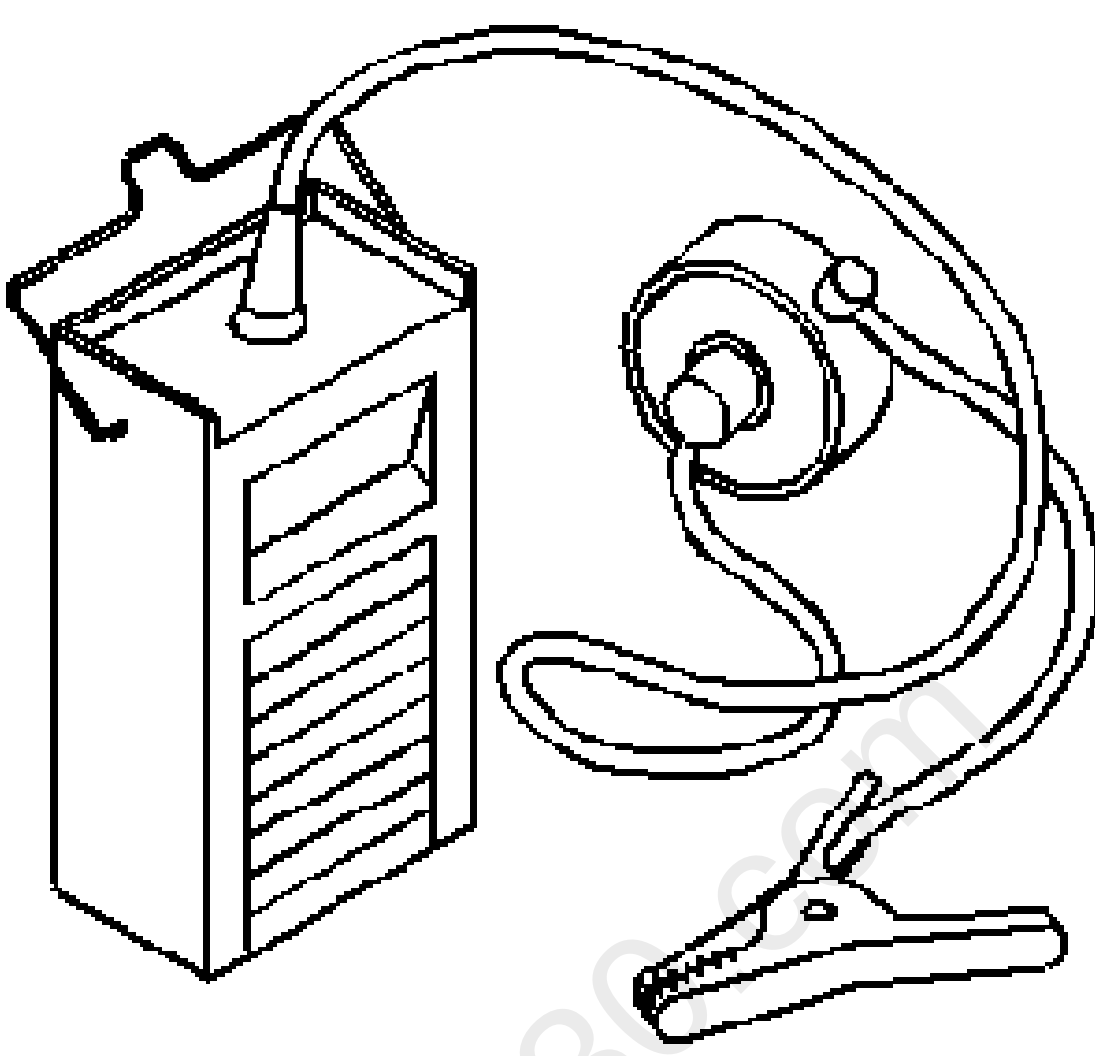
- Support assembly
- Coil springs and insulators
- Stabilizer shaft, insulators and stabilizer links
- Toe adjust links
- Upper lateral links
- Lower control arms
- Trailing arms
- Knuckles

- Wheel bearing/hub
- Shock absorbers

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Description
	CH-49455 J-49455 Ball Joint Remover

Illustration	Tool Number/Description
	J 36660-A Torque Angle Meter

2018 SUSPENSION

Suspension General Diagnosis - Equinox & Terrain

SPECIFICATIONS

TRIM HEIGHT SPECIFICATIONS

Trim Height Specifications (Z-D Height)

Model	RPO	Z-Height $\hat{A} \pm 10$ mm (0.40 in)	Cross-Z $\hat{A} \pm 10$ mm (0.40 in)	D-Height $\hat{A} \pm 10$ mm (0.40 in)	Cross-D $\hat{A} \pm 10$ mm (0.40 in)
1XC26- 1XD26, 1XG26- 1XH26, 1XL26- 1XM26- 1XN26, 1XP26- 1XR26- 1XS26, 1XU26- 1XV26, TXL26- TXM26- TXN26, 8XD26- 8XE26- 8XF26	FWD, GNA	$7 \hat{A} \pm 10$ mm (.3 $\hat{A} \pm 0.4$ in)	0	$38 \hat{A} \pm 10$ mm (1.5 $\hat{A} \pm 0.4$ in)	0
1XD26, 1XH26- 1XJ26, 1XN26, 1XP26- 1XR26- 1XS26, 1XV26, TXL26- TXM26- TXN26, 8XF26	F48, 5CW, 5CY, RLV, RR0	$15 \hat{A} \pm 10$ mm (.50 $\hat{A} \pm 0.4$ in)	0	$45 \hat{A} \pm 10$ mm (2 $\hat{A} \pm 0.4$ in)	0
1XD26- 1XF26, 1XH26, 1XM26- 1XN26, 1XR26- 1XS26, 1XW26, TXL26- TXM26	F48, RM2, RUB, RLY	$18 \hat{A} \pm 10$ mm (1 $\hat{A} \pm 0.4$ in)	0	$49 \hat{A} \pm 10$ mm (2 $\hat{A} \pm 0.4$ in)	0

Trim Height Specifications (P-R Height)

Model	RPO	Tire Size	P-Height $\hat{A} \pm 12$ mm (0.50 in)	Cross-P $\hat{A} \pm 10$ mm (0.40 in)	R-Height $\hat{A} \pm 12$ mm (0.50 in)	Cross-R $\hat{A} \pm 10$ mm (0.40 in)
-------	-----	-----------	--	---	--	---

Model	RPO	Tire Size	P-Height Â± 12 mm (0.50 in)	Cross-P Â± 10 mm (0.40 in)	R-Height Â± 12 mm (0.50 in)	Cross-R Â± 10 mm (0.40 in)
1XC26- 1XD26, 1XG26- 1XH26, 1XL26- 1XM26- 1XN26, 1XP26- 1XR26, 1XU26	FWD, 5CW, 5CX, 5CY, RR0	P225/65R17 P235/50R19	788 Â± 12 mm (31 Â± 0.4 in)	0	804 Â± 12 mm (32 Â± 0.4 in)	0
1XH26, 1XM26- 1XN26, 1XR26- 1XS26, 1XV26, 8XD26- 8XE26	FWD, RM2, RLY, RUB	P225/60R18	790 Â± 12 mm (31 Â± 0.4 in)	0	807 Â± 12 mm (32 Â± 0.4 in)	0
1XN26, 1XS26, 8XF26	FWD, RR0, RLV	P235/50R19	788 Â± 12 mm (31 Â± 0.4 in)	0	804 Â± 12 mm (32 Â± 0.4 in)	0
TXL26- TXM26	FWD, 5CW, 5CX	P225/65R17	788 Â± 12 mm (31 Â± 0.4 in)	0	816 Â± 12 mm (32 Â± 0.4 in)	0
TXN26	FWD, RR0	P235/50R19	789 Â± 12 mm (31 Â± 0.4 in)	0	816 Â± 12 mm (32 Â± 0.4 in)	0
TXL26- TXM26	FWD, RUB	P225/60R18	791 Â± 12 mm (31 Â± 0.4 in)	0	818 Â± 12 mm (32 Â± 0.4 in)	0
1XD26, 1XH26, 1XN26, 1XP26- 1XR26, 1XV26	F48, 5CW, 5CY, 5CX	P225/65R17	798 Â± 12 mm (31 Â± 0.4 in)	0	809 Â± 12 mm (32 Â± 0.4 in)	0
1XD26- 1XF26, 1XH26, 1XM26, 1XN26, 1XR26- 1XS26, 1XW26	F48, RM2, RUB, RLY	P225/60R18	801 Â± 12 mm (31 Â± 0.4 in)	0	812 Â± 12 mm (32 Â± 0.4 in)	0
1XJ26, 1XN26, 1XR26, 1XS26, 8XF26	F48, RR0, RLV	P235/50R19	799 Â± 12 mm (31 Â± 0.4 in)	0	810 Â± 12 mm (32 Â± 0.4 in)	0
TXL26- TXM26	F48, 5CW, 5CY,	P225/65R17	791 Â± 12 mm (31 Â± 0.4 in)	0	816 Â± 12 mm (32 Â± 0.4 in)	0
TXN26	F48, RR0	P235/50R19	791 Â± 12 mm (31 Â± 0.4 in)	0	816 Â± 12 mm (32 Â± 0.4 in)	0
TXL26- TXM26	F48, RUB	P225/60R18	794 Â± 12 mm (31 Â± 0.4 in)	0	818 Â± 12 mm (32 Â± 0.4 in)	0

DIAGNOSTIC INFORMATION AND PROCEDURES

SYMPTOMS - SUSPENSION GENERAL DIAGNOSIS

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

Review the system description and operation in order to familiarize yourself with the system functions. Refer to the appropriate description and operation:

- [General Description](#) for the front suspension
- [General Description](#) for tires and wheels

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of any of the suspension subsystems.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Inspect for proper tire size and inflation pressure.

Symptom List

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

- [Ride Diagnosis](#)
- [Vehicle Leads/Pulls](#)
- [Suspension Bottoms](#)
- [Torque Steer](#)
- [Memory Steer](#)

RIDE DIAGNOSIS

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	IMPORTANT: Verify the vehicle suspension package RPO. Verify that the ride is too soft or too hard. Does the vehicle ride normally?	System OK	Go to Step 3
3	Check the tire inflation and adjust to specifications. Did you adjust the tire pressure?	Go to Step 6	Go to Step 4
4	Inspect the vehicle trim height. Refer to Trim Height Inspection Did you find and correct the condition?	Go to Step 6	Go to Step 5
5	Inspect the following suspension components for wear or damage: • Shock Absorbers - Refer to Suspension Strut and Shock Absorber Testing - On Vehicle • Springs Did you find and correct the condition?	Go to Step 6	-
6	Drive the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

VEHICLE LEADS/PULLS

Step	Action	Yes	No
DEFINITION: At a constant highway speed on a typical straight road, lead/pull is the amount of effort required at the steering wheel to maintain the vehicle's straight path.			
1	Did you review the General Description and perform the visual/physical inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis

Step	Action	Yes	No
2	Road test the vehicle in order to verify the complaint. Does the vehicle operate normally?	System OK	Go to Step 3
3	Inspect the tire/wheel assemblies for the following conditions: • Correct tire pressure - Refer to the tire placard. • Correct tire size - Refer to the tire placard. • Abnormal tire wear or damage Did you find and correct the condition?	Go to Step 9	Go to Step 4
4	Perform the Radial Tire Lead/Pull Correction . Did you find and correct the condition?	Go to Step 9	Go to Step 5
5	Inspect and correct/adjust the suspension and steering systems for the following conditions: • Vehicle trim height - Refer to Trim Height Specifications. • Excessively worn, loose, or damaged components Did you find and correct the condition?	Go to Step 9	Go to Step 6
6	Inspect the brake system for brake drag. With the vehicle suspended on a hoist, brake drag can be identified by rotating each wheel several times and observing whether more force is need to rotate the left wheel or the right wheel. Refer to Disc Brake System Diagnosis . Did you find and correct the condition?	Go to Step 9	Go to Step 7
7	Inspect the wheel alignment and adjust as necessary. Refer to Wheel Alignment Measurement . Did you correct the condition?	Go to Step 9	Go to Step 8
8	Inspect the steering gear for unequal effort. The vehicle must be suspended on a hoist, the engine running, and the transmission in PARK or NEUTRAL. Grasp the tire assembly and manually simulate a turn from the left of center and the right of center observing whether more force is needed to turn to the left or to the right. If this condition exists replace the steering gear. Did you correct the condition?	System OK	Go to Step 3
9	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

SUSPENSION BOTTOMS

Step	Action	Yes	No
DEFINITION: A loud bang or thump that can usually be felt and/or heard when the vehicle is driven over bumps. This condition is commonly noticed when the vehicle trim height is too low.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Verify that the suspension bottoms. Does the vehicle operate normally?	System OK	Go to Step 3
3	Inspect for vehicle overloading and correct the overloading condition as necessary. Refer to Vehicle Certification, Tire Placard, Anti-Theft, And Service Parts ID Label for specifications. Did you find and correct the condition?	Go to Step 6	Go to Step 4

Step	Action	Yes	No
4	Inspect the following components: - Inspect the shock absorbers. Refer to Suspension Strut and Shock Absorber Testing - On Vehicle. - Inspect for damaged coil springs, torsion bar or leaf springs and replace as necessary. Did you find and correct the condition?	Go to Step 6	Go to Step 5
5	Inspect the vehicle trim height. Refer to Trim Height Inspection. Did you complete the trim height inspection procedure?	Go to Step 6	-
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

TORQUE STEER

Step	Action	Yes	No
DEFINITION: On a dry, smooth, flat road, the vehicle has a left or right steering force only during acceleration.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	- Drive the vehicle on a straight, smooth, flat road. - Press the accelerator and determine if any additional steering input is required to maintain a straight ahead direction. - Repeat this test with the vehicle traveling in the opposite direction in order to eliminate crosswind effects. Lead/pull caused by unlevel roads and crosswinds are considered normal. Does the vehicle exhibit torque steer when the accelerator is pressed?	Go to Step 3	System OK
3	- Drive the vehicle on a straight, smooth, flat road at 64 - 97 km/h (40 - 60 mph). - Remove your foot from the accelerator. - Shift the transmission into NEUTRAL in order to allow the vehicle to coast. - Is any additional steering input required to maintain a straight ahead direction? - Repeat this test with the vehicle traveling in the opposite direction in order to eliminate crosswind effects. Lead/pull caused by unlevel roads and crosswinds are considered normal. Does the vehicle direction change when the steering wheel is momentarily released?	Go to Vehicle Leads/Pulls	Go to Step 4
4	Inspect the front suspension and powertrain mounts for worn or damaged components and repair as necessary. Did you find and correct the condition?	Go to Step 6	Go to Step 5
5	Inspect the vehicle trim height. Refer to Trim Height Inspection. Did you find and correct the condition?	Go to Step 6	-

Step	Action	Yes	No
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	-

MEMORY STEER

Step	Action	Yes	No
DEFINITION: A lead or pull in the direction the driver previously turned the vehicle. Additionally, after turning in the opposite direction, the vehicle will want to lead or pull in that direction.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Verify that memory steer is present. Does the system operate normally?	System OK	Go to Step 3
3	1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Lubricate the tie rod ends and the ball joints if applicable. 3. Inspect the suspension system for worn or damaged components. 4. Repair as necessary. Did you find and correct the condition?	Go to Step 7	Go to Step 4
4	Inspect for binding strut bearings. 1. Disconnect the strut from the steering knuckle. 2. If the strut is abnormally difficult to rotate, repair or replace the upper bearing mount. Did you find and complete the repair?	Go to Step 7	Go to Step 5
5	Inspect for binding in the lower ball joints. If joint is binding, replace the joint. Did you find and complete the repair?	Go to Step 7	Go to Step 6
6	Inspect the wheel alignment and adjust as necessary. Refer to Wheel Alignment Measurement . Did you complete the wheel alignment?	Go to Step 7	-
7	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	-

NOISE DIAGNOSIS - FRONT SUSPENSION

Step	Action	Yes	No
DEFINITION: Any noise emitted from the front of the vehicle that is induced by VEHICLE SPEED or DRIVING TERRAIN as related to the front suspension.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Attempt to duplicate the condition. Road test the vehicle. Did you duplicate the condition?	Go to Step 3	System OK
3	Is the noise reactive to vehicle load or speed?	Go to Step 4	Go to Step 7

Step	Action	Yes	No
4	Inspect the tires for the following condition: • Proper tire inflation and adjust as necessary. • Unusual tire wear, correct as necessary. Refer to Vibration Analysis - Tire and Wheel • Inspect the wheel nuts for looseness and tighten as necessary. Refer to Fastener Specifications Did you find and correct the condition?	Go to Step 14	Go to Step 5
5	Inspect the front wheel bearings. Refer to Wheel Bearings Diagnosis Did you find and correct the condition?	Go to Step 14	Go to Step 6
6	Inspect for front axle or transaxle noises. Refer to Noise and Vibration Analysis Did you find and correct the condition?	Go to Step 14	Go to Step 7
7	Bounce the front of the vehicle in order to duplicate the noise. Did you duplicate the noise?	Go to Step 8	Go to Step 9
8	1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Inspect the front suspension components for looseness. Refer to Fastener Specifications 3. Inspect the front suspension components for damage and repair as necessary. Did you find and correct the condition?	Go to Step 14	Go to Step 9
9	1. Install a listening device, if existing. 2. Bounce the front of the vehicle, preferably by using a listening device, in order to locate the source of the noise. If necessary road test the vehicle. 3. Repair or replace any damaged components as necessary. Did you find and correct the condition?	Go to Step 14	Go to Step 10
10	Inspect the ball joints and steering components for the following conditions: • Lack of lubrication where applicable • Looseness in the ball joints. Refer to Ball Joint Inspection • Looseness in the tie rods. Refer to Steering Linkage Outer Tie Rod Replacement Did you find and correct the condition?	Go to Step 14	Go to Step 11
11	Inspect for damaged shock absorbers. Refer to Suspension Strut and Shock Absorber Testing - On Vehicle Did you find and correct the condition?	Go to Step 14	Go to Step 12

Step	Action	Yes	No
12	Inspect the front stabilizer shaft and stabilizer shaft links for damage and repair as necessary. - Refer to Stabilizer Shaft Replacement (Equinox, Terrain, FWD, LYX) Stabilizer Shaft Replacement (Equinox, Terrain, AWD, LYX) Stabilizer Shaft Replacement (Equinox, Terrain, FWD, LH7) Stabilizer Shaft Replacement (Equinox, Terrain, AWD, LH7) Stabilizer Shaft Replacement (Equinox, Terrain, FWD, LTG) Stabilizer Shaft Replacement (Equinox, Terrain, AWD, LTG) - Refer to Stabilizer Shaft Link Replacement (Equinox) Stabilizer Shaft Link Replacement (Terrain) Did you find and correct the condition?	Go to Step 14	Go to Step 13
13	Inspect for control arm damage and repair as necessary. Refer to Lower Control Arm Replacement (Equinox) Lower Control Arm Replacement (Terrain). Did you find and correct the condition?	Go to Step 14	-
14	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

NOISE DIAGNOSIS - REAR SUSPENSION

Step	Action	Yes	No
DEFINITION: Any noise emitted from the rear of the vehicle that is induced by VEHICLE SPEED or DRIVING TERRAIN as related to the rear suspension.			
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Attempt to duplicate the condition. Road test the vehicle. Did you duplicate the condition?	Go to Step 3	System OK
3	Is the noise reactive to vehicle load or speed?	Go to Step 4	Go to Step 6
4	Perform the following inspections: - Inspect and adjust the tire pressure. - Inspect for unusual tire wear. Refer to Vibration Analysis - Tire and Wheel - Inspect the wheel nuts for looseness. Refer to Fastener Specifications Did you find and correct the condition?	Go to Step 10	Go to Step 5
5	Inspect the rear wheel bearings. Refer to Wheel Bearings Diagnosis Did you find and correct the condition?	Go to Step 10	Go to Step 6
6	Bounce the rear of the vehicle in order to duplicate the noise. Did you duplicate the noise?	Go to Step 7	Go to Step 9

Step	Action	Yes	No
7	1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Inspect the rear suspension components for looseness. Refer to Fastener Specifications 3. Inspect the rear suspension components for damage and repair as necessary. Did you find and correct the condition?	Go to Step 10	Go to Step 8
8	Inspect the rear shock absorber. Refer to Suspension Strut and Shock Absorber Testing - On Vehicle Did you find and correct the condition?	Go to Step 10	Go to Step 9
9	1. Install a listening device, if existing. 2. Bounce the rear of the vehicle, preferably by using a listening device, in order to locate the source of the noise. If necessary, road test the vehicle. 3. Repair or replace any defective component, as necessary. Did you find and correct the condition?	Go to Step 10	System OK
10	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

BALL JOINT INSPECTION

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Clean and inspect the ball joint seal for cuts or tears. If the ball joint seal is damaged, replace the lower control arm. Refer to [Lower Control Arm Replacement \(Equinox\)](#). [Lower Control Arm Replacement \(Terrain\)](#) .

FRONT BALL JOINT INSPECTION

Special Tools

J 8001 Dial Indicator Set

IMPORTANT:

- The vehicle must rest on a level surface.
- The vehicle must be stable. Do not rock the vehicle on the floor stands.

1. Raise and suitably support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Clean and inspect the ball joint seal for cuts or tears. If the ball joint seal is damaged, replace the ball joint. Refer to [Lower Control Arm Replacement \(Equinox\)](#). [Lower Control Arm Replacement \(Terrain\)](#) .
3. Support the lower control arm with a floor stand as far outboard as possible and raise the suspension to just below ride height.

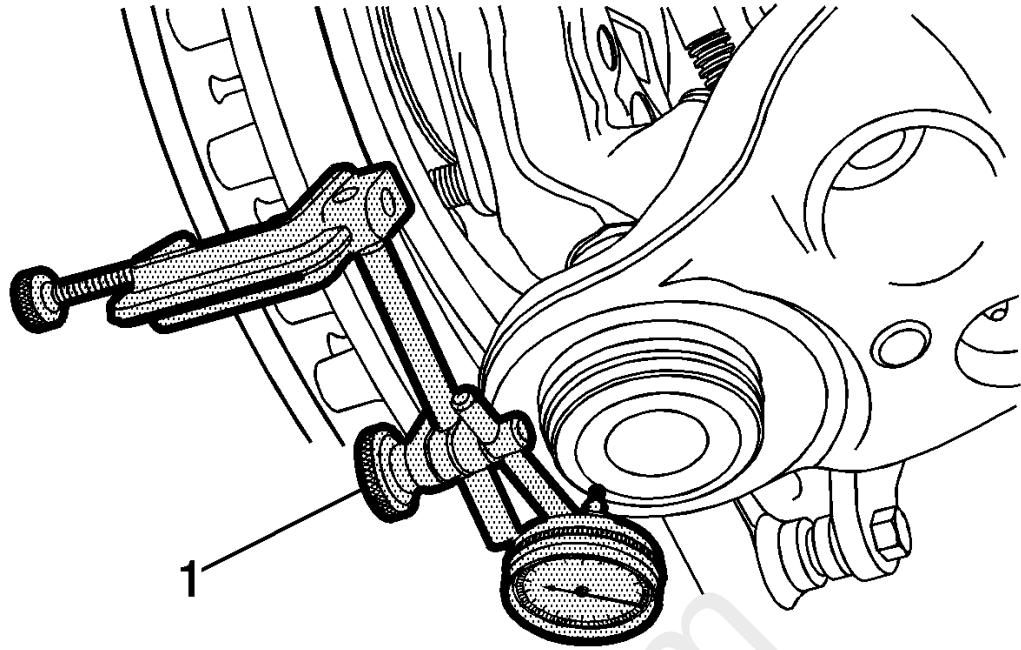


Fig. 1: Measuring Vertical Lash In Ball Joint
 Courtesy of GENERAL MOTORS COMPANY

4. Install **J 8001** Dial Indicator Set or a suitable dial indicator in a way to measure vertical lash in the ball joint.

IMPORTANT: Do not pry between the lower control arm and the wheel drive shaft boot.

5. Gently lift or pry the suspension to induce ball joint movement.
6. If the dial indicator reading is more than 0.5 mm (0.020 in), replace the ball joint. Refer to [Lower Control Arm Replacement \(Equinox\)](#) [Lower Control Arm Replacement \(Terrain\)](#) .

SUSPENSION STRUT AND SHOCK ABSORBER TESTING - ON VEHICLE

Step	Action	Yes	No
1	Did you review the General Description and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Suspension General Diagnosis
2	Verify that the customer's concern is present. Does the vehicle operate normally?	System OK	Go to Step 3
3	IMPORTANT: A light film of oil on the top portion of the shock reservoir is normal. Inspect each strut or shock absorber for external fluid leakage. Is a strut or shock absorber leaking?	Go to Step 5	Go to Step 4

Step	Action	Yes	No
4	1. Use your hands in order to lift up and push down each corner of the vehicle 3 times. 2. Remove your hands from the vehicle. 3. Locate a shock or strut that exceeds 2 cycles. Did you locate shock or strut that exceeds 2 cycles?	Go to Step 5	Go to Step 6
5	IMPORTANT: Inspect the vehicle trim height in order to correct any possible causes of shock/strut failures. Refer to <u>Trim Height Inspection</u> . Replace the strut or shock absorber. Refer to <u>Strut, Strut Component, or Spring Replacement (Equinox, Terrain)</u> , or <u>Shock Absorber Replacement</u> .Did you complete the repair?	Go to Step 6	-
6	Operate the vehicle in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

WHEEL BEARINGS DIAGNOSIS

Step	Action	Values	Yes	No
1	Did you review the General Description and perform the necessary inspections?	-	Go to Step 2	Go to <u>Symptoms - Suspension General Diagnosis</u>
2	Road test the vehicle in order to verify the customer's complaint. Does the vehicle operate normally?	-	System OK	Go to Step 3
3	1. Raise and support the vehicle. Refer to <u>Lifting and Jacking the Vehicle</u> . 2. Inspect for tire or wheel damage. Did you find and correct the condition?	-	Go to Step 6	Go to Step 4
4	Road test the vehicle to verify the location of the wheel bearing noise. Did you locate the source of the wheel bearing noise?	-	Go to Step 5	Go to Step 2
5	Replace the wheel bearing. Refer to <u>Front Wheel Bearing and Hub Replacement (Equinox)</u> <u>Front Wheel Bearing and Hub Replacement (Terrain)</u> , or <u>Rear Wheel Bearing and Hub Replacement (AWD)</u> <u>Rear Wheel Bearing and Hub Replacement (FWD)</u> . Did this complete the repair?	-	Go to Step 6	-
6	Road test the vehicle to verify the repair. Does the vehicle operate normally?	-	System OK	Go to Step 3

TRIM HEIGHT INSPECTION

Trim Height Measurement

Trim height is a predetermined measurement relating to vehicle ride height. Incorrect trim heights can cause the vehicle to bottom out over bumps, damage to the suspension components and symptoms similar to wheel alignment problems. Check the trim heights when diagnosing suspension concerns and before checking the wheel alignment.

Perform the following before measuring the trim heights:

- Set the tire pressure to the specifications shown on the tire placard.

NOTE:

One U.S. gallon of gasoline weighs approximately 6.5 lbs. One liter of gasoline weighs approximately 0.7 kg.

- Check the fuel level. Add additional weight if necessary to simulate a full tank.
- Make sure the passenger and rear compartments are empty, except for the spare tire.
- Make sure the vehicle is on a flat and level surface, such as an alignment rack.
- Check that all the vehicle doors are securely closed.
- Check that the vehicle hood and rear deck lids are securely closed.
- Check for installed after market accessories or modifications that could affect trim height measurement:
 - Larger or Smaller than production wheels and tires.
 - Lifting or Lowering Kits
 - Wheel Opening Flares or Ground Affects

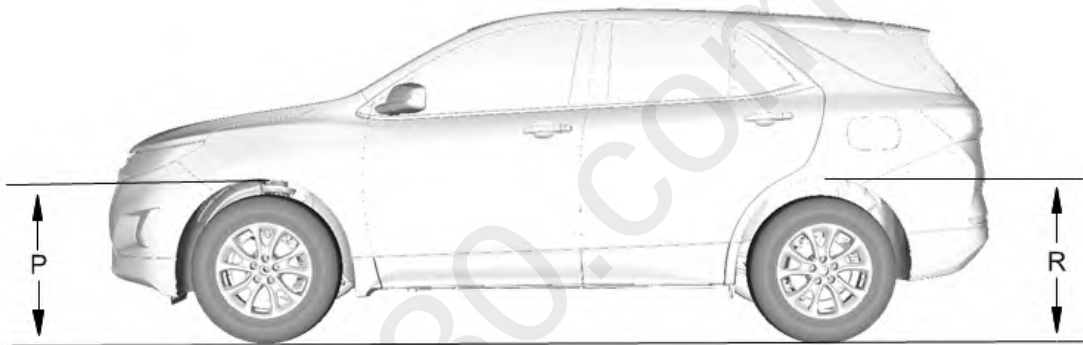
Measuring the P and R Dimension

Fig. 2: Identifying P And R Height Measurement Definitions

Courtesy of GENERAL MOTORS COMPANY

Measurement Definitions

P Height: The vertical distance from the ground to the top of the wheel opening through the centerline of the front wheel.

R Height: The vertical distance from the ground to the top of the wheel opening through the centerline of the rear wheel.

Use the following procedures to measure the P and R dimensions:

NOTE:

- **Measure from the center of the wheel well opening to the ground.**
- **The left and right P and R height differences should be no more than 10 mm (0.39 in).**

1. Push the front bumper down a minimum of 25 mm (1 in) and release. Perform this step three times.
2. Measure and record the trim height per the "Measurement Definitions" above.
3. Lift the bumper up a minimum of 25 mm (1 in) and release. Perform this step three times.
4. Measure and record the trim height per the "Measurement Definitions" above.

5. The true P height measurement is the average of the measurements taken in step 2 and 4. Refer to [Trim Height Specifications](#)
6. Repeat the above steps at the rear of the vehicle for the R heights.
7. If the P and R heights are outside of the specifications, measure the Z & D heights.

Measuring the Z Dimension

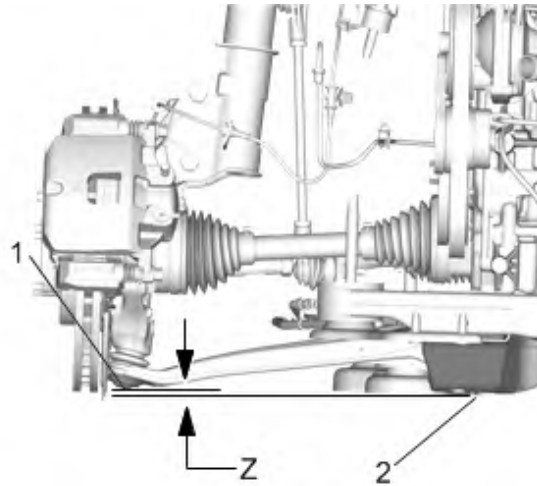


Fig. 3: Identifying Z Height Measurement Definitions

Courtesy of GENERAL MOTORS COMPANY

Measurement Definitions

The Z Height: The vertical distance from the bottom of the lower ball joint cup (1) to the bottom of the cradle (2) directly inward from the bottom of the ball joint cup.

Use the following procedures to measure the Z dimensions:

NOTE: The left and right Z height differences should be no more than 10 mm (0.39 in).

1. Push the front bumper down a minimum of 25 mm (1 in) and release. Perform this step three times.
2. Measure and record the trim height per the "Measurement Definitions" above.
3. Lift the front bumper a minimum of 25 mm (1 in) and release. Perform this step three times.
4. Measure and record the trim height per the "Measurement Definitions" above.
5. The true Z height dimension is the average of the measurements taken in steps 2 and 4. Refer to [Trim Height Specifications](#)
6. If these measurements are out of specifications, inspect for the following conditions:
 - Worn or damaged suspension components
 - Collision damage

D Height Measurement

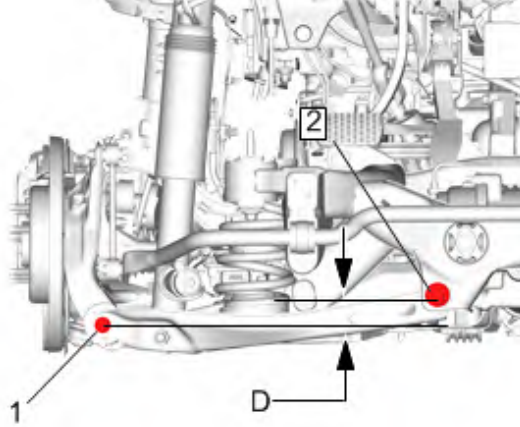


Fig. 4: Identifying D Height Measurement Definitions

Courtesy of GENERAL MOTORS COMPANY

Measurement Definitions

The D Height: The vertical distance from the center of the bolt head attaching the lower control arm to the knuckle (1) to the center of the bolt head attaching the lower control arm to the cradle (2).

Use the following procedure to check the D dimension:

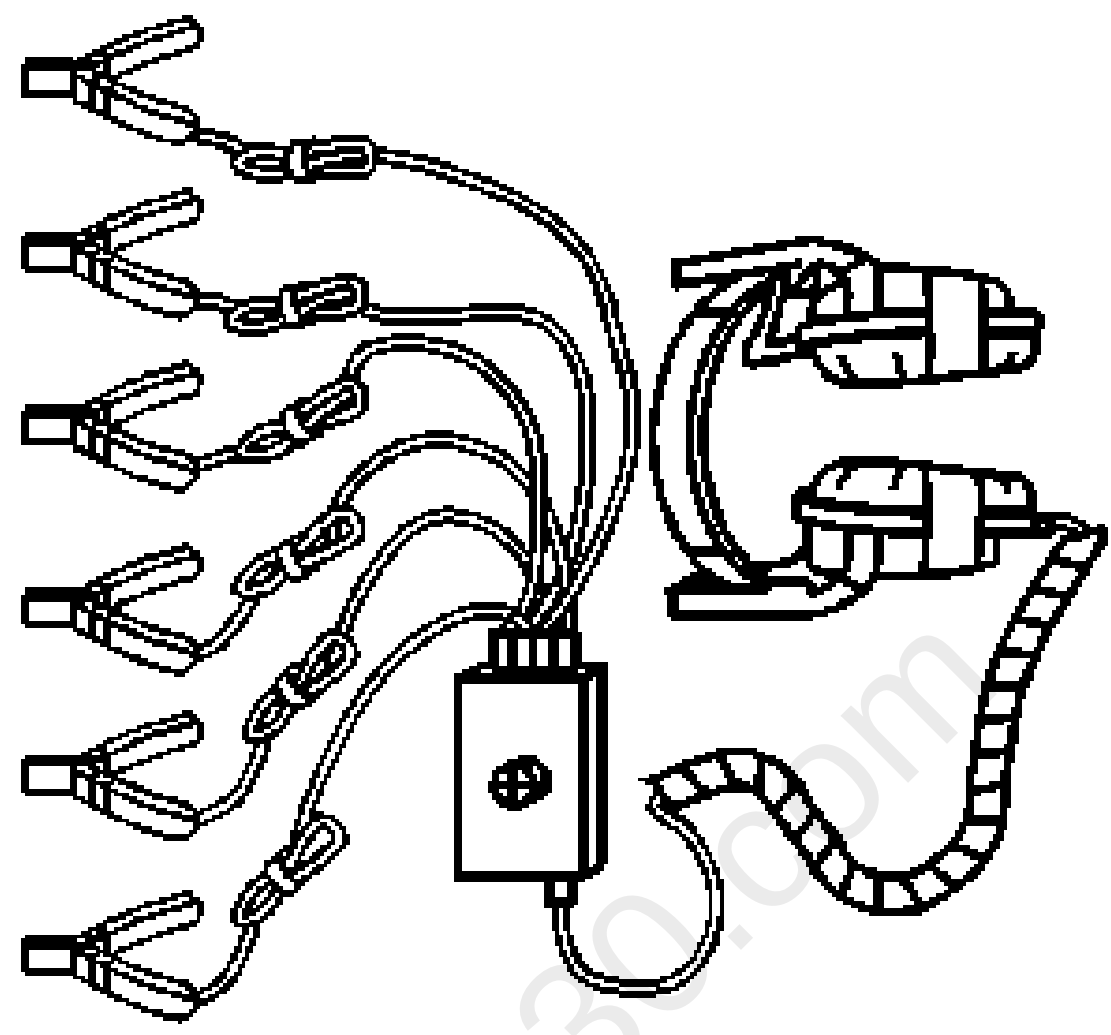
NOTE: The left and right D height difference should be no more than 10 mm (0.39 in).

1. Push the rear bumper down a minimum of 25 mm (1 in) and release. Perform this step three times.
2. Measure and record the trim height per the "Measurement Definitions" above.
3. Lift the rear bumper up a minimum of 25 mm (1 in) and release. Perform this step three times.
4. Measure and record the trim height per the "Measurement Definitions" above.
5. The true D height is the average of the measurements taken in steps 2 and 4. Refer to [Trim Height Specifications](#)
6. If these measurements are out of specifications, inspect for the following conditions:
 - Worn or damaged suspension components
 - Collision damage

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Description

Illustration	Tool Number/Description
	CH-39570 J-39570 Chassis Ear

--

Illustration	Tool Number/Description
	J-8001 Dial Indicator Set

2018 SUSPENSION

Tires And Wheels - Equinox & Terrain

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

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

Application	Specification
	Metric (English)
Wheel Nut	140 N.m (103 lb ft)

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	Canadian Part Number
Aluminum Wheel	Adhesive/Sealant	12378478	88900041
Aluminum Wheel	3M [®] General Purpose Cleaner	08984	-
Wheel	Mounting Lubricant	12345884	88863415
Wheel to Hub	Lubricant	1051344	993037

DIAGNOSTIC INFORMATION AND PROCEDURES

TIRE DIAGNOSIS - IRREGULAR OR PREMATURE WEAR

Tire Wear

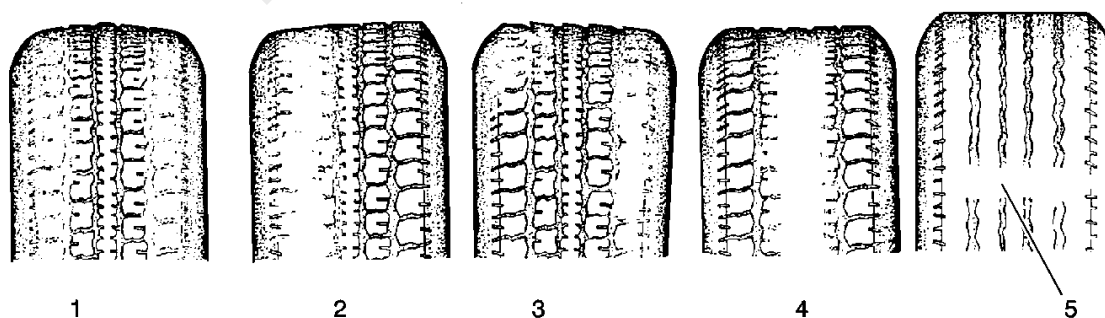


Fig. 1: Identifying Types Of Tire Wear

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Under-Inflation, Hard Cornering, Lack of Regular Rotation
2	Incorrect Wheel Alignment, Hard Cornering, Lack of Regular Rotation
3	Incorrect Wheel Alignment
4	Over-Inflation, Heavy Acceleration, Lack of Regular Rotation

Callout	Component Name
5	Normal Wear to the Wear Indicator

Inspection Procedure

1. Inspect the front tire wear.
2. Inspect the rear tire wear.
3. Rotate the tires if any of the following conditions exist:
 - The amount of time or mileage since the last tire rotation matches the maintenance schedule.
 - The outer tread blocks are worn more than the middle tread blocks (1).
 - The outer tread blocks are worn more than the inner tread blocks (2).
 - The middle tread blocks are worn more than the outer tread blocks (4).
4. Measure the wheel alignment if any of the following conditions exist:
 - The tread blocks have feathered edges (3).
 - The outer tread blocks are worn more than the inner tread blocks (2).
 - The inner tread blocks are worn more than the outer tread blocks (2).
5. Inspect the struts or the shock absorbers if the tire tread exhibits a cupped appearance (3).

WHEEL MOUNTING SURFACE CHECK

Replace any wheels that are bent or dented, or have excessive lateral or radial runout. Wheels with runout greater than specified may cause objectionable vibrations.

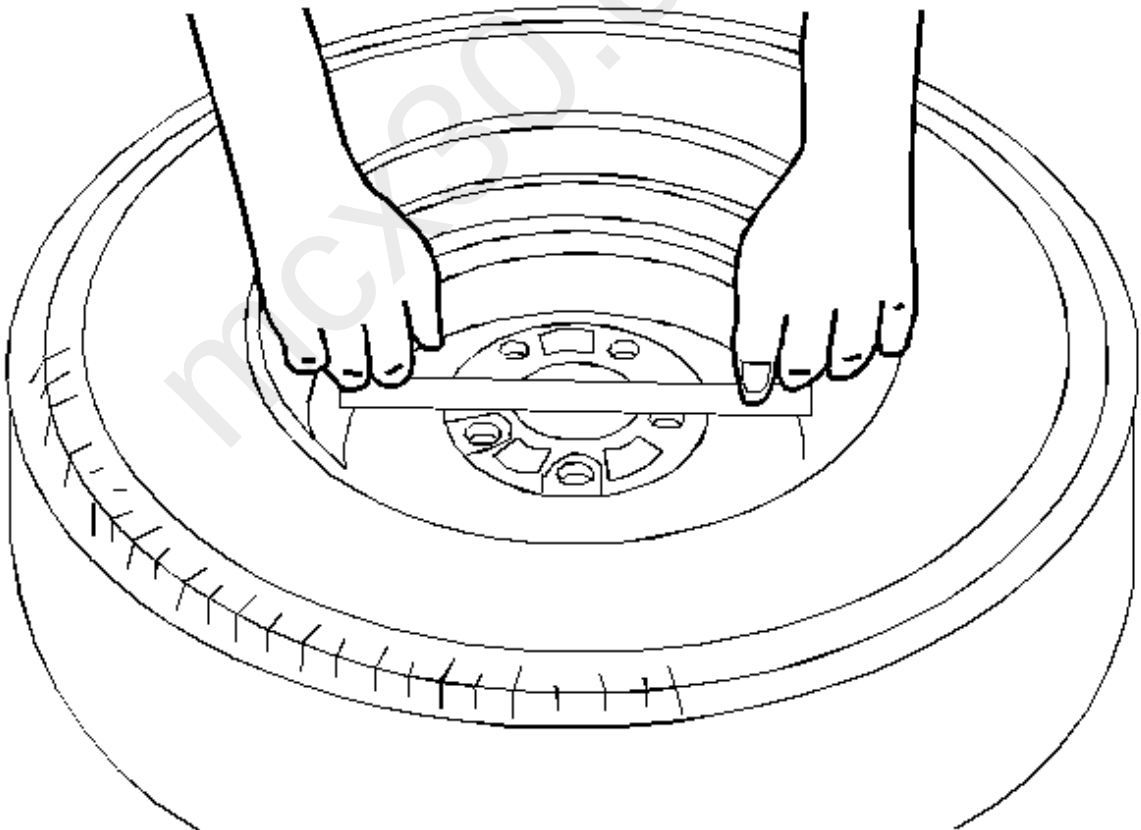


Fig. 2: Checking Wheel Mounting Surface
 Courtesy of GENERAL MOTORS COMPANY

1. Thoroughly clean the wheel mounting surface with a clean shop towel and denatured alcohol, or equivalent.
2. Use a straight edge 203 - 229 mm (8 - 9 in) long. Place the straight edge on the wheel inboard mounting surface. Try to rock the straight edge up and down within the mounting surface.
3. For aluminum flat-mount wheels, repeat the procedure in step 2 on at least 3 - 4 different positions on the inboard mounting surface.

If you can rock the straight edge, the mounting surface is bent and you must replace the wheel.

4. Inspect the mounting wheel/nut holes for damage caused from over-torquing the wheel/nuts. Inspect for collapsed wheel/nut bosses. Inspect for cracked wheel bosses.

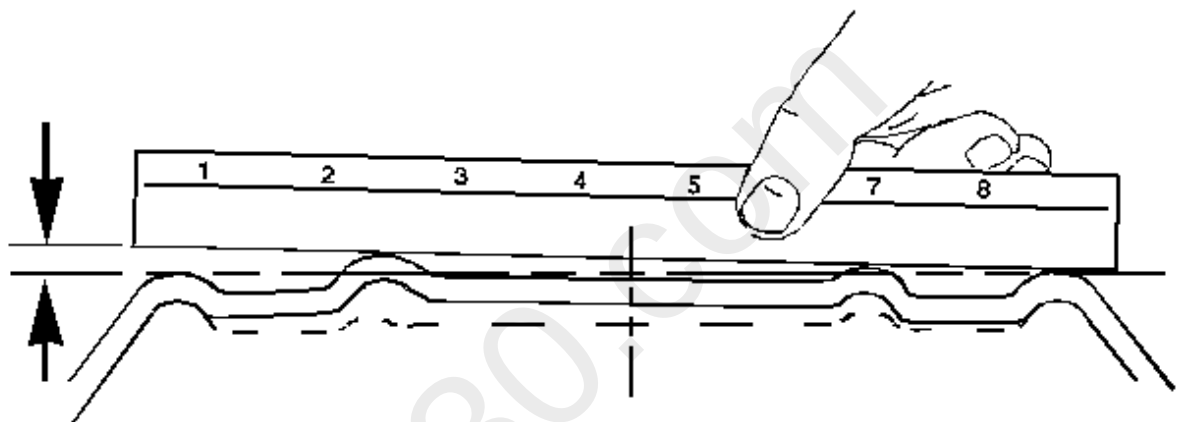


Fig. 3: Inspecting Wheel Inboard Mounting Surface
Courtesy of GENERAL MOTORS COMPANY

5. For steel wheels, repeat the procedure in step 2 on at least 3 - 4 different positions on the inboard mounting surface.
 - The outer mounting ring is designed to be raised slightly above the inner mounting ring.
 - If you can rock the straight edge, the mounting surface is bent and you must replace the wheel.

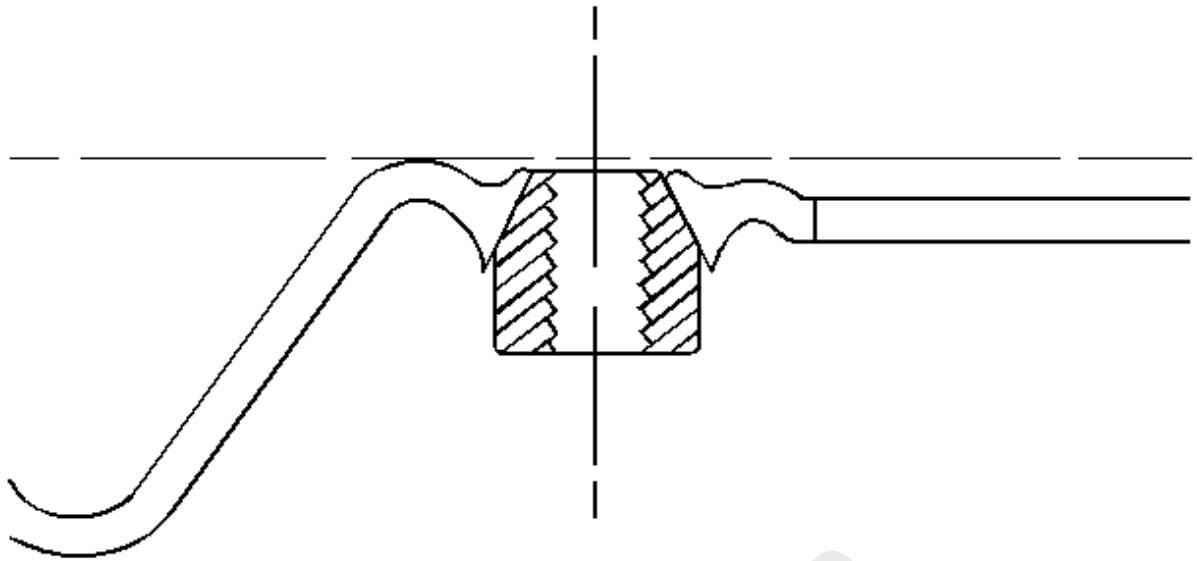


Fig. 4: Inspecting Mounting Wheel/Nut Holes For Damage Caused From Over-Torquing The Wheel/Nuts

Courtesy of GENERAL MOTORS COMPANY

6. Inspect the mounting wheel/nut holes for damage caused from over-torquing the wheel/nuts. Inspect for collapsed wheel/nut bosses. Inspect for cracked wheel bosses.

CAUTION: The use of non-GM original equipment wheels may cause:

- Damage to the wheel bearing, the wheel fasteners and the wheel
- Tire damage caused by the modified clearance to the adjacent vehicle components
- Adverse vehicle steering stability caused by the modified scrub radius
- Damage to the vehicle caused by the modified ground clearance
- Speedometer and odometer inaccuracy

NOTE:

- Replacement wheels must be equivalent to the original equipment wheels in the following ways:
 - The load capacity
 - The wheel diameter
 - The rim width
 - The wheel offset
 - The mounting configuration

- A wheel of the incorrect size or type may affect the following conditions:
 - Wheel and hub-bearing life
 - Brake cooling
 - Speedometer/odometer calibration
 - Vehicle ground clearance
 - Tire clearance to the body and the chassis

7. Replace the wheel if the wheel is bent.

8. Replace the wheel if the wheel/nut boss area is cracked.

Identify steel wheels with a 2 or 3-letter code stamped into the rim near the valve stem. Aluminum wheels have the code, the part number, and the manufacturer identification cast into the back side of the wheel.

RADIAL TIRE LEAD/PULL CORRECTION

Step	Action	Yes	No
DEFINITION: Lead/pull is the deviation of the vehicle from a straight path on a level road with no pressure on the steering wheel.			
1	Did you perform the Vehicle Leads/Pull diagnostic table?	Go to Step 2	Go to
2	Road test the vehicle to verify the complaint. Select a smooth level surface to perform the test. Does the condition exist?	Go to Step 3	System OK
3	1. Cross-switch the front tire/wheel assemblies. Refer to Tire and Wheel Removal and Installation . 2. Road test the vehicle on a smooth level surface. Does the vehicle still lead/pull?	Go to Step 4	System OK
4	Does the vehicle lead/pull in the opposite direction?	Go to Step 5	Go to Wheel Alignment Measurement
5	1. Cross-switch the left front tire/wheel assembly with the left rear tire/wheel assembly. Refer to Tire and Wheel Removal and Installation . 2. Road test the vehicle on a smooth level surface. Does the vehicle still lead/pull?	Go to Step 6	Go to Step 7
6	1. Cross-switch the right front tire/wheel assembly with the right rear tire/wheel assembly. Refer to Tire and Wheel Removal and Installation . 2. Road test the vehicle on a smooth level surface. Does the vehicle still lead/pull?	Go to Wheel Alignment Measurement	Go to Step 8
7	Replace the left rear tire. Is the repair complete?	Go to Step 9	-
8	Replace the right rear tire. Is the repair complete?	Go to Step 9	-

Step	Action	Yes	No
9	Verify proper vehicle operation. Does the original condition still exist?	Go to Step 1	System OK

REPAIR INSTRUCTIONS

ALUMINUM WHEEL POROSITY REPAIR

1. Remove the tire and wheel. [Tire and Wheel Removal and Installation](#)
2. Inflate the tire to the pressure stated on the tire placard.
3. Submerge the tire/wheel into a water bath in order to locate the leak.
4. Using a grease pencil, mark the wheel in order to indicate the leak areas.
5. Using a grease pencil, mark the tire at the valve stem in order to Indicate the orientation of the tire to the wheel.
6. Remove the tire from the wheel. [Tire Dismounting and Mounting](#)

IMPORTANT: Do not damage the exterior surface of the wheel.

7. Use number 80 grit sandpaper to scuff the inside of the rim surface at the leak area.
8. Use tire prep to clean the leak area.
9. Apply 3 mm (0.12 in) thick layer of adhesive/sealant to the leak area. [Adhesives, Fluids, Lubricants, and Sealers](#)
10. Allow for the adhesive/sealant to dry.
11. Align the inscribed mark on the tire with the valve stem on the wheel.
12. Install the tire to the wheel. [Tire Dismounting and Mounting](#)
13. Inflate the tire to the pressure stated on the tire placard.
14. Submerge the tire/wheel into a water bath in order ensure the leak is sealed.
15. Balance the tire and wheel. [Tire and Wheel Assembly Balancing - On-Vehicle](#)
16. Install the tire and wheel. [Tire and Wheel Removal and Installation](#)
17. Lower the vehicle.

ALUMINUM WHEEL REFINISHING

Aluminum Wheel Refinishing Guidelines

WARNING: To avoid personal injury when exposed to plastic media blast, hand and/or lathe sanding dust, primer, color coat, and clearcoat, you must work in a properly ventilated area, wearing an approved respirator, eye protection, earplugs and protective gloves and clothing.

Evaluating Damage

NOTE:

- Inspect the wheel for corrosion, scrapes, gouges, etc. Damage **MUST NOT** be deeper than what can be sanded or polished off.
- Inspect the wheel for cracks. If cracks are found, discard the wheel.
- **ALL** wheels with bent rim flanges must not be repaired or refinished.
- The re-machining and the re-clear coating of aluminum wheels is not recommended in the dealer environment due to concerns of repair durability.
- Do not use any re-machining process that removes aluminum. This could affect the dimensions and function of the wheel.

Aluminum Wheel Refinishing General Recommendations/Options

- Painted aluminum wheels use a primer, color coat, and clearcoat procedure. If the paint is damaged, refinishing is possible. As with polished wheels, all original coatings must be removed first. Media blasting is recommended. (See option number 1).
- If the clearcoat is damaged, it is possible to refinish with clearcoat only, however, the required refinishing process cannot be performed in the dealer environment. Refer to Refinishers Responsibility (Repair option number 2).
- Re-plating of chrome-plated aluminum wheels is not recommended.

Repair Option Number 1

Material Required/Information Resources

- The Paint Manufacturer's Color Book
- Refer to the latest GM Approved Refinish Materials Booklet (GM 4901 MD-2005) for specific products for aluminum refinishing.
- To access the booklet, go to www.gmgoodwrench.com. Click on GM Collision Parts. Click on GM Technical Repair Information, select Paint Shop.
- A Color Compatibility chart is also at this site defining what colors are used on what models.

NOTE: Chemical strippers are not recommended.

- Refer to specific Paint Manufacturers for refinish procedures and process pertaining to "Aluminum Refinishing".

The procedure requires the wheel surface to be plastic media blasted to remove old paint or clearcoat.

General Color Selection

- If the wheels being painted were previously clearcoated aluminum, and a painted aluminum look is desired, using Corsican Silver WAEQ9283 for a fine "aluminum-like" look, or Sparkle Silver WA9967 for a very bright look. Body color is another option to the customer that may also be used.
- Some specific colors may be recommended on certain models.
- If painting wheels that were previously clearcoated aluminum, it is recommended that all 4 wheels and their center caps be refinished to maintain color uniformity.

General Refinishing Procedures - Removal

1. Remove the wheels from the vehicle. The tires may remain mounted on the wheels.
2. Remove the balance weights and mark their locations on the tire.
3. Remove excess grease, etc. from the wheels with wax and grease remover.
4. Have the wheels plastic media blasted to remove the clearcoat.

NOTE: MASK OFF ALL MOUNTING SURFACES, whenever a wheel is refinished. The mounting surface and the wheel nut contact surfaces must not be painted or clearcoated. Coating these surfaces could affect the wheel nut torque.

5. Clean and mask and paint the wheels.

General Refinishing Procedures - Installation

1. Unmask the wheels.
2. Clean all wheel mounting surface of any corrosion, overspray, or dirt.

NOTE: When re-balancing a tire on an aluminum wheel, coated balance weights must be used in order to reduce the chance of future cosmetic damage.

3. Install NEW coated balance weights at marked locations.

NOTE:

Use a torque stick on an impact wrench, or a torque wrench to consistently and uniformly fasten the wheel to the specified torque for the vehicle. The star pattern must be followed.

4. Install wheels on vehicle.

Repair Option Number 2 - Outside Companies

- Some outside companies are offering wheel refinishing services. One such company, Transwheel Corporation (800 - 892 - 3733), provides this service with GM guidelines. Other companies may also exist.
- Any process that re-machines or otherwise remanufactures the wheel should not be used.
- The wheel ID must be recorded and follow the wheel throughout the process to assure that the same wheel is returned. The refinisher must permanently ID stamp the wheel and warrant the painted/clearcoated surfaces for a minimum of one year or the remainder of the new vehicle warranty, whichever is longer.
- Paint and/or clearcoat must not be present on the following surfaces, the nut chamfers, the wheel mounting surfaces and the wheel pilot hole.
- A refinishers responsibility includes inspecting for cracks using the Zyglo system or the equivalent. Any cracked wheels must not be refinished. No welding, hammering or reforming of any kind is allowed. A plastic media blast may be used for clean up of the wheel. Hand and/or lathe sanding of the machined surface and the wheel window is allowed. Material removal, though, must be kept to a minimum.

TIRE AND WHEEL REMOVAL AND INSTALLATION**Special Tools**

- **CH-41013** Rotor Resurfacing Kit
- **CH-42450-A** Wheel Hub Resurfacing Kit

For equivalent regional tools, refer to [Special Tools](#).

Removal Procedure

1. Raise and support the vehicle. [Lifting and Jacking the Vehicle](#)
2. Remove the wheel cover, if equipped.

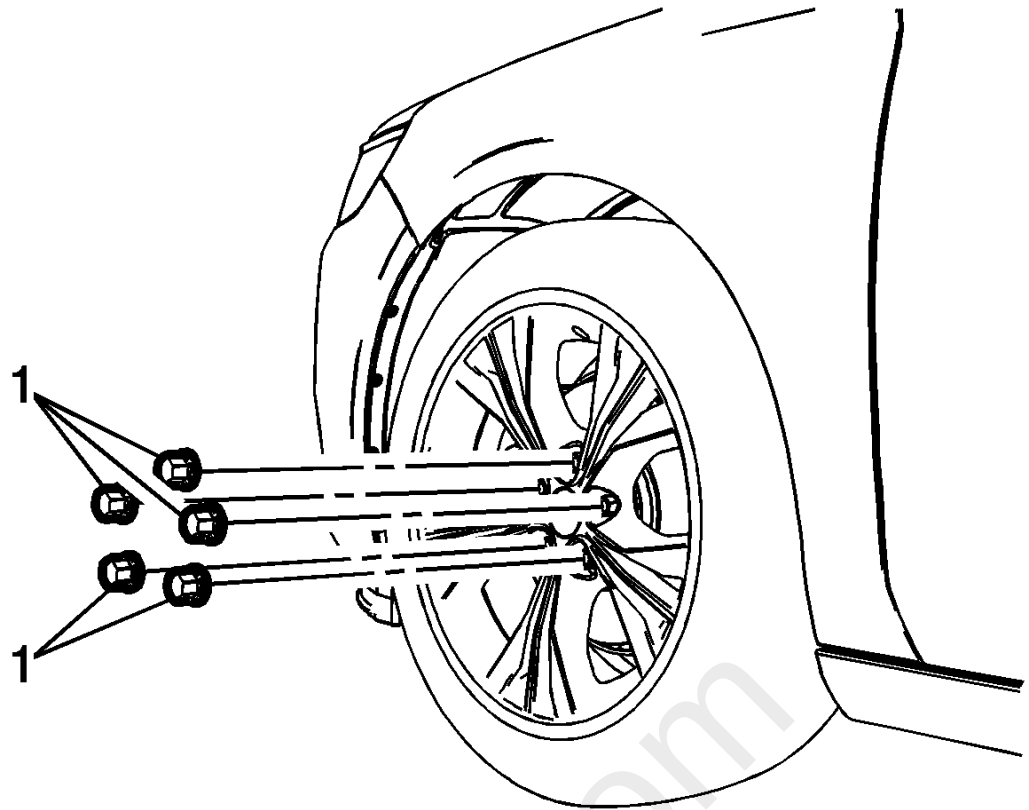


Fig. 5: Wheel Nut Caps

Courtesy of GENERAL MOTORS COMPANY

3. Remove the wheel nut caps (1), if equipped.

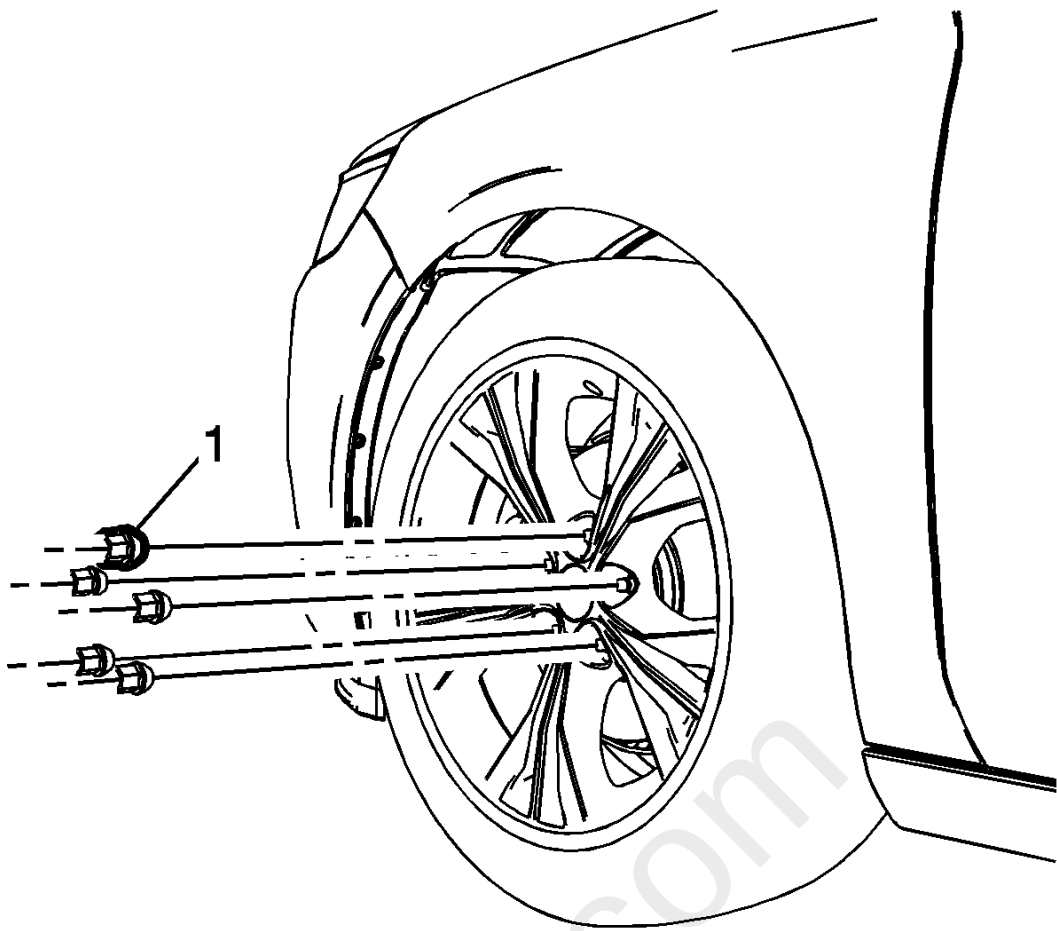


Fig. 6: Wheel Nuts

Courtesy of GENERAL MOTORS COMPANY

4. Remove the wheel nuts (1).

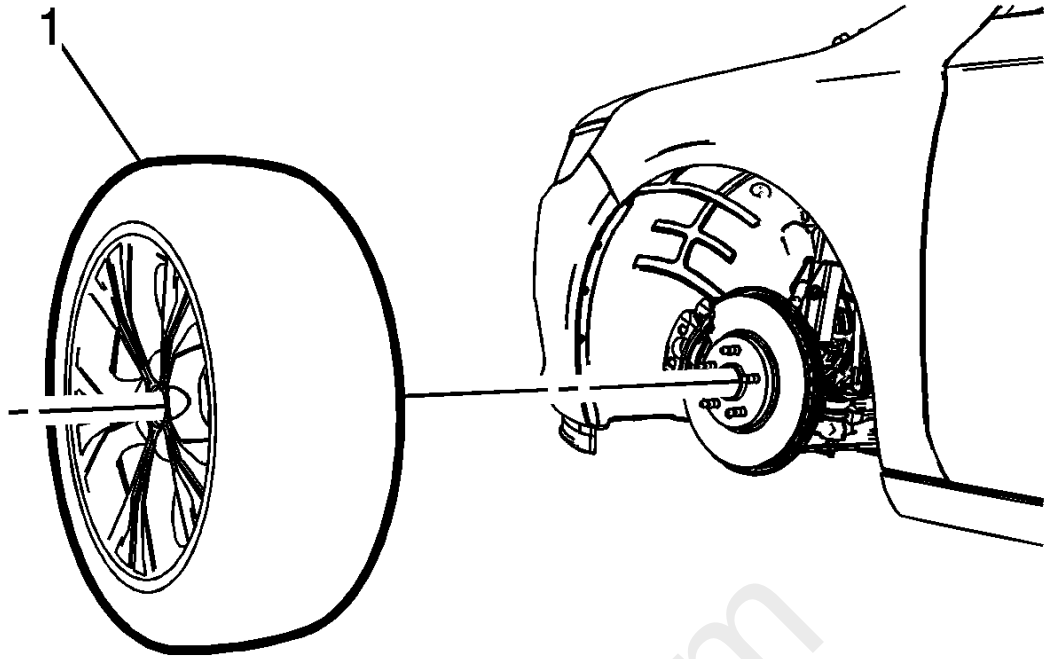


Fig. 7: Tire & Wheel Assembly

Courtesy of GENERAL MOTORS COMPANY

5. Remove the tire and wheel assembly (1).

WARNING: If penetrating oil gets on the vertical surfaces between the wheel and the rotor or drum it could cause the wheel to work loose as the vehicle is driven, resulting in loss of control and an injury accident.

CAUTION: Removing the wheel may be difficult because of foreign materials or a tight fit between the wheel and the hub/rotor. Slightly tap the tire side wall with a rubber mallet in order to remove the wheel. Failure to follow these instructions may result in damage to the wheel.

CAUTION: Never use heat to loosen a tight wheel bolt or nut. This can shorten the life of wheel and damage wheel bearings.

6. If the tire and wheel assembly is difficult to remove or cannot be removed, perform the following steps:

- Hand install the wheel nuts.
- Loosen the wheel nuts 2 complete turns.
- Lower the vehicle.
- Rock the vehicle from side to side.
- Repeat the procedure if necessary.

7. When the tire and wheel assembly loosens, raise and support the vehicle. **Lifting and Jacking the Vehicle**

8. Remove the wheel nuts.

9. Remove the tire and wheel assembly.

10. If necessary and equipped, remove the center cap.

Installation Procedure

WARNING: Before installing the wheels, remove any buildup of corrosion on the wheel mounting surface and brake drum or disc mounting surface. Installing wheels with poor metal-to-metal contact at the mounting surfaces can cause wheel nuts to loosen. This can cause a wheel to come off when the vehicle is moving, causing loss of control and possibly personal injury.

NOTE: Do not use power grinding tools to clean the brake rotor or drum to wheel mating surfaces.

1. Using a wire brush or wire wheel, clean the wheel to brake rotor or drum mating surface.
2. Using the **CH-41013** Rotor Resurfacing Kit, clean the rotor or drum to wheel contact area.
3. Using the **CH-42450-A** Wheel Hub Resurfacing Kit, clean the surfaces around the wheel studs.
4. Clean the threads of the wheel studs.
5. If the threads of the wheel stud are damaged, replace the wheel stud. [Wheel Stud Replacement \(Equinox, Terrain\)](#), or [Wheel Stud Replacement](#)
6. After cleaning all of the wheel and brake rotor or drum contact areas, use brake cleaner or denatured alcohol to remove any dirt and debris from the wheel nuts and the brake rotor or drum.
7. Inspect and clean the contact areas of the wheel. [Wheel Mounting Surface Check](#)

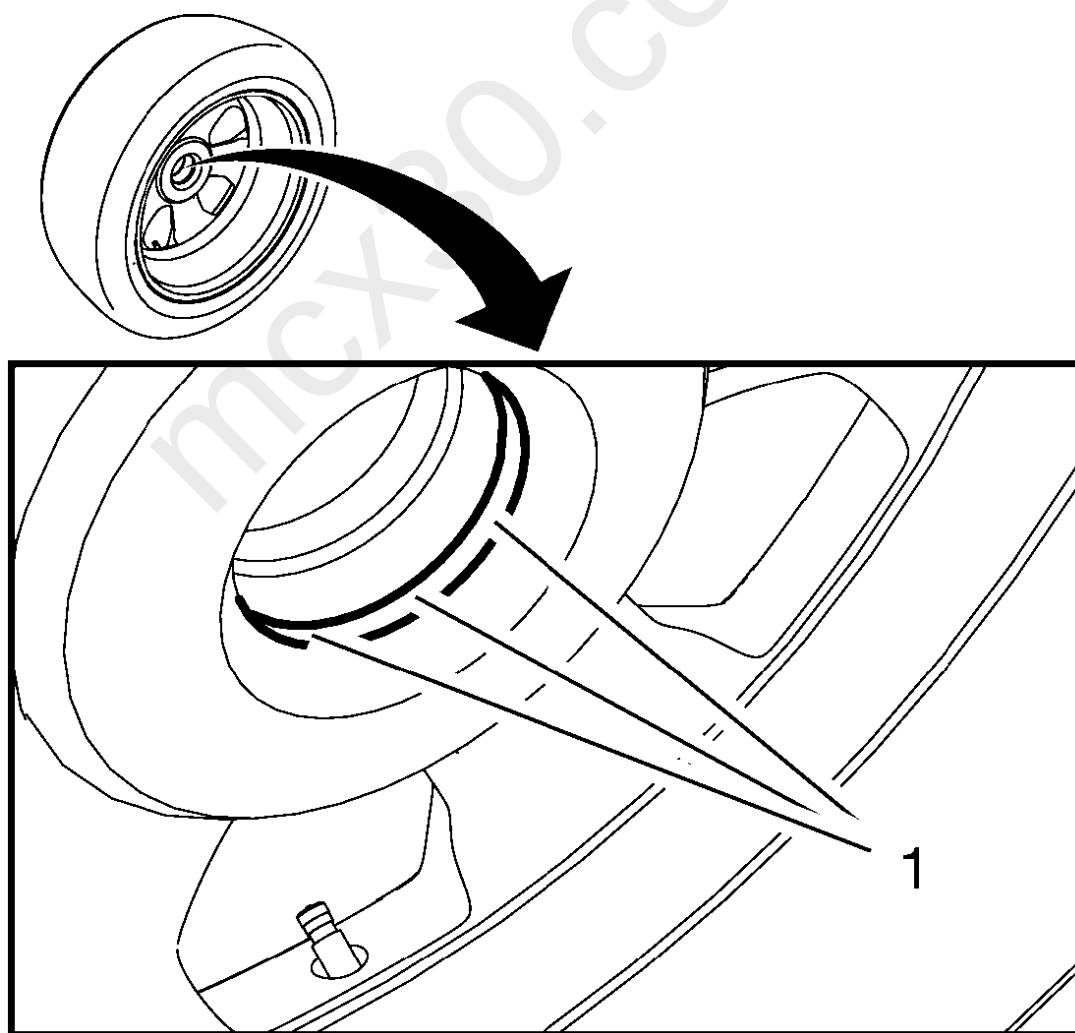


Fig. 8: Rim Inner Center Seat

Courtesy of GENERAL MOTORS COMPANY

8. Apply a small amount of lubricant to the inner diameter of the wheel hub pilot hole (1) where it contacts the wheel hub flange. [Adhesives, Fluids, Lubricants, and Sealers](#)

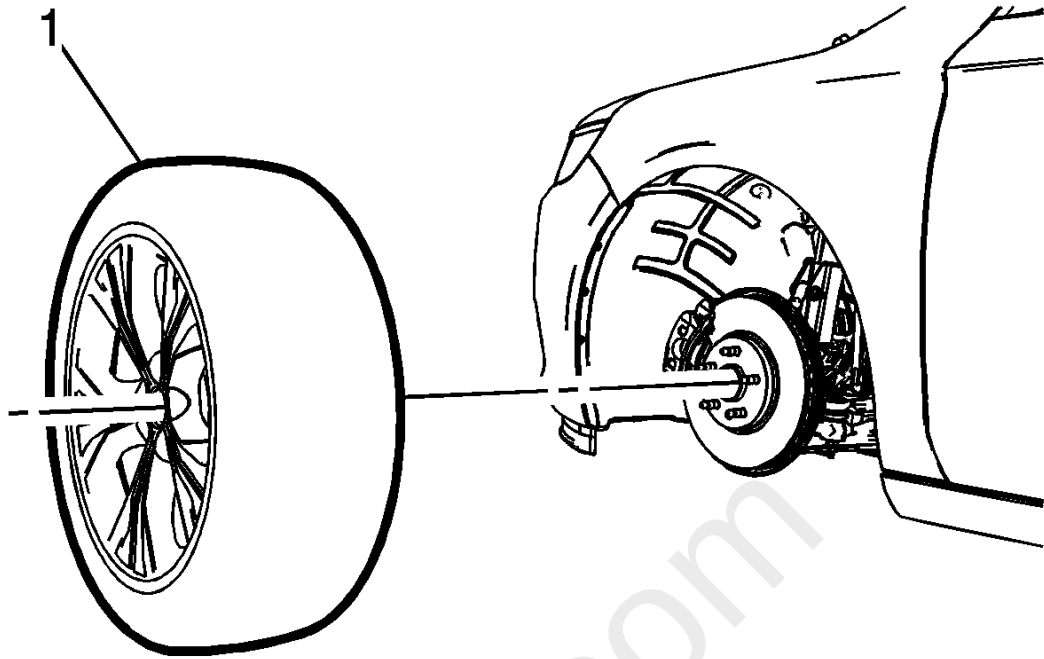


Fig. 9: Tire & Wheel Assembly

Courtesy of GENERAL MOTORS COMPANY

9. Install the tire and wheel assembly (1).

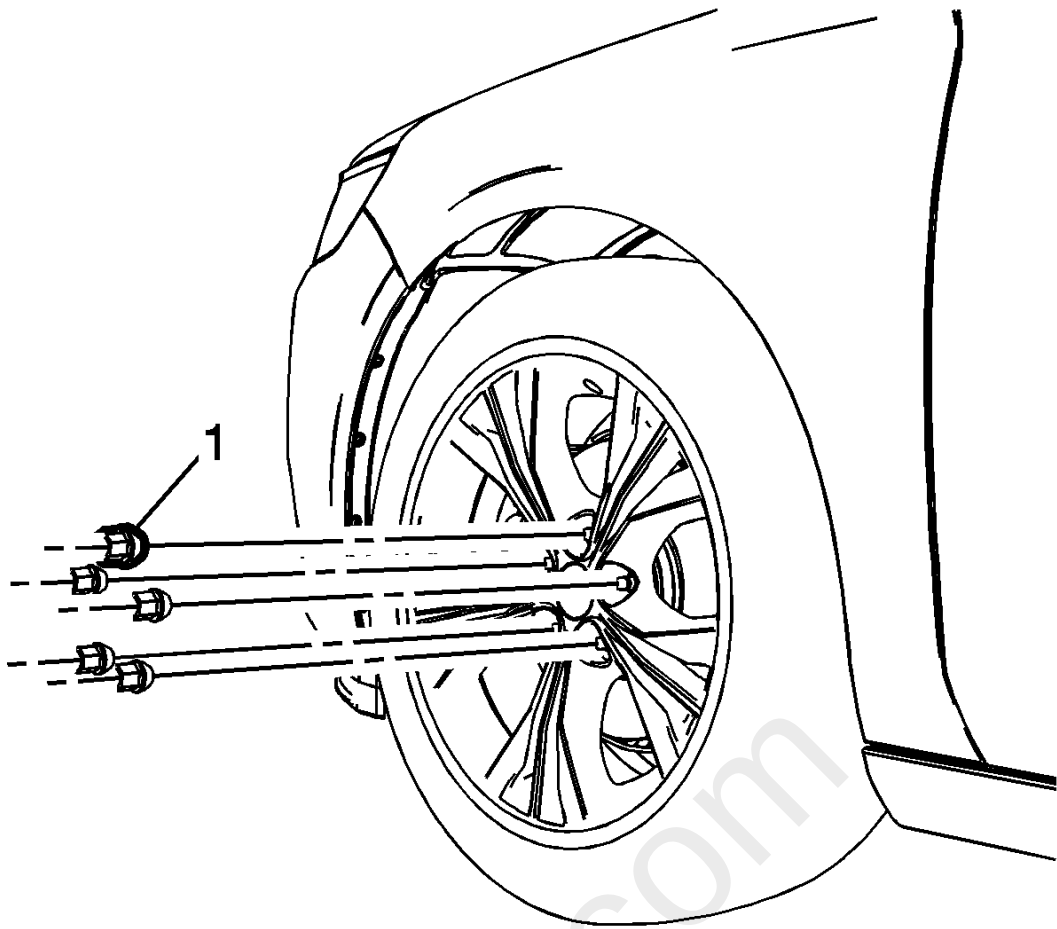


Fig. 10: Wheel Nuts

Courtesy of GENERAL MOTORS COMPANY

WARNING: Never grease or lubricate wheel nuts, studs and mounting surfaces. Wheel nuts, studs, and mounting surfaces must be clean and dry. Tightening the lubricated parts can cause damage to the wheel studs. This can cause a wheel to come off when the vehicle is moving, causing loss of control and possibly personal injury.

10. Hand install the wheel nuts (1).

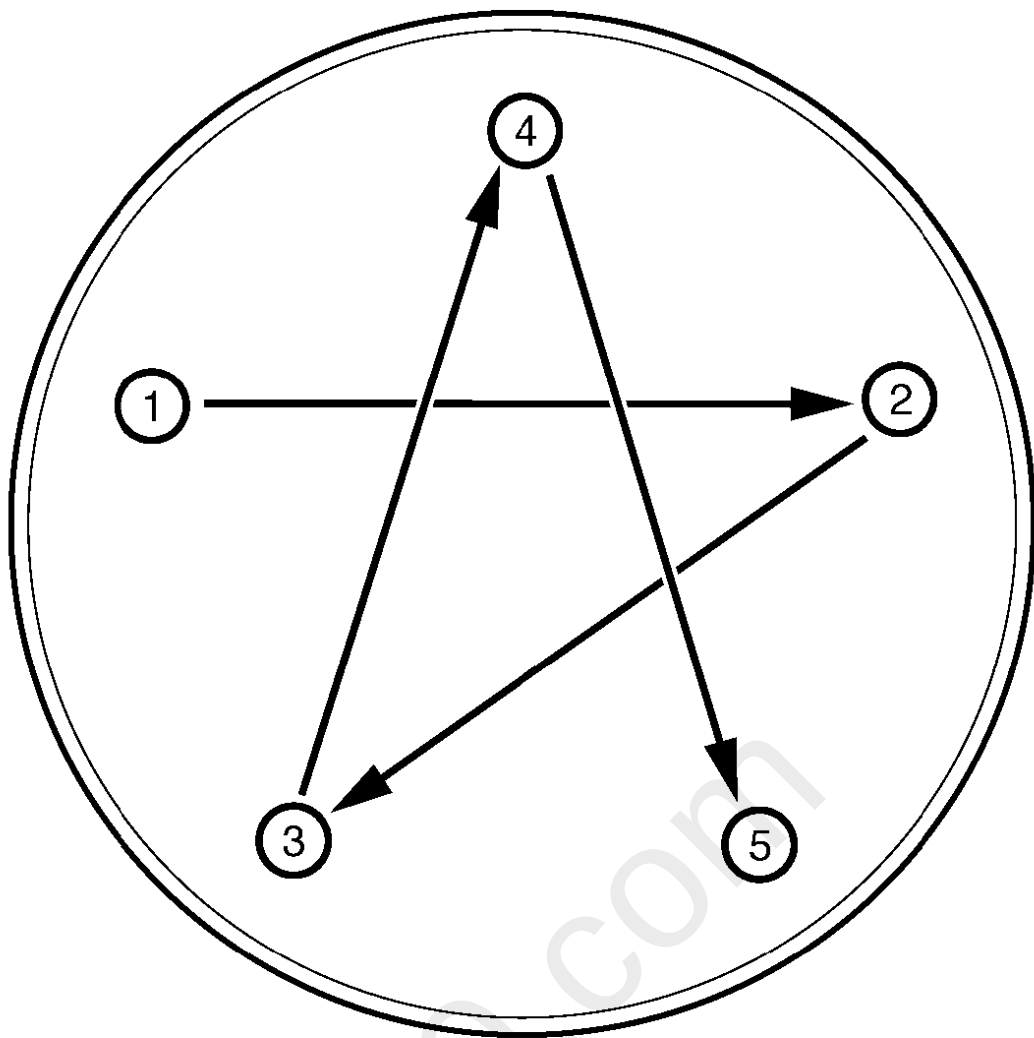


Fig. 11: Wheel Nut Tightening Sequence

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Improperly tightened wheel bolts or nuts can lead to brake pulsation and rotor damage. In order to avoid expensive brake repairs, evenly tighten the wheel bolts or nuts to the proper torque specification.

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

11. Using a torque wrench and the appropriate socket, alternately and evenly tighten the wheel nuts to 140 N.m (103 lb ft) in the sequence illustrated.

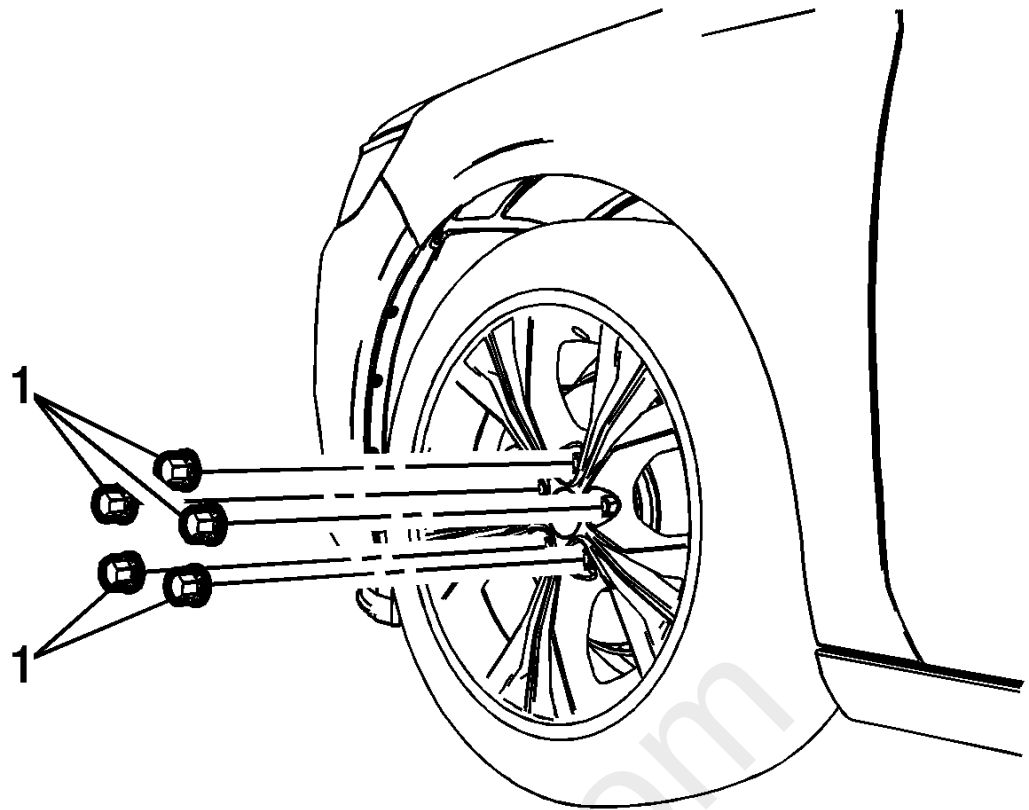


Fig. 12: Wheel Nut Caps

Courtesy of GENERAL MOTORS COMPANY

12. Install the wheel nut caps (1), if equipped.
13. Install the wheel center cap or wheel cover, if equipped.

TIRE DISMOUNTING AND MOUNTING

CAUTION: Use a tire changing machine in order to dismount tires. Do not use hand tools or tire irons alone in order to remove the tire from the wheel. Damage to the tire beads or the wheel rim could result.

CAUTION: Do not scratch or damage the clear coating on aluminum wheels with the tire changing equipment. Scratching the clear coating could cause the aluminum wheel to corrode and the clear coating to peel from the wheel.

CAUTION: Damage to either the tire bead or the wheel mounting holes can result from the use of improper wheel attachment or tire mounting procedures. It takes up to 70 seconds for all of the air to completely exhaust from a large tire. Failure to follow the proper procedures could cause the tire changer to put enough force on the tire to bend the wheel at the mounting surface. Such damage may result in vibration and/or shimmy, and under severe usage lead to wheel cracking.

1. Remove the valve core from the valve stem.
2. Deflate the tire completely.

NOTE: Rim-clamp European-type tire changers are recommended.

3. Use the tire changer in order to remove the tire from the wheel. Follow steps 4 - 7 to remove the tire from the wheel.

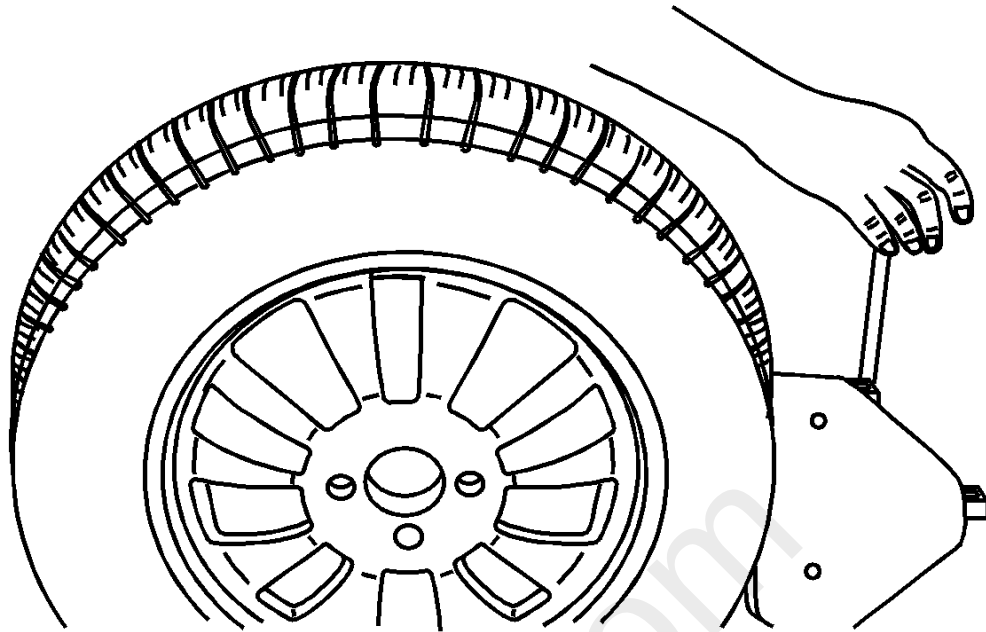


Fig. 13: Using Tire Changer to Remove Tire
Courtesy of GENERAL MOTORS COMPANY

4. When separating the tire bead from the wheel, position the bead breaking fixture 90, 180 and 270 degrees from the valve stem.

CAUTION: Failure to position valve stem in proper position while dismounting and mounting the tire may result in the TPM sensor to become damaged.

5. Position the wheel and tire so the valve stem is at the 7 o'clock position relative to the head. Apply tire bead lubricant to the pry bar to prevent damage to the tire bead. The tire iron or pry bar can be inserted when prying the outer tire bead up and over the mounting/dismounting head.

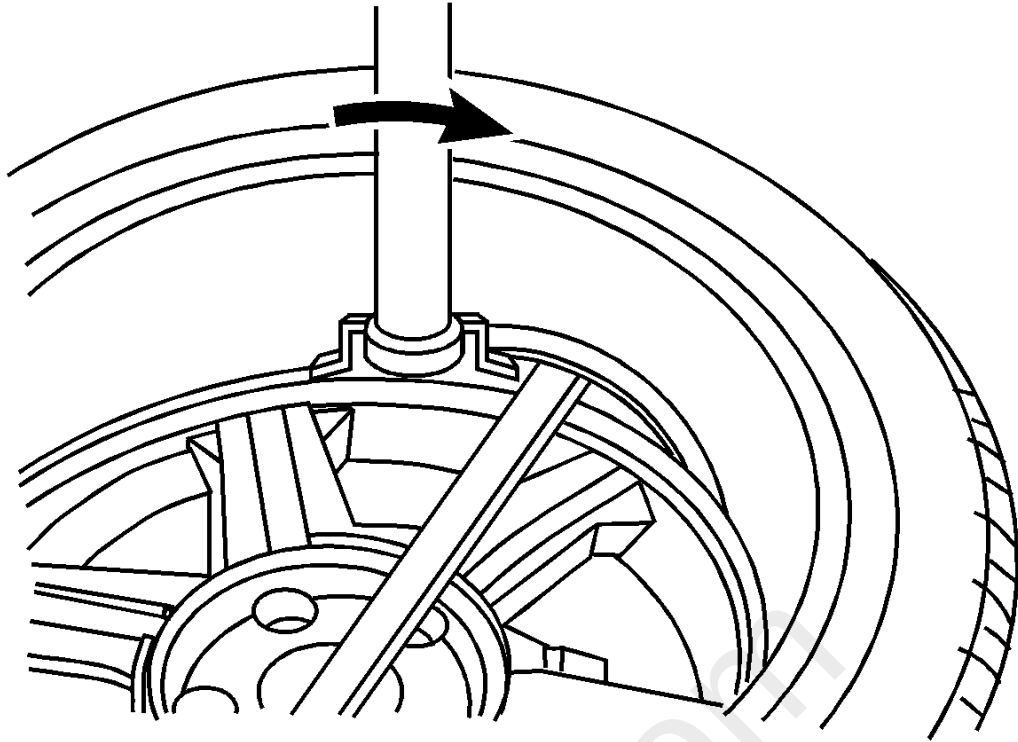


Fig. 14: Separating Tire Bead from Wheel

Courtesy of GENERAL MOTORS COMPANY

6. Position the wheel and tire so the valve stem is again at the 7 o'clock position relative to the head. The tire iron or pry bar can be inserted when prying the inner tire bead up and over the mounting/dismounting head.
7. Remove all residual liquid sealant from the inside of the tire and wheel surfaces. If any tire sealant is noted upon tire dismounting on vehicles equipped with TPM, replace the tire pressure sensor. Refer to [Tire Pressure Indicator Sensor Replacement](#).
8. Use medium coarseness steel wool in order to remove any rubber, light rust or corrosion from the wheel bead seats.

CAUTION:

When mounting the tires, use an approved tire mounting lubricant. **DO NOT** use silicon or corrosive base compounds to lubricate the tire bead and the wheel rim. A silicon base compound can cause the tire to slip on the rim. A corrosive type compound can cause tire or rim deterioration.

9. Apply mounting lubricant to the tire bead and the wheel rim. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#).

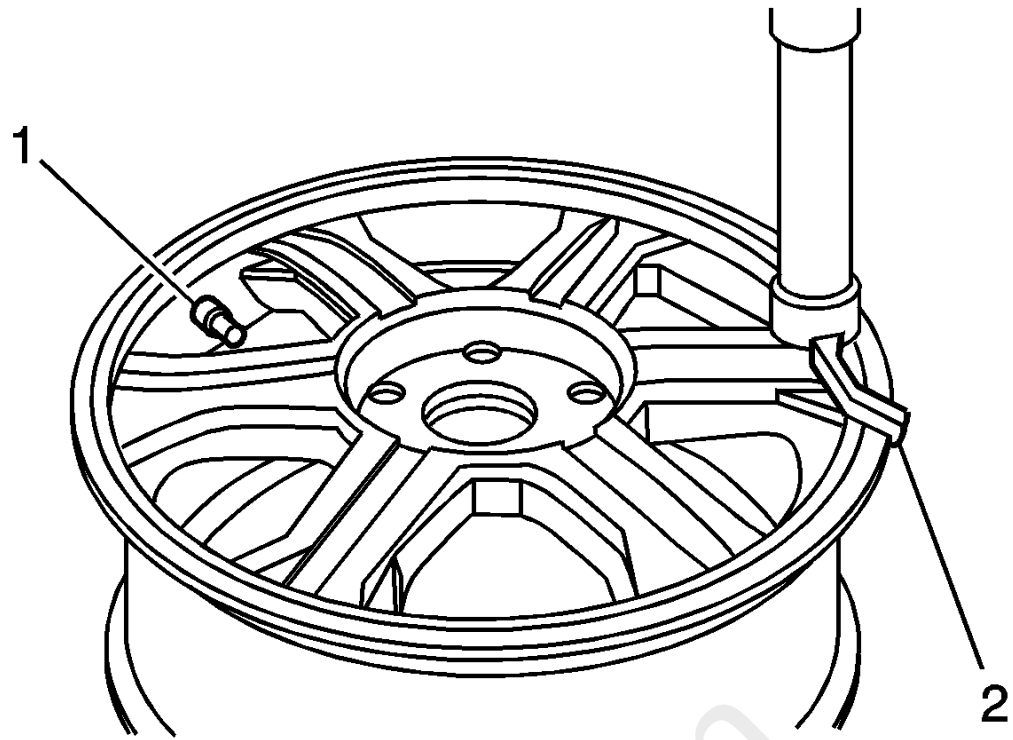


Fig. 15: Position Rim So Valve Stem Is At 7 O'clock Position Relative To Head
Courtesy of GENERAL MOTORS COMPANY

10. Position the rim so the valve stem (1) is at the 7 o'clock position relative to the head (2). This will protect the sensor when the bottom bead seats.

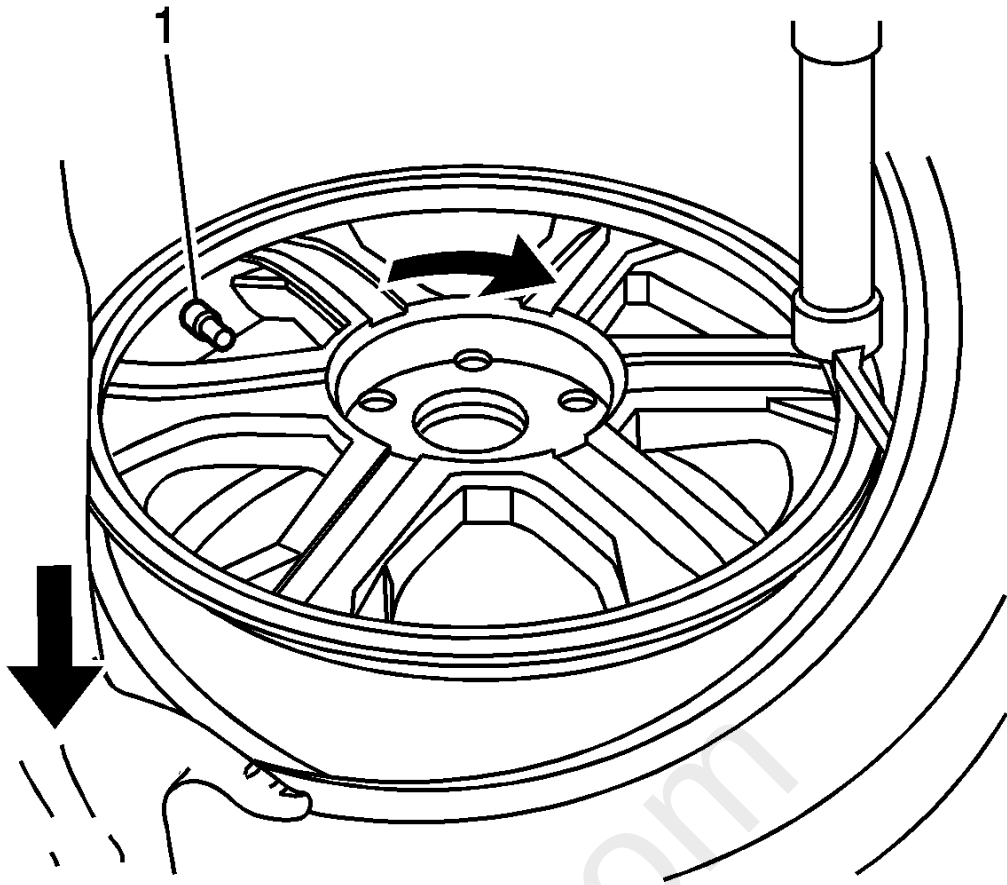


Fig. 16: Ensure Valve Stem Is At 7 O'clock Position

Courtesy of GENERAL MOTORS COMPANY

11. Using the tire machine, rotate the tire/wheel assembly clockwise when transferring the tire bead to the inside of the wheel rim. Ensure that the valve stem (1) is at the 7 o'clock position.

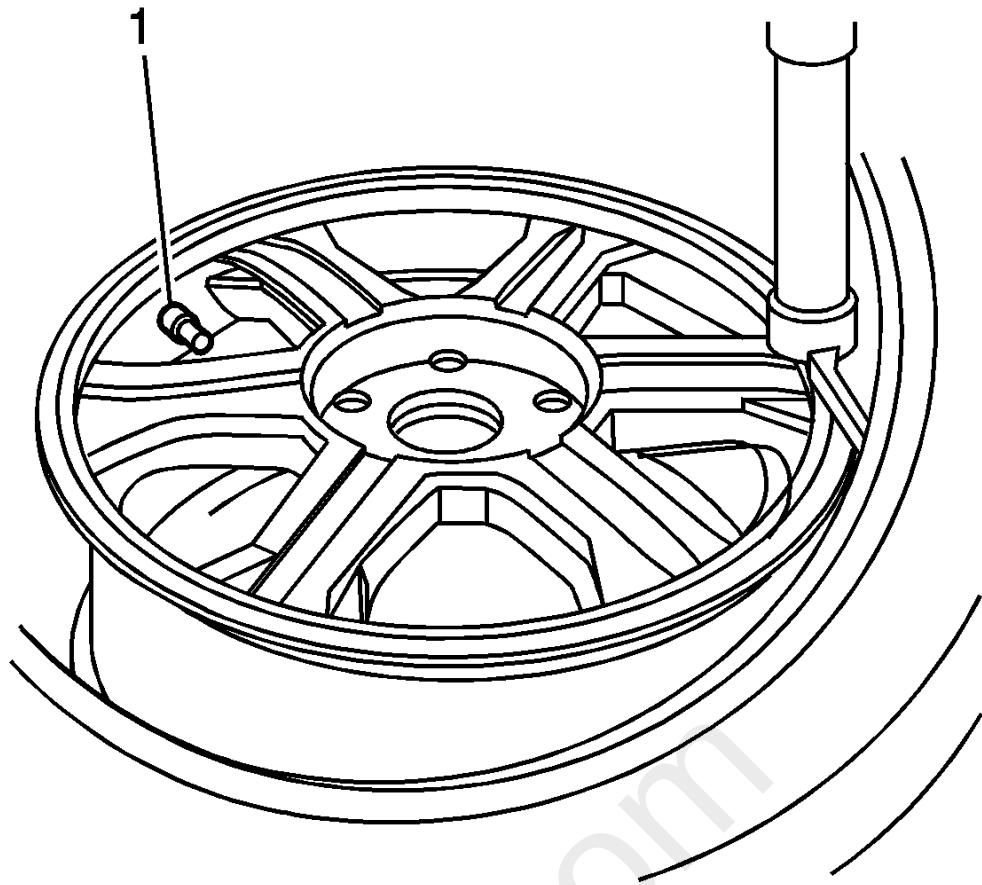


Fig. 17: Reposition Wheel And Tire So Valve Stem Is At 7 O'clock Position Relative To Head
Courtesy of GENERAL MOTORS COMPANY

12. After the bottom bead is on the wheel, reposition the wheel and tire so that the valve stem (1) is at the 7 o'clock position relative to the head. This will protect the sensor while mounting the tire bead to the outside of the wheel.

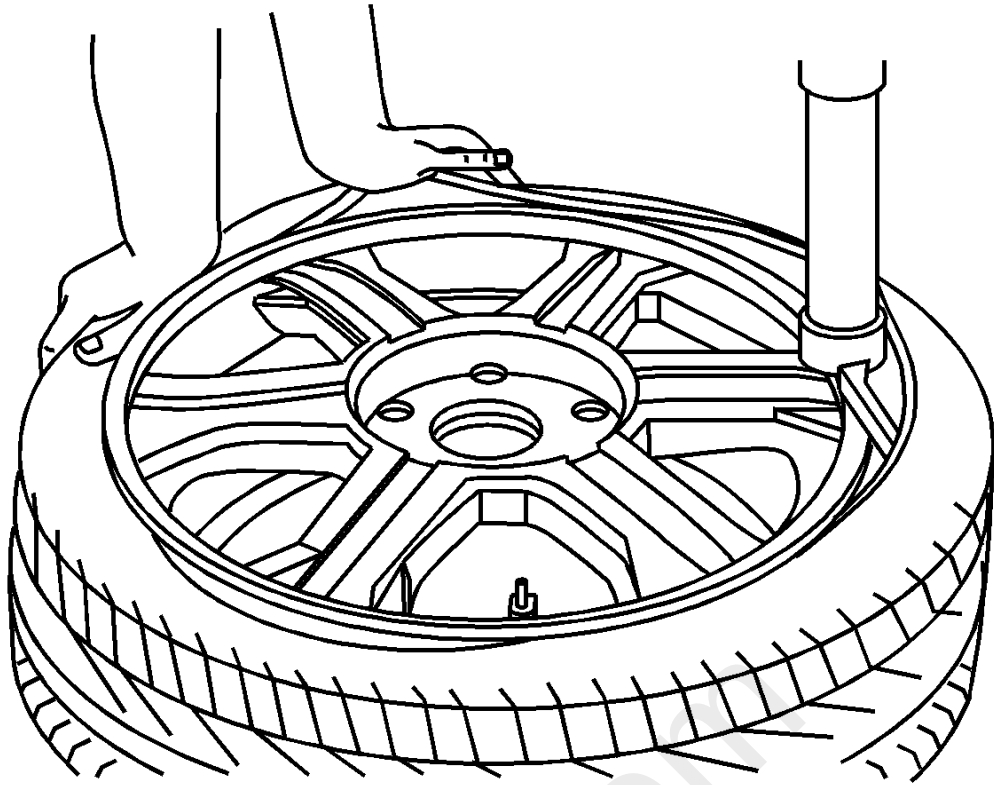


Fig. 18: Using Tire Changer

Courtesy of GENERAL MOTORS COMPANY

13. Use the tire changer in order to install the tire to the wheel.

WARNING: To avoid serious personal injury, do not stand over tire when inflating. The bead may break when the bead snaps over the safety hump. Do not exceed 275 kPa (40 psi) pressure when inflating any tire if beads are not seated. If 275 kPa (40 psi) pressure will not seat the beads, deflate, relubricate the beads and reinflate. Overinflation may cause the bead to break and cause serious personal injury.

14. Inflate the tire until it passes the bead humps. Be sure that the valve core is not installed at this time.
15. Install the valve core to the valve core stem.
16. Inflate the tire to the proper air pressure.
17. Ensure that the locating rings are visible on both sides of the tire in order to verify that the tire bead is fully seated on the wheel.

TIRE ROTATION

Rotate the tires and wheels at frequent intervals to equalize wear. Refer to [Maintenance Schedule](#) . In addition to scheduled rotation, rotate the tire and wheel whenever uneven tire wear is noticed.

Radial tires tend to wear faster in the shoulder area, particularly in front positions. Radial tires in non-drive locations may develop an irregular wear pattern that may increase tire noise. This makes regular rotation especially necessary.

Refer to [Tire and Wheel Removal and Installation](#).

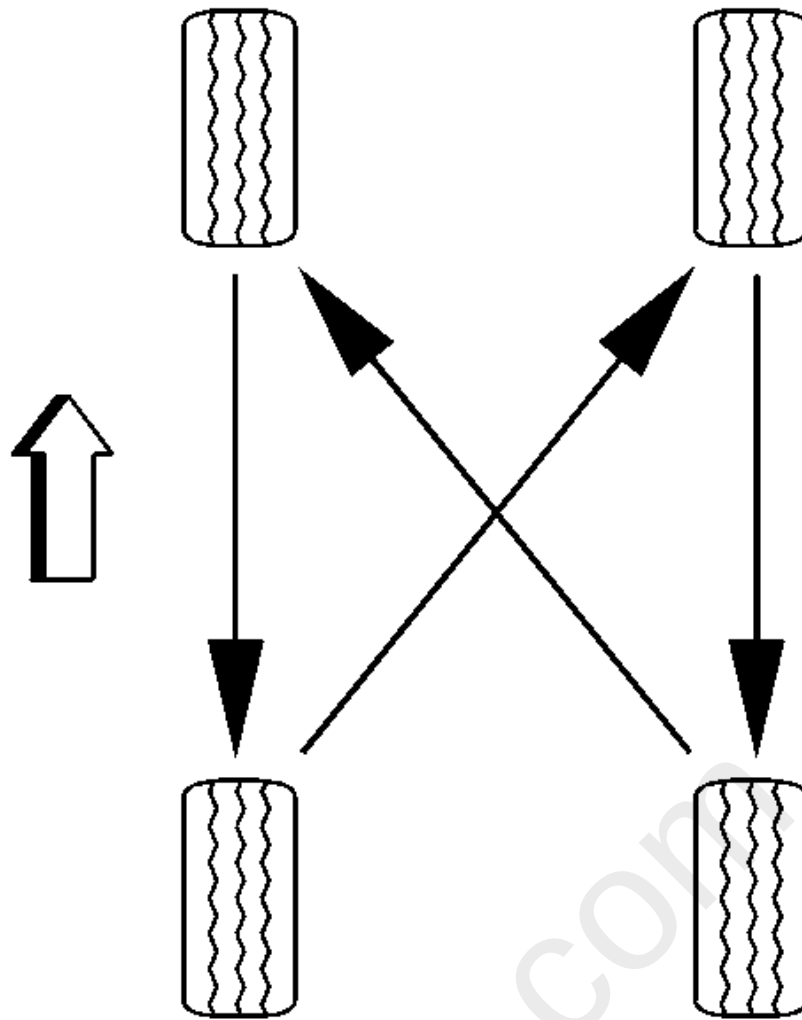


Fig. 19: Identifying Tire Rotation Pattern

Courtesy of GENERAL MOTORS COMPANY

Always use a 4-wheel rotation. After rotation, check the wheel nuts for specified torque. Then, set the tire pressure.

After the tires have been rotated, the tire pressure sensors must be reset, if applicable.

TIRE AND WHEEL BALANCING

WARNING: Failure to adhere to the following precautions before tire balancing can result in personal injury or damage to components:

- Clean away any dirt or deposits from the inside of the wheels.
- Remove any stones from the tread.
- Wear eye protection.
- Use coated weights on aluminum wheels.

Tire and Wheel Assembly Balancer Calibration

Tire and wheel balancers can drift out of calibration over time, or can become inaccurate as a result of heavy use. There will likely not be any visual evidence that a calibration problem exists. If a balancer is not calibrated within specifications, and a tire and wheel assembly is balanced on that machine, the assembly may actually be imbalanced.

Tire and wheel assembly balancer calibration should be checked approximately every 2 weeks, if the machine is used frequently, and/or whenever the balance readings are questionable.

Tire and Wheel Assembly Balancer Calibration Test

NOTE: If the balancer fails any of the steps in this calibration test, the balancer should be calibrated according to the manufacturer's instructions. If the balancer cannot be calibrated, contact the manufacturer for assistance.

Inspect the calibration of the tire and wheel assembly balancer according to the manufacturer's recommendations, or perform the following test.

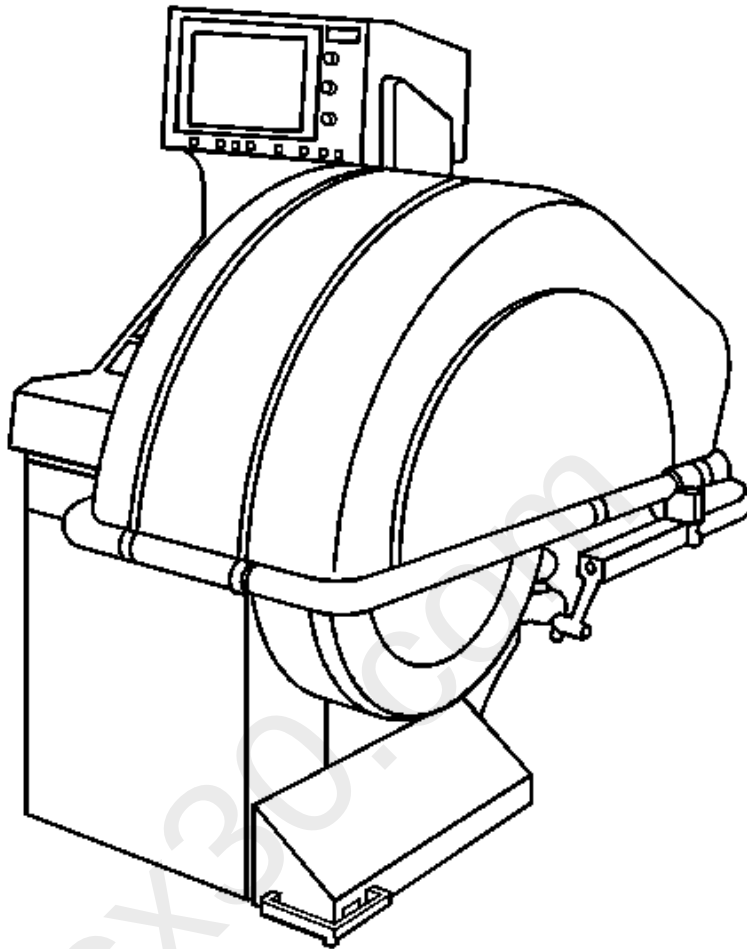


Fig. 20: View Of Tire & Wheel Assembly Balancer
Courtesy of GENERAL MOTORS COMPANY

1. Spin the balancer without a wheel or any of the adapters on the shaft.
2. Inspect the balancer readings.

Specification

Zero within 7 g (1/4 oz)

3. If the balancer is within the specification range, balance a tire and wheel assembly - that is within radial and lateral runout tolerances - to ZERO, using the same balancer.
4. After the tire and wheel assembly has been balanced, add an 85 g (3 oz) test weight to the wheel at any location.
5. Spin the tire and wheel assembly again. Note the readings.
 - In the static and dynamic modes, the balancer should call for 85 g (3 oz) of weight, 180 degrees opposite the test weight.
 - In the dynamic mode, the weight should be called for on the flange of the wheel opposite the test weight.
6. With the assembly imbalanced to 85 g (3 oz), cycle the balancer 5 times.
7. Inspect the balancer readings:

Specification

Maximum variation: 7 g (1/4 oz)

8. Index the tire and wheel assembly on the balancer shaft, 90 degrees from the previous location.
9. Cycle the balancer with the assembly at the new location.
10. Inspect the balancer readings:

Specification

Maximum variation: 7 g (1/4 oz)

11. Repeat steps 8 through 10 until the tire and wheel assembly has been cycled and checked at each of the 4 locations on the balancer shaft.

Tire and Wheel Assembly Balancing Guidelines

NOTE: Tire and wheel assemblies which exhibit excessive runout can produce vibrations even if the assemblies are balanced.

It is strongly recommended that the tire and wheel assembly runout be measured and corrected if necessary **BEFORE** the assemblies are balanced.

If the runout of the tire and wheel assemblies has not yet been measured, refer to [Tire and Wheel Assembly Runout Measurement - Off Vehicle](#) before proceeding.

There are 2 types of tire and wheel balance:

Static Balance

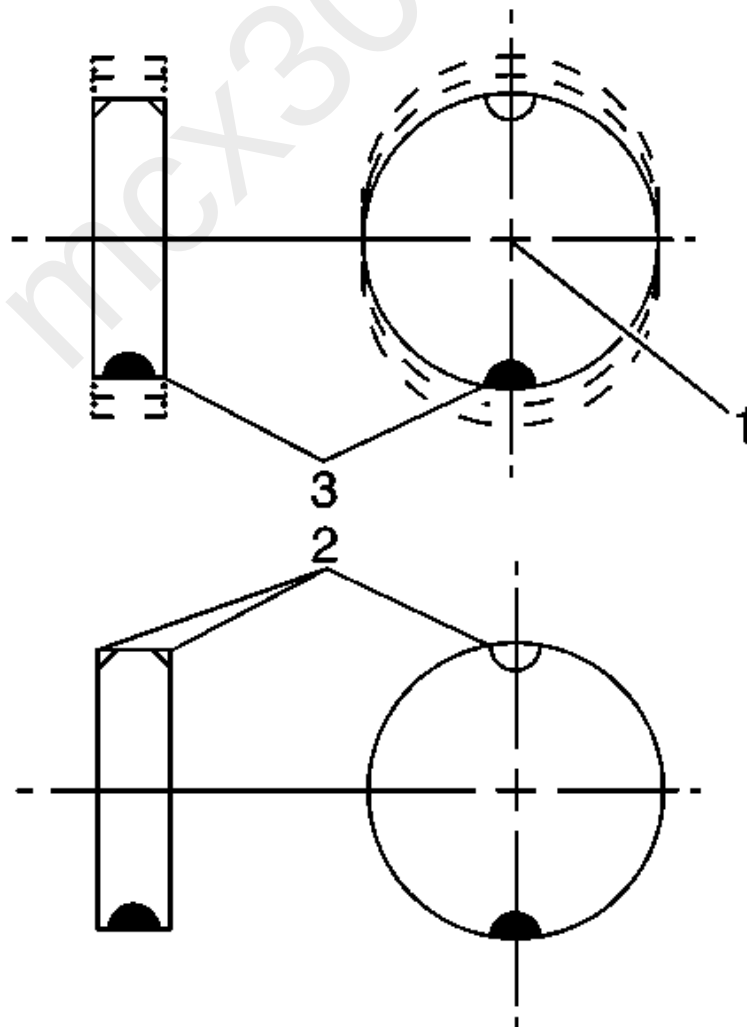


Fig. 21: View Of Static Balance

Courtesy of GENERAL MOTORS COMPANY

Static balance is the equal distribution of weight around the wheel circumference. The wheel balance weights (2) are positioned on the wheel in order to offset the effects of a heavy spot (3). Wheels that have static imbalance can produce a bouncing action called tramp.

Dynamic Balance

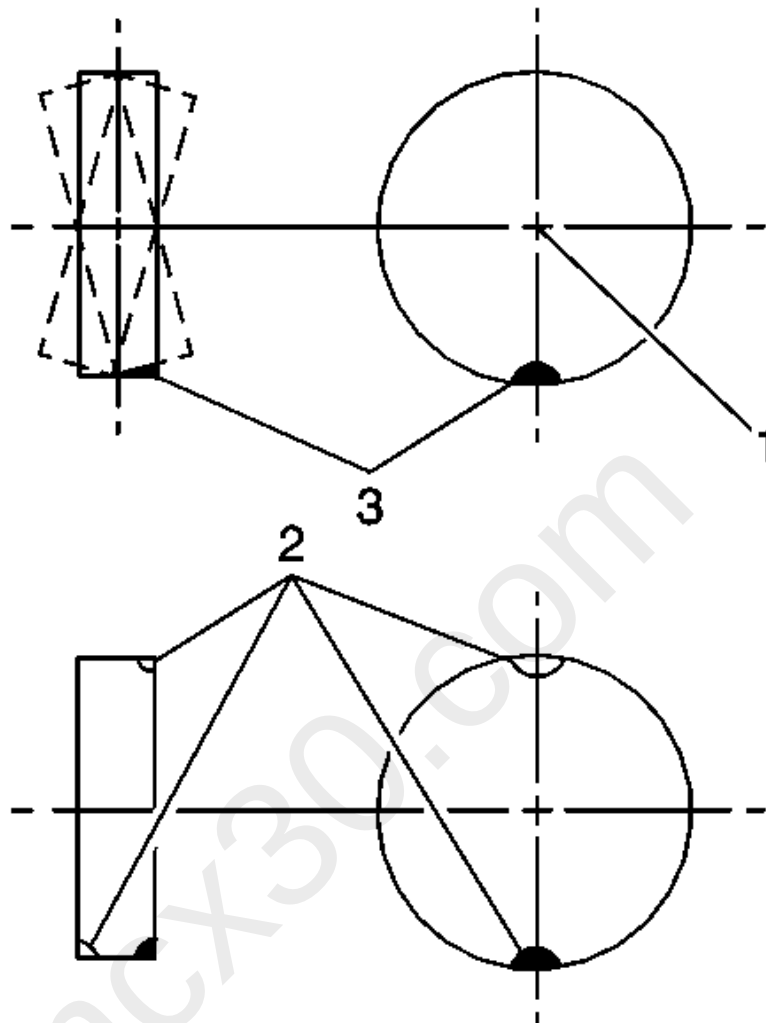


Fig. 22: View Of Dynamic Balance

Courtesy of GENERAL MOTORS COMPANY

Dynamic balance is the equal distribution of weight on each side of the tire and wheel assembly centerline. The wheel balance weights (2) are positioned on the wheel in order to offset the effects of a heavy spot (3). Wheels that have dynamic imbalance have a tendency to move from side to side and can cause an action called shimmy.

Most off-vehicle balancers are capable of checking both types of balance simultaneously.

As a general rule, most vehicles are more sensitive to static imbalance than to dynamic imbalance; however, vehicles equipped with low profile, wide tread path, high performance tires and wheels are susceptible to small amounts of dynamic imbalance. As little as 14 - 21 g (1/2 - 3/4 oz) imbalance is capable of inducing a vibration in some vehicle models.

Balancing Procedure

NOTE: When balancing tire and wheel assemblies, use a known good, recently calibrated, off-vehicle, two-plane dynamic balancer set to the finest balance mode available.

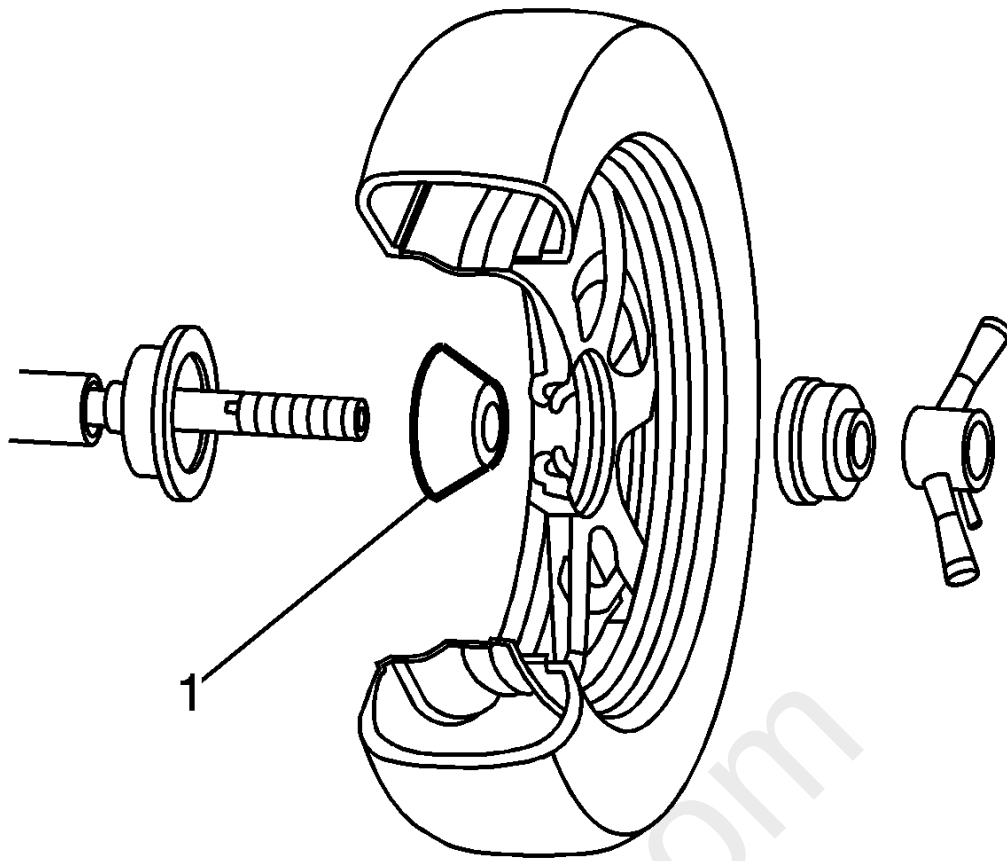


Fig. 23: Wheel Balancer Center Cone

Courtesy of GENERAL MOTORS COMPANY

NOTE: Carefully follow the wheel balancer manufacturers's instructions for proper mounting of the center cone (1).

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Mark the location of the wheels to the wheel studs and mark the specific vehicle position on each tire and wheel - LF, LR, RF, RR.
3. Remove the tire and wheel assemblies one at a time and mount on a spin-type wheel balancer. Refer to [Tire and Wheel Removal and Installation](#).
4. Carefully follow the wheel balancer manufacturer's instructions for proper mounting techniques to be used on different types of wheels.

Regard aftermarket wheels, especially those incorporating universal lug patterns, as potential sources of runout and mounting concerns.

5. Be sure to use the correct type of wheel balance weights for the type of wheel rim being balanced. Be sure to use the correct type of coated wheel balance weights on aluminum wheels. Refer to Wheel Weight Usage.
6. Balance all four tire and wheel assemblies as close to zero as possible.
7. Using the matchmarks made prior to removal, install the tire and wheel assemblies to the vehicle. Refer to [Tire and Wheel Removal and Installation](#).
8. Lower the vehicle.

Wheel Weight Usage

Tire and wheel assemblies can be balanced using either the static or dynamic method.

Clip-on Weights



1



4



2



3

Fig. 24: Identifying Clip-On Wheel Weight Types
Courtesy of GENERAL MOTORS COMPANY

NOTE: When balancing factory aluminum wheels with clip-on wheel balance weights, be sure to use special polyester-coated weights. These coated weights reduce the potential for corrosion and damage to aluminum wheels.

These coated weights reduce the potential for corrosion and damage to aluminum wheels.

- MC (1) and AW (2) series weights are approved for use on aluminum wheels.
- P (3) series weights are approved for use on steel wheels only.
- T (4) series coated weights are approved for use on both steel and aluminum wheels.

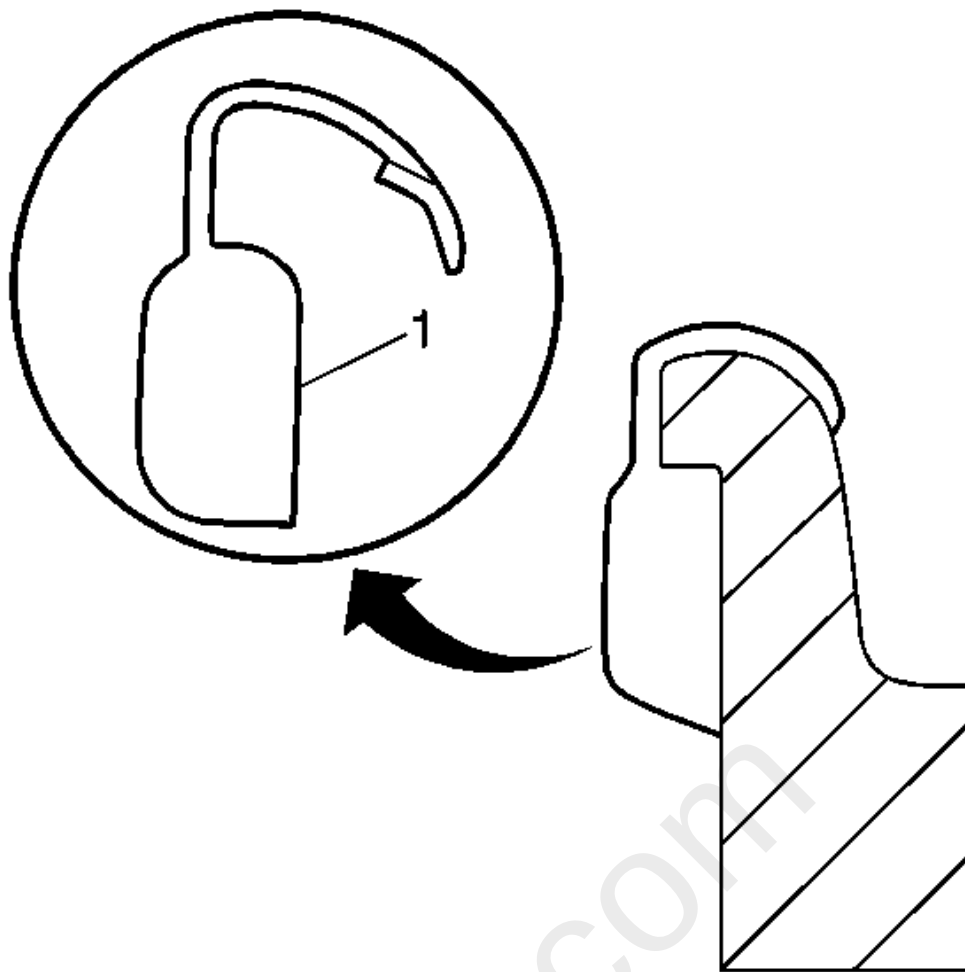


Fig. 25: Attaching Clip-On Wheel Weight
Courtesy of GENERAL MOTORS COMPANY

NOTE: Use a nylon or plastic-tipped hammer when installing coated clip-on wheel balance weights to minimize the possibility of damage to the polyester coating.

The contour and style of the wheel rim flange will determine which type of clip-on wheel weight (1) should be used. The weight should follow the contour of the rim flange. The weight clip should firmly grip the rim flange.

Wheel Weight Placement - Clip-on Weights

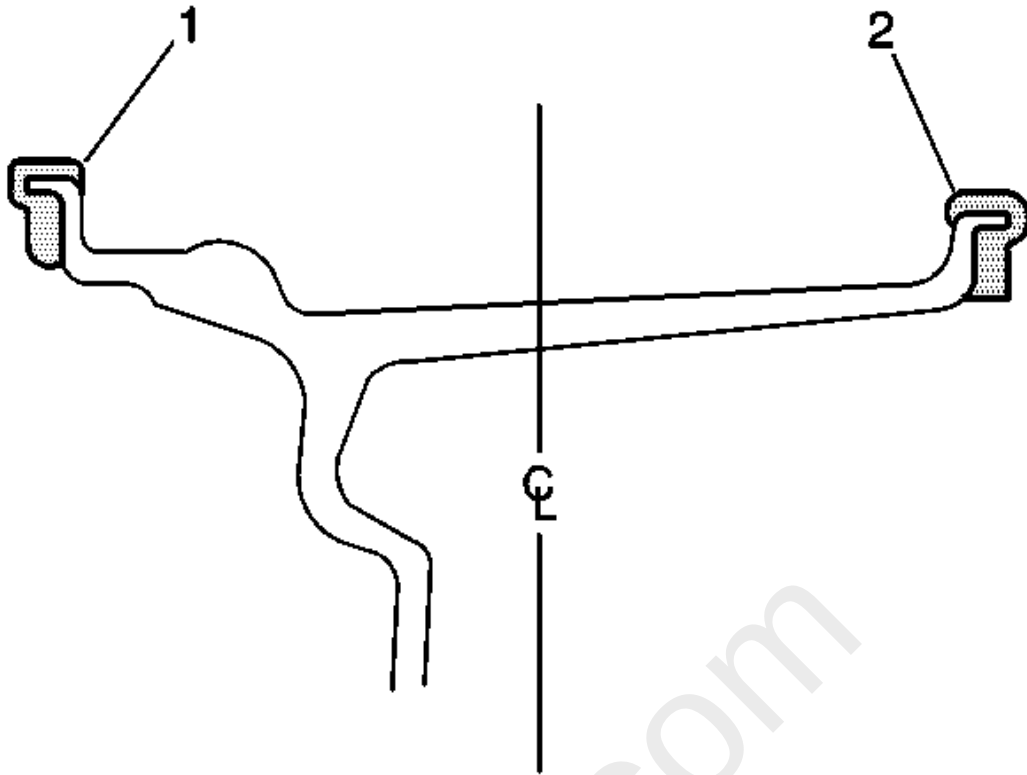


Fig. 26: Clip-On Weight Placement

Courtesy of GENERAL MOTORS COMPANY

When static balancing, locate the wheel balance weights on the inboard flange (2) if only 28 g (1 oz) or less is called for. If more than 28 g (1 oz) is called for, split the weights as equally as possible between the inboard (2) and outboard (1) flanges.

When dynamic balancing, locate the wheel balance weights on the inboard (2) and outboard (1) rim flanges at the positions specified by the wheel balancer.

Adhesive Weights

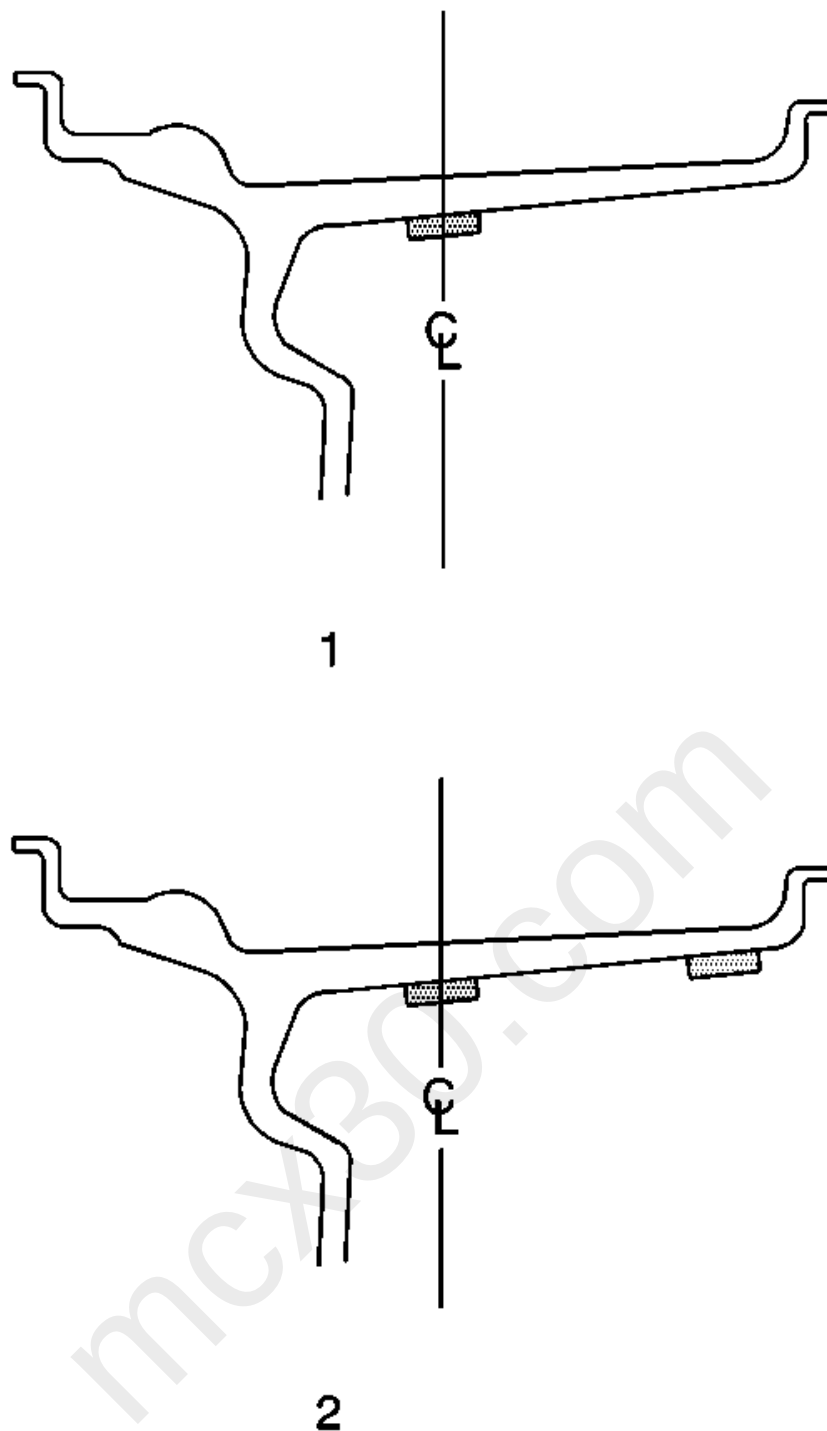


Fig. 27: Identifying Adhesive Weight Wheel Placement
Courtesy of GENERAL MOTORS COMPANY

NOTE: When installing adhesive balance weights on flangeless wheels, do NOT install the weight on the outboard surface of the rim.

Adhesive wheel balance weights may be used on factory aluminum wheels. Perform the following procedure to install adhesive wheel balance weights.

1. Determine the correct areas for placement of the wheel weights on the wheel.
 - When static balancing, locate the wheel balance weights along the wheel centerline (1) on the flat area of inner wheel surface if only 28 g (1 oz) or less is called for. If more than 28 g (1 oz) is called for, split the weights as equally as possible between the wheel centerline and the inboard edge of the inner wheel surface (2).
 - When dynamic balancing, locate the wheel balance weights along the designated flat areas of the wheel centerline and the inboard edge of the inner wheel surface (2), at the positions

specified by the wheel balancer.

2. Ensure that there is sufficient clearance between the wheel weights and brake system components.

NOTE: Do not use abrasives to clean any surface of the wheel.

3. Using a clean cloth or paper towel with a general purpose cleaner, thoroughly clean the designated balance weight attachment areas of any corrosion, overspray, dirt or any other foreign material.
4. To ensure there is no remaining residue, wipe the balance weight attachment areas again, using a clean cloth or paper towel with a mixture of half isopropyl alcohol and half water.
5. Dry the attachment areas with hot air until the wheel surface is warm to the touch.
6. Warm the adhesive backing on the wheel balance weights to room temperature.
7. Remove the protective covering from the adhesive backing on the back of the balance weights. DO NOT touch the adhesive surface.
8. Apply the wheel balance weights to the wheel, press into place with hand pressure.
9. Secure the wheel balance weights to the wheel with a 90 N (21 lb) force applied with a roller.

DESCRIPTION AND OPERATION

ALL SEASONS TIRES DESCRIPTION

Steel belted all-season radial tires qualify as snow tires, with a higher than average rating for snow traction than the non-all season radial tires previously used. Other performance areas, such as wet traction, rolling resistance, tread life, and air retention, are also improved. This is done by improvements in both tread design and tread compounds. These tires are identified by an M + S molded in the tire side wall after the tire size. The suffix MS is also molded in the tire side wall after the TPC specification number.

GENERAL DESCRIPTION

This vehicle has been engineered to operate up to the stated load capacity with wheel and tire assemblies of the type, size, construction, and configuration as originally installed. Maintenance of the tire inflation pressures is critical to the continued satisfactory performance, handling, and operating economy of the vehicle. Operation with incorrectly or improperly inflated tires can adversely affect vehicle performance and may contribute to the following:

- Reduced fuel economy
- Tire overloading
- Shortened tire life
- Excessive tire wear
- Uneven tire wear
- Vehicle handling concerns

Inspect the tire pressures when the vehicle has not been driven for at least 3 hours or not more than 1.6 km (1 mi) and when the tires are cool to the touch.

Tire inflation pressures should be inspected monthly and before an extended trip and adjusted to meet the specifications listed for the particular vehicle. Replace any missing or damaged tire valve stem extensions and/or caps to prevent the intrusion of water and contaminants.

One pound per square inch (psi) equals 6.9 kilopascals (kPa). The following table illustrates the conversion of kilopascals to pounds per square inch:

Inflation Pressure Conversion (Kilopascals to PSI)

kPa	psi	kPa	psi
140	20	215	31
145	21	220	32
155	22	230	33
160	23	235	34
165	24	240	35

kPa	psi	kPa	psi
170	25	250	36
180	26	275	40
185	27	310	45
190	28	345	50
200	29	380	55
205	30	415	60
Conversion: 6.9 kPa = 1 psi			

For the correct inflation pressures refer to the vehicle Tire Placard.

Tires inflated to a higher than recommended pressure can contribute to the following conditions:

- A hard ride
- Tire bruising
- Rapid tread wear at the center of the tire

Tires inflated to a lower than recommended pressure can contribute to the following conditions:

- Tire squeal on turns
- Hard steering
- Rapid and/or uneven wear on the outer edges of the tread
- Tire rim bruises and tire rim rupture
- Tire cord breakage
- High tire temperatures
- Sluggish vehicle handling
- Higher fuel consumption

Unequal pressure on the same axle can cause the following conditions:

- Uneven braking action
- Steering lead
- Imprecise vehicle handling

RIM AND TIRE IDENTIFICATION

Rim Identification

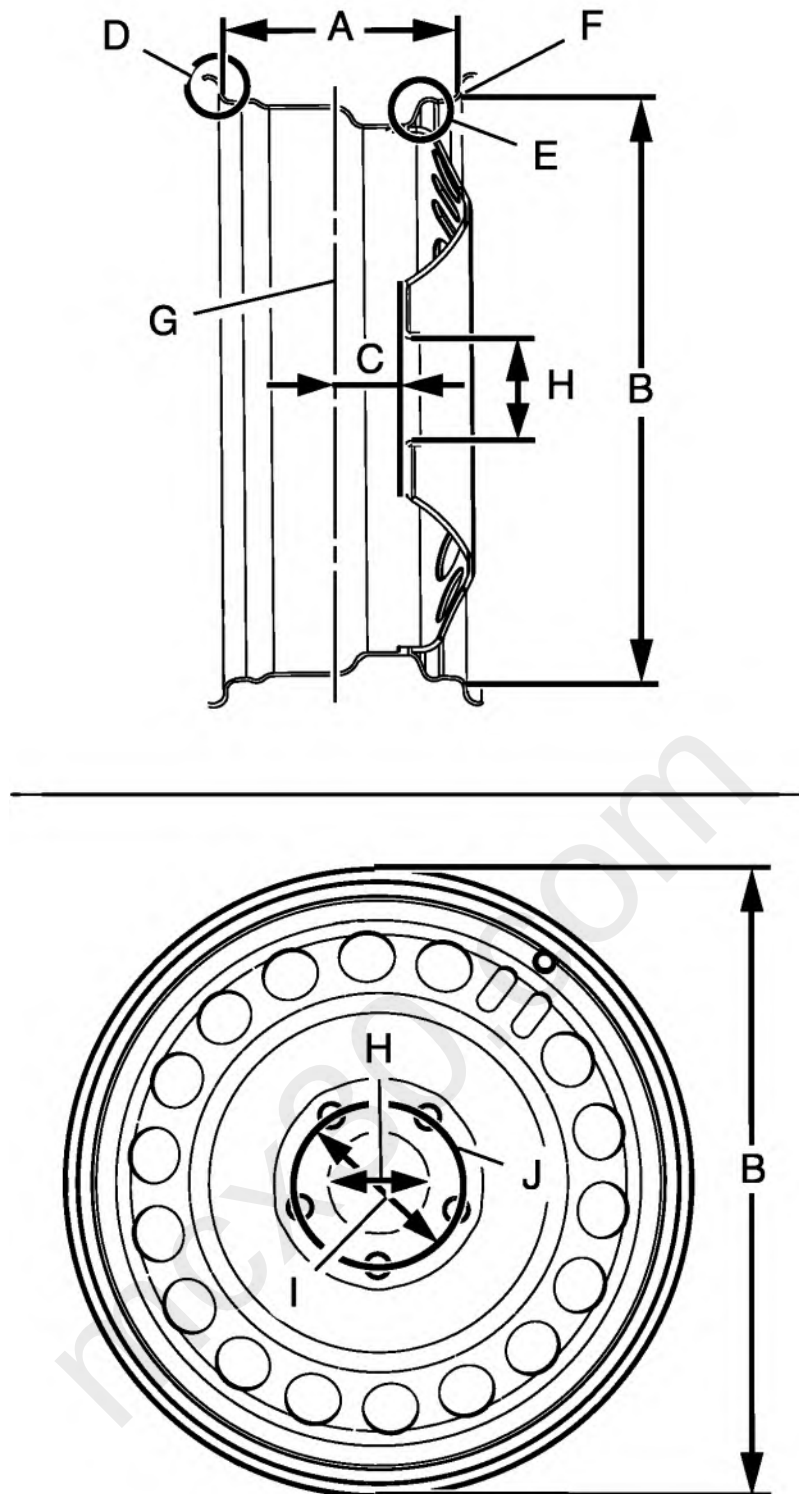


Fig. 28: Rim Identification

Courtesy of GENERAL MOTORS COMPANY

Example for a complete rim identification: 6.5Jx16H2 ET35 5X115

Measure	Meaning	Example
A	Width (Inch)	6.5 in
B	Diameter (inch)	16 in
C	Offset (ET) (Millimeter)	35 mm
D	Shape of rim flange	J
E	Rim hump	H2
F	Point for lateral runout measurement	-
G	Rim center	-
H	Rim center hole (mm)	65 mm
I	Bolt circle	115 mm

Measure	Meaning	Example
J	Number of holes	5x

Tire Identification

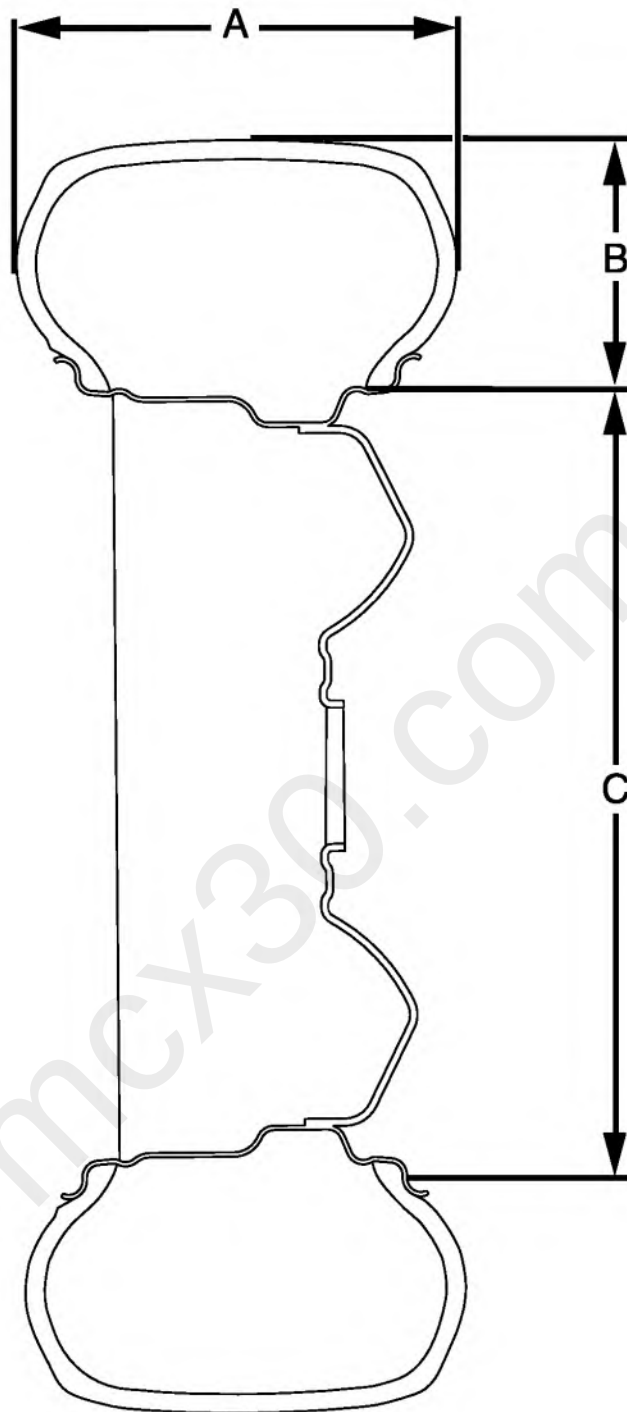


Fig. 29: Tire Identification

Courtesy of GENERAL MOTORS COMPANY

Example for a complete tire coding: 205/55 R16 91H

Code	Meaning
205	Tire width in millimeters (Measure A)
55	Percental rate between tire width and sidewall height (Measure B)
R	Constructive form
16	Inner tire diameter (Measure C)

Code	Meaning
91	Load index
H	Speed index

Tire Constructive Form Identification

Constructive Form	Identification
Bias / Cross ply	none
Radial	R
Radial-Belted / Belted bias	B

Speed Indices

Speed index	Speed limit (km/h)	Speed index	Speed limit (km/h)
E	70	R	170
F	80	S	180
G	90	T	190
J	100	U	200
K	110	H	210
L	120	V	240
M	130	VR	>210
N	140	W	270
P	150	ZR	>240
Q	160	Y	300

Load Indices

Load index	Max. wheel load (kg)	Max. axle load (kg)	Load index	Max. wheel load (kg)	Max. axle load (kg)
70	335	670	91	615	1230
71	345	690	92	630	1260
72	355	710	93	650	1300
73	365	730	94	670	1340
74	375	750	95	690	1380
75	387	774	96	710	1420
76	400	800	97	730	1460
77	412	824	98	750	1500
78	425	850	99	775	1550
79	437	874	100	800	1600
80	450	900	101	825	1650
81	462	924	102	850	1700
82	475	950	103	875	1750
83	487	974	104	900	1800
84	500	1000	105	925	1850
85	515	1030	106	950	1900
86	530	1060	107	975	1950
87	545	1090	108	1000	2000
88	560	1120	109	1030	2060
89	580	1160	110	1060	2120
90	600	1200	111	1090	2180

Important Terms

Term	Explanation
Rim Width	The rim width is measured between the inside of both rim flanges
Tire Width	The tire width is measured between the very outer ends of the tire sidewalls on an inflated tire

Term	Explanation
Outer Diameter	Diameter of an inflated tire at the most outward tread surface
Sidewall height	Half difference between inch diameter and outer tire diameter
Sidewall ratio	Percental ratio between tire width and sidewall height (for example: "55" means, that the sidewall height is 55 % of the tire width)
Tire load	The number indicates, how much weight an inflated tire (to 250 psi) can be loaded.
Tire Inflation pressure	Pressure inside the inflated and cold tire in relation to the ambient air pressure
Speed index	Indicates, how fast a tire can be driven when loaded as specified by the load index (only valid for tires up to 210 km/h)
Offset (abbr. ET)	Difference between rim center and rim to hub mounting surface

Tire Labeling

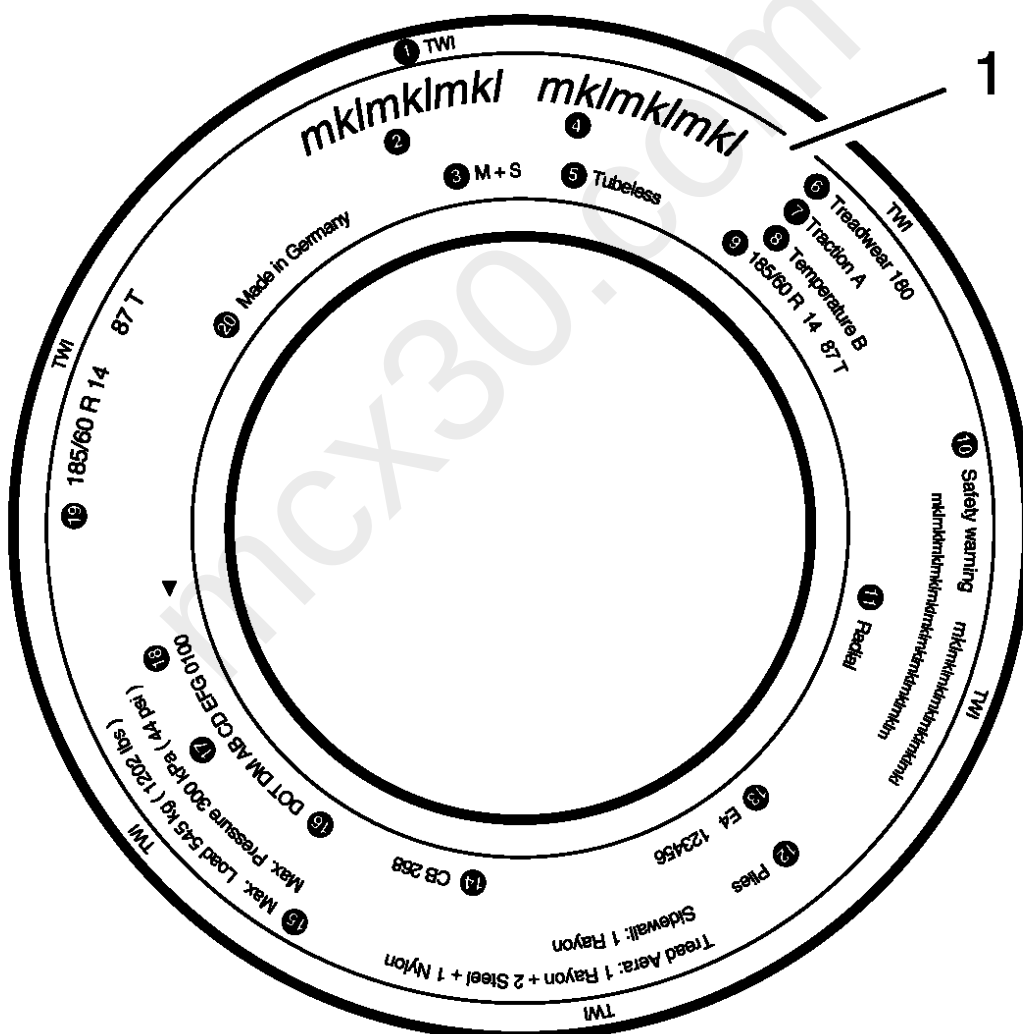


Fig. 30: Tire Labeling

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
1	Position of Tread Wear Indicator (TWI), height 1.6 mm
2	Manufacturer
3	Indicator for special usage (mud and snow)

Callout	Component Name
4	Tread pattern name
5	Marking for tubeless tires
6	Relative life expectation (by US rating; 180 = 180%)
7	Wet braking power (by US rating; A, B or C)
8	High speed temperature stability (by US rating; A, B or C)
9	Tire size labeling
10	Safety warnings for usage or tire mounting (US-specification)
11	Constructive form (radial)
12	Amount and material of tire tread, plies and sidewall
13	Approval symbol for European directive ECE-R 30
14	Internal manufacturer code
15	Details for north American countries: maximum load and pressure
16	DOT-symbol after directives of the US department of transportation (DOT)
17	DOT-coding for factory, manufacturer and tire variant
18	Date of production (here: 1 week of 2000). Code has 4 digits since 2000. Codes before 2000 have 3 digits and are marked with a triangle. Codes before 1990 have 3 digits and no further marking. The first two digits indicate the week of production, the other digits indicate the year of production.
19	Tire size labeling (just as position number 9)
20	Country of production

P-METRIC SIZED TIRES DESCRIPTION

Tire Designation

The dimensions of a P-metric sized tire are described in its designation as per the following table.

Example: 205/65 R 15 94V

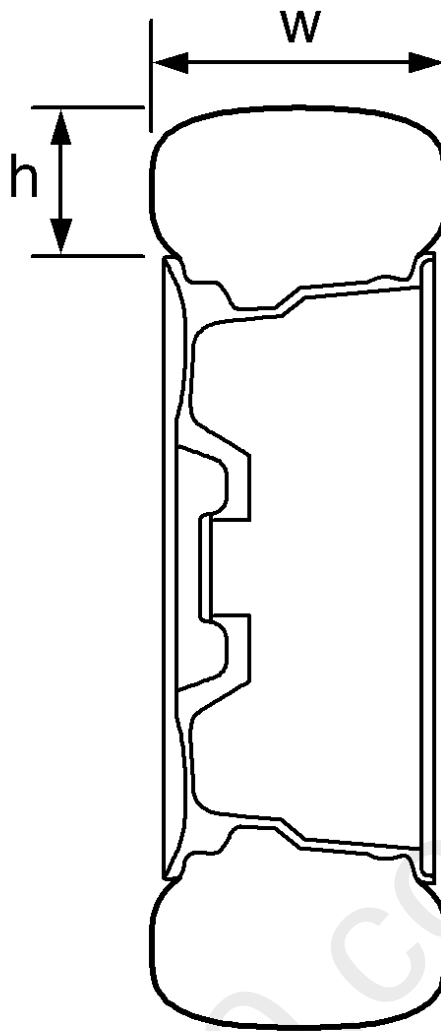


Fig. 31: View Of Tire Width & Height
 Courtesy of GENERAL MOTORS COMPANY

Designation	Explanation
205	Tire width in mm
65	Aspect ratio height (h)/width (w) %
R	Construction type, see table below
16	Rim diameter in inches
94	Load index, see table below
V	Speed rating, see table below

Construction Type

Designation	Explanation
R	Radial
B	Bias-belted
D	Diagonal (Bias)

Load Index

Code	Max Load kg	Max Load lb
91	615	1353
93	650	1430
94	670	1474
95	690	1518

Speed Rating

Code	Max Speed km/h	Max Speed mph

Code	Max Speed km/h	Max Speed mph
Q	160	99
S	180	112
T	190	118
H	210	130
V	240	149
W	270	168
Y	300	186

The marking of the tire in the example means:

- 205 - Tire width is 205 mm
- 65 - Aspect Ratio is 65% (height is 65% of width)
- 205 - Tire width is 205 mm
- 16 - The tire is for 16 inch rim
- 94 - Max load is 670 kg (1, 474 lb)
- V - Max speed is 240 km/h (149 mph)

There may sometimes be an added marking showing that the tire can handle more load:

- RF - Reinforced
- XL - Extra Load

Winter tires have an extra marking M+S.

Week of Manufacture

The week and year of manufacture is indicated on the tire.

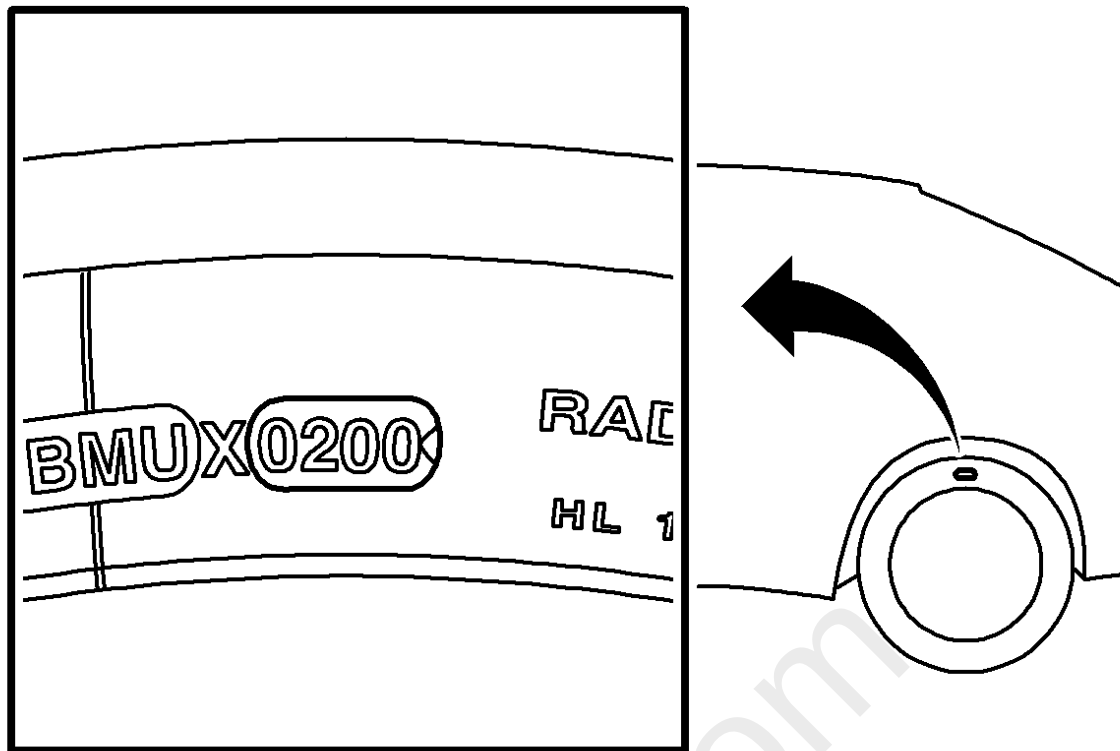


Fig. 32: Week Of Manufacture

Courtesy of GENERAL MOTORS COMPANY

The 2 first digits states the production week and the 2 last digits states the year. The symbol "<" points to the year. The code 0200< means that the tire is manufactured week 02 year 2000.

Replacing Tires

When replacing wheels/tires/rims using other dimensions always use the diagnostic tool to program the new values to avoid inaccuracy for e.g. speedometer, odometer and TPMS.

Most P-metric tire sizes do not have exact corresponding alphanumeric tire sizes. Replacement tires should be of the same tire performance criteria TPC specification number including the same size, the same load range, and the same construction as those originally installed on the vehicle.

REPLACEMENT WHEELS DESCRIPTION

Replace the wheel if any of the following conditions exist:

- The wheel exhibits excessive runout.
- The wheel is bent.
- The wheel is cracked.
- The wheel is severely corroded.
- The wheel leaks air.

WARNING:

If you are replacing the wheel(s), the wheel stud(s), the wheel nut(s) or the wheel bolt(s), install only new GM original equipment parts. Installation of used parts or non-GM original equipment parts may cause the wheel to

loosen, loss of tire air pressure, poor vehicle handling and loss of vehicle control resulting in personal injury.

CAUTION: The use of non-GM original equipment wheels may cause:

- Damage to the wheel bearing, the wheel fasteners and the wheel
- Tire damage caused by the modified clearance to the adjacent vehicle components
- Adverse vehicle steering stability caused by the modified scrub radius
- Damage to the vehicle caused by the modified ground clearance
- Speedometer and odometer inaccuracy

Replace the wheel, the wheel studs and the wheel/nuts, or the wheel bolts if applicable, if any of the following conditions exist:

- The wheel has elongated bolt holes.
- The wheel/nuts, or bolts if applicable, loosen repeatedly.

Aluminum wheel identification is cast into the inboard side of the wheel.

When replacing wheels/tires/rims using other dimensions always use the diagnostic tool to program the new values to avoid inaccuracy for e.g. speedometer, odometer and TPMS.

STEEL WHEEL REPAIR DESCRIPTION

CAUTION: Do not heat wheels in an attempt to soften them for straightening or repair damage from striking curbs, etc. Do not weld wheels. The alloy used in these wheels is heat-treated and uncontrolled heating from welding affects the properties of the material.

CAUTION: The use of tubes in tubeless tires is not a recommended repair due to the fact that speed ratings are greatly reduced.

You can repair porosity in aluminum wheels. If leaks are found in a steel wheel, replace the wheel with a wheel of original equipment quality.

TREAD WEAR INDICATORS DESCRIPTION

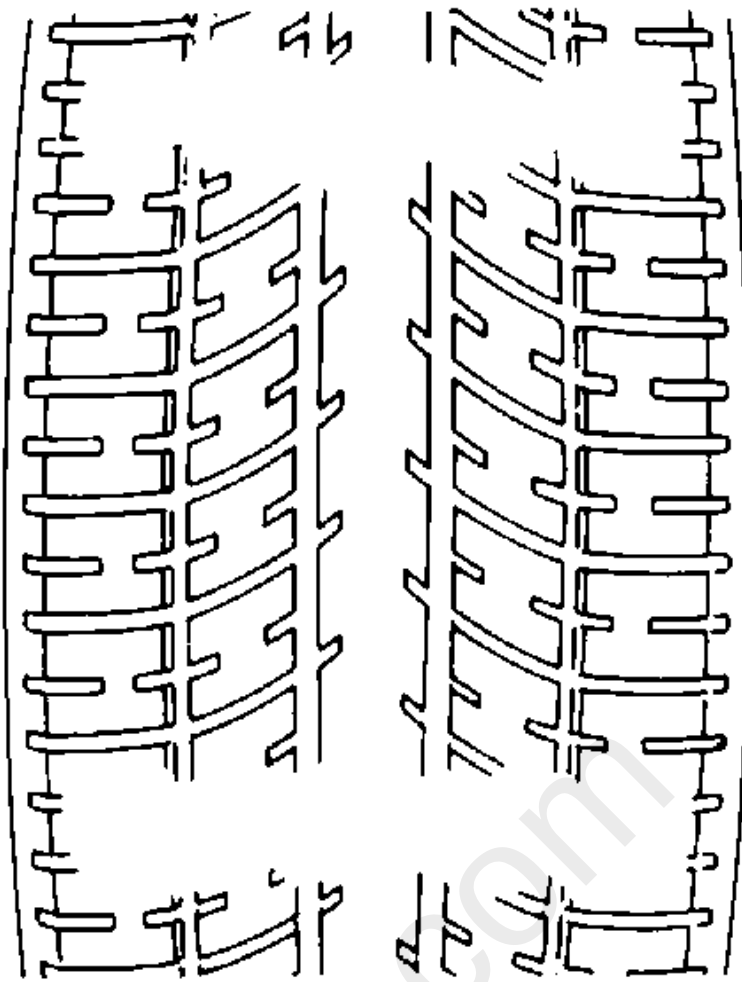


Fig. 33: View Of Tread Wear Indicators
Courtesy of GENERAL MOTORS COMPANY

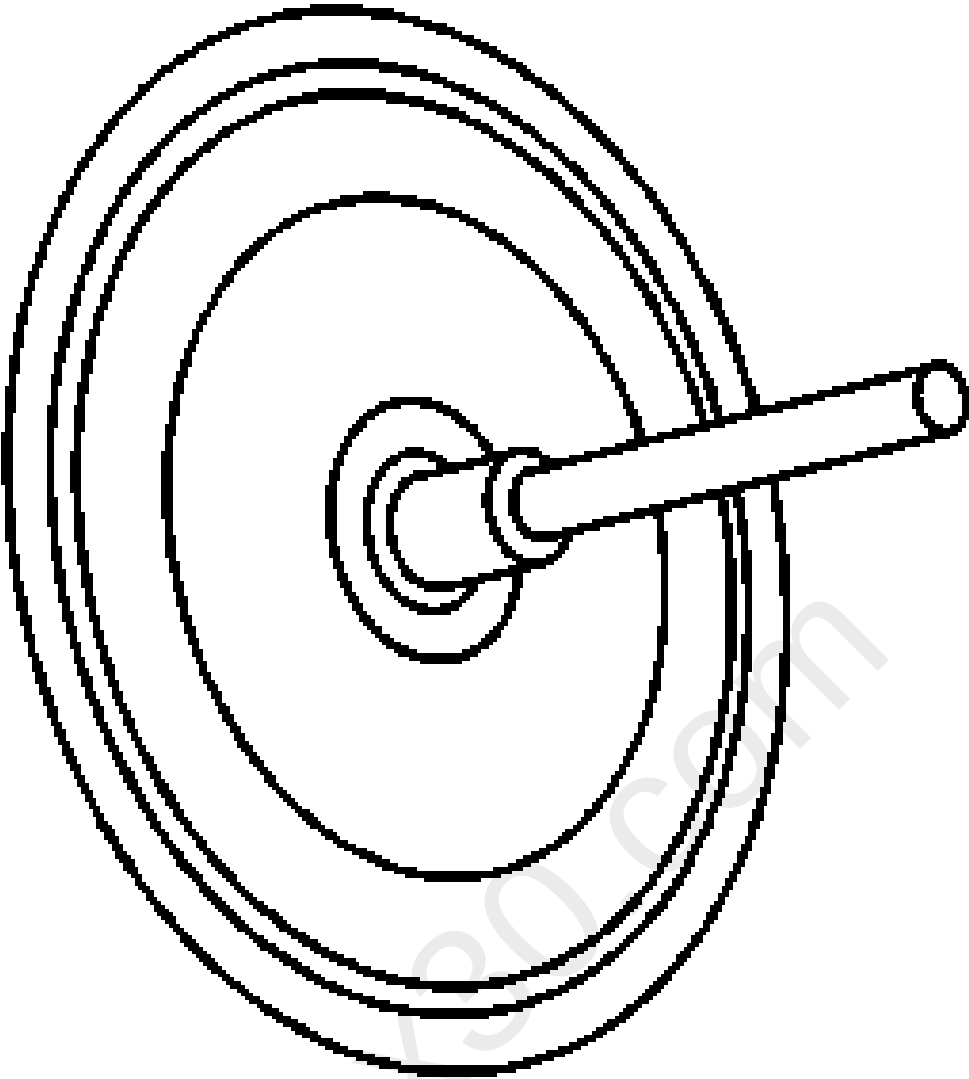
The original equipment tires have tread wear indicators that show when you should replace the tires.

The location of these indicators are at 60 degree intervals around the outer diameter of the tire. The indicators appear as a 6 mm (0.25 in) wide band when the tire tread depth becomes 1.6 mm (2/32 in).

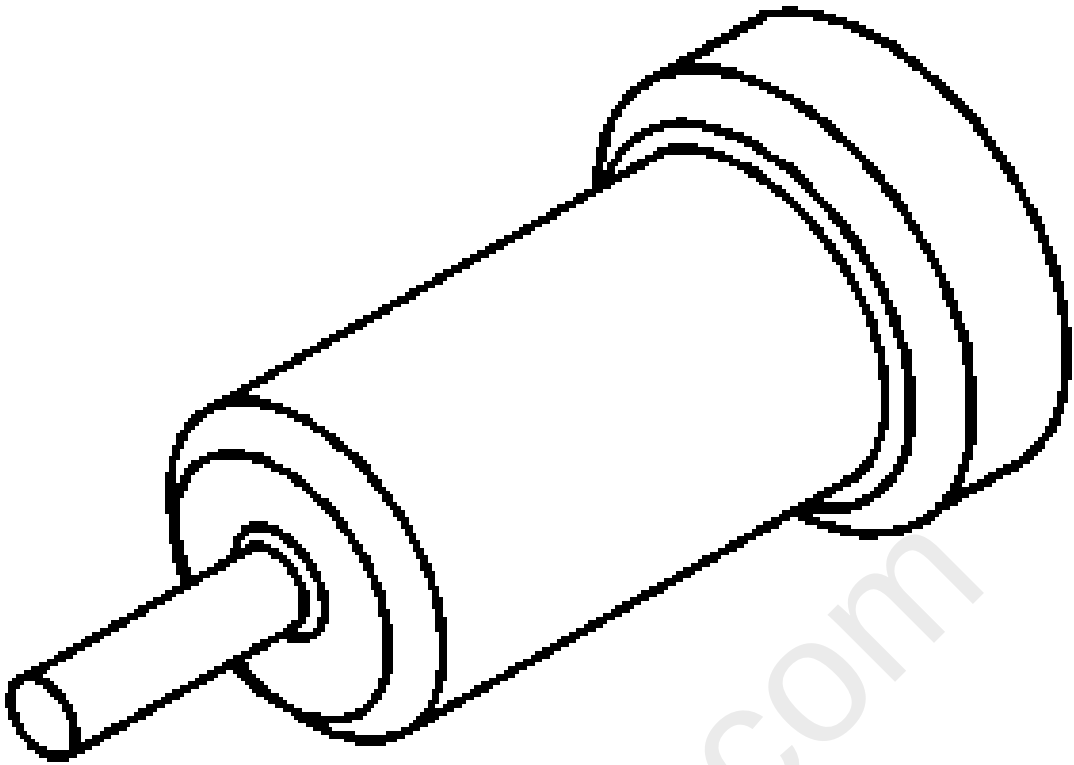
SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description

Illustration	Tool Number/ Description
	CH 41013 J 41013 Rotor Resurfacing kit

--

Illustration	Tool Number/ Description
	CH 42450 - A J 42450 - A Wheel Hub Resurfacing Kit

2018 SUSPENSION

Wheel Alignment - Equinox & Terrain

SPECIFICATIONS

WHEEL ALIGNMENT SPECIFICATIONS

Suspension	Camber		Cross Camber (L-R)	Caster		Cross Caster (L-R)	Total Toe	Steering Wheel Angle	Thrust Angle / 2
	Left	Right		Left	Right				
Front FWD	-0.50° ± 0.70°	-0.50° ± 0.70°	0.0° ± 0.80°	4.50° ± 0.80°	4.50° ± 0.80°	0.0° ± 0.80°	+0.20° ± 0.20°	0.0° ± 3.50°	-
Front AWD	-0.35° ± 0.70°	-0.35° ± 0.70°	0.0° ± 0.80°	4.50° ± 0.80°	4.50° ± 0.80°	0.0° ± 0.80°	+0.20° ± 0.20°	0.0° ± 3.50°	-
Rear	-0.50° ± 0.80°	-0.50° ± 0.80°	-	-	-	-	0.10° ± 0.20°	-	0.0° ± 0.30°

Alignment Condition: Full tank of fuel, no passengers and placed on flat level surface.

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Tie Rod Jam Nut	75 N.m (55 lb ft)

REPAIR INSTRUCTIONS

WHEEL ALIGNMENT MEASUREMENT

Steering and vibration complaints are not always the result of improper alignment. One possible cause is wheel and tire imbalance. Another possibility is tire lead due to worn or improperly manufactured tires. Lead/pull is defined as follows: At a constant highway speed on a typical straight road, lead/pull is the amount of effort required at the steering wheel to maintain the vehicle straight path. Lead is the vehicle deviation from a straight path on a level road without pressure on the steering wheel.

Before performing any adjustment affecting wheel alignment, perform the following inspections and adjustments in order to ensure correct alignment readings:

- Inspect the tires for the proper inflation and adjust as necessary.
- Inspect the tires for irregular tire wear. Refer to [Tire Diagnosis - Irregular or Premature Wear](#)
- Inspect the runout of the wheels and the tires.
- Inspect the wheel bearings for backlash and excessive play.
- Inspect the ball joints and tie rod ends for looseness or wear.
- Inspect the control arms and stabilizer shaft for looseness or wear.
- Inspect the steering gear for looseness at the frame. Refer to [Fastener Specifications](#)
- Inspect the struts/shock absorbers for wear, leaks, and any noticeable noises. Refer to [Suspension Strut and Shock Absorber Testing - On Vehicle](#)

- Inspect the vehicle trim height. Refer to [Trim Height Inspection](#)
- Inspect the steering wheel for excessive drag or poor return due to stiff or rusted linkage or suspension components.

Give consideration to the condition of the equipment being used for the alignment. Follow the equipment manufacturer instructions.

Satisfactory vehicle operation may occur over a wide range of alignment settings. However, if the setting exceeds the service allowable specifications, correct the alignment to the service preferred specifications. Refer to [Wheel Alignment Specifications](#)

Perform the following steps in order to measure the front and rear alignment angles:

1. Install the alignment equipment according to the manufacturer instructions.
2. Jounce the front and the rear bumpers 3 times prior to checking the wheel alignment.
3. Measure the alignment angles and record the readings.
4. Adjust alignment angles to vehicle specification, if necessary. Refer to [Wheel Alignment Specifications](#)

FRONT CAMBER ADJUSTMENT

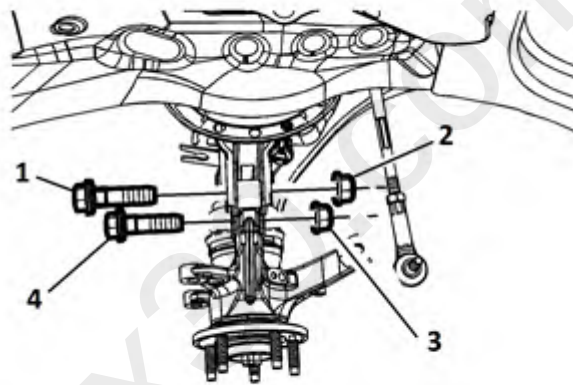


Fig. 1: Front Camber Adjustment Nuts And Bolts

Courtesy of GENERAL MOTORS COMPANY

NOTE: A Service Bolt is available for the lower strut to steering knuckle position. Do not attempt to file on the strut to make camber adjustment. The service bolt is approximately 2 mm smaller in diameter to allow adjustment. Refer to the electronic parts catalog for proper application.

1. If the front camber is out of specifications, perform the following:
 - Remove the top front strut to steering knuckle nut (2) and the bolt (1). DISCARD the bolt.
 - Replace the top front strut to steering knuckle bolt (1) with the service bolt. (No spines or knurls) Do not fully Tighten the nut.
 - Loosen the nut (3) on the bottom bolt (4) enough to allow the strut to move.
 - Adjust the front camber to specifications. Refer to [Wheel Alignment Specifications](#)
2. Tighten the top front strut nut (2). Refer to [Strut Assembly Removal and Installation](#)
3. Remove the bottom front strut to steering knuckle nut (3) and the bolt (4). DISCARD the bolt.
4. Replace the bottom front strut to steering knuckle bolt. Install a NEW splined/knurled bolt.
5. Tighten the bottom front strut nut. Refer to [Strut Assembly Removal and Installation](#)

WHEEL ALIGNMENT - STEERING WHEEL ANGLE AND/OR FRONT TOE ADJUSTMENT

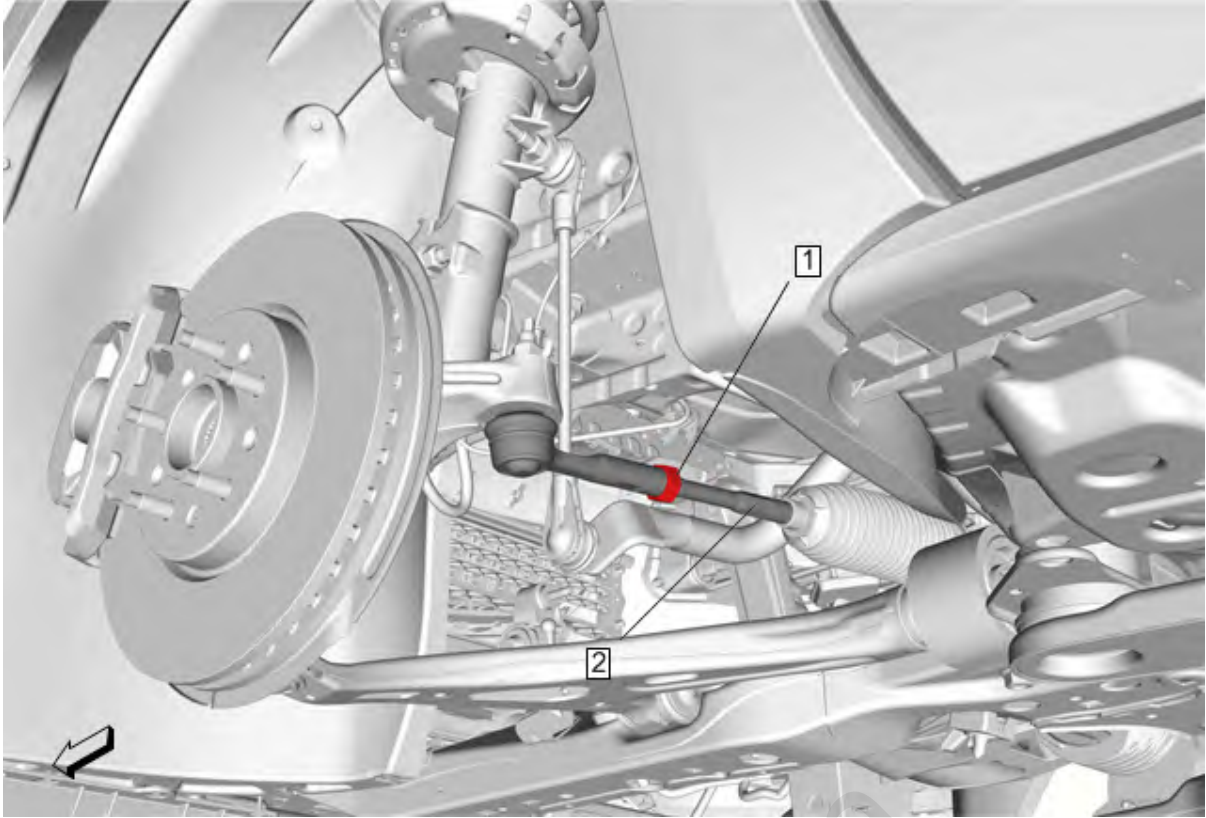


Fig. 2: Steering Linkage Inner Tie Rod And Jam Nut
Courtesy of GENERAL MOTORS COMPANY

1. Ensure the steering wheel and the front wheels are in the straight ahead position.
2. Loosen Steering Linkage Inner Tie Rod Nut (1)
3. Rotate the inner tie rod (2) as necessary to achieve the required toe specification setting. Refer to [Wheel Alignment Specifications](#)

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

4. Tighten Steering Linkage Inner Tie Rod Nut (1) to 75 N.m (55 lb ft)
5. Check the toe setting after Tightening.
6. Re-adjust the toe setting if necessary.
7. Center the steering angle sensor. Refer to [Steering Wheel Angle Sensor Centering](#)

REAR CAMBER ADJUSTMENT

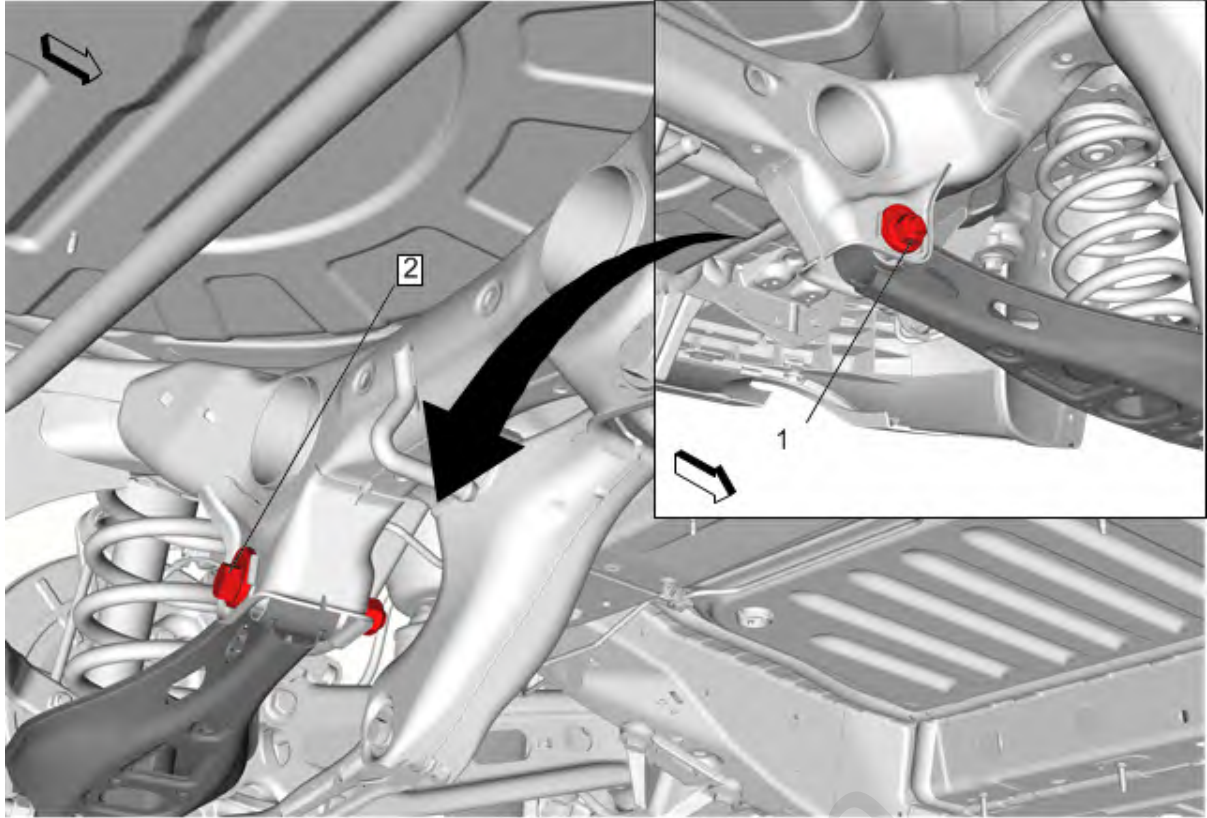


Fig. 3: Rear Camber Adjustment Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: The frame of the vehicle is slotted, turning the cam bolt will move the camber to the desired location.

1. Loosen the lower control arm-to-frame nut (1) enough to allow movement.
2. Rotate the lower control arm-to-frame bolt (2) in the direction necessary to correct the camber measurement.
3. Snug the lower control arm-to-frame nut, do not Tighten at this time.
4. Re-inspect the rear camber specifications and adjust as necessary.
5. Hold the bolt and Tighten the lower control arm-to-frame nut. Refer to [Lower Control Arm Replacement](#)
6. Repeat the procedure for the other rear wheel.

REAR TOE ADJUSTMENT

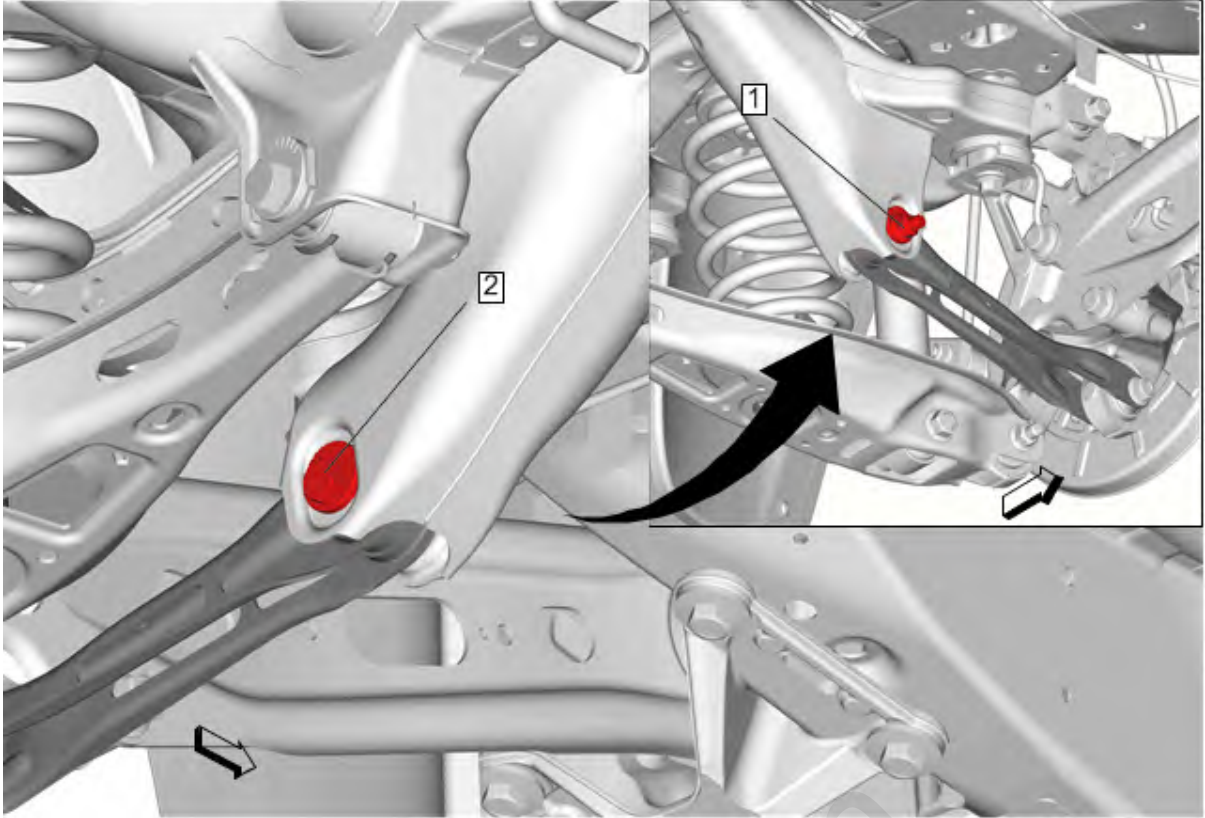


Fig. 4: Toe Link-To-Frame Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: The frame of the vehicle is slotted, turning the cam bolt will move the toe to the desired location.

1. Loosen the toe link-to-frame nut (1) enough to allow movement.
2. Rotate the toe link-to-frame bolt (2) in the direction necessary to correct the toe measurement.
3. Snug the toe link-to-frame nut, do not Tighten at this time.
4. Re-inspect the rear toe specifications and adjust as necessary.
5. Hold the bolt and Tighten the toe link-to-frame nut. Refer to [Adjust Link Replacement](#)
6. Repeat the procedure for the other rear wheel.

DESCRIPTION AND OPERATION

CAMBER DESCRIPTION

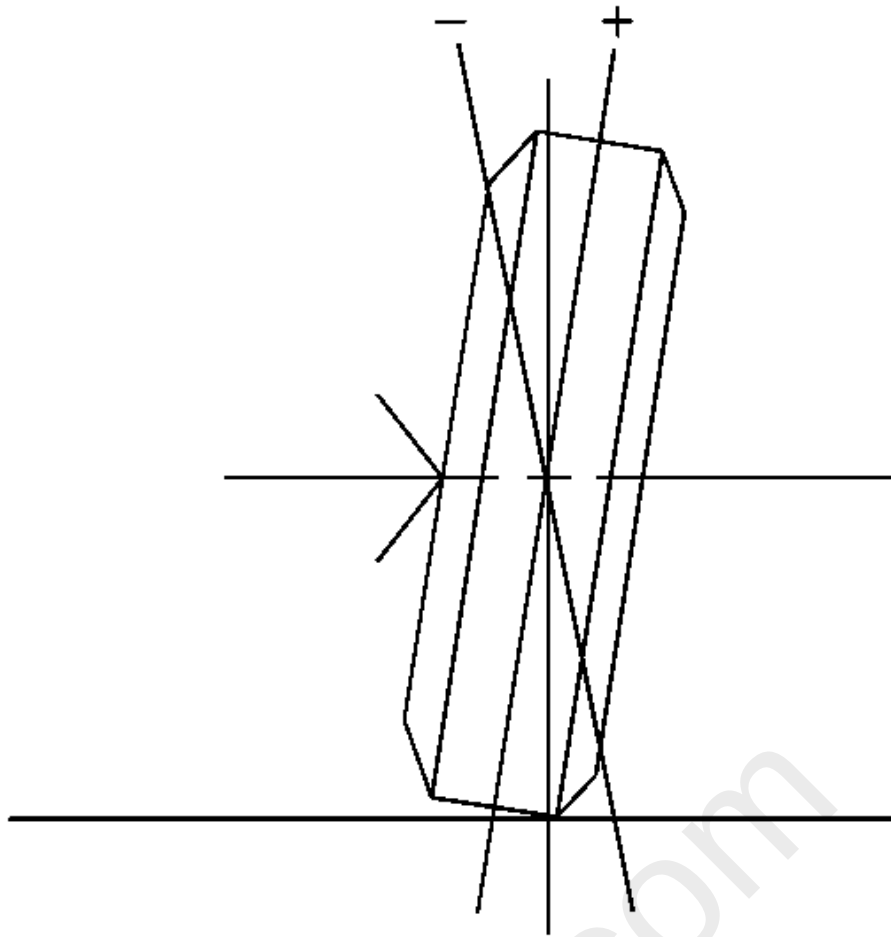


Fig. 5: Identifying Camber Angle

Courtesy of GENERAL MOTORS COMPANY

Camber is the tilting of the wheels from the vertical when viewed from the front of the vehicle. When the wheels tilt outward at the top, the camber is positive (+). When the wheel tilts inward at the top, the camber is negative (-). The amount of tilt is measured in degrees from the vertical. Camber settings influence the directional control and the tire wear.

- Too much positive camber will result in premature wear on the outside of the tire and cause excessive wear on the suspension parts.
- Too much negative camber will result in premature wear on the inside of the tire and cause excessive wear on the suspension parts.
- Unequal side-to-side camber of 1 degree or more will cause the vehicle to pull or lead to the side with the most positive camber.

CASTER DESCRIPTION

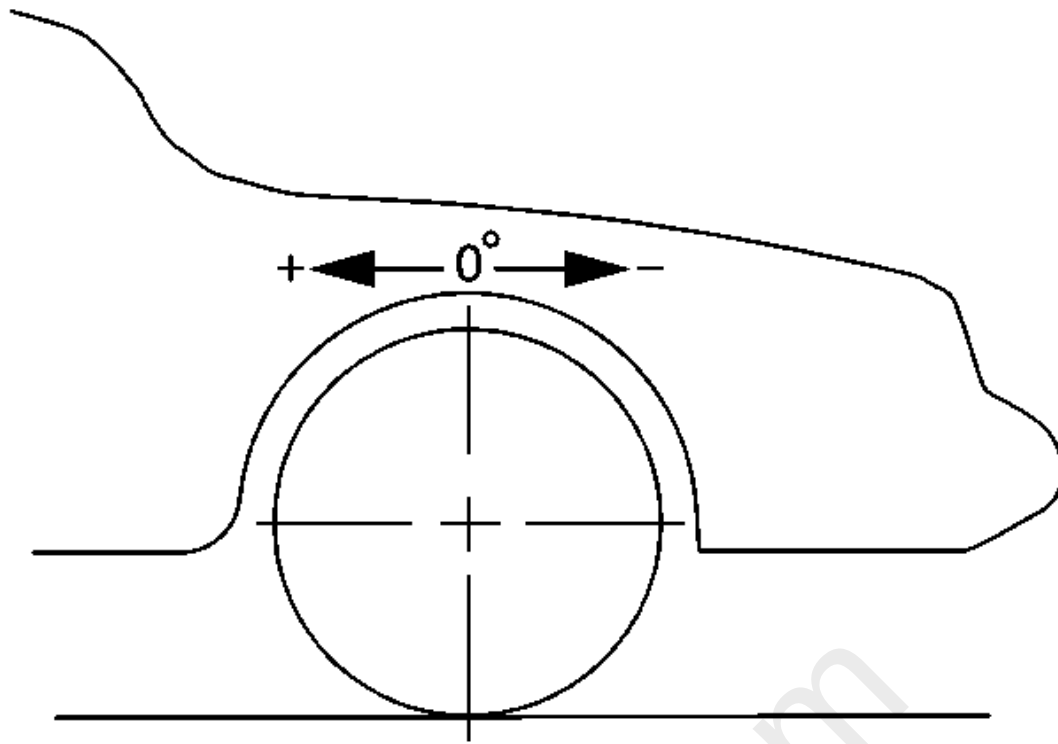


Fig. 6: Identifying Caster Angle

Courtesy of GENERAL MOTORS COMPANY

Caster is the tilting of the uppermost point of the steering axis either forward or backward, when viewed from the side of the vehicle. A backward tilt is positive (+) and a forward tilt is negative (-). Caster influences directional control of the steering but does not affect the tire wear. Caster is affected by the vehicle height, therefore it is important to keep the body at its designed height. Overloading the vehicle or a weak or sagging rear spring will affect caster. When the rear of the vehicle is lower than its designated trim height, the front suspension moves to a more positive caster. If the rear of the vehicle is higher than its designated trim height, the front suspension moves to a less positive caster.

With too little positive caster, steering may be touchy at high speed and wheel returnability may be diminished when coming out of a turn. If one wheel has more positive caster than the other, that wheel will pull toward the center of the vehicle. This condition will cause the vehicle to pull or lead to the side with the least amount of positive caster.

LEAD/PULL DESCRIPTION

At a constant highway speed on a typical straight road, lead/pull is the amount of effort required at the steering wheel to maintain the vehicle's straight path.

NOTE: Vehicles will tend to lead/pull in the direction of the road slope as part of normal operation.

Lead/pull is usually caused by the following factors:

- Road slope
- Variability in tire construction
- Wheel alignment (front cross caster and camber)

- Unbalanced steering gear
- Electronic power steering (EPS) steering position and torque sensors not calibrated correctly, if equipped

MEMORY STEER DESCRIPTION

Memory steer is when the vehicle wants to lead or pull in the direction the driver previously turned the vehicle. Additionally, after turning in the opposite direction, the vehicle will want to lead or pull in that direction.

SCRUB RADIUS DESCRIPTION

Ideally, the scrub radius is as small as possible. Normally, the SAI angle and the centerline of the tire and the wheel intersect below the road surface, causing a positive scrub radius. With struts, the SAI angle is much larger than the long arm/short arm type of suspension. This allows the SAI angle to intersect the camber angle above the road surface, forming a negative scrub radius. The smaller the scrub radius, the better the directional stability. Installing aftermarket wheels that have additional offset will dramatically increase the scrub radius. The newly installed wheels may cause the centerline of the tires to move further away from the spindle. This will increase the scrub radius.

A large amount of scrub radius can cause severe shimmy after hitting a bump. Four-wheel drive vehicles with large tires use a steering damper to compensate for an increased scrub radius. Scrub radius is not directly measurable by the conventional methods. Scrub radius is projected geometrically by engineers during the design phase of the suspension.

SETBACK DESCRIPTION

Setback applies to both the front and the rear wheels. Setback is the amount that one wheel may be aligned behind the other wheel. Setback may be the result of a road hazard or a collision. The first clue is a caster difference from side-to-side of more than 1 degree.

THRUST ANGLES DESCRIPTION

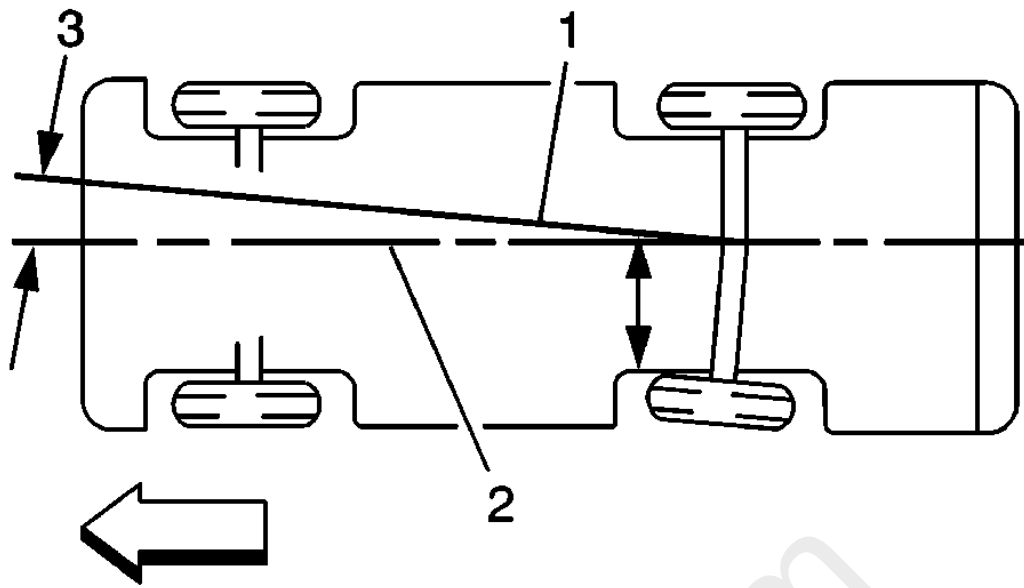


Fig. 7: Identifying Thrust Angles

Courtesy of GENERAL MOTORS COMPANY

The front wheels aim or steer the vehicle. The rear wheels control tracking. This tracking action relates to the thrust angle (3). The thrust angle is the path that the rear wheels take. Ideally, the thrust angle is geometrically aligned with the body centerline (2).

In the illustration, toe-in is shown on the left rear wheel, moving the thrust line (1) off center. The resulting deviation from the centerline is the thrust angle.

If the thrust angle is not set properly the vehicle may "dog track", the steering wheel may not be centered or it could be perceived as a bent axle. Thrust angle can be checked during a wheel alignment.

Positive thrust angle means the thrust line is pointing to the right hand side (RHS) of the vehicle.

Negative thrust angle means the thrust line is pointing to the left hand side (LHS) of the vehicle.

If the thrust angle is out of specification, moving the axle to body relationship will change the thrust angle reading.

If the vehicle is out in the Positive (+) direction-moving the RHS forward and/or LHS rearward will move the thrust angle towards zero degrees.

If the vehicle is out in the Negative (-) direction-moving the RHS rearward and/or LHS forward will move the thrust angle towards zero degrees.

TOE DESCRIPTION

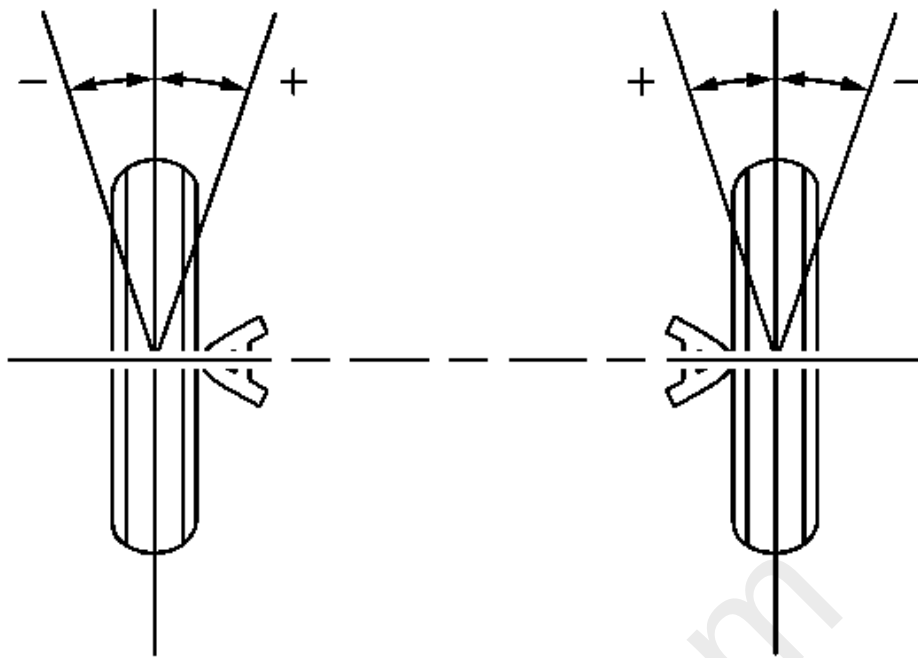


Fig. 8: Identifying Toe Angle

Courtesy of GENERAL MOTORS COMPANY

Toe is a measurement of how much the front and/or rear wheels are turned in or out from a straight-ahead position. When the wheels are turned in, toe is positive (+). When the wheels are turned out, toe is negative (-). The actual amount of toe is normally only a fraction of a degree. The purpose of toe is to ensure that the wheels roll parallel.

Toe also offsets the small deflections of the wheel support system that occur when the vehicle is rolling forward. In other words, with the vehicle standing still and the wheels set with toe-in, the wheels tend to roll parallel on the road when the vehicle is moving.

Improper toe adjustment will cause premature tire wear and cause steering instability.

TORQUE STEER DESCRIPTION

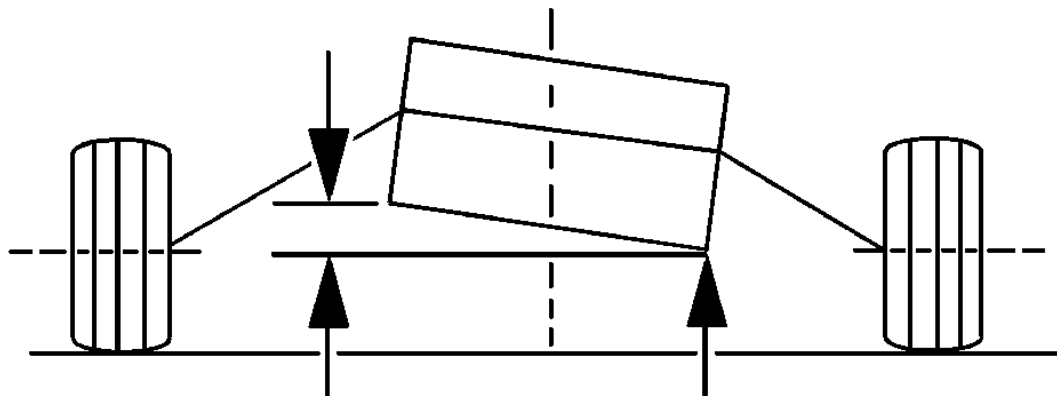


Fig. 9: Identifying Torque Steer

Courtesy of GENERAL MOTORS COMPANY

A vehicle pulls or leads in one direction during hard acceleration. A vehicle pulls or leads in the other direction during deceleration.

The following factors may cause torque steer to be more apparent on a particular vehicle:

- A slightly smaller diameter tire on the right front increases a right torque lead. Inspect the front tires for differences in the brand, the construction, or the size. If the tires appear to be similar, change the front tires from side-to-side and retest the vehicle. Tire and wheel assemblies have the most significant effect on torque steer correction.
- A large difference in the right and left front tire pressure
- Left-to-right differences in the front view axle angle may cause significant steering pull in a vehicle. The pull will be to the side with the most downward sloping axle from the differential to the wheels. Axles typically slope downward from the differential. The slope of the transaxle pan to level ground may be used as an indication of bias axle angles. The side with the higher transaxle pan (shown on the left side of the illustration) has the most downward sloping axle angle.

WANDER DESCRIPTION

Wander is the undesired drifting or deviation of a vehicle to either side from a straight path with hand pressure on the steering wheel. Wander is a symptom of the vehicle's sensitivity to external disturbances, such as road crown and crosswind, and accentuated by poor on-center steering feel.

