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SUSPENSION

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Tires and Wheels



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Front Suspension

SUSPENSION

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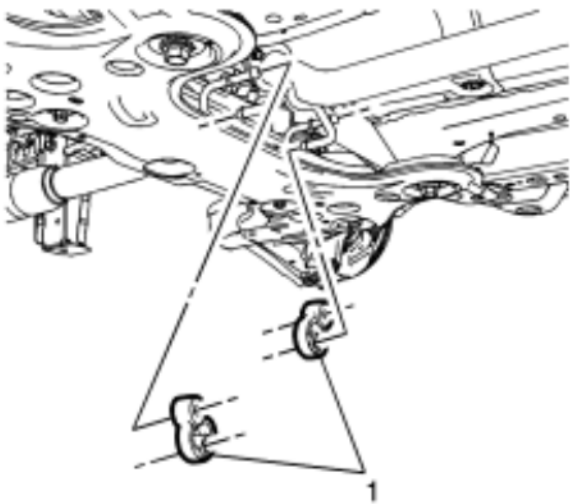
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Brake Dust Shield	9 N·m	80 lb in
Front Lower Control Arm Ball Joint Nut		
• First Pass	30 N·m	22 lb ft
• Second Pass	plus 120 degrees	
• Third Pass	30 N·m	22 lb ft
• Final Pass	plus 35 degrees	
Front Lower Control Arm Front Bolt		
• First Pass	115 N·m	85 lb ft
• Final Pass	plus 65 degrees	
Front Lower Control Arm Rear Nut		
• First Pass	160 N·m	118 lb ft
• Final Pass	plus 35 degrees	
Front Suspension Stabilizer Shaft Clamp Bolts	22 N·m	16 lb ft
Front Suspension Stabilizer Shaft Link Nuts	65 N·m	48 lb ft
Front Suspension Strut to Steering Knuckle Nuts	110 N·m	82 lb ft
Front Suspension Strut Upper Mount Nut	65 N·m	48 lb ft
Front Suspension Strut Lower Mount Nut	65 N·m	48 lb ft

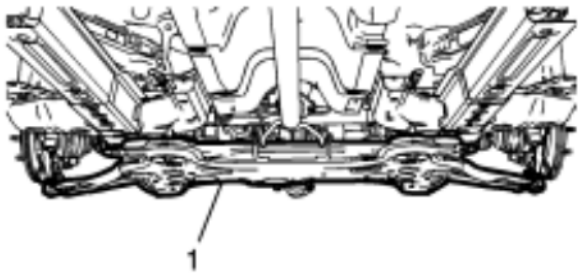
Stabilizer Shaft Replacement

Removal Procedure

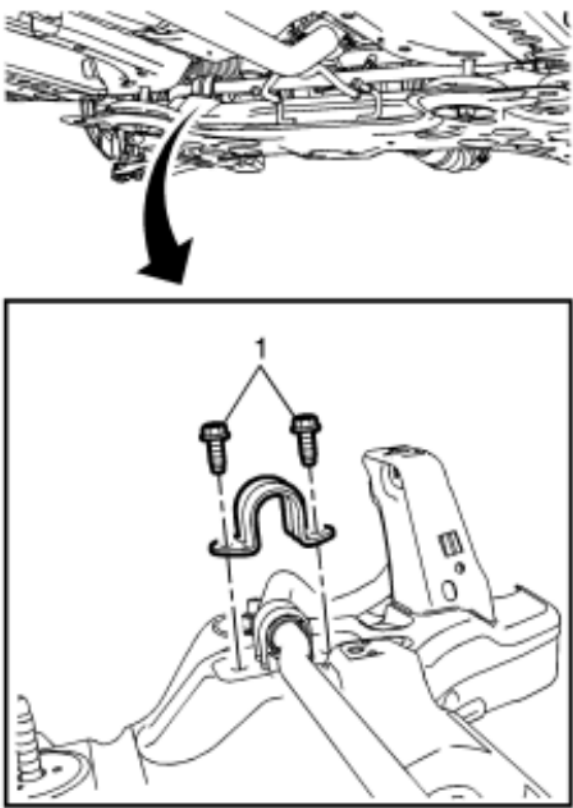
1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
3. Remove the stabilizer shaft links from the stabilizer shaft. Refer to [Stabilizer Shaft Link Replacement](#) .
4. Remove the lower control arm ball joint bolt and nut from the steering knuckle. Refer to [Lower Control Arm Replacement](#) .



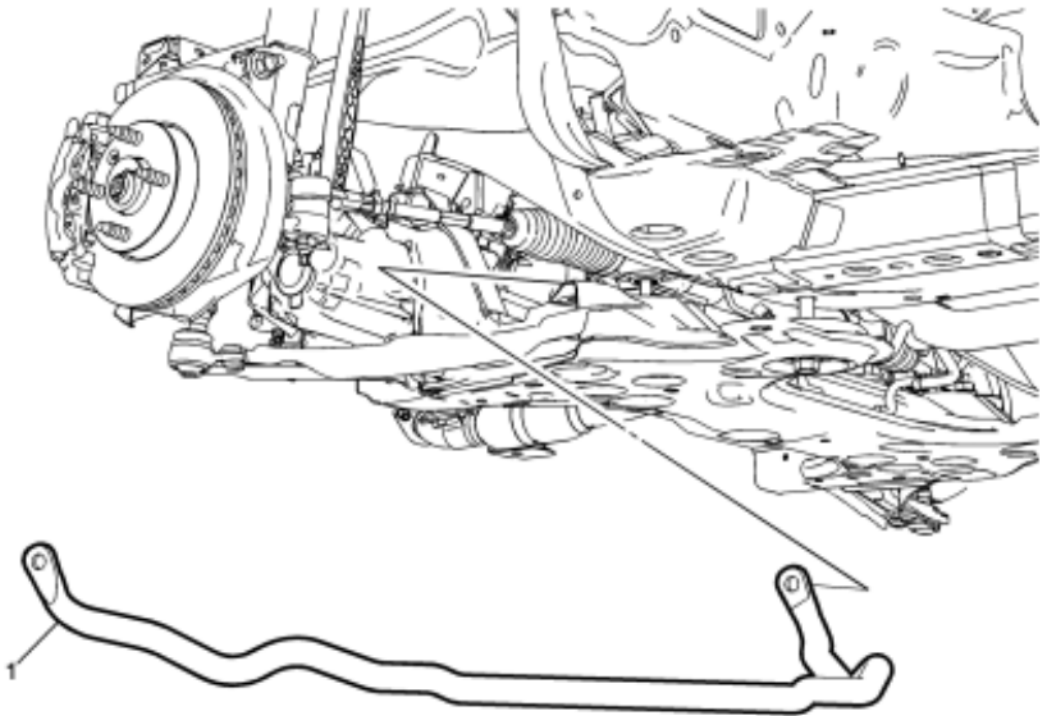
5. Remove the exhaust pipe insulators (1).



6. Using a suitable support, lower the front suspension frame (1) enough to gain access to the stabilizer shaft insulator bolts. Refer to [Drivetrain and Front Suspension Frame Replacement](#) .



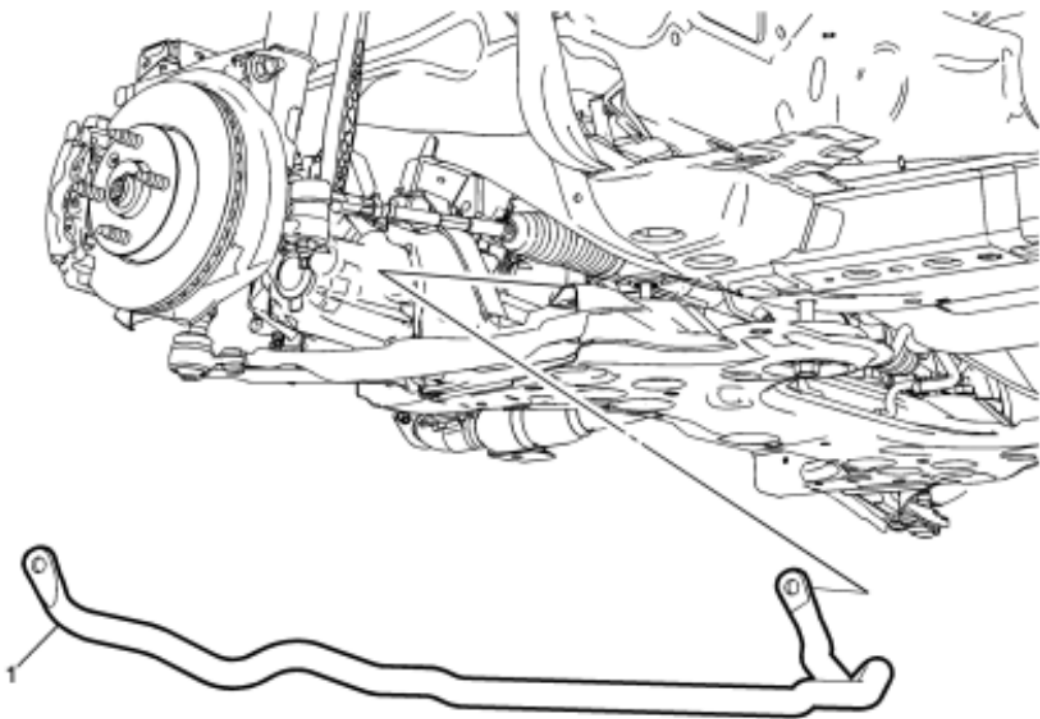
7. Remove the stabilizer shaft insulator bolts (1).



Note: It maybe necessary to maneuver the front stabilizer shaft in such away as to remove it from the front suspension frame.

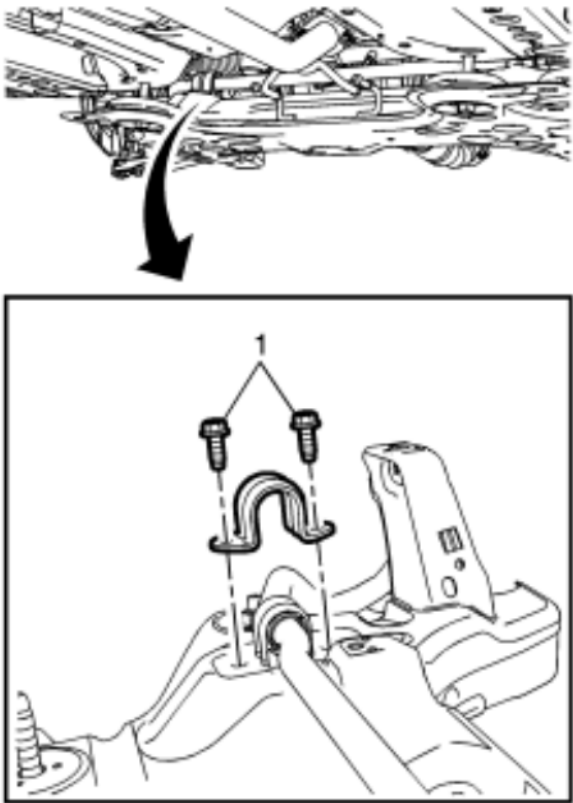
8. Remove the front stabilizer shaft(1) from the front suspension frame.

Installation Procedure

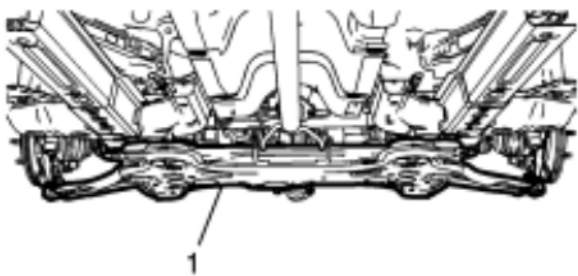


1. Position the front stabilizer shaft(1) in the front suspension frame.

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

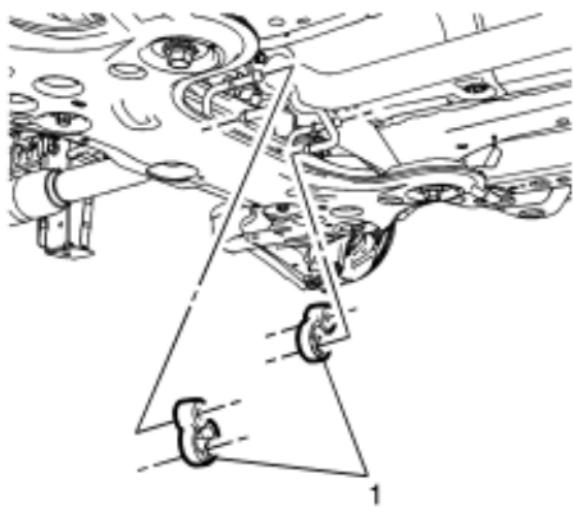


2. Install the front stabilizer shaft insulator bolts and tighten to **22 N·m (16 lb ft)**.



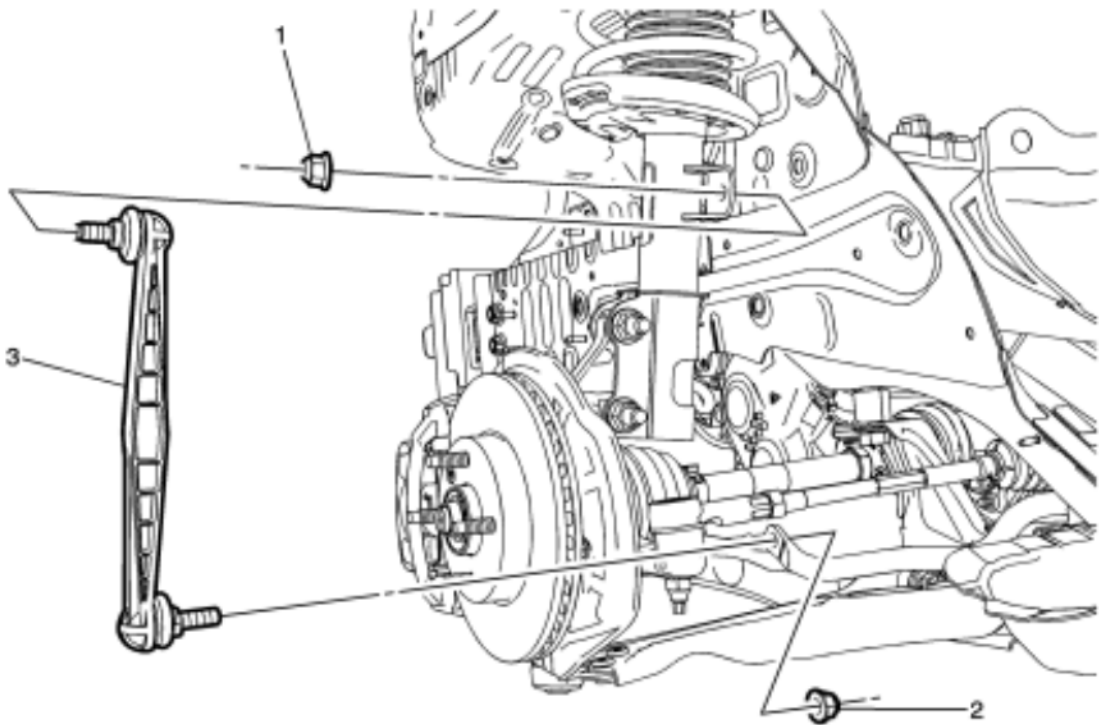
3. Lift the front suspension frame(1) into the proper position. Refer to [Drivetrain and Front Suspension Frame Replacement](#) .
4. Install the lower control arm ball joint to steering knuckle bolts. Refer to [Lower Control Arm Replacement](#) .

5. Install the stabilizer shaft link to the stabilizer shaft. Refer to [Stabilizer Shaft Link Replacement](#) .



6. Install the exhaust pipe insulators(1).
7. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
8. Remove the support and lower the vehicle.

Stabilizer Shaft Link Replacement



Callout	Component Name
Preliminary 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 .	
1	Front Stabilizer Shaft Link Upper Nut Caution: Refer to Fastener Caution . Procedure 1. Use the proper size Allen wrench to hold the stabilizer shaft link stud when loosening or tightening the stabilizer shaft link nut. 2. Remove and discard the stabilizer shaft link nut. Replace with NEW only. Tighten 65N·m (48lbft)
2	Front Stabilizer Shaft Link Lower Nut Procedure 1. Use the proper size Allen wrench to hold the stabilizer shaft link stud when loosening or tightening the stabilizer shaft link nut. 2. Remove and discard the nut. Replace with NEW only. Tighten 65N·m (48lbft)
3	Front Stabilizer Shaft Link

Front Wheel Bearing and Hub Replacement

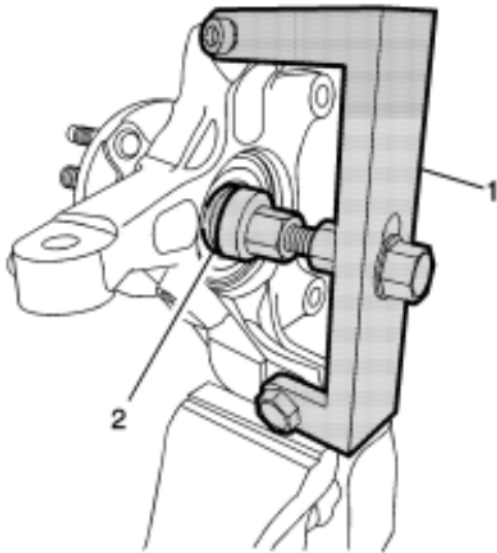
Special Tools

CH-50559 Wheel Hub/Bearing Remover Kit

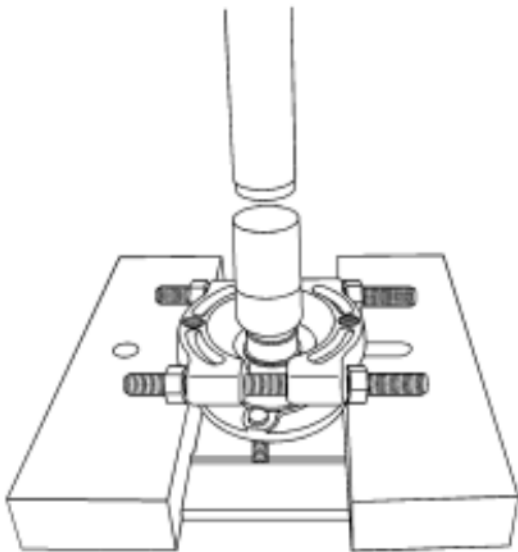
For equivalent regional tools, refer to [Special Tools](#) .

Removal Procedure

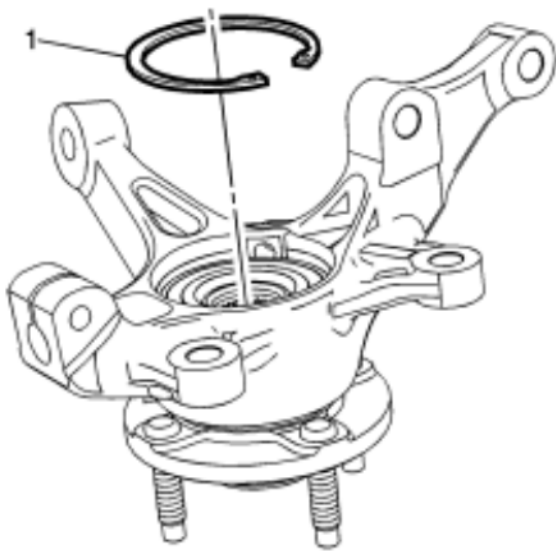
1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the steering knuckle assembly from the vehicle. Refer to [Steering Knuckle Replacement](#) .



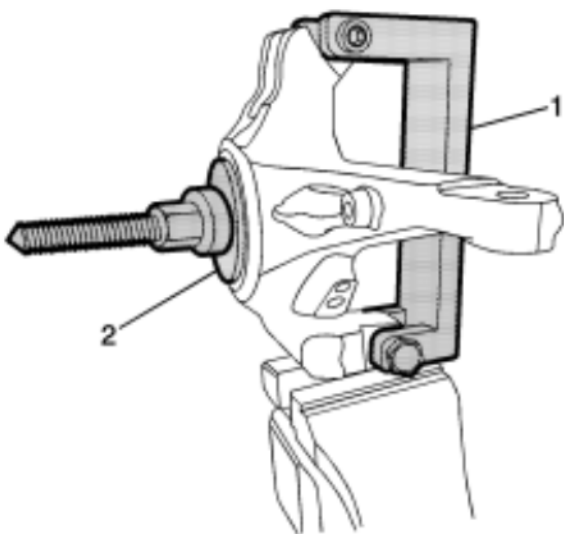
3. Position the steering knuckle assembly (1) in a suitable vise.
4. Position the CH-50059-1 wheel hub/bearing removal/installation bridge assembly (1) and the CH-50559-2 wheel hub/bearing removal/installation adapter (2) on the wheel bearing inner hub.
5. Using the CH-50059-1 and the CH-50559-2, remove the wheel hub from the wheel bearing.



6. If the inner race of the bearing is pulled out with the hub, remove the inner race from the using the appropriate tools.

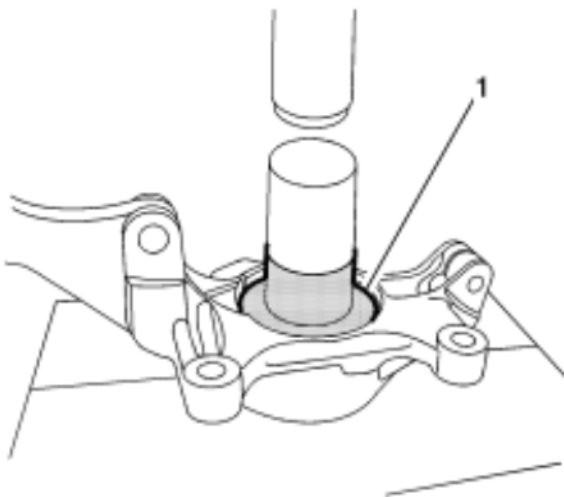


7. Using the appropriate tool, remove the retaining ring(1)from the steering knuckle.



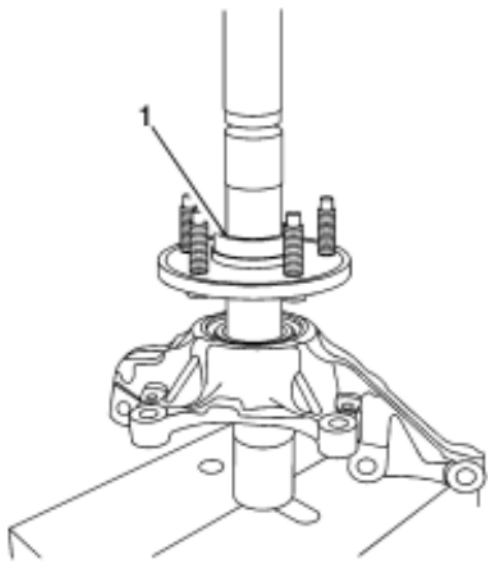
- 8. Position the CH-50559-1 wheel hub/bearing removal/installation bridge assembly(1) and the CH-50559-3 wheel bearing removal adapter(2) on the steering knuckle.
- 9. Remove the wheel bearing from the steering knuckle and discard it. Inspect the bore of the of the steering knuckle for pitting, scoring wear, or corrosion. If damage cannot be easily cleaned up with light sanding, replace the steering knuckle.

Installation Procedure

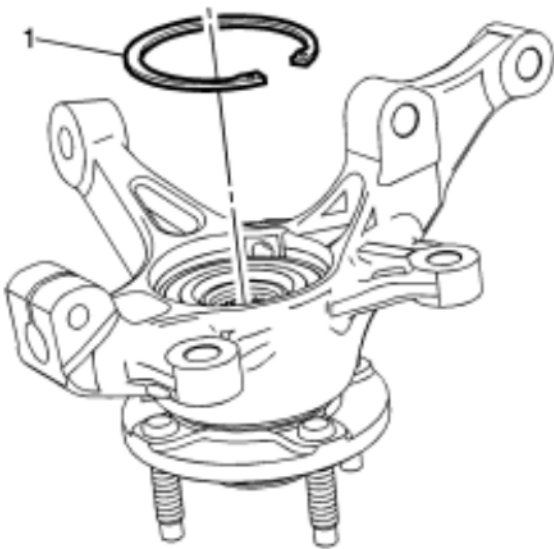


Note: Ensure that the wheel bearing is evenly seated in the steering knuckle.

- 1. Using the CH-50559-4 wheel hub/bearing installation adapter(1) and the appropriate extension and press, install the new bearing into the steering knuckle until it is correctly seated.



- 2. Position the CH-50559-4 (1) wheel hub/bearing installation adapter and the appropriate extension to the inside of the bearing and position the CH-50559-2 wheel hub removal/installation adapter and the appropriate extension on the wheel hub.
- 3. Press in the hub until it is correctly seated.

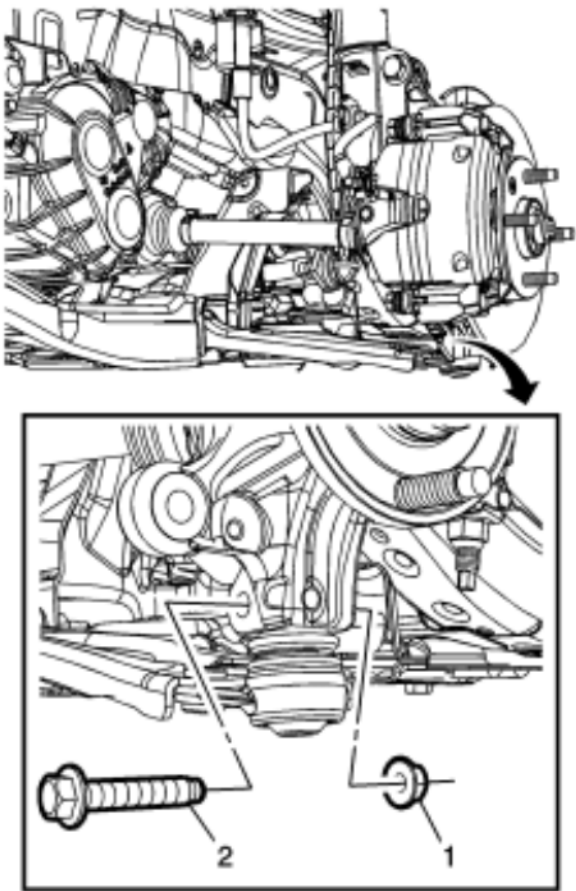


- 4. Using the appropriate tool, install the retaining ring (1).
- 5. Lower the vehicle.
- 6. Install the steering knuckle assembly in the vehicle. Refer to [Steering Knuckle Replacement](#).

Lower Control Arm Replacement

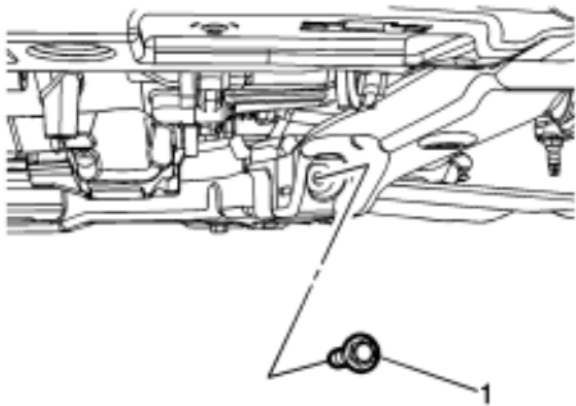
Removal Procedure

- 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](#) .

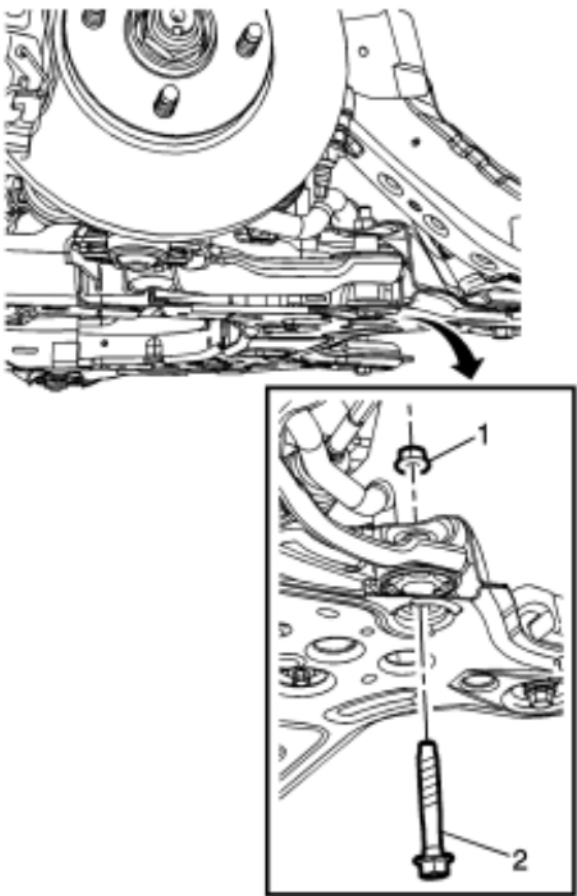


Note: DO NOT reuse the ball joint nut. The nut is NOT reusable.

- 3. Remove the lower ball joint nut(1)and bolt(2).

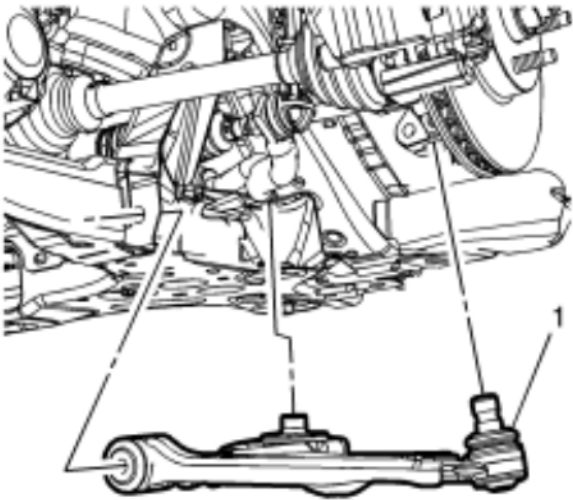


- 4. Remove and discard the front lower control bolt(1). Replace with NEW only.



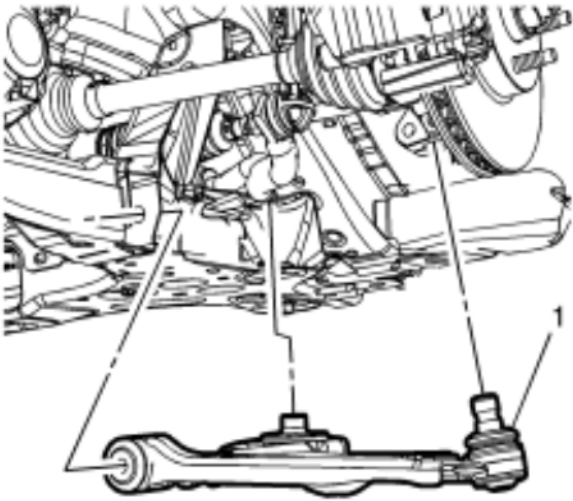
Note: DO NOT reuse the rear lower control arm nut. The nut is NOT reusable.

5. Remove the front lower control arm rear nut(1)and bolt(2).

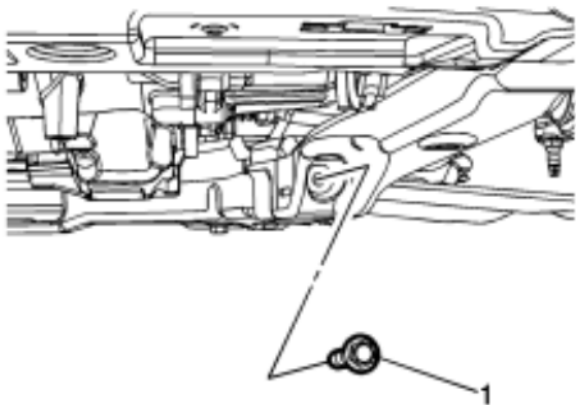


6. Remove the front lower control arm(1).

Installation Procedure

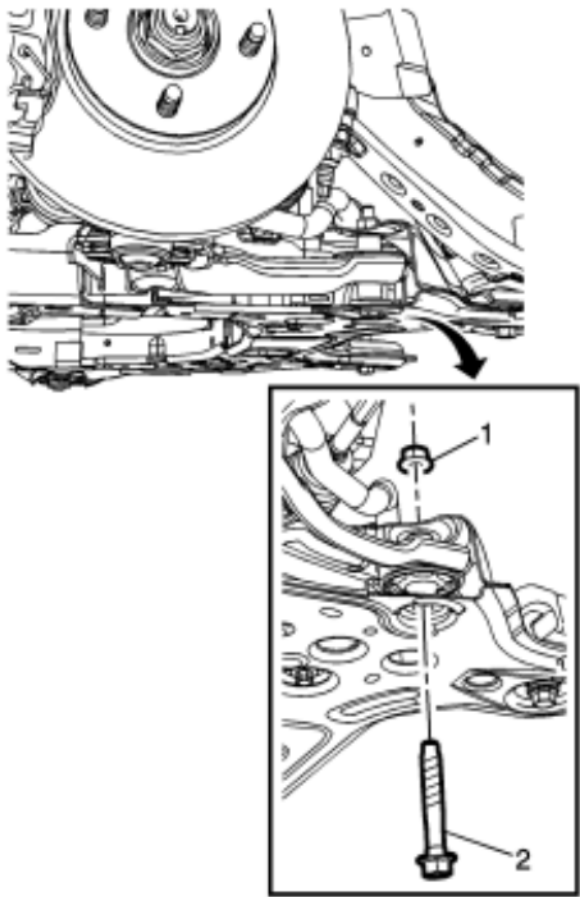


1. Position the lower control arm(1) in the vehicle.

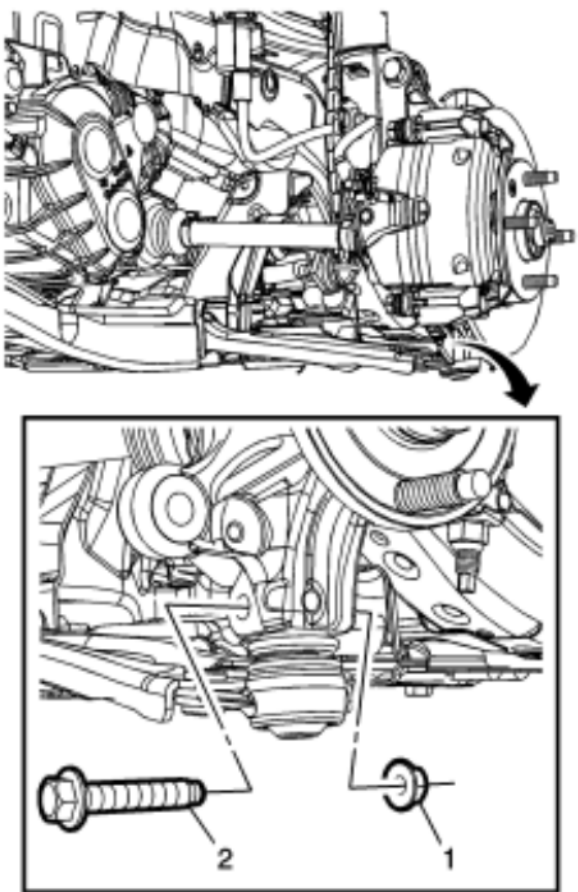


Note: Install the front lower control arm rear bolt and nut hand tight to hold the lower control arm in place while tightening the front lower control arm bolt.

2. Install the NEW front lower control arm front bolt(1)and tighten to.
- First Pass: **115N·m (85lb ft)**
 - Final Pass: **plus an additional 65 degrees**

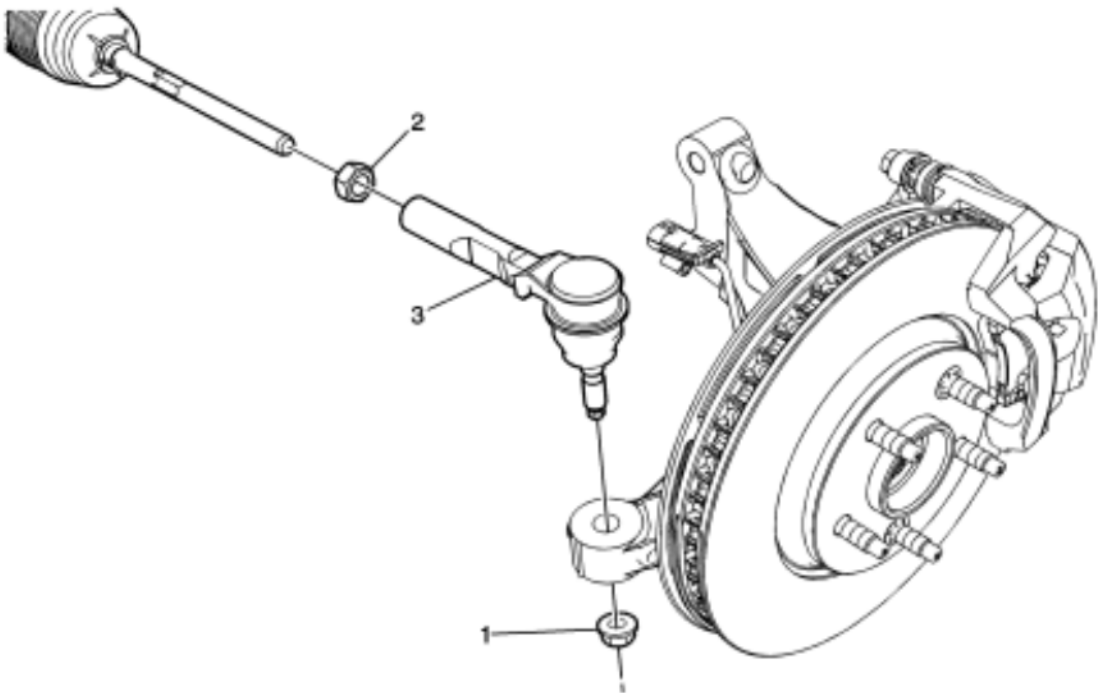


3. Tighten the NEW front lower control arm rear nut(1)to:
- First Pass: **160N·m (118lb ft)**
 - Final Pass: **plus an additional 35 degrees**



4. Install the NEW lower ball joint bolt(2) and nut(1) and tighten the to nut(1):
- First Pass: **30N·m (22lb ft)**
 - Final Pass: **plus an additional 35 degrees**
5. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
6. Remove the support and lower the vehicle.

Steering Linkage Outer Tie Rod Replacement



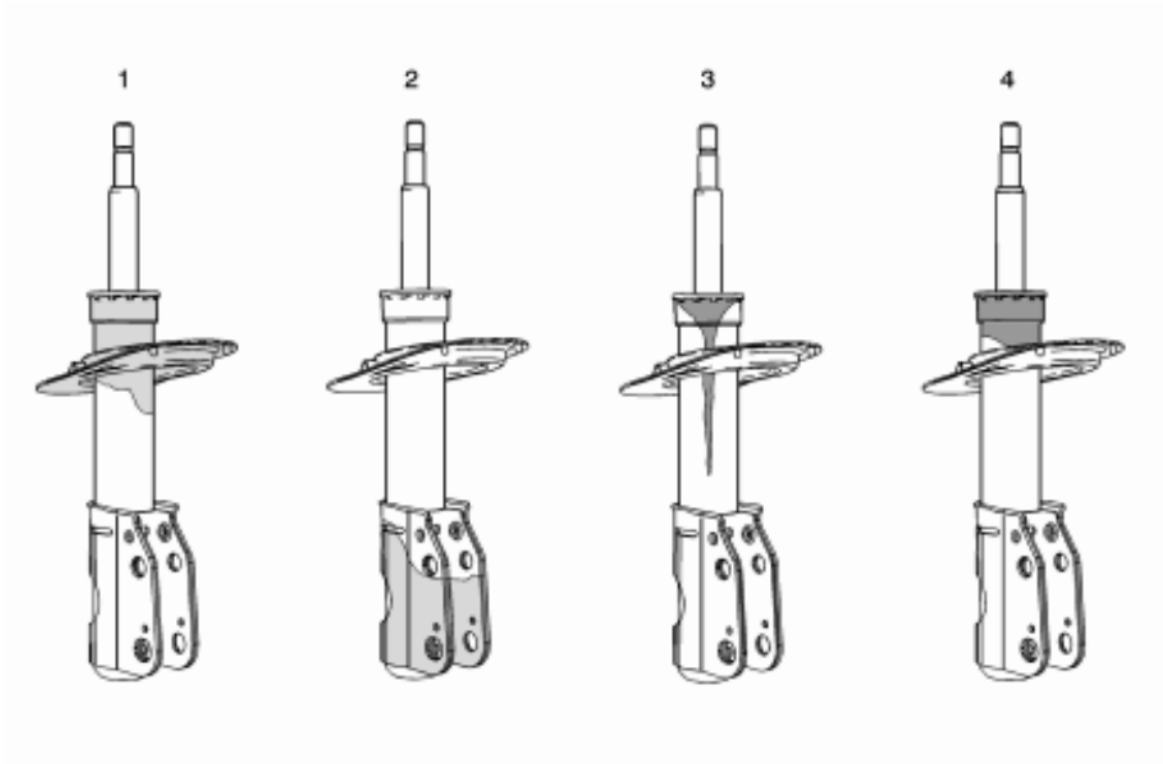
Callout	Component Name
Preliminary Procedures 1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 2. Remove the front tire and wheel assembly. Refer to Tire and Wheel Removal and Installation .	
1	Steering Linkage Outer Tie Rod Nut Warning: This component is equipped with torque-to-yield fasteners. Install a NEW torque-to-yield fastener when installing this component. Failure to replace the torque-to-yield fastener could cause bodily injury and damage to the vehicle or component. Caution: Refer to Fastener Caution . Procedure 1. Remove the steering linkage outer tie rod nut. DISCARD the nut. 2. Install a NEW outer tie rod nut. 3. Use the <i>EN-45059</i> meter in order to tighten the outer tie rod nut to the specification. Tighten 1. 30 N·m (22 lbft) 2. 128degrees Special Tools <i>EN-45059</i> Angle Meter For equivalent regional tools, refer to Special Tools .
2	Steering Linkage Inner Tie Rod Nut

	Procedure 1. Use paint in order to place match marks on the steering linkage inner tie rod nut and on the steering linkage inner tie rod. 2. During installation, align the match marks. 3. Do not tighten the nut during installation. Tighten the nut after adjusting the front toe. Refer to Wheel Alignment - Steering Wheel Angle and/or Front Toe Adjustment .
3	Steering Linkage Outer Tie Rod Caution: Do not free the ball stud by using a pickle fork or a wedge-type tool. Damage to the seal or bushing may result. Procedure 1. Use the <i>CH-161-B</i> puller in order to separate the steering linkage outer tie rod from the steering knuckle. 2. Inspect the steering linkage inner tie rod for bent or damaged threads. 3. Clean the tapered surface of the steering knuckle. 4. After the installation is complete, measure and adjust the front toe. Refer to Wheel Alignment - Steering Wheel Angle and/or Front Toe Adjustment . Special Tools <i>CH-161-B</i> Bearing Puller For equivalent regional tools, refer to Special Tools .

Strut and Shock Absorber Inspection (Strut)

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

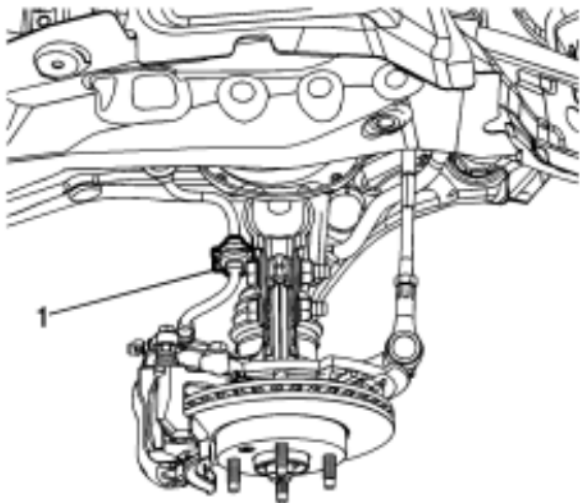
Special Tools

CH35669 Strut Rod Nut Socket

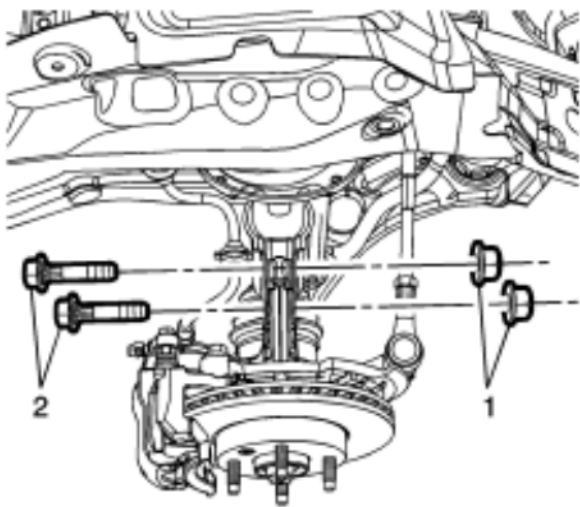
For equivalent regional tools, refer to [Special Tools](#)

Removal Procedure

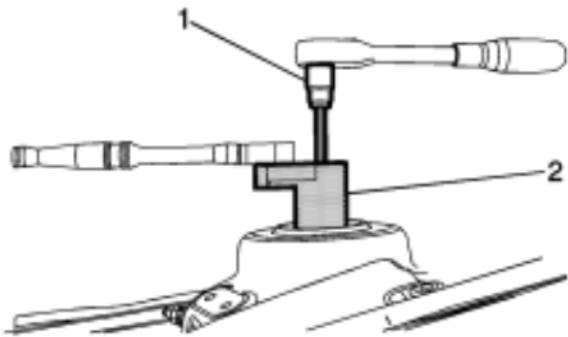
1. Remove the air inlet grille panel. Refer to [Air Inlet Grille Panel Replacement](#) .
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
3. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
4. Remove the stabilizer shaft link from the front strut assembly. Refer to [Stabilizer Shaft Link Replacement](#) .



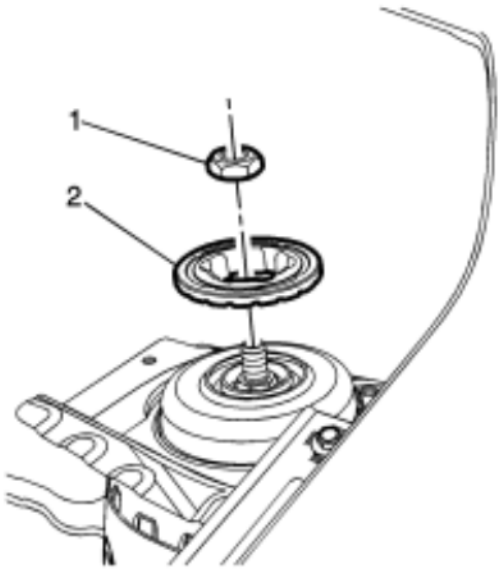
5. Remove the front brake hose(1)from the front strut assembly.
6. Remove the speed sensor wiring harness from the front strut assembly, if needed.
7. Remove the outer tie rod end from the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#) .
8. Support the lower control arm with a jack stand.



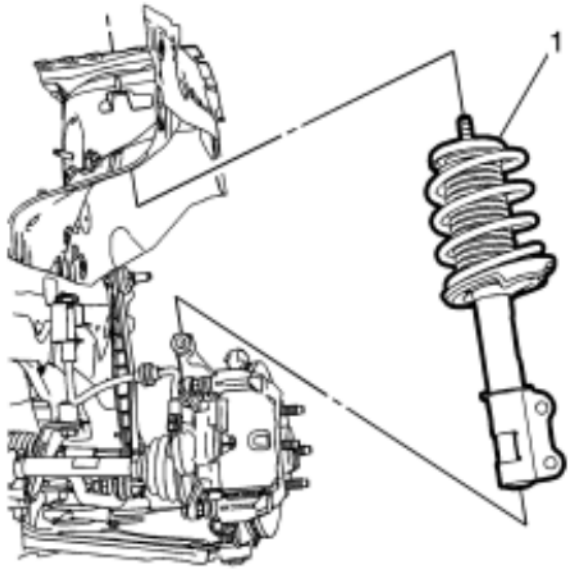
9. Remove the front strut nut(1)and the bolt(2)from the front strut. Discard the nut and replace with NEW only.



10. Using the *CH35669* socket (2) and the proper size allen wrench, loosen the front strut nut.

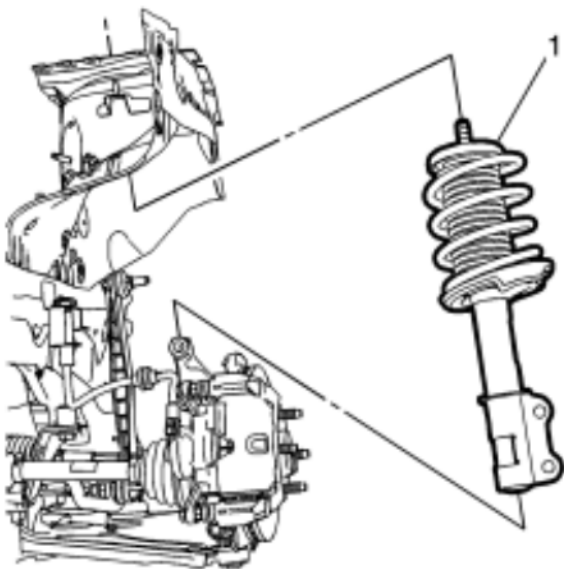


11. Remove the front strut nut(1) and the retaining plate(2). Discard the nut and replace with NEW only.

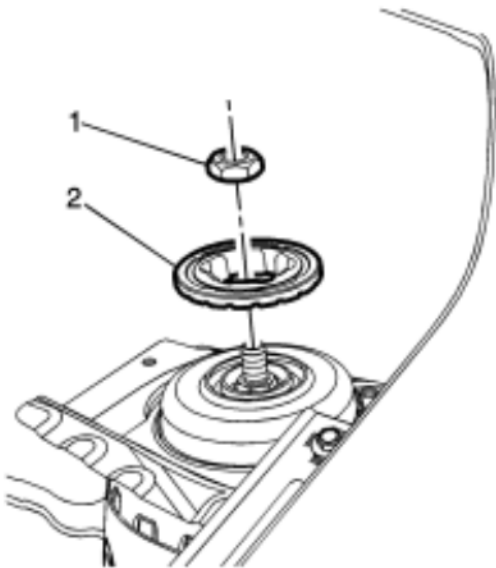


12. Remove the front strut assembly from the vehicle(1).
13. If removing the front strut assembly to service any of the front strut components, refer to [Strut, Strut Component, or Spring Replacement](#) .

Installation Procedure

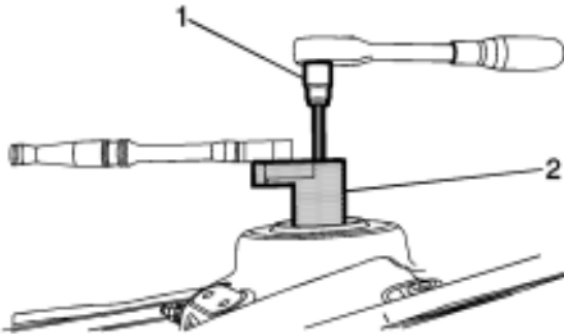


- 1. Position the front strut assembly(1) in the vehicle.

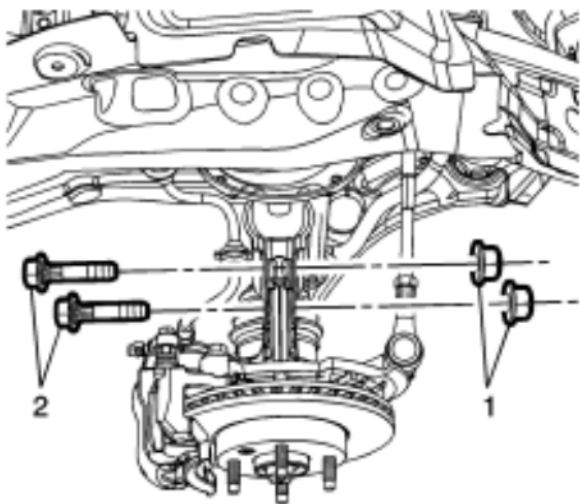


- 2. Install the NEW front strut nut(1) and the retaining plate(2).

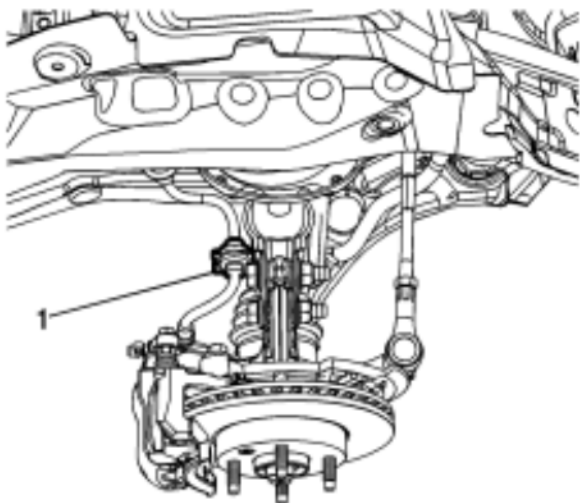
Caution: Refer to [Fastener Caution](#) .



- 3. Using the CH35669 socket (2) and the proper size allen wrench, tighten the nut to **35 N·m (26 lb ft)**.

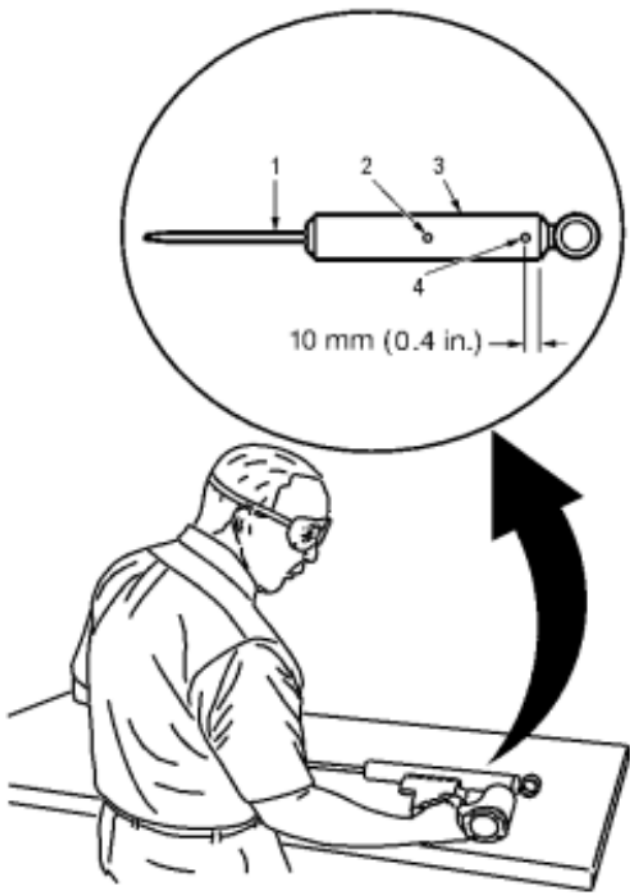


- 4. Install the NEW front strut nut(1)and the bolt(2)from the front strut and tighten the nut to **110N·m (82lb ft)**.
- 5. Install the stabilizer shaft link in the front strut assembly. Refer to [Stabilizer Shaft Link Replacement](#) .
- 6. Remove the jack stand from the lower control arm.
- 7. Install the outer tie rod end in the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#) .
- 8. Install the speed sensor wiring harness on the front strut assembly, if needed.



- 9. Install the front brake hose(1)on the front strut assembly.
- 10. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
- 11. Remove the support and lower the vehicle.
- 12. Install the air inlet grille panel. Refer to [Air Inlet Grille Panel Replacement](#) .

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.

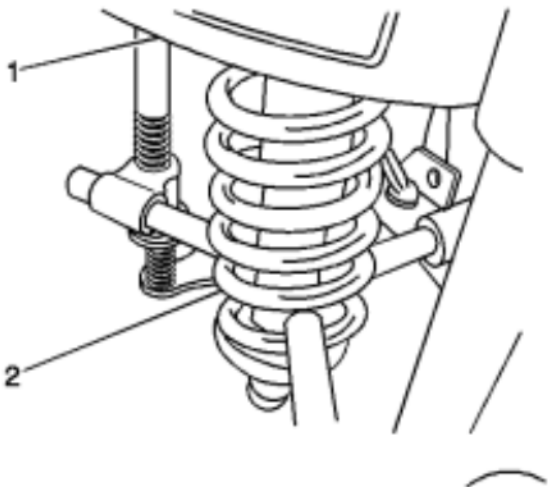
Warning: To prevent personal injury, wear safety glasses when centerpunching and drilling the shock absorber. Use care not to puncture the shock absorber tube with the centerpunch.

1. Make an indentation 10 mm (0.4in) 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 (3/16in) 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 (3/16in) 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.

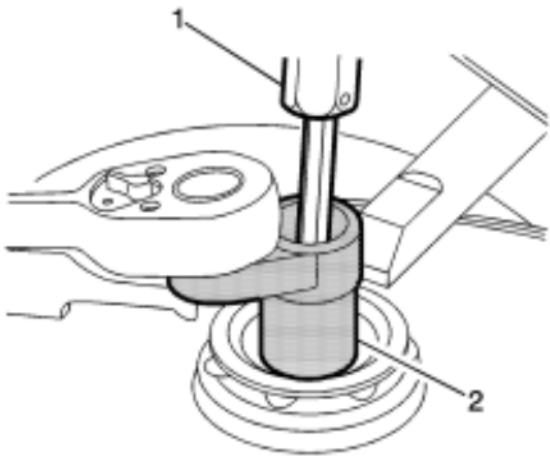
Strut, Strut Component, or Spring Replacement

Disassembly Procedure

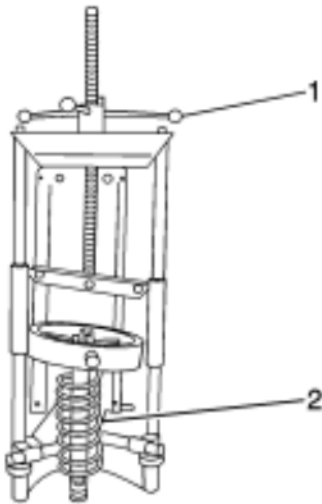
1. Remove the front suspension strut from the vehicle. Refer to [Strut Assembly Removal and Installation](#) .



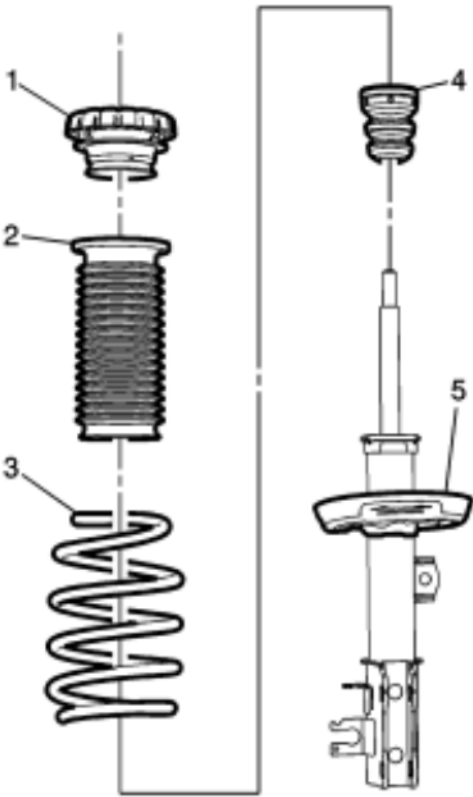
2. Install the front suspension strut(2) in the spring compressor(1).
Note: The spring is compressed when the strut moves freely.
3. Using the spring compressor(1), compress the front spring.



4. Using a TORX® bit(1) and the appropriate socket(2), loosen the front suspension strut nut.

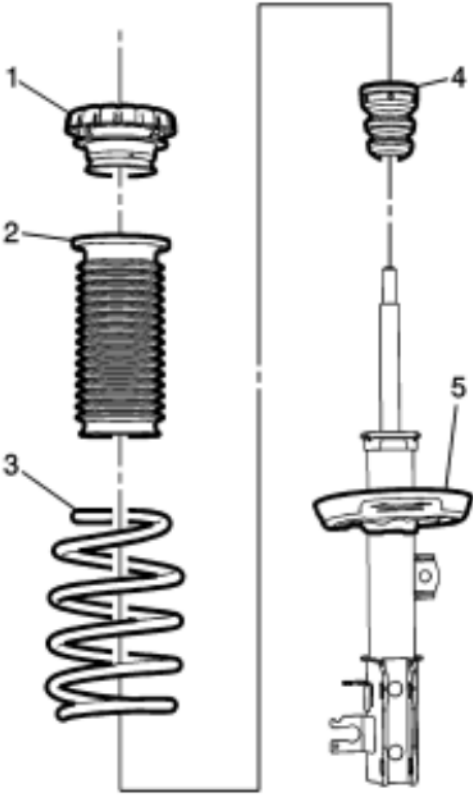


5. Slowly loosen the spring compressor(2) to remove the front suspension strut components to be serviced.

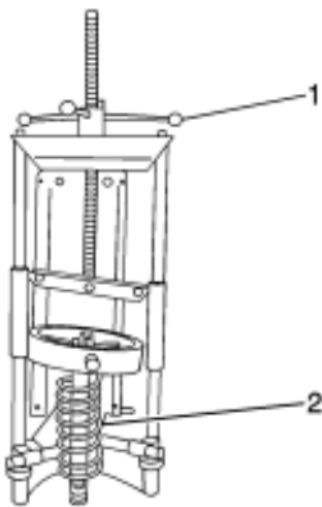


6. Remove the front suspension strut mount(1), front spring insulator(2), front spring(3), front suspension strut bumper(4), and the front strut(5)from the spring compressor.

Assembly Procedure

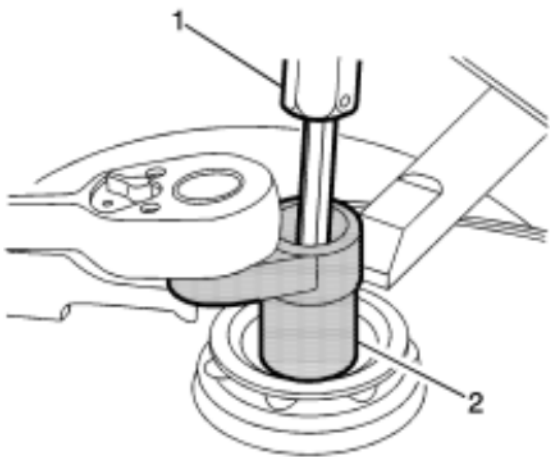


1. Install the front suspension strut(5), front suspension strut bumper(4), front spring(3), front spring insulator(2), and the front suspension strut mount(1)in the spring compressor.



- 2. Using the spring compressor(1), compress the front spring assembly (2)install the front strut spring mount nut.
- 3. Hand tighten the front suspension strut nut.

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



Note: Use the proper size TORX® bit, hold the strut shaft.

- 4. Using the appropriate size socket(2)and the TORX® bit(1), tighten the front suspension strut nut to **65 N·m (48lb ft)**.
- 5. Remove the front suspension strut from the spring compressor.
- 6. Install the front suspension strut to the vehicle. Refer to [Strut Assembly Removal and Installation](#) .

Front Suspension Description and Operation

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.

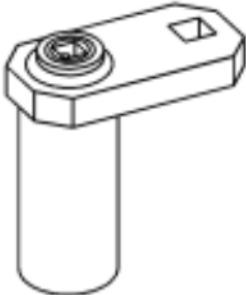
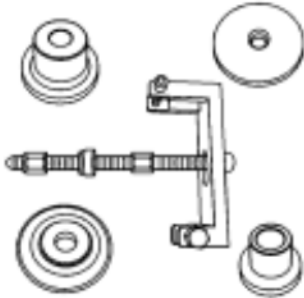
The front suspension absorbs the impact of the tires travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The rate at which the suspension dissipates the energy and the amount of energy 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

Illustration	Tool Number/ Description
	CH49375 Strut Rod Nut Socket
	CH43631 Ball Joint Remover
	CH50559 Wheel Hub/Bearing Remover/Installer Kit



Rear Suspension

SUSPENSION

Specifications	Rear Spring Insulator and Jounce Bumper Replacement
Strut and Shock Absorber Inspection	Description and Operation
Shock Absorber Replacement	Special Tools

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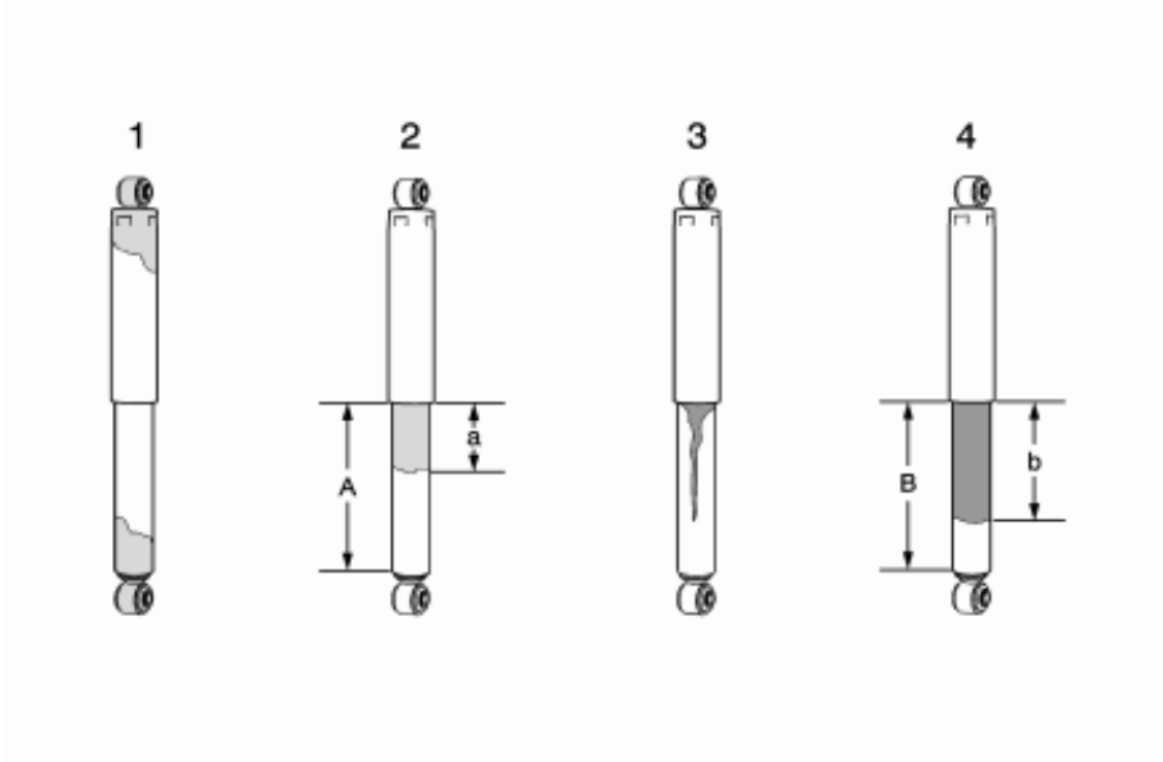
Fastener Tightening Specifications

Application	Specification	
	Metric	English
Rear Axle to Body Bolts	175 N·m	129 lb ft
Rear Wheel Bearing and Hub Bolts	58 N·m	43 lb ft
Shock Absorber-to-Axle Bolt- Lower	120 N·m	89 lb ft
Shock Absorber Nut	25 N·m	18 lb ft
Shock Absorber-to-Upper Mount Bolts	58 N·m	43 lb ft

Strut and Shock Absorber Inspection (Shock Absorber)

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.



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.

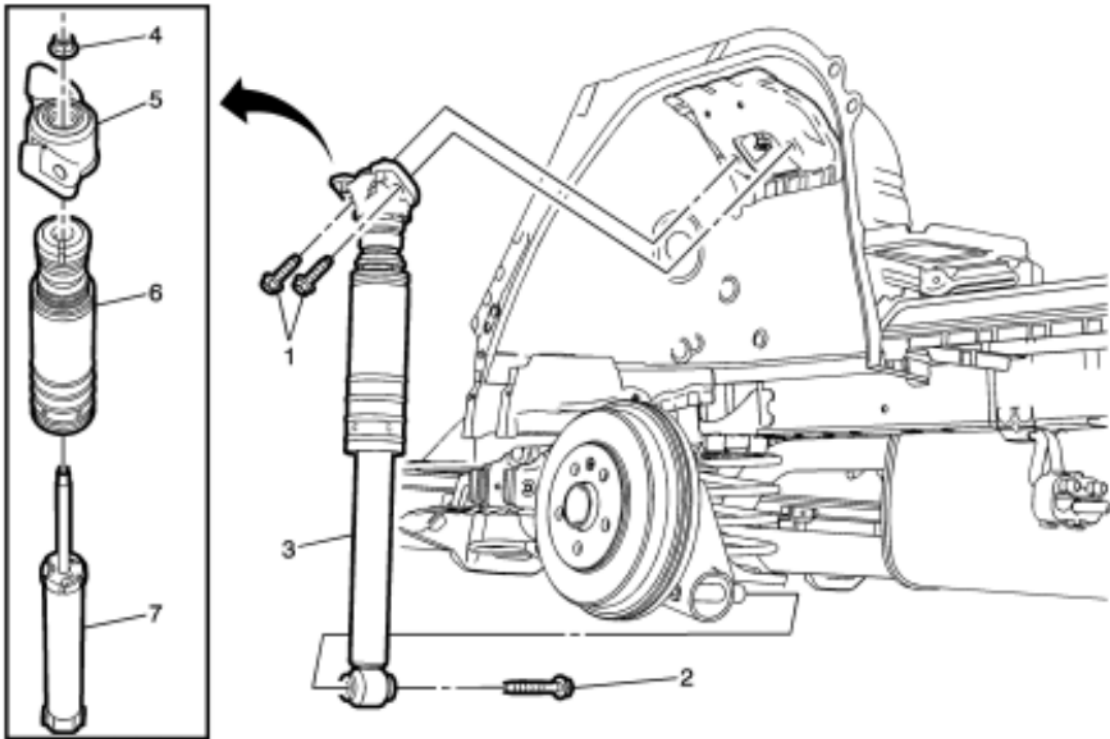
Condition 4

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.

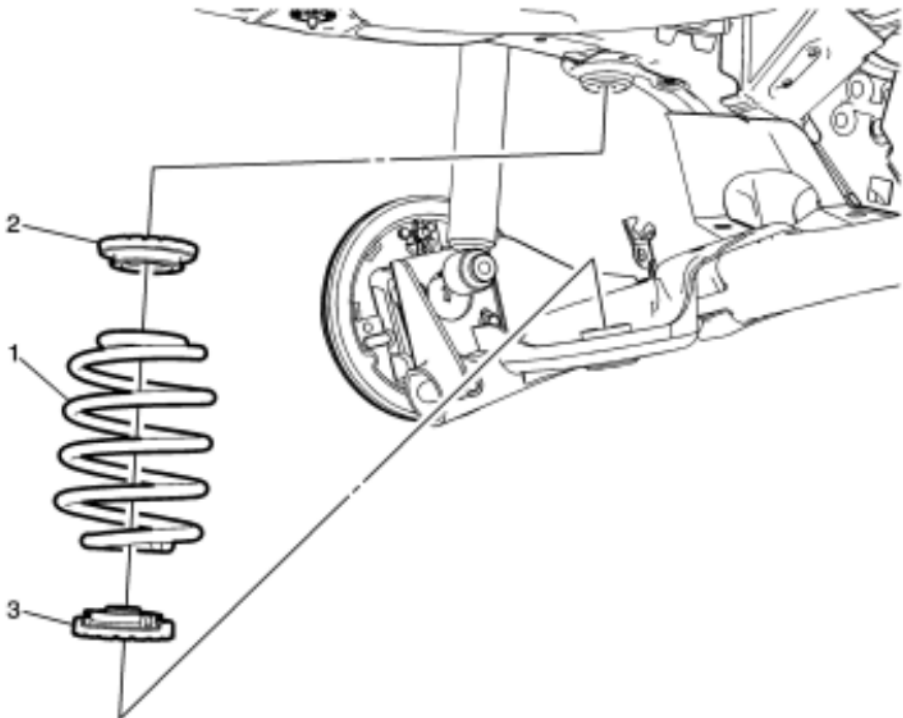
Shock Absorber Replacement



Callout	Component Name
Preliminary 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 .	
1	Rear Shock Absorber Upper Bolt (Qty: 2) Caution: Refer to Fastener Caution . Procedure Support the rear axle with a hydraulic jack. Tighten 58 N·m (43 lb ft)
2	Rear Shock Absorber Lower Bolt Tighten 120 N·m (89 lb ft)
3	Rear Shock Absorber Assembly
4	Shock Absorber Nut Tighten 25 N·m (18 lb ft)
5	Shock Absorber Mount

6	Shock Absorber Bumper
7	Rear Shock Absorber

Rear Spring, Insulator, and Jounce Bumper Replacement



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 relationship to the insulators. 2. Support the rear axle with a hydraulic jack. 3. Remove the lower rear shock absorber bolt. Refer to Shock Absorber Replacement .
2	Upper Rear Spring Insulator Tip Ensure that the rear spring insulator is properly seated in the rear frame rail.
3	Lower Rear Spring Insulator Tip Ensure that the rear spring insulator is properly seated in the rear axle.

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

Illustration	Tool Number/ Description
	CH43631 Ball Joint Remover



Tyres and Wheels

SUSPENSION

- Specifications
- Aluminum Wheel Porosity Repair

- Aluminum Wheel Refinishing
- Tire and Wheel Removal and Installation



Fastener Tightening Specifications

Application	Specification	
	Metric	English
Wheel Nuts	140 N·m	103 lb ft

Aluminum Wheel Porosity Repair

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. Inflate the tire to the manufacturer specified pressure as stated on the tire.
4. Submerge the tire/wheel into a water bath in order to locate the leak.
5. Inscribe a mark on the wheel in order to indicate the leak areas.
6. Inscribe a mark on the tire at the valve stem in order to indicate the orientation of the tire to the wheel.
7. Remove the tire from the wheel. Refer to [Tire Dismounting and Mounting](#) .

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

8. Use number 80grit sandpaper to scuff the inside of the rim surface at the leak area.
9. Use general purpose cleaner such as 3M®, P/N08984 or equivalent, to clean the leak area.
10. Apply 3 mm (0.12in) thick layer of adhesive/sealant, GM P/N 1052366 or equivalent, to the leak area.
11. Allow for the adhesive/sealant to dry.
12. Align the inscribed mark on the tire with the valve stem on the wheel.
13. Install the tire to the wheel. Refer to [Tire Dismounting and Mounting](#) .
14. Inflate the tire to the manufacturer specified pressure as stated on the tire.
15. Submerge the tire/wheel into a water bath in order ensure the leak is sealed.
16. Balance the tire and wheel. Refer to [Tire and Wheel Assembly Balancing - Off Vehicle](#) .
17. Install the tire and wheel. Refer to [Tire and Wheel Removal and Installation](#) .
18. Lower the vehicle.

Aluminum Wheel Refinishing

Finish Damage Evaluation Procedure

Note:

- If the wheels are chrome-plated, do not re-plate or refinish the wheels.
- If the wheels are polished aluminum, do not refinish the wheels in the dealer environment. Utilize a refinisher that meets manufacturer guidelines.

1. Inspect the wheels for damage from uncoated wheel balance weights or from automatic car wash facilities.
2. Inspect the wheels for the following conditions:
 - Corrosion
 - Scrapes
 - Gouges
3. Verify the damage is not deeper than what sanding can remove.
4. Inspect the wheels for cracks. If a wheel has cracks, discard the wheel.
5. Inspect the wheels for bent rim flanges. If a rim flange is bent, discard the wheel.

Refinishing Procedure

Warning: To avoid serious personal injury when applying any two part component paint system, follow the specific precautions provided by the paint manufacturer. Failure to follow these precautions may cause lung irritation and allergic respiratory reaction.

1. Remove the tire and wheel assembly from the vehicle. Refer to [Tire and Wheel Removal and Installation](#) .
2. Remove the balance weights from the wheel.
3. Remove the tire from the wheel. Refer to [Tire Dismounting and Mounting](#) .
4. Use a suitable cleaner in order to remove the following contaminants from the wheel:
 - Lubricants
 - Wax
 - Dirt

Note:

- Do not re-machine the wheel.
- Do not use chemicals in order to strip the paint from the wheel.

5. Use plastic media blasting in order to remove the paint from the wheel.
6. If the wheel had a machined aluminum finish, spin the wheel and use sand paper in order to restore the circular machined appearance.

Note: The wheel mounting surface and the wheel nut contact surface must remain free of paint.
7. Mask the wheel mounting surface and the wheel nut contact surface.
8. Follow the paint manufacturer's instructions for painting the wheel.
9. Unmask the wheel.
10. Install a new valve stem.

Note: Use new coated balance weights in order to balance the wheel.

11. Install the tire to the wheel. Refer to [Tire Dismounting and Mounting](#) .
12. Use a suitable cleaner in order to remove the following contaminants from the wheel mounting surface:
 - Corrosion
 - Overspray
 - Dirt
13. Install the tire and wheel assembly to the vehicle. Refer to [Tire and Wheel Removal and Installation](#) .

Tire and Wheel Removal and Installation

Removal Procedure

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. If rotating the tires, refer to [Tire Rotation](#) .
3. Remove the wheel center cap, if equipped.
4. Remove the wheel center cap nuts, if equipped.
5. Remove the wheel nuts.
6. Remove the tire and wheel assembly.

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

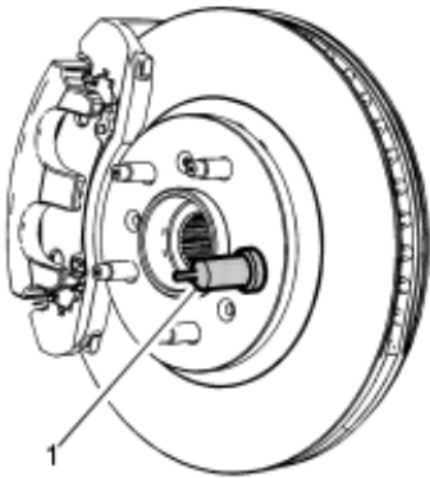
7. If the tire and wheel assembly is difficult to remove or cannot be removed, perform the following steps:
 - 7.1 Apply a small amount of penetrating oil to the wheel nuts, and the center hub. Allow a few moments for the penetrating oil to work.
 - 7.2 Loosen each wheel nut 2 complete turns.
 - 7.3 Lower the vehicle.
 - 7.4 Rock the vehicle from side to side.
 - 7.5 Repeat the procedure if necessary.
8. If the tire and wheel assembly still does not loosen, perform the following:
 - 8.1 Start the engine.
 - 8.2 Allow the vehicle to move forward, and quickly apply the brakes. Repeat this procedure in reverse.
 - 8.3 Repeat this procedure if necessary.
9. With the tire and wheel assembly loose, raise and support the vehicle.
10. Remove the tire and wheel assembly.

Caution: Before installing wheels, remove any build-up of corrosion on the wheel mounting surface by scraping and wire brushing. Installing wheels without good metal-to-metal contact at the mounting surfaces can cause wheel bolts or nuts to loosen, which can later allow a wheel bolt or nut to come off while the vehicle is moving. Wheel bolts or nuts must be tightened in sequence and to proper torque to avoid bending the wheel, brake drum or rotor.

Note:

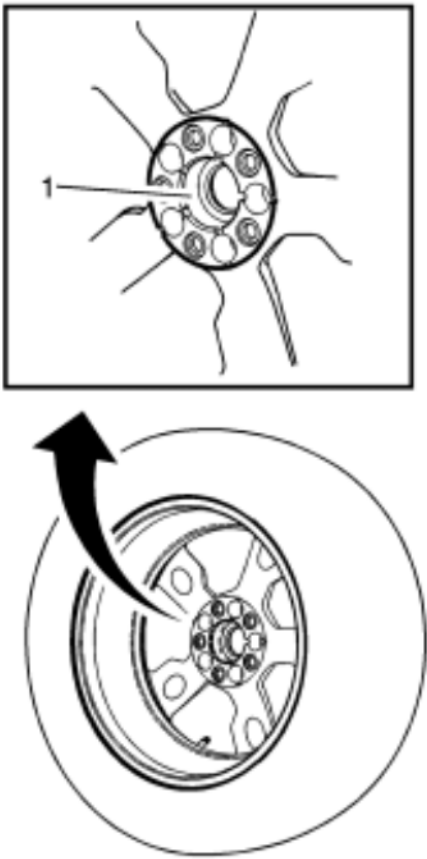
- Wear approved safety glasses when performing the following service procedures.
- DO NOT use power grinders to clean any of the brake rotor or brake drum to wheel contact areas.

11. Using a wire brush or wire wheel, clean the rotor to the wheel or brake drum to wheel hub contact area.
12. Using the appropriate special tool, clean the contact areas of the wheel to brake rotor or brake drum.



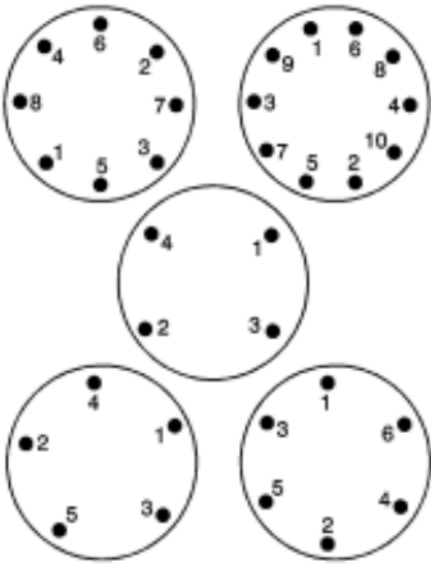
13. Using the appropriate special tool (1), clean the surface around the wheel studs.
14. Clean the threads of the wheel studs. If the threads are damaged, replace the wheel stud.
 - For the front wheel stud replacement, refer to [Wheel Stud Replacement](#) .
 - For the rear wheel stud replacement, refer to [Wheel Stud Replacement](#) .
15. After cleaning all the contact areas, use brake clean or denatured alcohol to remove all the penetrating oil, dirt and debris from the wheel nuts, brake rotor or brake drum.
16. Inspect and clean the contact area of the wheel. Refer to [Wheel Mounting Surface Check](#) .

Installation Procedure



Note: Only apply a small amount the lubricant to the pilot hole of the wheel and NOT the wheel bearing flange. DO NOT apply it to the entire pilot hole of the wheel.

- 1. Apply a small amount of lubricant to the inner diameter of the wheel hub pilot hole(1) where it contacts the with the wheel bearing/hub flange.
- 2. Install the tire and wheel assembly.
- 3. Hand start the wheel nuts.



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.

- 4. Using the proper size socket and the torque wrench, tighten the wheel nuts in the proper sequence to **140 N·m (100 lbft)**.
- 5. Install the wheel center cap, if required.
- 6. Install the wheel cap nuts, if required.
- 7. Remove the support and lower the vehicle.