

2017 SUSPENSION

Rear Suspension - Encore, Trax

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

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

Application	Specification
	Metric (English)
Rear Axle Mounting Bolt	
First Pass:	160 N.m (118 lb ft)
Final Pass:	38 degrees
Rear Shock Absorber Lower Bolt	
First Pass:	150 N.m (111 lb ft)
Final Pass:	60-75 degrees
Rear Shock Absorber Upper Bolt	100 N.m (74 lb ft)
Rear Wheel Bearing and Hub Bolt	58 N.m (43 lb ft)
Shock Absorber Nut	25 N.m (18 lb ft)
Wheel Hub Bolt	58 N.m (43 lb ft)

REPAIR INSTRUCTIONS

REAR WHEEL BEARING AND HUB REPLACEMENT (WITH DRUM BRAKES)

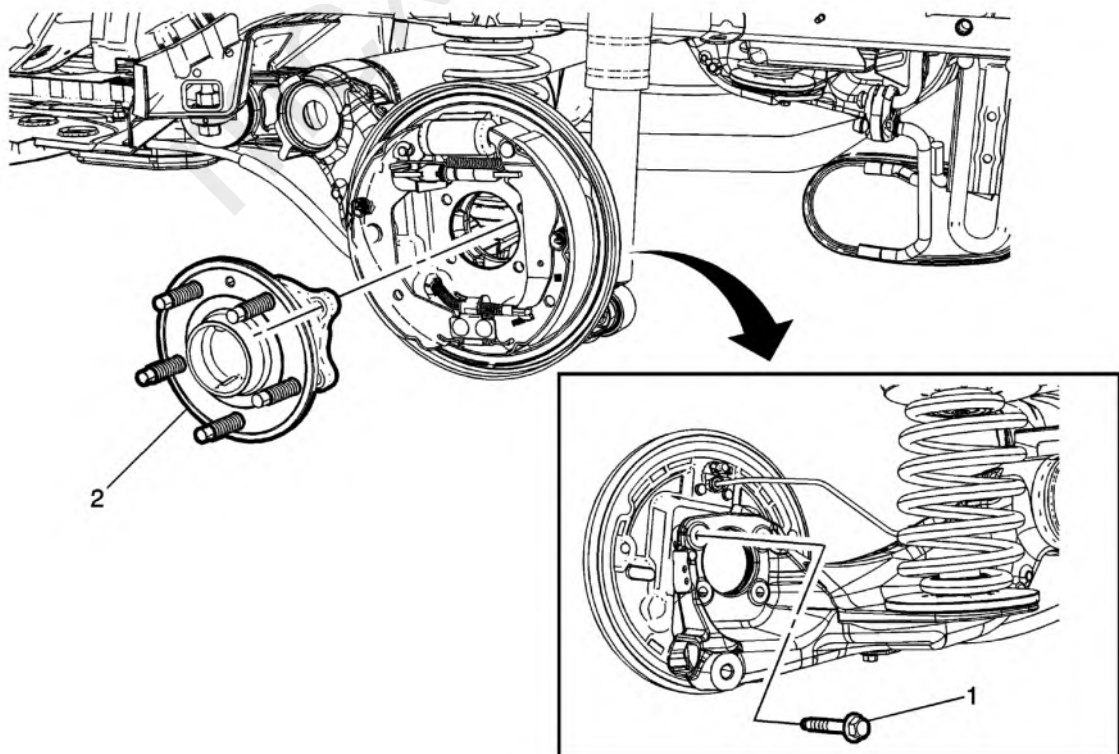


Fig. 1: Rear Wheel Bearing And Hub (With Drum Brakes)

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name

Callout	Component Name
Preliminary Procedure 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Remove the tire and wheel. Refer to Tire and Wheel Removal and Installation 3. Remove the rear brake drum. Refer to Brake Drum Replacement 4. Remove the rear wheel speed sensor. Refer to Rear Wheel Speed Sensor Replacement	
1	Rear Wheel Bearing Hub Bolts (Qty: 4) CAUTION: Refer to Fastener Caution . Tighten 58 N.m (43 lb ft)
2	Rear Wheel Bearing/Hub Assembly Procedure 1. If the new rear wheel bearing hub assembly has an integrated corrosion protection cap, remove the cap from the anchor plate prior to installing the wheel bearing and hub assembly. 2. Ensure that the rear wheel bearing/hub is properly aligned with the rear axle to allow access to the wheel speed sensor connector.

REAR WHEEL BEARING AND HUB REPLACEMENT (WITH DISC BRAKES)

Special Tools

CH 50559 Wheel Hub/Bearing Remover Kit

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

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
3. Separate the wheel drive shaft from the wheel bearing/hub. Refer to [Rear Wheel Drive Shaft Replacement](#)
4. Remove the rear brake shield. Refer to [Rear Brake Shield Replacement \(All Wheel Drive\)](#) [Rear Brake Shield Replacement \(Front Wheel Drive\)](#)
5. Remove the rear wheel speed sensor. Refer to [Rear Wheel Speed Sensor Replacement](#)

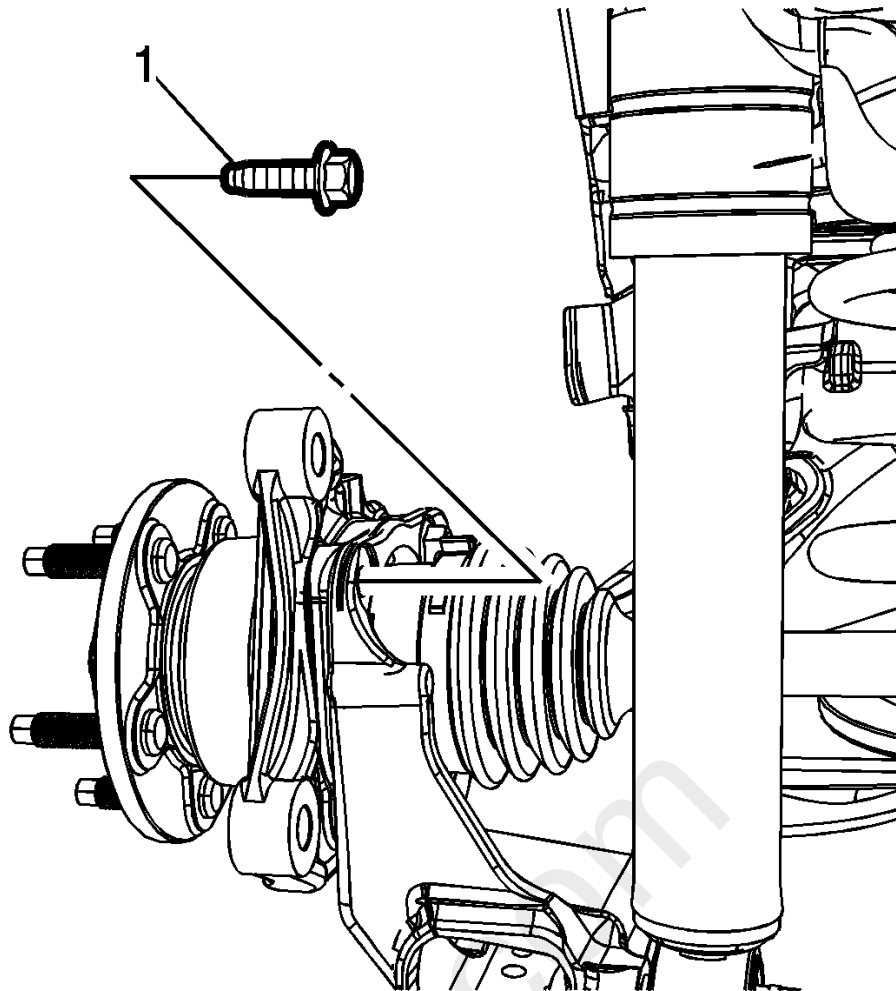


Fig. 2: Wheel Hub Bolts

Courtesy of GENERAL MOTORS COMPANY

6. Remove the 4 wheel hub bolts (1).

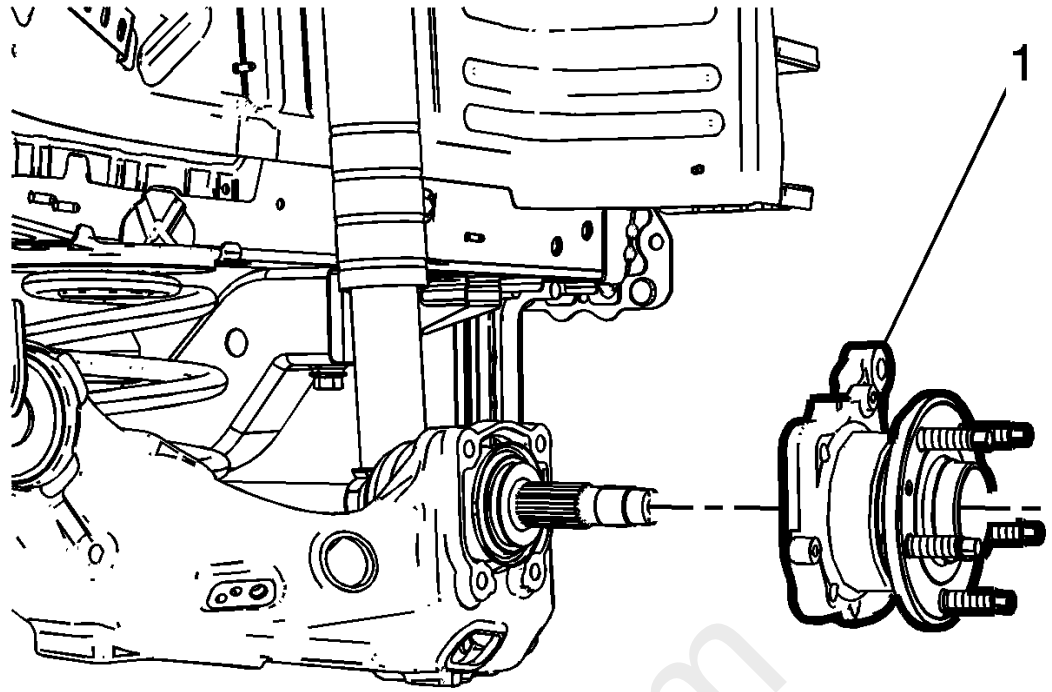


Fig. 3: Wheel Hub Assembly

Courtesy of GENERAL MOTORS COMPANY

7. Remove the wheel hub assembly (1) from the rear axle.

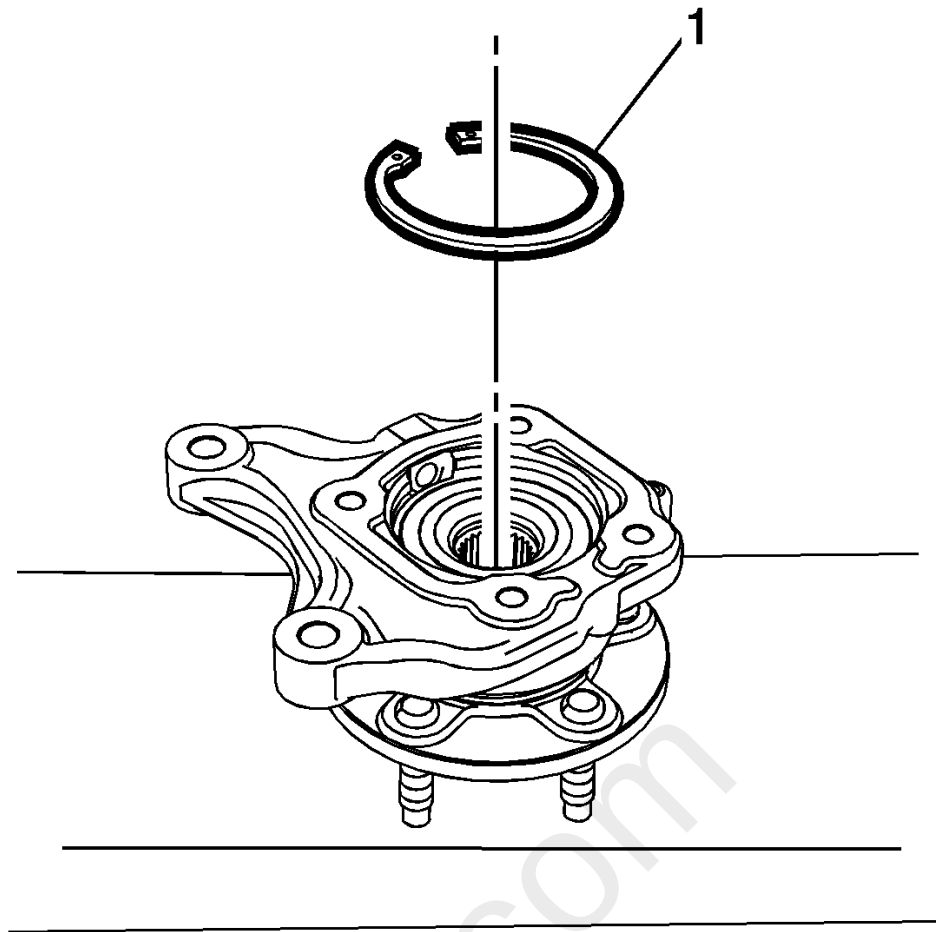


Fig. 4: Retaining Ring

Courtesy of GENERAL MOTORS COMPANY

NOTE: When removing the retaining ring, ensure the original position of retaining ring.

8. Remove the retaining ring (1).
9. Position the rear knuckle assembly on a press so that the wheel hub is horizontally placed using a suitable spacer.
10. Using the **CH-50559-2** adaptor, the appropriate extension and press, remove the wheel hub from the wheel bearing.
11. If the inner race of the bearing is pulled out with the hub, remove the inner race from the hub using the appropriate tools.
12. Using the **CH-50559-3** adaptor, the appropriate extension and press, remove the wheel bearing from the rear knuckle and discard it.

Installation Procedure

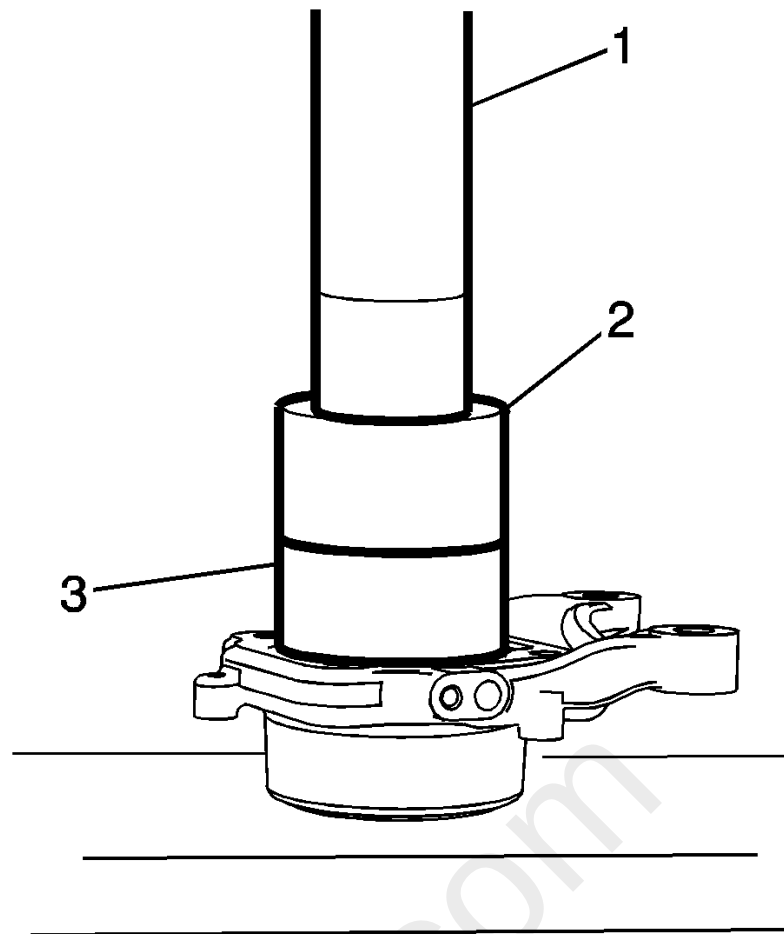


Fig. 5: Adapter, Press Extension And Bearing
Courtesy of GENERAL MOTORS COMPANY

1. Using the **CH-50559-4** adaptor (2) the appropriate extension and press (1), install the NEW bearing (3) into the rear knuckle until it is correctly seated.

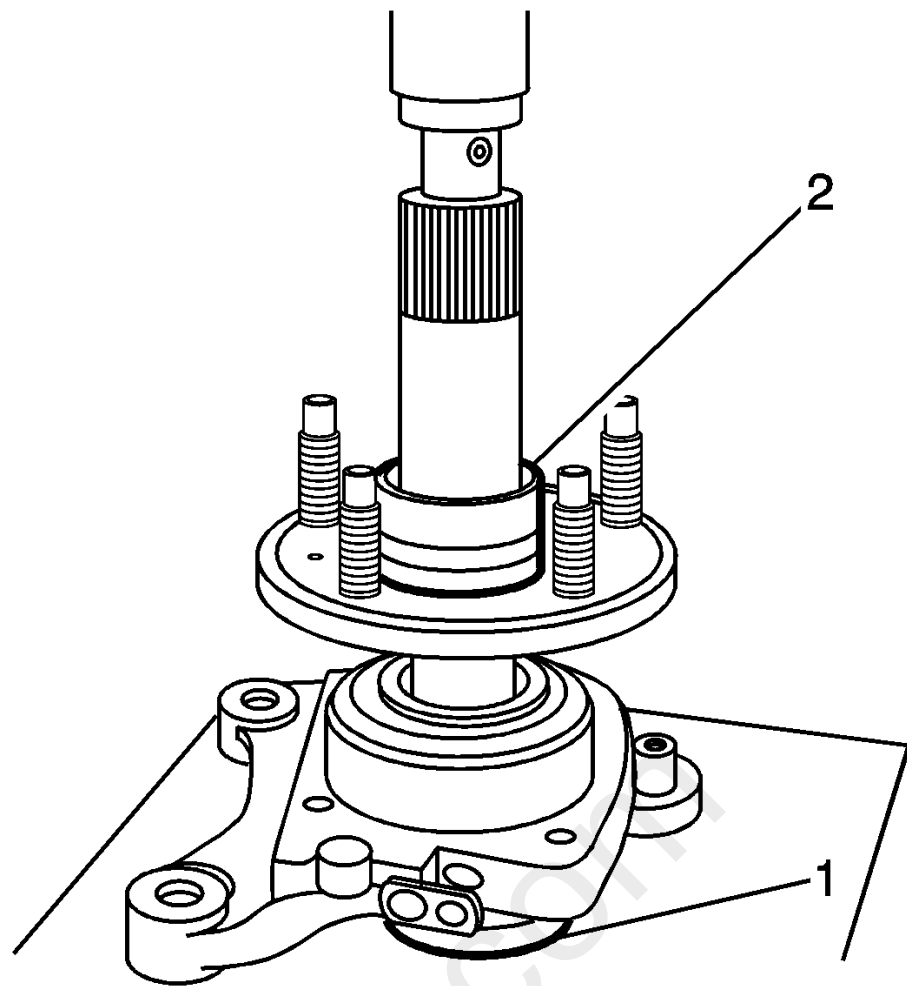


Fig. 6: Special Tool

Courtesy of GENERAL MOTORS COMPANY

2. Position the **CH-50559-4** adaptor (1) to the inside of the bearing and position the **CH-50559-2** adaptor (2) and the appropriate extension on the wheel hub.

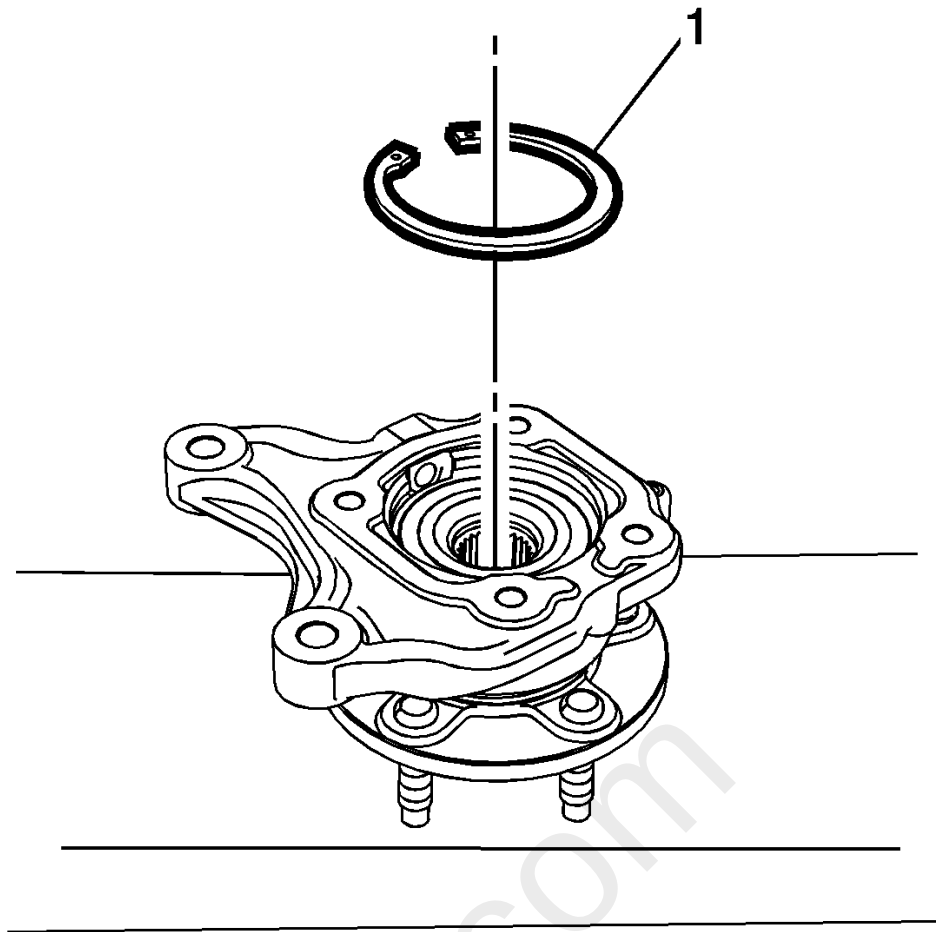


Fig. 7: Retaining Ring

Courtesy of GENERAL MOTORS COMPANY

NOTE: Ensure that the retaining ring is seated in the original position.

3. Using the appropriate tool, install the retaining ring (1).

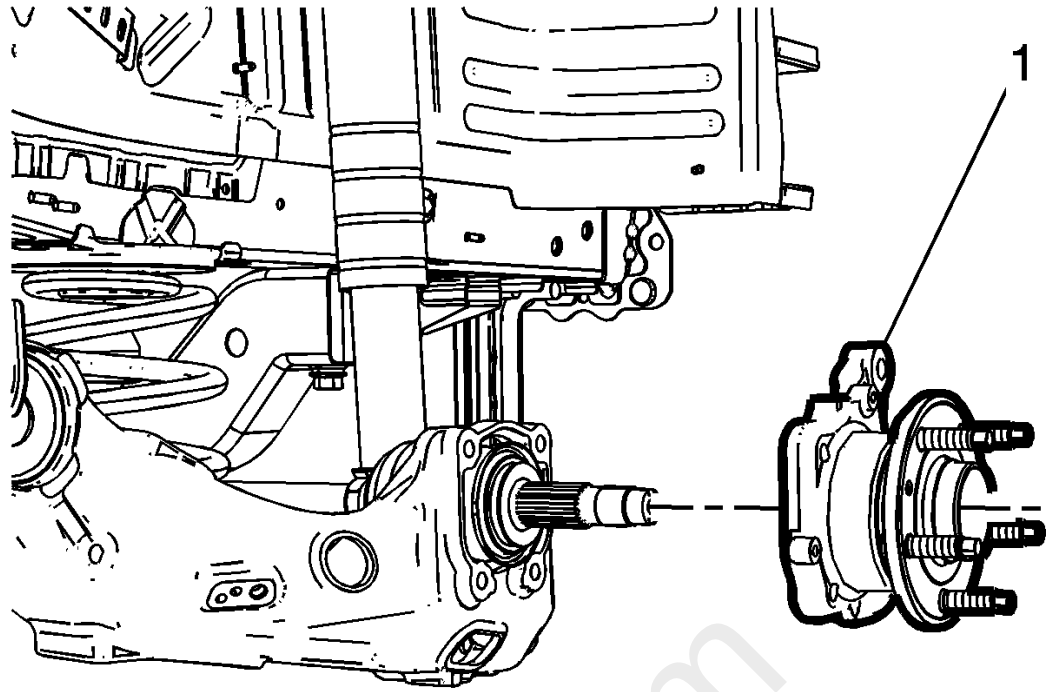


Fig. 8: Wheel Hub Assembly

Courtesy of GENERAL MOTORS COMPANY

4. Position the wheel bearing/hub assembly (1) in the rear axle.

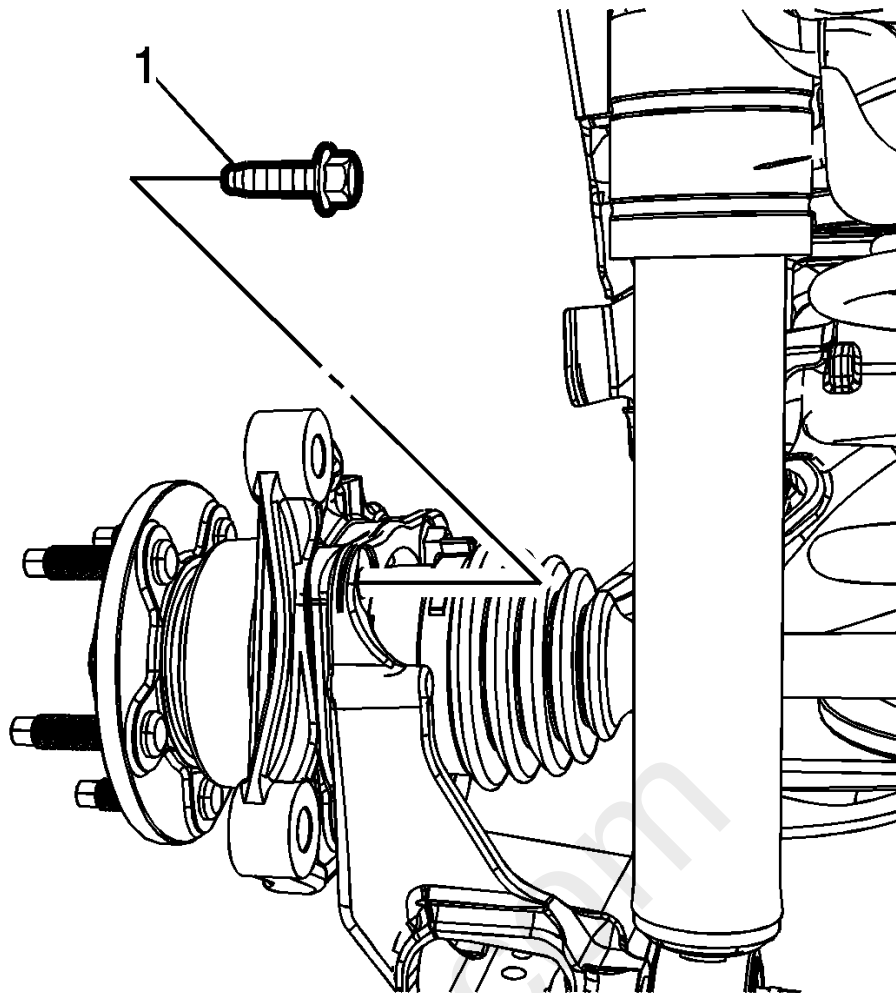


Fig. 9: Wheel Hub Bolts

Courtesy of GENERAL MOTORS COMPANY

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

5. Install the 4 wheel hub bolts (1) and tighten to 58 N.m (43 lb ft)
6. Install the rear wheel speed sensor. Refer to [Rear Wheel Speed Sensor Replacement](#)
7. Install the rear brake shield. Refer to [Rear Brake Shield Replacement \(All Wheel Drive\)](#) [Rear Brake Shield Replacement \(Front Wheel Drive\)](#)
8. Install the NEW wheel drive shaft nut. Refer to [Rear Wheel Drive Shaft Replacement](#)
9. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
10. Remove the support and 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.

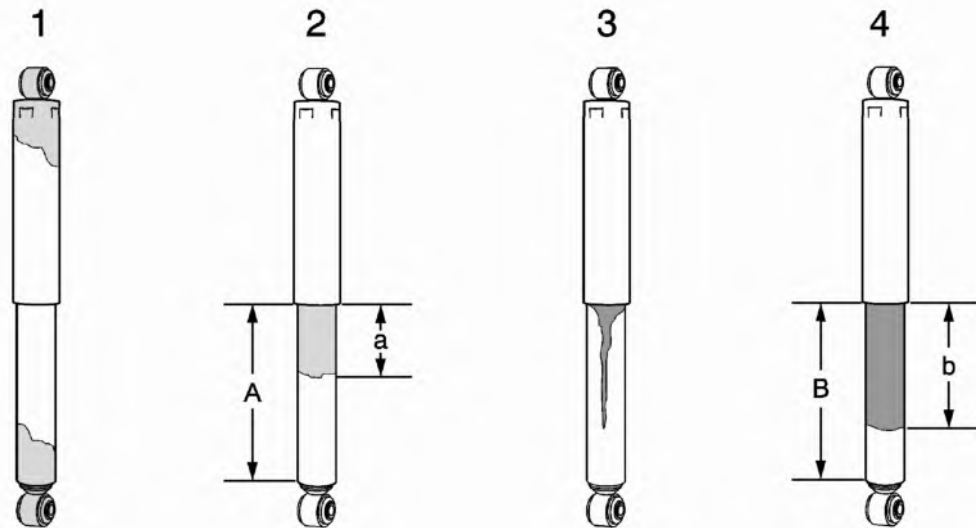


Fig. 10: Strut And Shock Absorber Inspection
 Courtesy of GENERAL MOTORS COMPANY

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.

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.
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.

SHOCK ABSORBER REPLACEMENT

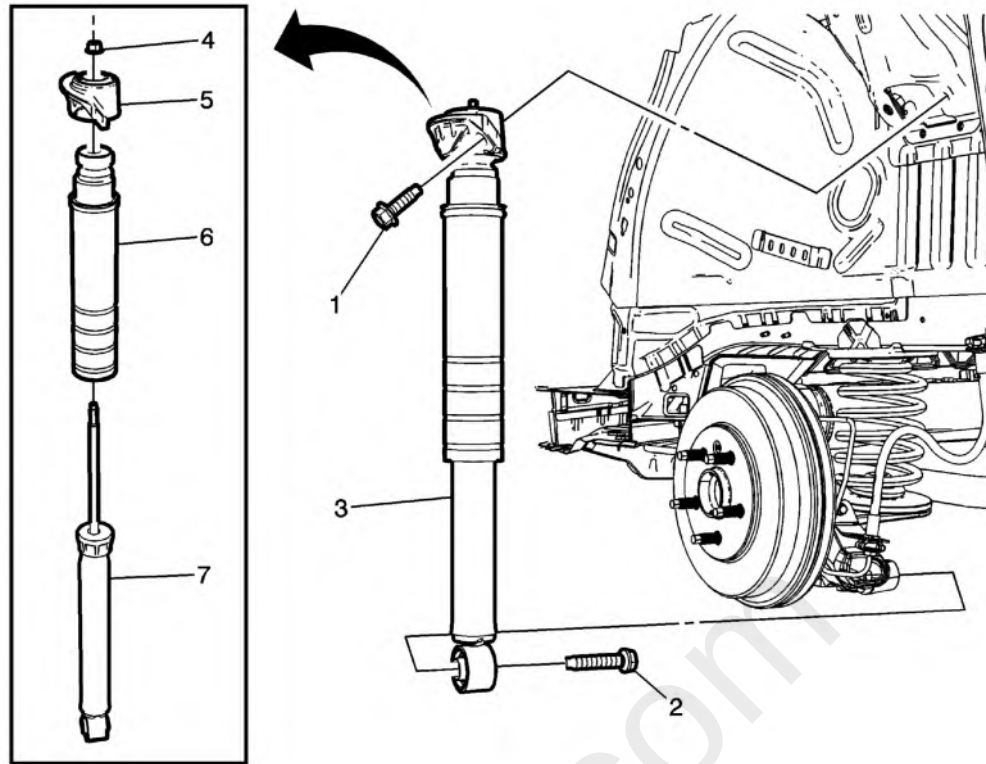


Fig. 11: Shock Absorber

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 2. Remove the wheel and tire assembly. Refer to Tire and Wheel Removal and Installation	
1	Rear Shock Absorber Upper Bolt (Qty: 2) CAUTION: Refer to Fastener Caution . Procedure Support the rear axle with a hydraulic jack stand. Tighten 100 N.m (74 lb ft)

Callout	Component Name
2	Rear Shock Absorber Lower Bolt Procedure 1. Support the rear portion of the axle with a hydraulic jack stand. 2. Raise the hydraulic jack until the rear suspension height (D) reaches neutral position. The D height is the distance from the bolt hole center of the rear shock absorber lower attachment to the bottom surface of the underbody side rail. Measure axle position to D height specification. Refer to Trim Height Specifications (USA), Trim Height Specifications (Canada) 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. NOTE: Torque to yield fastener in use, replace with a new bolt. 3. Tighten the NEW rear shock absorber lower bolt to: Tighten • First Pass 150 N.m (111 lb ft) • Final Pass 60-75 degrees
3	Rear Shock Absorber Assembly
4	Shock Absorber Nut Procedure Using the CH-51095 wrench, or equivalent remove shock absorber nut. Tighten 25 N.m (18 lb ft) Special Tools CH-51095 Shock Absorber Strut Wrench Equivalent regional tools: Special Tools.
5	Shock Absorber Mount
6	Shock Absorber Bumper
7	Shock Absorber

SHOCK ABSORBER DISPOSAL

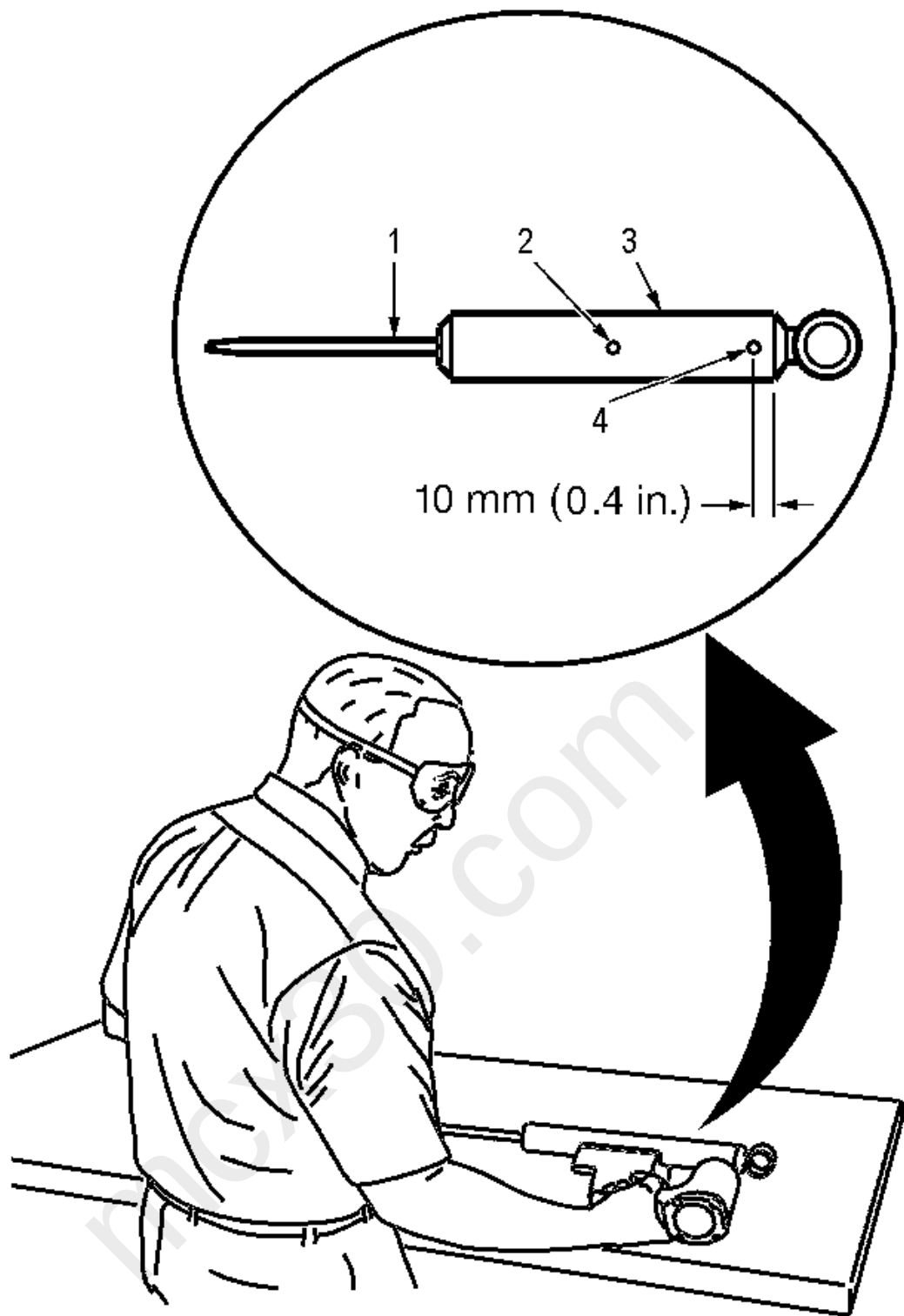


Fig. 12: Drilling Hole In Shock Absorber At Center Punched Locations

Courtesy of GENERAL MOTORS COMPANY

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.

1. Make an indentation 10 mm (0.4 in) from the bottom (4) 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 SPRING REPLACEMENT

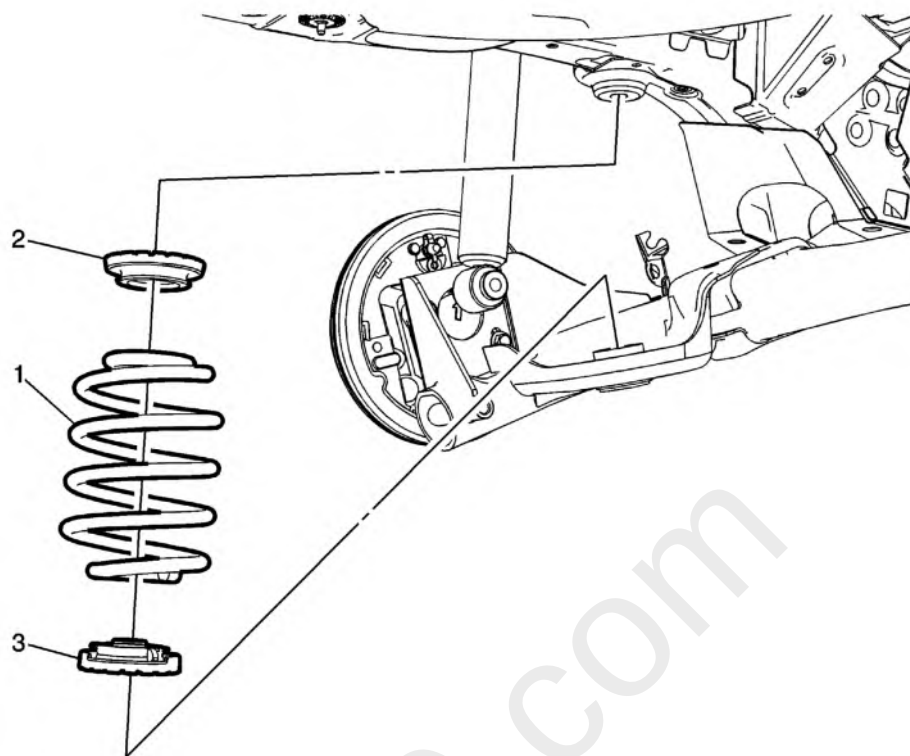


Fig. 13: Rear Spring And Insulators

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .	
1	Rear Spring Procedure 1. If removing the rear spring to service other suspension components, note the position of the rear spring in the relationship to the insulators. 2. Support the rear axle with a hydraulic jack stand. 3. Remove the lower rear shock absorber bolt. Refer to Shock Absorber Replacement.
2	Upper Rear Spring Insulator. NOTE: Ensure that the rear spring insulator is properly seated in the rear frame rail.
3	Lower Rear Spring Insulator NOTE: Ensure that the rear spring insulator is properly seated in the rear axle.

REAR AXLE REPLACEMENT

Special Tools

- **CH 51035** Rear Axle Supporter Adapter
- **DT 50187** Rear Axle Supporter

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

Removal Procedure

1. Remove the rear tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)
2. Remove the park brake cables from the rear axle.
3. Remove the exhaust muffler. Refer to [Exhaust Muffler Replacement \(2H0\)](#) [Exhaust Muffler Replacement \(LUV\)](#) [Exhaust Muffler Replacement \(LE2\)](#)
4. If equipped, remove the rear propeller shaft. Refer to [Two-Piece Propeller Shaft Replacement](#)
5. If equipped, remove the differential carrier assembly. Refer to [Differential Carrier Assembly Replacement](#)

NOTE: Cap the rear brakes lines so as to prevent the hydraulic brake system from being contaminated.

6. Remove the rear brake line from the rear axle.

NOTE: Re-locate the rear brake assembly to the side using mechanics wire.

7. Remove the rear spring. Refer to [Rear Spring Replacement](#)
8. Remove the rear wheel bearing/hub from the rear axle. Refer to [Rear Wheel Bearing and Hub Replacement \(With Drum Brakes\)](#) [Rear Wheel Bearing and Hub Replacement \(With Disc Brakes\)](#)
9. Install the **DT 50187** supporter with the **CH 51035** adapter on a hydraulic jack or an appropriate support, and using a hydraulic jack stand with the supporter, support the rear axle assembly.

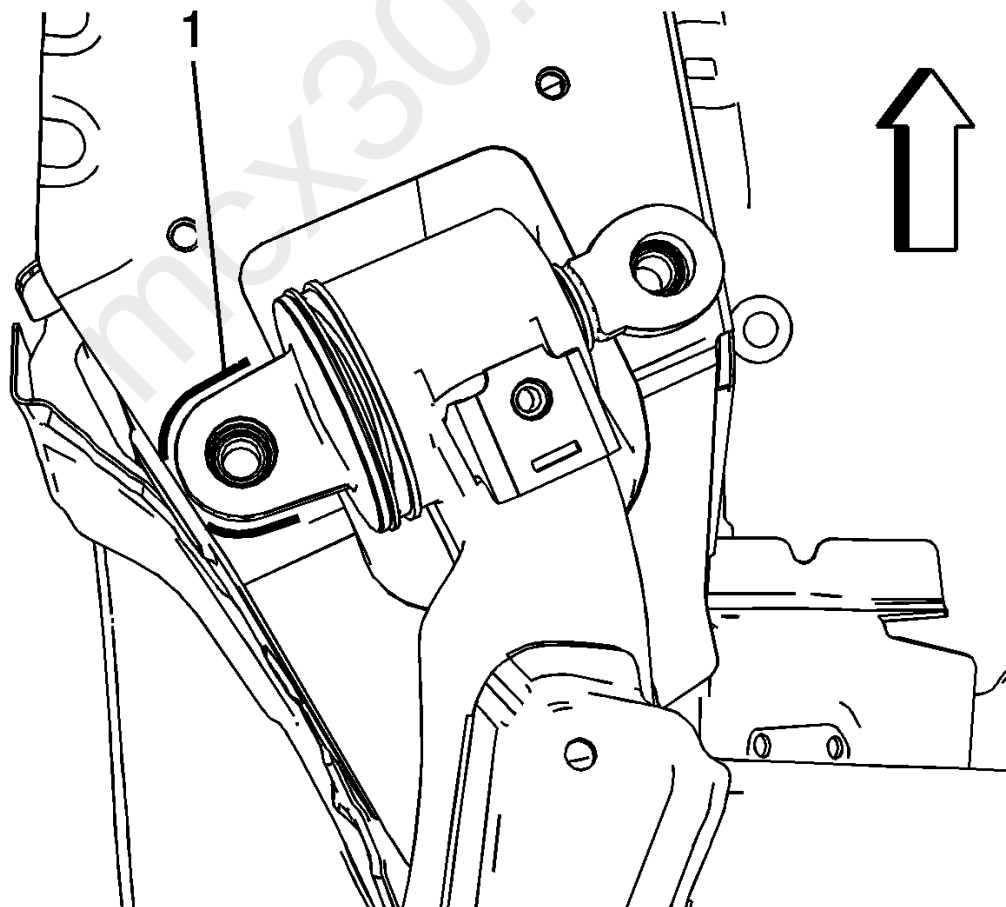


Fig. 14: Rear Axle Mounting Bracket Outline Mark
Courtesy of GENERAL MOTORS COMPANY

10. Using a bright colored paint, mark (1) the outline of the rear axle mounting bracket to the chassis to properly align the rear axle to the chassis for installation.

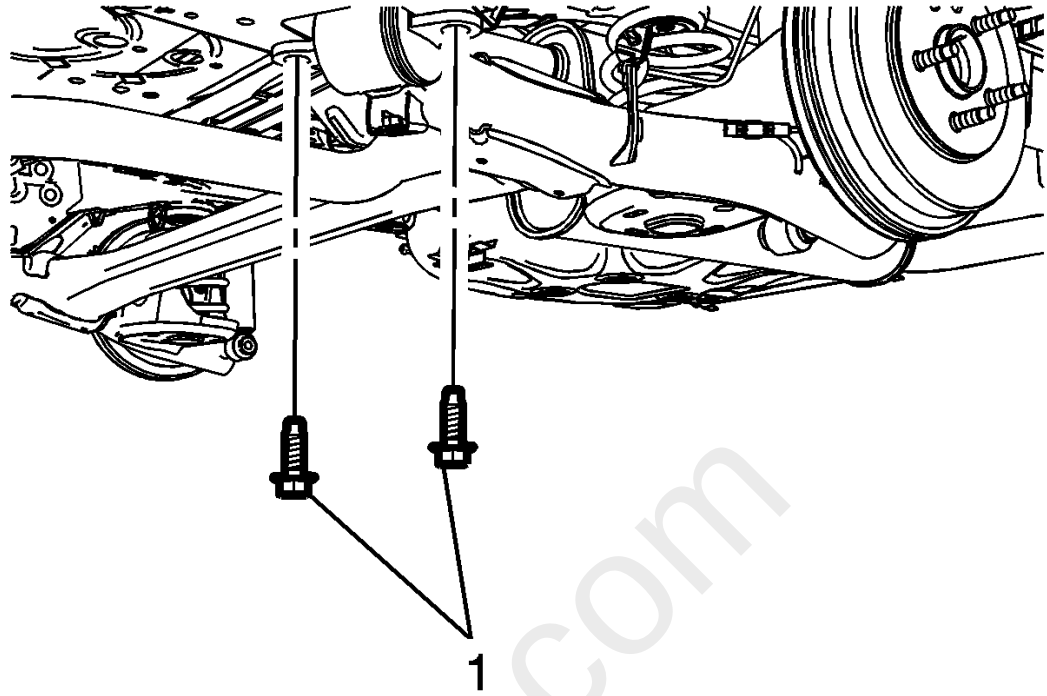


Fig. 15: Rear Axle Mounting Bolts
Courtesy of GENERAL MOTORS COMPANY

11. Remove the rear axle mounting bolts (1).

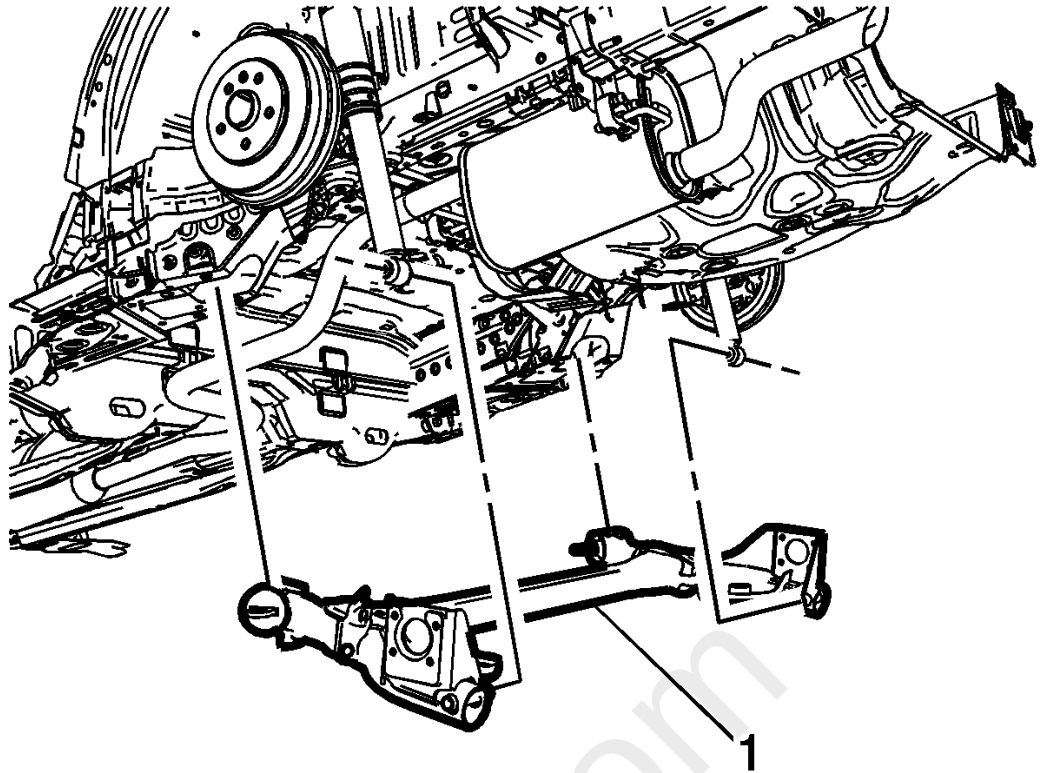


Fig. 16: Rear Axle Assembly

Courtesy of GENERAL MOTORS COMPANY

12. Lower the hydraulic jack with the rear axle and remove the rear axle assembly (1).

Installation Procedure

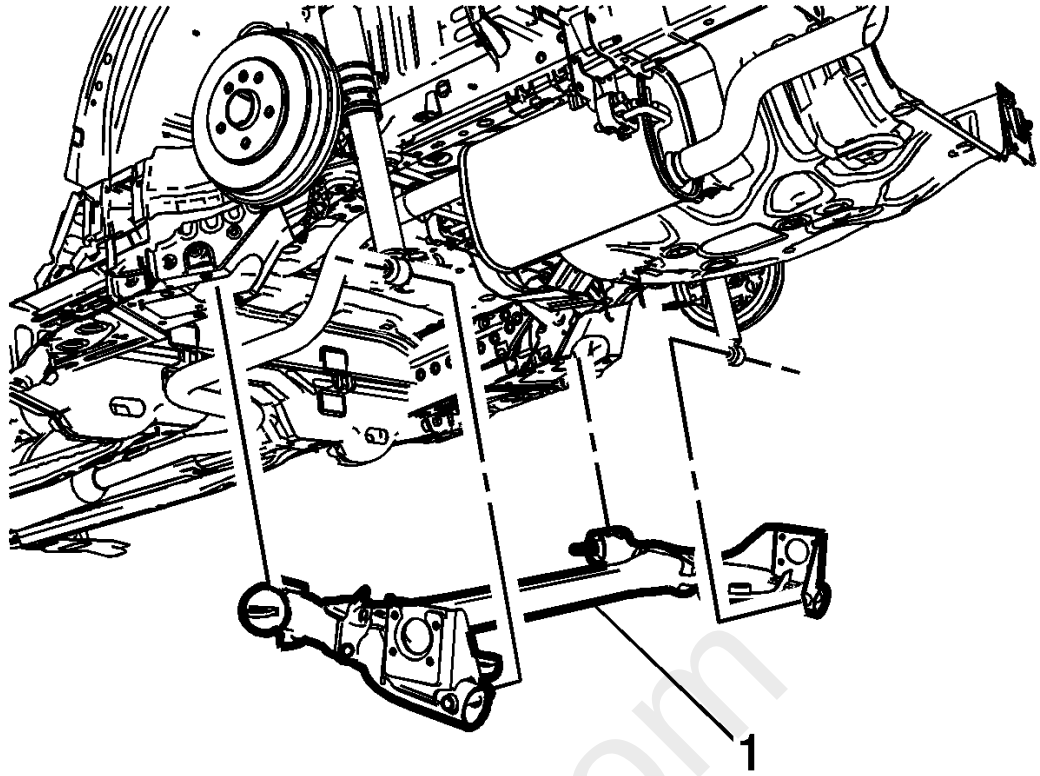


Fig. 17: Rear Axle Assembly

Courtesy of GENERAL MOTORS COMPANY

1. Using a hydraulic jack stand with the **DT 50187** supporter and the **CH 51035** adapter, position the rear axle assembly (1) in the vehicle.

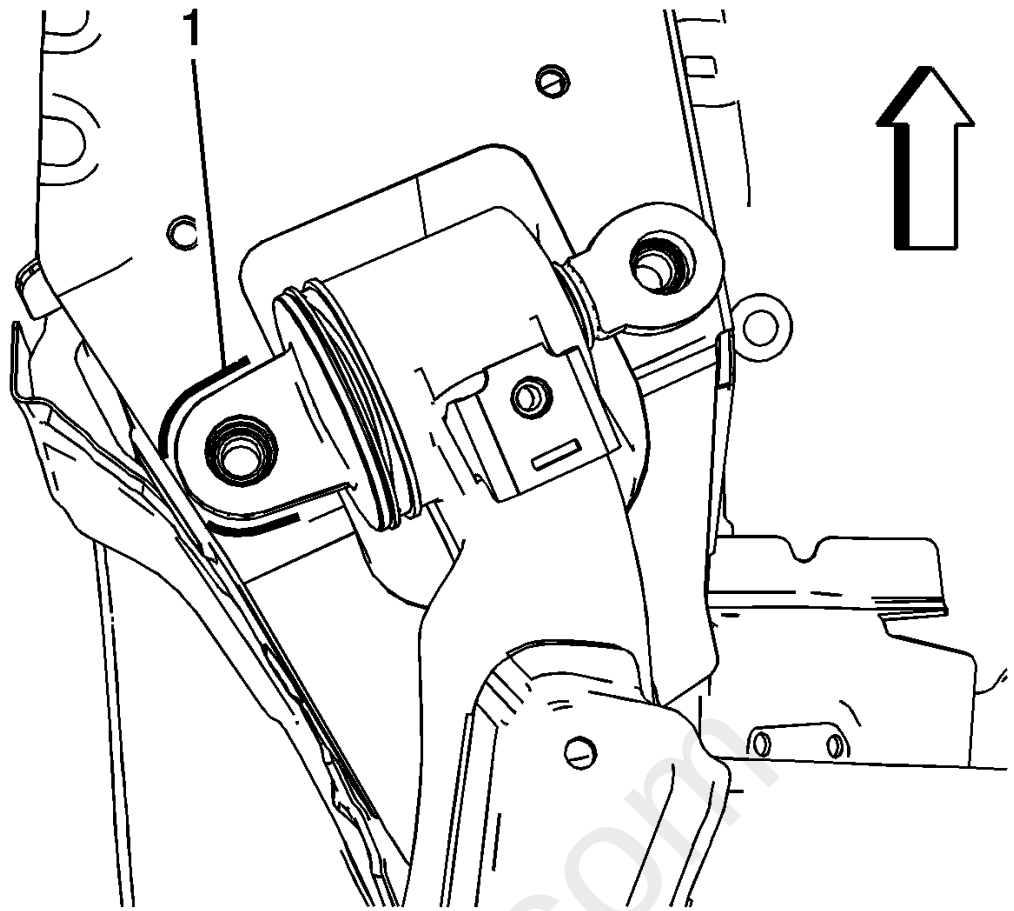


Fig. 18: Rear Axle Mounting Bracket Outline Mark

Courtesy of GENERAL MOTORS COMPANY

2. Align the mounting points of the rear axle to the painted outline (1) on the chassis.

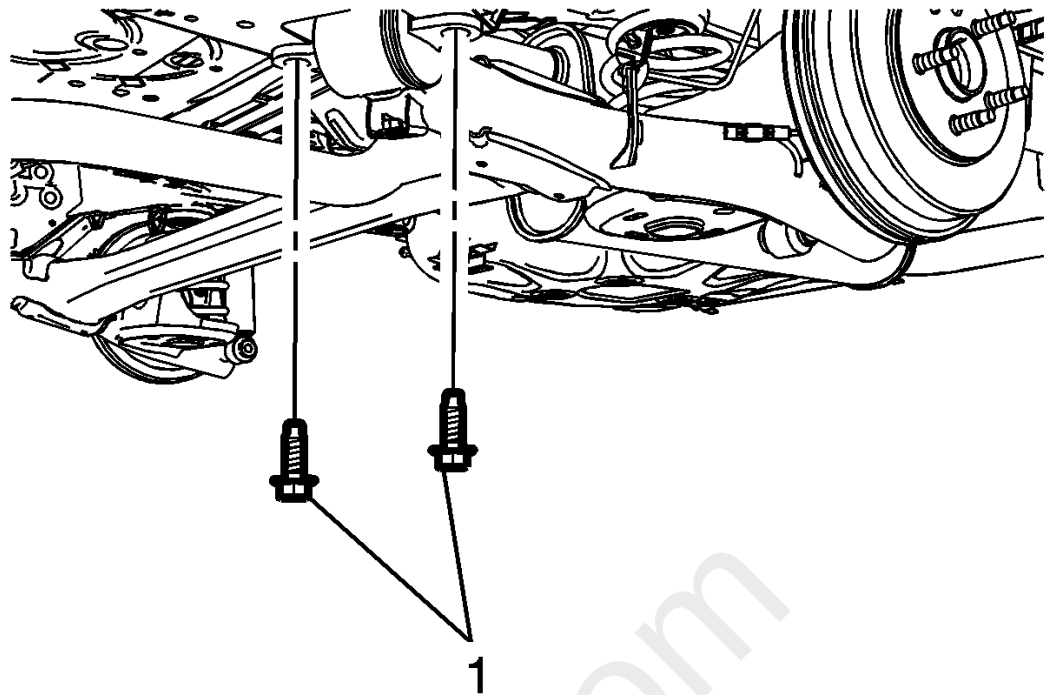


Fig. 19: Rear Axle Mounting Bolts

Courtesy of GENERAL MOTORS COMPANY

3. Install the rear axle mounting bolts (1).

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

4. Using the **EN-45059** meter, tighten the rear axle mounting bolts (1) to:
 - First Pass 160 N.m (118 lb ft)
 - Final Pass plus 38 degrees
5. Install the rear spring. Refer to [Rear Spring Replacement](#)
6. Install the rear wheel bearing/hub mounting bolts to the rear axle. Refer to [Rear Wheel Bearing and Hub Replacement \(With Drum Brakes\)](#)[Rear Wheel Bearing and Hub Replacement \(With Disc Brakes\)](#)
7. Install the rear park brake cables.
8. Install the exhaust muffler. Refer to [Exhaust Muffler Replacement \(2H0\)](#) [Exhaust Muffler Replacement \(LUV\)](#) [Exhaust Muffler Replacement \(LE2\)](#)
9. If equipped, install the differential carrier assembly. Refer to [Differential Carrier Assembly Replacement](#)
10. If equipped, install the rear propeller shaft. Refer to [Two-Piece Propeller Shaft Replacement](#)
11. Install the rear brake lines on the rear axle.
12. Bleed the hydraulic brake system. Refer to [Hydraulic Brake System Bleeding \(Manual\)](#) [Hydraulic Brake System Bleeding \(Pressure\)](#)
13. Install the rear tire and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#)

WHEEL STUD REPLACEMENT

Special Tools

CH 43631 Ball Joint Separator

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

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the wheel bearing and hub assembly. Refer to [Rear Wheel Bearing and Hub Replacement \(With Drum Brakes\)](#)[Rear Wheel Bearing and Hub Replacement \(With Disc Brakes\)](#).

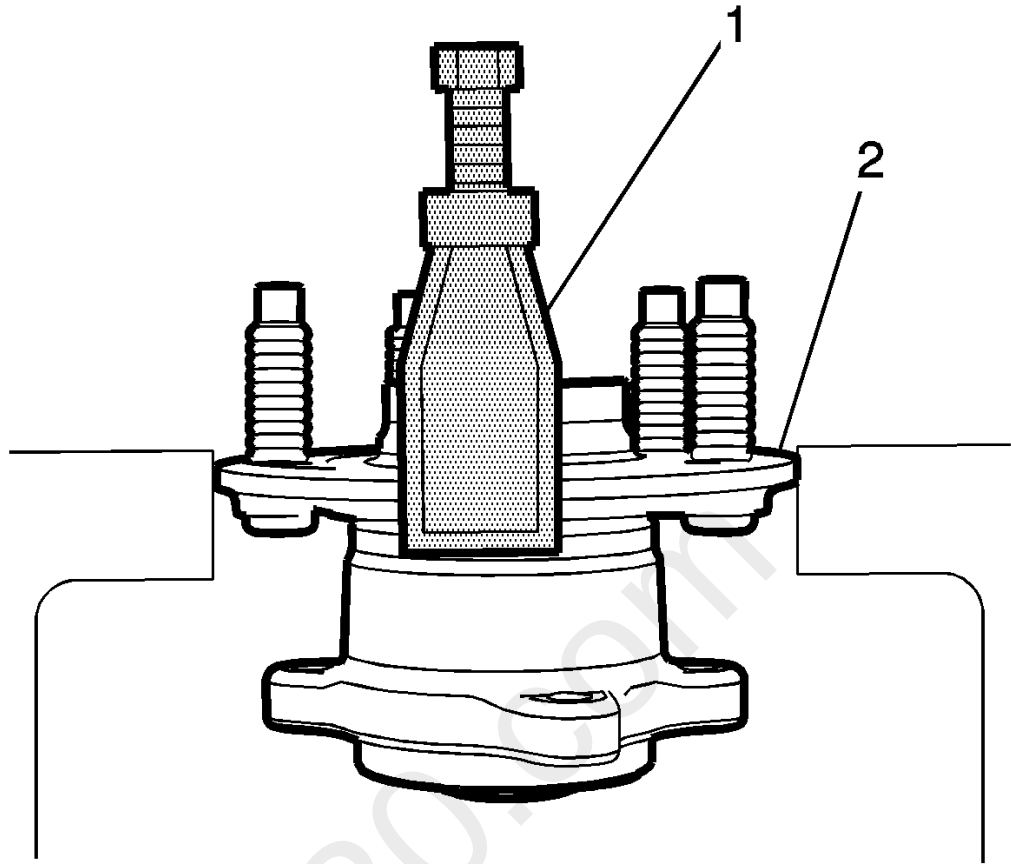


Fig. 20: Wheel Bearing Hub/Assembly And Separator

Courtesy of GENERAL MOTORS COMPANY

NOTE: Ensure that the wheel bearing and hub flange is securely tighten in the vise.

3. Install the wheel bearing and hub assembly (2) in a suitable vise.
4. Using the **CH 43631** separator (1), remove and discard the wheel stud from the wheel bearing and hub assembly.

Installation Procedure

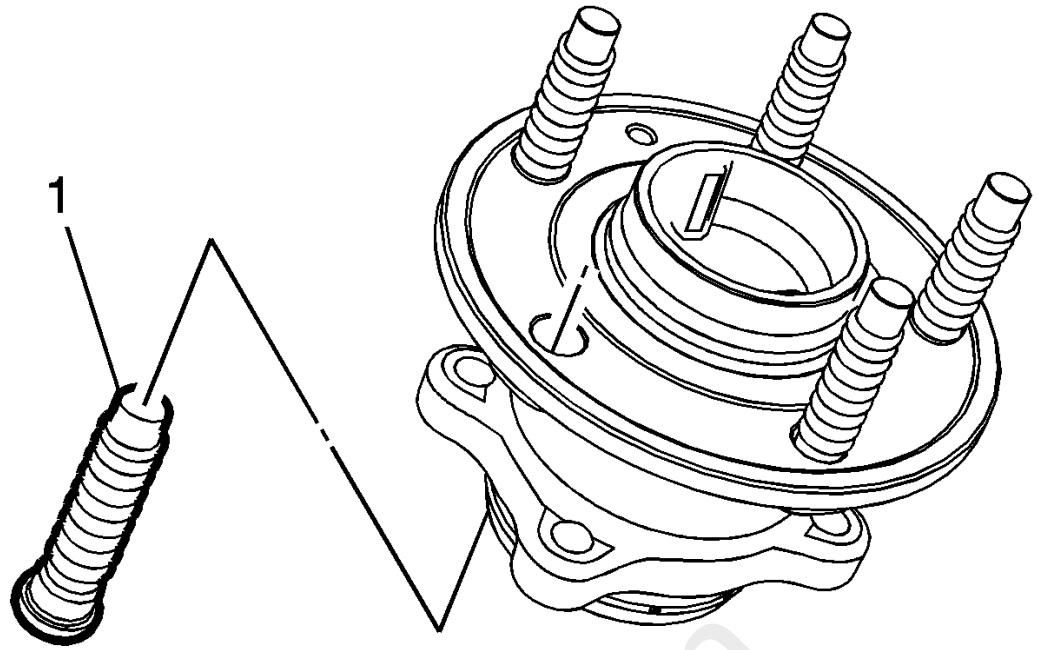


Fig. 21: Wheel Stud

Courtesy of GENERAL MOTORS COMPANY

NOTE: Ensure that the wheel stud is properly aligned in the wheel hub flange.

1. Position the NEW wheel stud (1) in the wheel bearing and hub assembly.

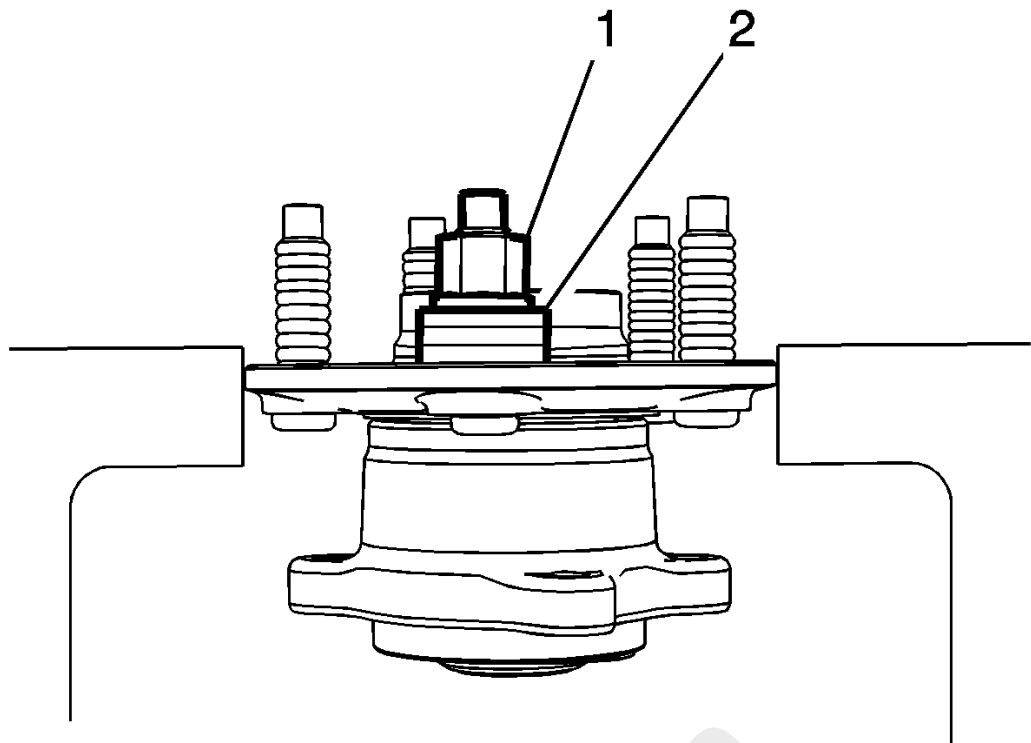


Fig. 22: Wheel Nut And Washers

Courtesy of GENERAL MOTORS COMPANY

2. Using three washers (2) and an old wheel nut (1), tighten the wheel nut (1) until the wheel stud is seated in the wheel bearing and hub flange.
3. Remove the wheel bearing and hub assembly from the vise.
4. Install the wheel bearing and hub assembly. Refer to [Rear Wheel Bearing and Hub Replacement \(With Drum Brakes\)](#)[Rear Wheel Bearing and Hub Replacement \(With Disc Brakes\)](#).
5. Remove the support and lower the vehicle.

DESCRIPTION AND OPERATION

REAR SUSPENSION DESCRIPTION AND OPERATION

This vehicle has a beam rear suspension system consisting of the following components:

- An axle with integral trailing arms
- A cross beam
- Two coil springs
- Two standard shock absorbers

Axle Assembly

The axle assembly attaches to the underbody through a rubber bushing and bracket located at the front of each integral trailing arm. The brackets are bolted to the underbody side rails. The axle structure itself maintains the geometrical relationship of the wheels relative to the centerline of the body.

Rear camber and tow are not adjustable. Replace any damaged suspension components as necessary.

Coil Spring

The coil springs support the weight of the vehicle in the rear. Rubber insulators isolate the coil spring at the upper and lower spring seat.

Shock Absorber

The shock absorbers are connected to the rear axle and the vehicle underbody. The shock absorbers are non-adjustable and non-refillable. Service of the shocks requires replacement of the shock assembly.

Wheel Bearing/Hub Assembly

A single hub and bearing assembly is bolted to both ends of the rear axle assembly. The hub and bearing assembly is a sealed unit that eliminates the need for wheel bearing adjustment or periodic maintenance.

Although the rear suspension components are lubricated for life and require no routine lubrication, they should be inspected periodically for damage and wear.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/Description
	CH-24319-B CH-43631 J-24319-B J-43631 Ball Joint Remover

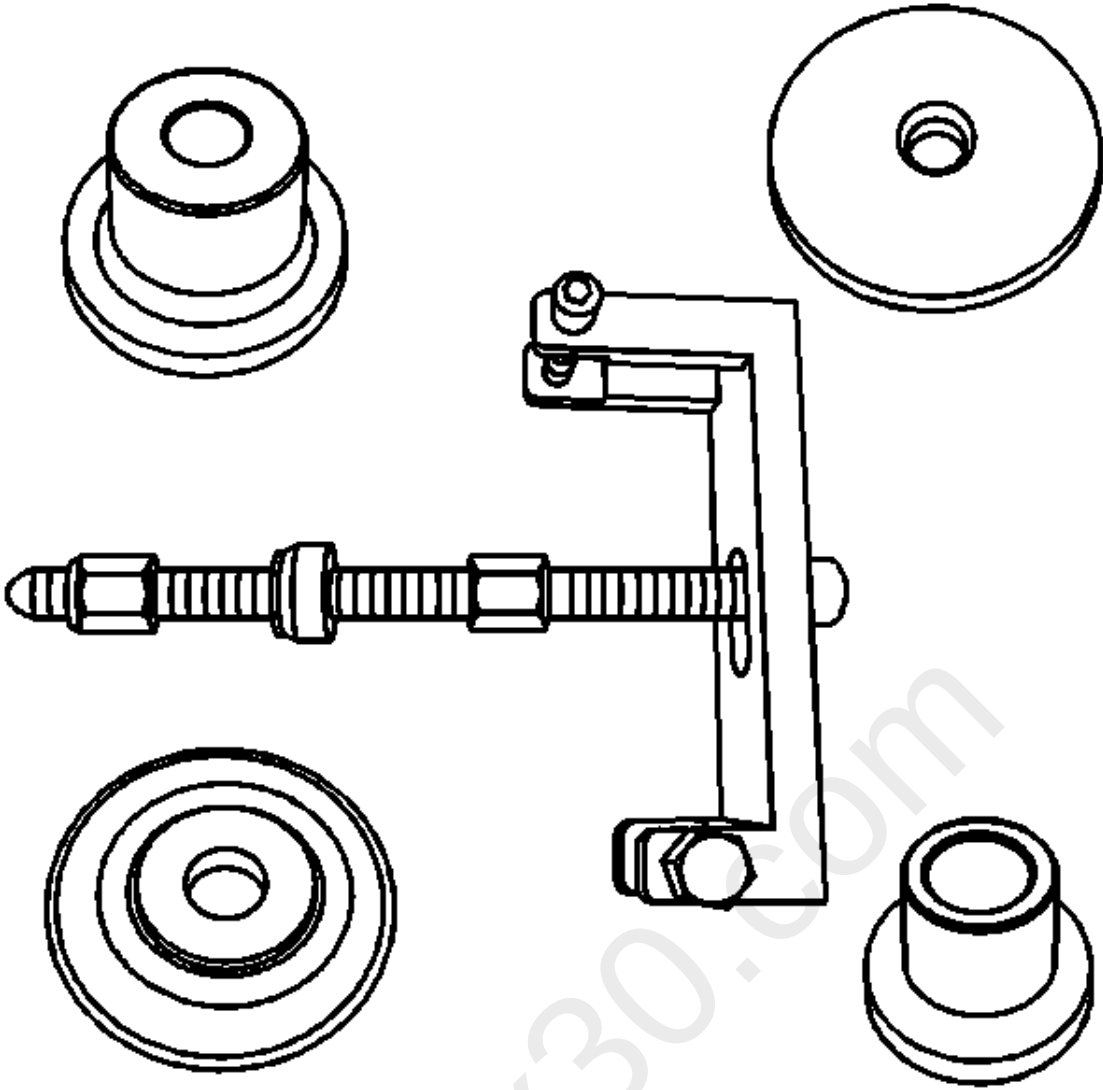
Illustration	Tool Number/Description
 The illustration shows the components of the CH-50559 Wheel Hub/Bearing Remover/Installer Kit. It includes a central L-shaped metal tool with a threaded rod and a conical end. Surrounding the tool are five other parts: two cylindrical bearing caps, two circular bearing plates, and a small circular washer. A large, faint watermark 'mcx30.com' is visible across the bottom half of the page.	CH-50559 Wheel Hub/Bearing Remover/Installer Kit

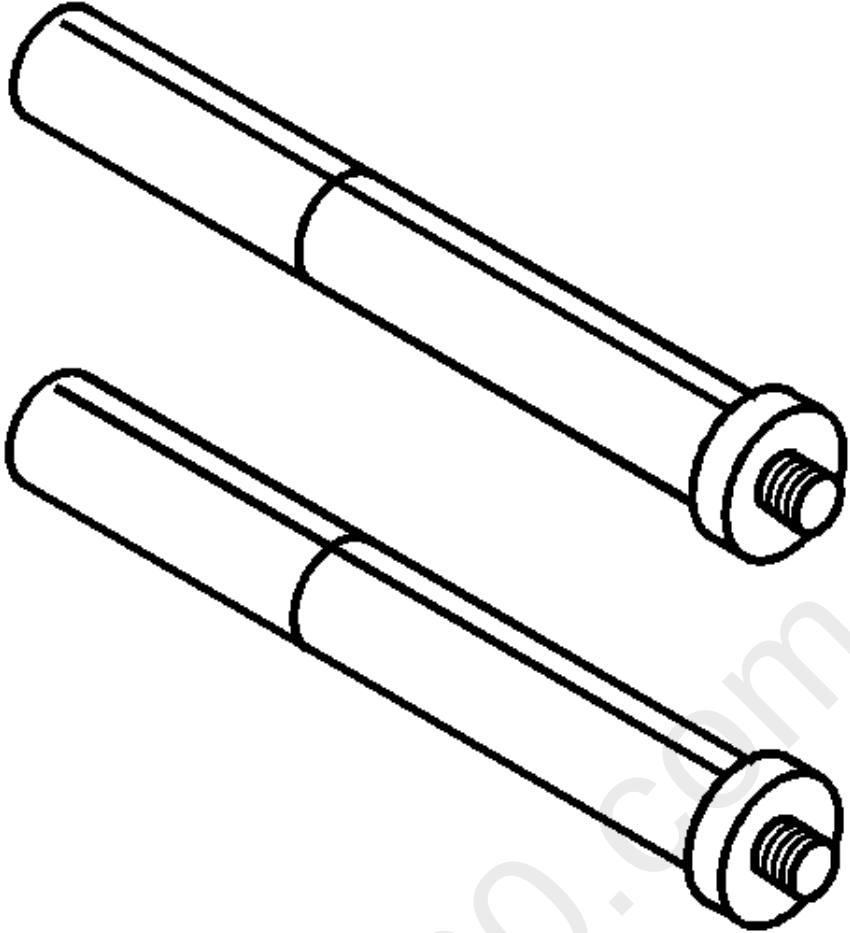
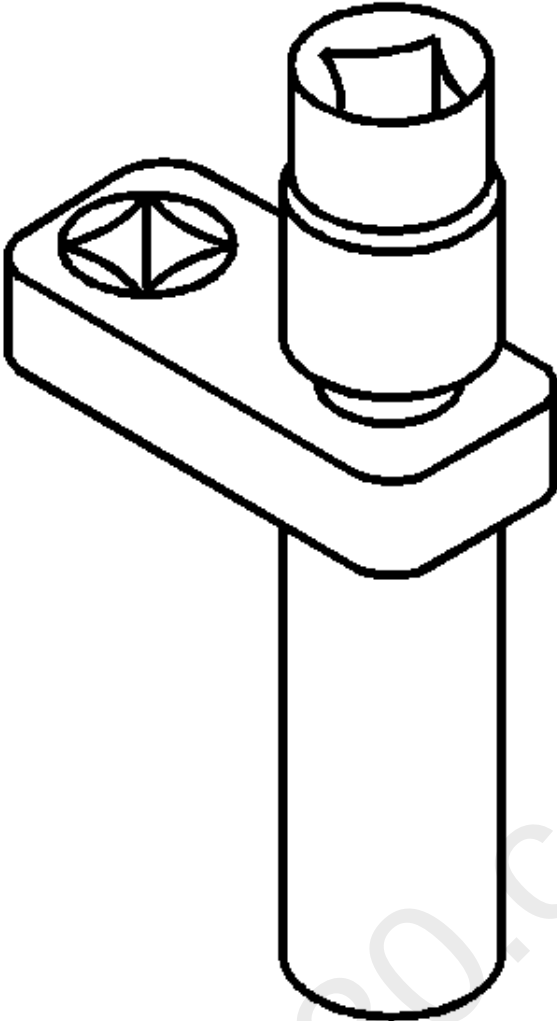
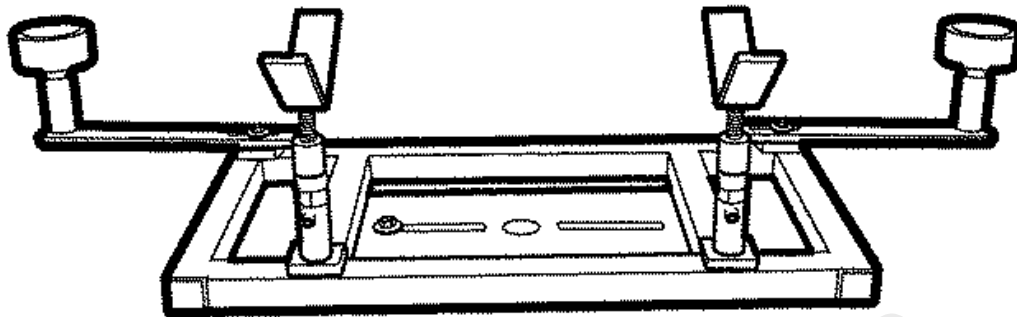
Illustration	Tool Number/Description
	CH-51035 Rear Axle Supporter Adapter

Illustration	Tool Number/Description
	CH-51095 J-39642 Shock Nut Removal Tool Set



DT-50187
Rear Axle Supporter