

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

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 80 grit sandpaper to scuff the inside of the rim surface at the leak area.
9. Use general purpose cleaner such as 3M®, P/N 08984 or equivalent, to clean the leak area.
10. Apply 3 mm (0.12 in) 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.

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[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
 - Verify the damage is not deeper than what sanding can remove.
 - Inspect the wheels for cracks. If a wheel has cracks, discard the wheel.
 - 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.
- Use plastic media blasting in order to remove the paint from the wheel.
- 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.

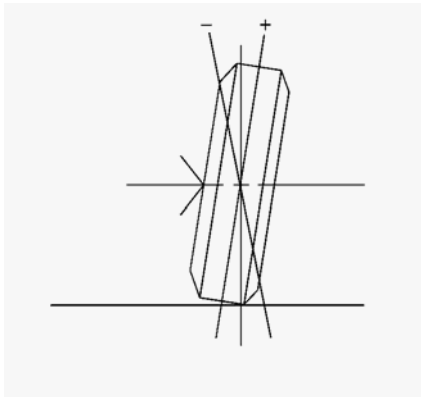
- Mask the wheel mounting surface and the wheel nut contact surface.
- Follow the paint manufacturer's instructions for painting the wheel.
- Unmask the wheel.
- Install a new valve stem.

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

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

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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 wheels tilt inward at the top, the camber is negative (-). The amount of tilt is measured in degrees from the vertical. Camber settings influence the tire wear.

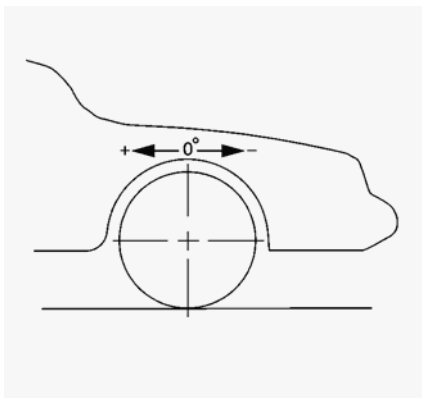
Too much positive camber will result in premature wear on the outside of the tire and cause excessive wear on the suspension parts.

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.

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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 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 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 at 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 less positive caster.

Cross Caster is the difference between the left caster value and the right caster value.

Cross caster = L caster - R caster

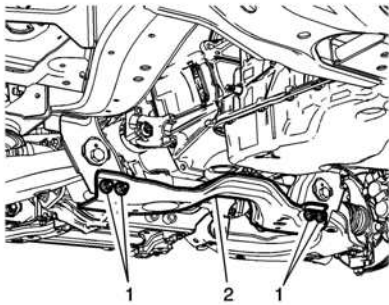
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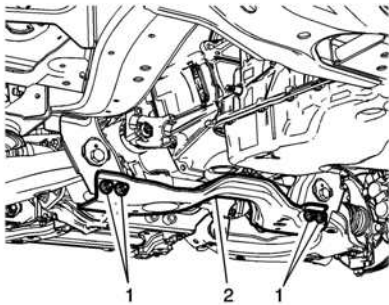
Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the rear shield, if equipped. Refer to Engine Protection Shield Replacement.
3. Support the front differential with a transmission jack stand.



4. Remove the 4 bolts and nuts (1) from the frame.
5. Remove the front crossmember (2).

Installation Procedure



1. Install the front crossmember (2).

Caution: Refer to Fastener Caution.

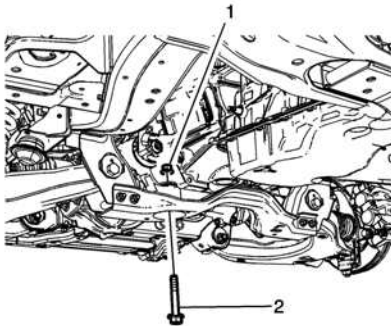
2. Install 4 bolts in the frame and tighten to **56 Y (41 lb ft)**.
3. Install the rear shield, if equipped. Refer to Engine Protection Shield Replacement.
4. Remove the supports and lower the vehicle.

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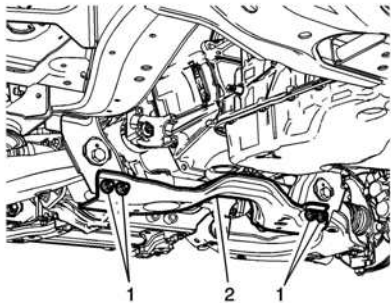
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.
3. Support the front differential with a transmission jack stand.

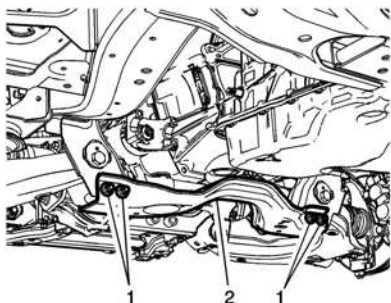


4. Remove the bolt (2) and nut (1) from the crossmember to the front differential.



5. Remove the 4 bolts and nuts (1) from the frame.
6. Remove the front crossmember (2).

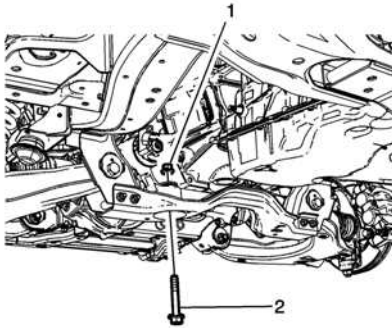
Installation Procedure



1. Install the front crossmember (2).

Caution: Refer to Fastener Caution.

2. Install 4 bolts and nuts (1) in the frame but do not tighten.

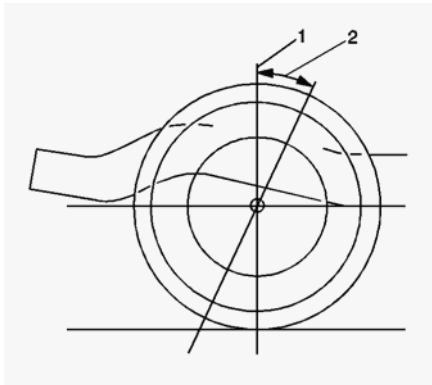


3. Install the bolt (2) and nut (1) in the crossmember to the front differential but do not tighten.
4. Tighten the 4 bolts to **56 Y (41 lb ft)** in the frame.
5. Remove the transmission jack stand from the front differential.
6. Tighten the bolt to **160 Y (118 lb ft)**.
7. Install the engine protection shield. Refer to Engine Protection Shield Replacement.
8. Remove the supports and lower the vehicle.

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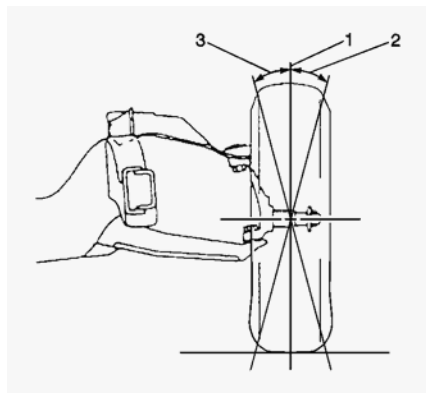
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1. The caster and camber adjustments are made by rotating the front and rear adjuster cam bolt which are located in the lower control arm.



Note: Be sure to compensate for frame angle where required.

2. Determine the caster angle (2).



3. Determine the positive camber (2) or negative camber (3) angle.



4. Loosen the front and rear control arm cam adjustment nuts (1).
5. Adjust the caster and the camber angle by turning the cam bolts until the specifications have been met.

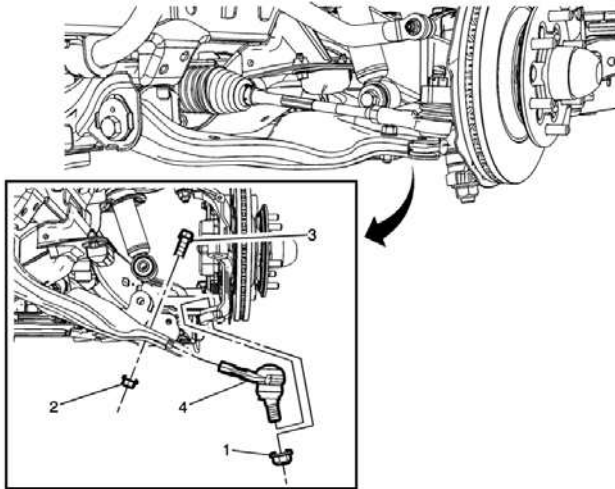
Caution: Refer to Fastener Caution.

Note: When the adjustments are complete, hold the cam bolt in order to ensure the cam bolt position does not change while tightening the nut.

6. Tighten the front and rear adjuster nuts to **186 Y (137 lb ft.)**.
7. Verify that the caster and the camber are still within specifications. Refer to Wheel Alignment Measurement.
8. With the caster and camber in specifications, adjust the toe. Refer to Wheel Alignment - Steering Wheel Angle and/or Front Toe Adjustment.

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Front Lower Control Arm Ball Stud 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.
3. Remove the lower shock absorber bolt from the lower control arm. Refer to Shock Absorber and Spring Removal and Installation.
4. Remove the outer tie rod end from the knuckle. Refer to Steering Linkage Outer Tie Rod Replacement.
5. Remove the stabilizer shaft link from the lower control arm. Refer to Stabilizer Shaft Link Replacement.

Lower Ball Stud Nut

Caution: Refer to Fastener Caution.

Procedure

Note: Support the knuckle with a jack stand.

- 1
 1. Using the CH 47975-B separator, separate the lower control arm from the knuckle.
 2. Loosen but DO NOT remove the lower control bolts at the frame. Refer to Lower Control Arm Replacement.

Special Tools

CH 47975-B Ball Joint Separator

Tighten

147 Y (108 lb ft)

Lower Control Arm Ball Joint Nut (Qty: 4)

- 2
 1. Tighten

31 Y (23 lb ft)

- 3
 1. Lower Control Arm Ball Stud Bolt (Qty: 4)

- 4
 1. Lower Control Arm Ball Stud

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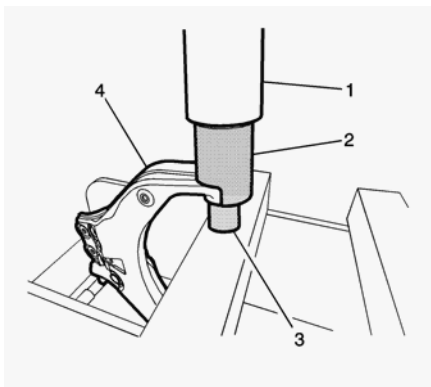
Special Tools

CH 50800 Control Arm Bushing Remover/Installer,

For regional equivalent tools, refer to Special Tools.

[Removal Procedure](#)

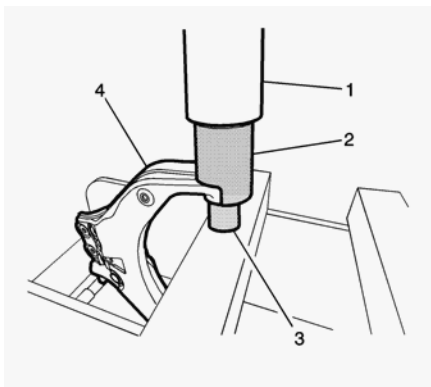
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the front lower control arm from the vehicle. Refer to Lower Control Arm Replacement.



3. Position the front lower control arm (4), CH 50800-2 (3) and the CH 50800-3 (2) in the hydraulic press (1).

Note:

- If the bore for the bushing is cracked or show signs of galling, replace the front lower control arm.
 - Ensure that the CH 50800 is properly aligned with the lower control arm prior to front bushing removal.
4. Using the hydraulic press (1), remove the front lower control arm front bushing.

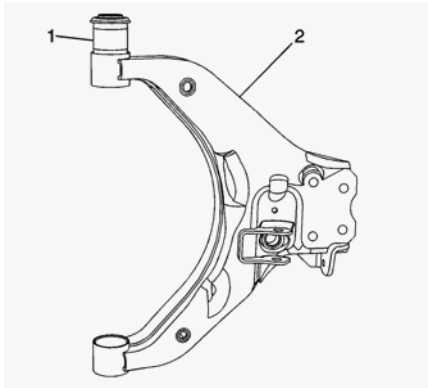


5. Position the front lower control arm (4), CH 50800-2 (3) and the CH 50800-3 (2) in the hydraulic press (1).

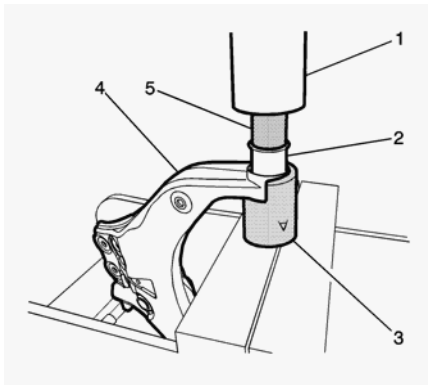
Note:

- If the bore for the bushing is cracked or show signs of galling, replace the front lower control arm.
 - Ensure that the CH 50800 is properly aligned with the lower control arm prior to rear bushing removal.
6. Using the hydraulic press (1), remove the front lower control arm rear bushing.

[Installation Procedure](#)



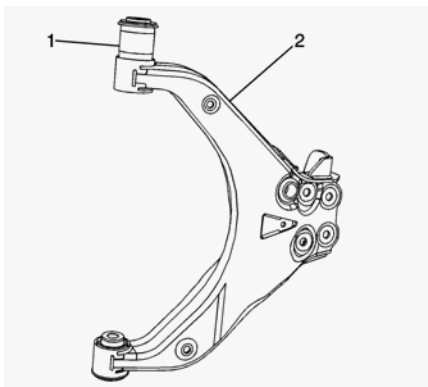
1. Position the front lower control arm front bushing (1) in the front lower control arm (2).



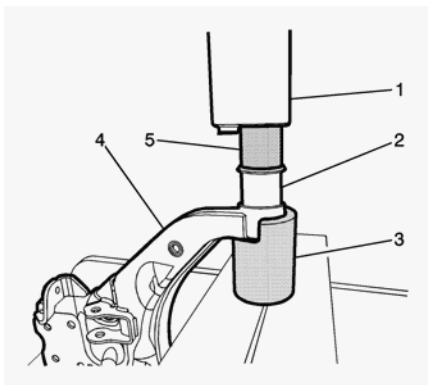
2. Position the front lower control arm (4), CH 50800-3 (2) and the CH 50800-2 (5) in the hydraulic press (1).

Note: Ensure that the CH 50800 is properly aligned with the lower control arm prior to front bushing installation.

3. Using the hydraulic press (1) with the CH 50800-2 (5) and the CH 50800-3 (3), Install the front lower control arm front bushing
4. Remove the front lower control arm (4), CH 50800-3 (2) and the CH 50800-2 (5) from the hydraulic press (1).



5. Position the front lower control arm front bushing (1) in the front lower control arm (2).



6. Position the front lower control arm (4), CH 50800-4 (3) and the CH 50800-2 (5) in the hydraulic press (1).

Note: Ensure that the CH 50800 is properly aligned with the lower control arm prior to rear bushing installation.

7. Using the hydraulic press (1) with the CH 50800—2 (5) and the CH 50800—3 (3), install the front lower control arm rear bushing (2).
8. Install the front lower control arm (4), CH 50800—4 (3) and the CH 50800—2 (5) from the hydraulic press (1).
9. Install the front lower control arm in the vehicle. Refer to Lower Control Arm Replacement.
10. remove the support and lower the vehicle.

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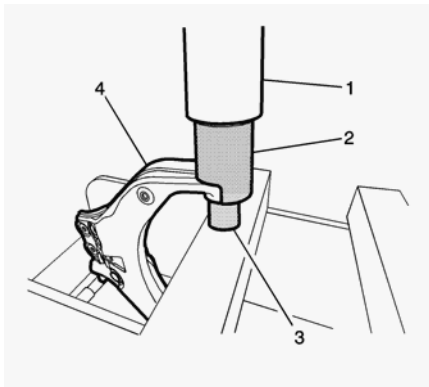
Special Tools

CH 50927 Control Arm Bushing Remover/Installer

For equivalent regional tools, refer to Special Tools.

[Removal Procedure](#)

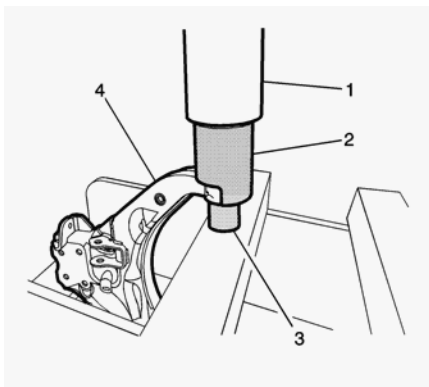
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the lower control arm from the vehicle. Refer to Lower Control Arm Replacement.



3. Position the lower control arm (4), CH 50927-1 (3) and the CH 50927-3 (2) in a hydraulic press.

Note:

- If the bore for the bushing is cracked or show signs of galling, replace the control arm.
 - Ensure that the CH 50927 is properly aligned with the lower control arm prior to front bushing removal.
4. Using the hydraulic press (1), remove the front lower control arm front bushing.

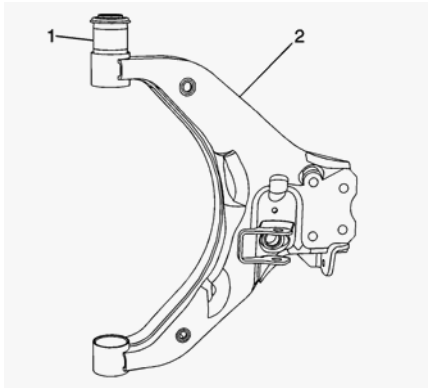


5. Position the lower control arm (4), CH 50927-1 (3) and the CH 50927-3 (2) in a hydraulic press.

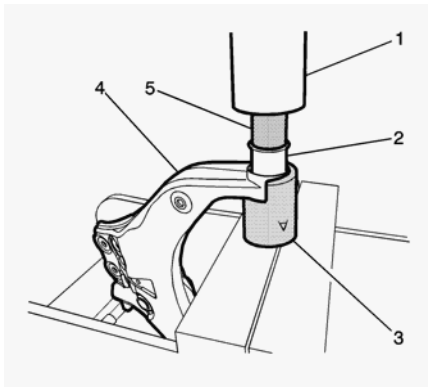
Note:

- If the bore for the bushing is cracked or show signs of galling, replace the control arm.
 - Ensure that the CH 50927 is properly aligned with the lower control arm prior to rear bushing removal.
6. Using the hydraulic press (1), remove the front lower front control arm rear bushing.

[Installation Procedure](#)



1. Position the front control arm front bushing (1) in the front lower control arm (2).

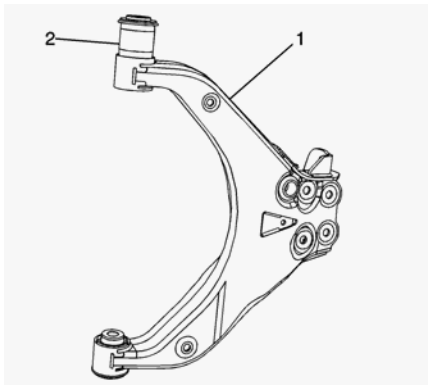


Note: If the bore for the bushing is cracked or show signs of galling, replace the control arm.

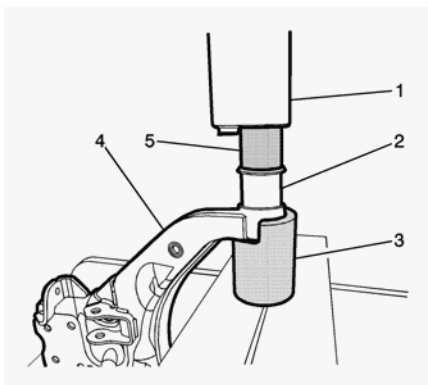
2. Position the lower control arm (4), CH 50927-2 (5) and the CH 50927-1 (3) in a hydraulic press.

Note: Ensure that the CH 50927 is properly aligned with the lower control arm prior to front bushing installation.

3. Using the hydraulic press (1) with the CH 50927-2 (5) and the CH 50927-1 (3) , install the front lower control arm front bushing.



4. Position the front control arm rear bushing (1) in the front lower control arm (2).



Note: If the bore for the bushing is cracked or show signs of galling, replace the control arm.

5. Position the lower control arm (4), CH 50927–3 (5) and the CH 50927–1 (3) in a hydraulic press.

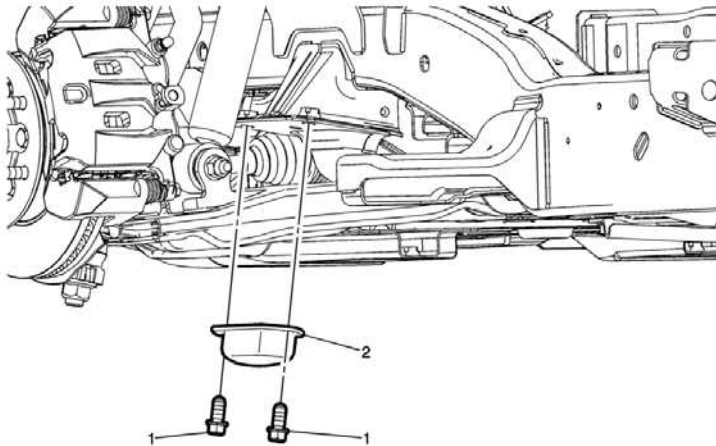
Note: Ensure that the CH 50927 is properly aligned with the lower control arm prior to rear bushing installation.

6. Using the hydraulic press (1) with the CH 50927– (5) and the CH 50927–1 (3) , install the front lower control arm rear bushing.
7. Install the front lower control arm in the vehicle. Refer to Lower Control Arm Replacement.
8. Remove the support and lower the vehicle.

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Front Shock Absorber Lower Bumper Replacement

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle

Front Shock Absorber Lower Bumper Bolt (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

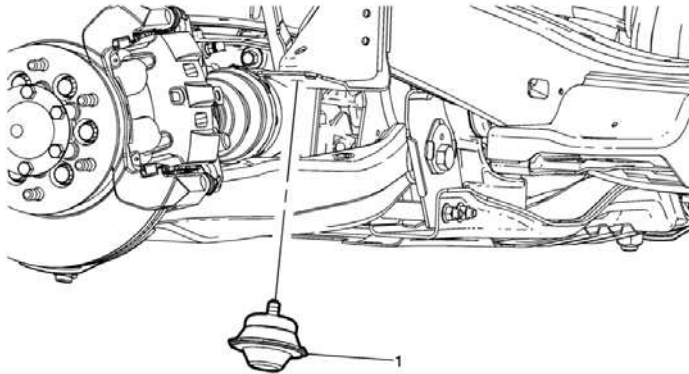
42 Y (31 lb ft)

2

Front Shock Absorber Lower Bumper

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Front Shock Absorber Lower Bumper 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.

Front Lower Control Arm Bumper

Caution: Refer to Fastener Caution.

Procedure

1. Using the *CH 50888* socket
, remove the bumper
2. Using the *CH 50888* socket and a torque wrench, tighten to
Tighten
106 Y (78 lb ft)

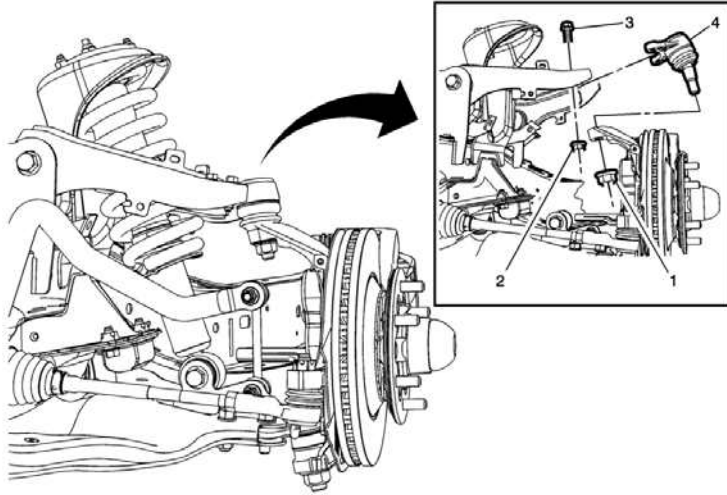
Special Tools

CH 50888 Socket

For regional equivalent tools, refer to Special Tools.

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Front Upper Control Arm Ball Stud Replacement

Callout	Component Name
Preliminary Procedure	
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle	
2. Remove and wheel assembly. Refer to Tire and Wheel Removal and Installation	
Upper Ball Stud Nut	
1	Caution: Refer to Fastener Caution.
	Tighten
	147 Y (108 lb ft)
Upper Ball Stud Nut (Qty: 4)	
2	Tighten
	31 Y (23 lb ft)
Upper Ball Stud Bolt (Qty: 4)	
3	
Upper Ball Stud	
Procedure	
4	Note: The upper control arm DOES NOT have to be removed from the vehicle to perform this service procedure.
	Using the CH 47975-B separator , separate the upper ball stud from the steering knuckle.
Special Tools	
CH 47975-B Ball Joint Separator	

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Special Tools

J 21474-01 Control Arm Bushing Set

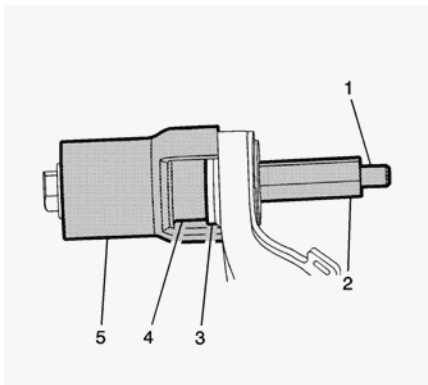
For regional equivalent tools, refer to Special Tools.

Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the upper control arm assembly. Refer to Upper Control Arm Replacement.



3. Install the control arm (1) in a soft jawed vise.

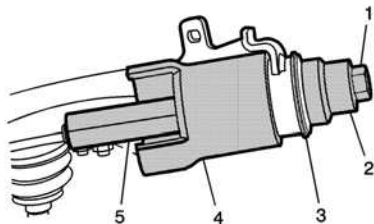


4. Using the J-21474-27 (1), J-21474-5 (2), J-21474-6 (3) and the J-21474-5 (4), remove the control arm bushing.
5. Inspect the both bores for the bushing for cracks or galling. Replace the upper control arm if needed.

Installation Procedure



1. Install the control arm (1) in a soft jawed vise, if removed.



2. Using the J-21474-27 (1), J-21474-5 (2), J-21474-6 (3) and the J-21474-5 (4), install the control arm bushing.
3. Remove the tools.
4. Install the upper control arm assembly. Refer to Upper Control Arm Replacement.
5. Remove the support and lower the vehicle.

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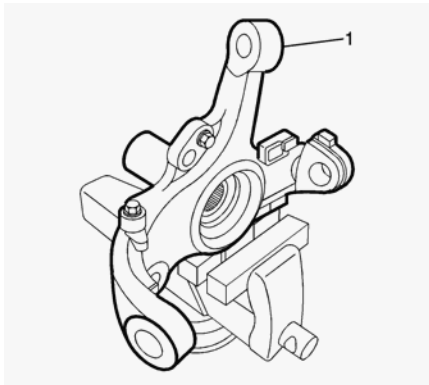
Special Tools

- *CH 50786* Seal Installer
- *DT 29369-1* Bearing Remover
- *EN 45000* Seal Remover
- *GE 8092* Universal Driver
- *GE 23907* Slide Hammer
- *J 36838* Bearing Installer

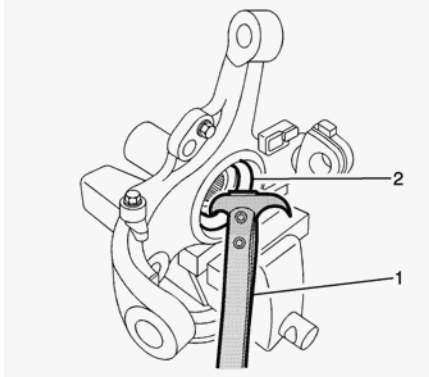
For regional equivalent tools, refer to Special Tools.

Removal Procedure

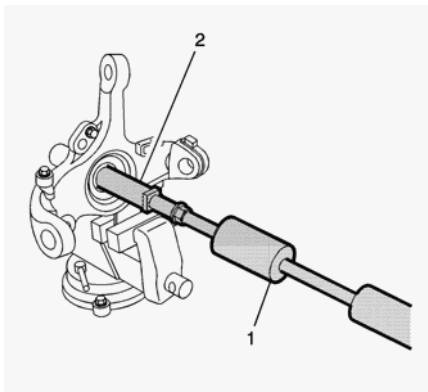
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the steering knuckle from the vehicle. Refer to Steering Knuckle Replacement.



3. Install the steering knuckle (1) in a soft jawed vise.



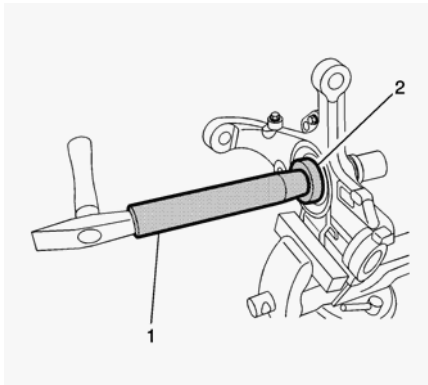
4. Using the *EN 45000* remover (1), remove the seal (2).



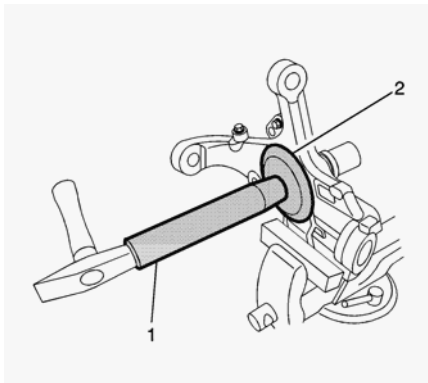
5. Using the *GE 23907* hammer and the *DT 29369-1* remover (2), remove the bearing.

Installation Procedure

1. Position the inner bearing in the steering knuckle



2. Using a hammer the *GE 8092* driver (1) and the *J 36838* installer (2), install the inner bearing in the steering knuckle.



3. Using a hammer the *GE 8092* driver (1) and the *CH 50786* Seal Installer (2), install the seal.
4. Apply grease to the needle bearings before installing the wheel drive shafts.
5. Install the steering knuckle in the vehicle. Refer to Steering Knuckle Replacement.
6. Remove the supports and lower the vehicle.

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Submodel: | **Engine Type:** | **Liters:**
Fuel Delivery: | **Fuel:**

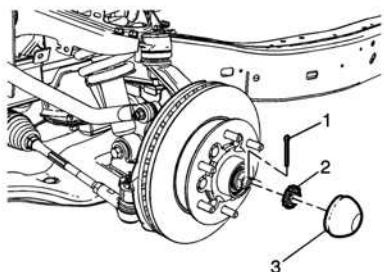
Special Tools

- CH 50798 Outer Bearing Cup Installer
- CH 50799 Inner Bearing Cup Installer
- CH 50819 Inner Dust Seal Installer
- EN 45000 Seal remover
- GE 8092 Universal Drive Handle

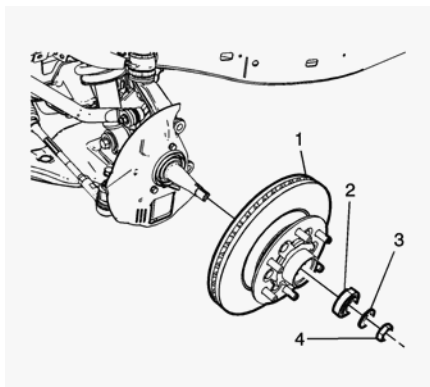
For regional equivalent tools, refer to Special Tools.

Removal Procedure

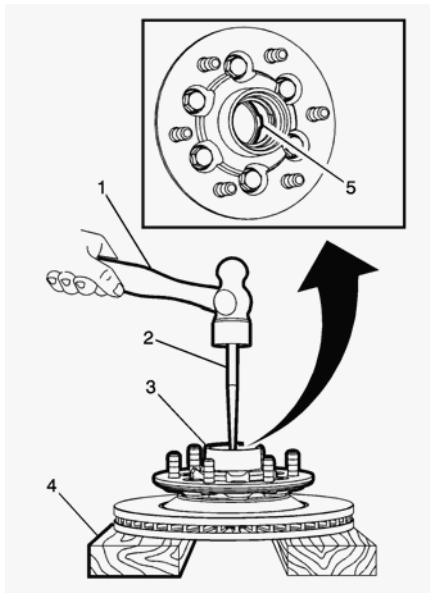
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation
3. Remove the front brake caliper bracket. Refer to Front Brake Caliper Bracket Replacement.



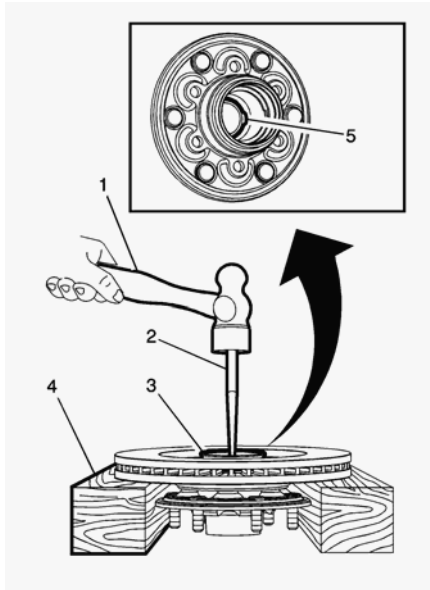
4. Remove the dust cover (3).
5. Remove the cotter pin (1), lock nut (2).



6. Remove the wheel bearing nut (4), washer (3), outer bearing race (2) and the brake rotor/wheel hub assembly (1).



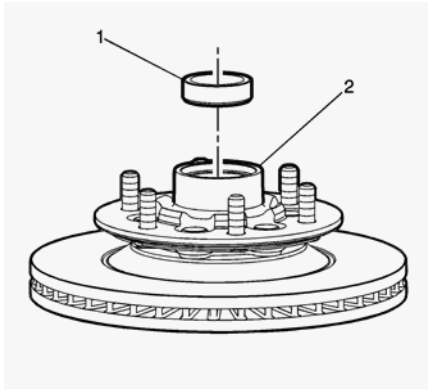
7. Position the brake rotor/wheel bearing hub assembly (2) on 2 blocks of wood (4).
8. Position the punch on the inner bearing cup (5).
9. Using the hammer (1) and punch (2), remove the inner bearing cup (5).



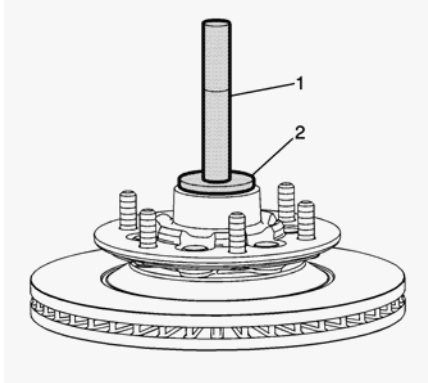
10. Position the brake rotor/wheel bearing hub assembly (2) on 2 blocks of wood (4).
11. Position the punch on the outer bearing cup (5).
12. Using the hammer (1) and punch (2), remove the outer bearing cup (5).
13. If servicing the brake rotor/wheel bearing hub, separate the brake rotor from the wheel bearing hub. Refer to Front Brake Rotor Replacement

Installation Procedure

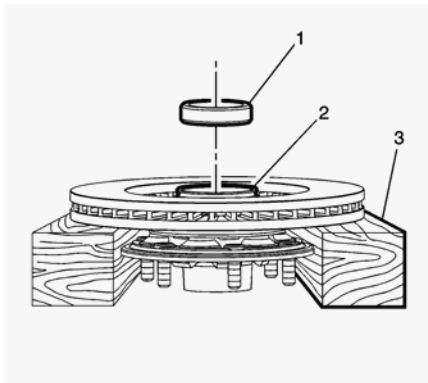
1. Install the wheel bearing hub to the brake rotor, if removed. Refer to Front Brake Rotor Replacement



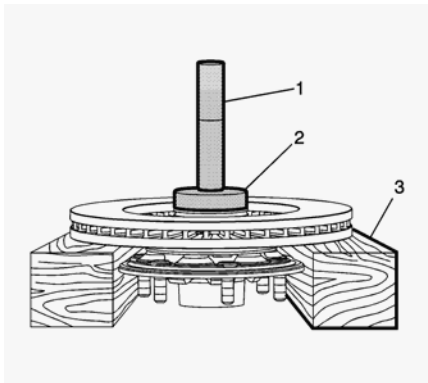
2. Position the outer wheel bearing cup (1) in the brake rotor/wheel bearing hub (2).



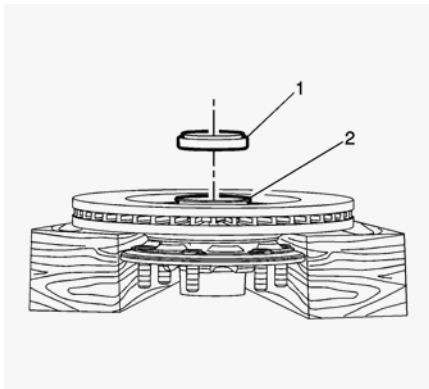
3. Using the GE 8092 handle (1) and the CH 50798 installer (2), install the outer wheel bearing cup.



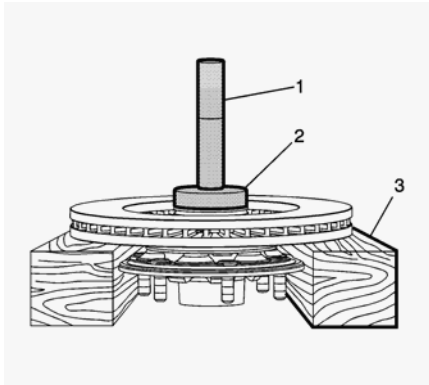
4. Position the inner wheel bearing cup (1) in the brake rotor/wheel bearing hub (2).



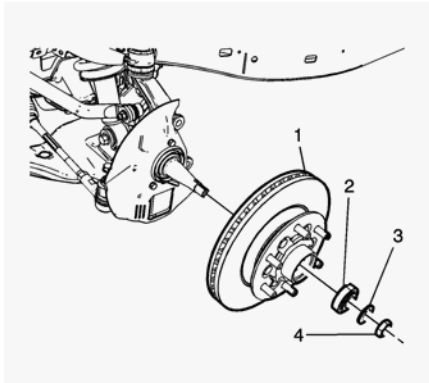
5. Using the GE 8092 handle (1) and the (2) CH 50799 installer, install the inner wheel bearing cup.
6. Install the inner bearing race in the brake rotor/wheel bearing hub.
7. Pack the inner wheel bearing race with the proper wheel bearing grease.



8. Position the wheel bearing seal (1) in the brake rotor/wheel bearing hub (2).



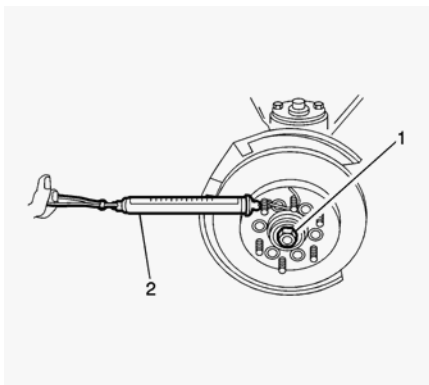
9. Using the GE 8092 handle (1) and the CH 50819 installer (2), install the wheel bearing seal.



10. Install the brake rotor/wheel bearing hub assembly (1), outer bearing race (2), washer (3) and the nut (4).

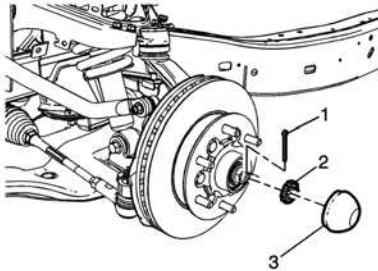
Caution: Refer to Fastener Caution.

11. Tighten the nut (1) to **29 Y (21 lb ft)**.
12. Rotate the brake rotor/wheel hub 2 or 3 turns and loosen the wheel nut (1) just enough to turn with fingers.
13. Tighten the wheel nut (1) by hand until there is no free play.



14. Using a spring scale (2), measure the bearing preload.

- The bearing and seal measurement should be **9.3-13.3 N (0.95-1.36/2.09-3.00 kgf/lb)**
 - If needed, adjust the wheel bearing by loosening or tightening the wheel bearing nut (1) until the proper specification is achieved.



- Install the lock nut (2), cotter pin (1) and the dust cap (3).
- Install the front brake caliper bracket. Refer to Front Brake Caliper Bracket Replacement.
- Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
- Remove the support and lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

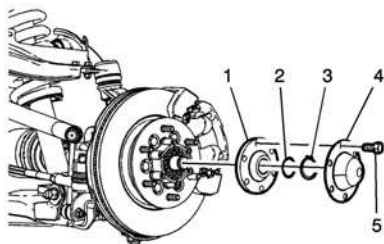
Special Tools

- CH-36827 Hub Socket
- CH-50786 Oil Seal Installer
- CH-50797 Inner Bearing cup Installer
- CH-50814 Outer Bearing Cup Installer
- GE-8092 Universal Drive Handle

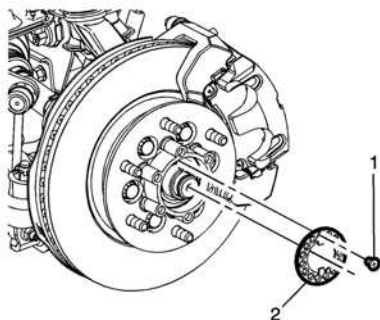
For regional equivalent tools, refer to Special Tools.

Removal Procedure

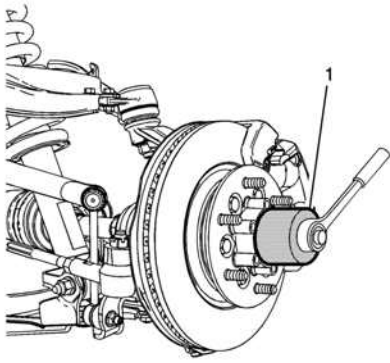
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.



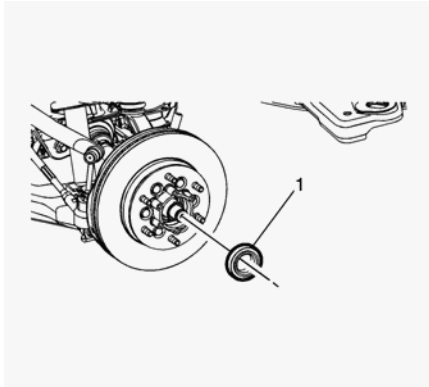
3. Remove the dust cover (4) and the dust cover bolts (5).
- Note:** DO NOT reuse the snap ring. Replace with NEW only.
4. Remove and discard the snap ring (3).
 5. Remove the shim (2) and the front wheel bearing adjust nut retainer (1).



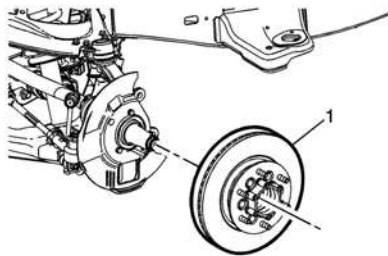
6. Remove the 3 screws (1) and the lock washer (2).



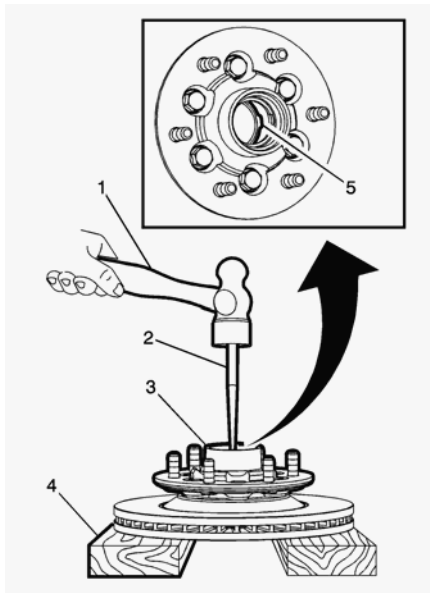
7. Using the *CH-36827* socket (1) and a ratchet wrench, remove the lock nut.
8. Remove the front brake caliper mounting bracket. Refer to Front Brake Caliper Bracket Replacement.



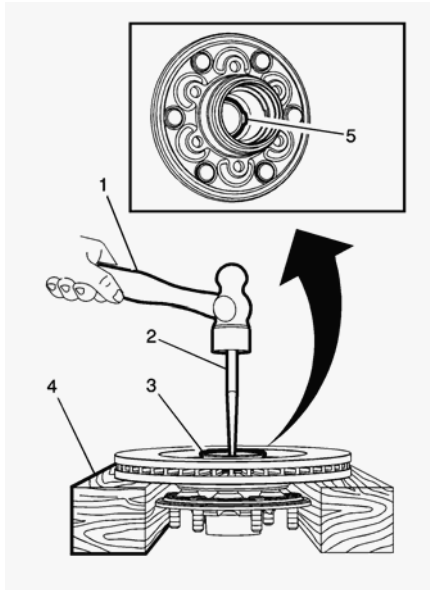
9. Remove the outer bearing race (1).



10. Remove the brake rotor/wheel bearing hub assembly (1).



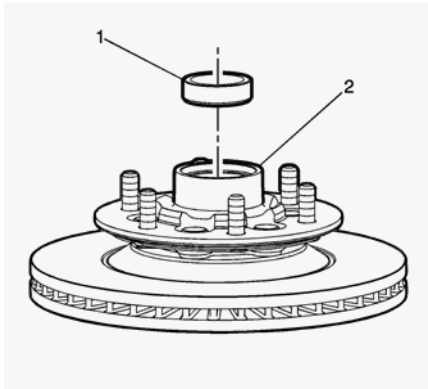
11. Position the brake rotor/wheel bearing hub assembly (3) on 2 blocks of wood (4).
12. Position a punch on the inner bearing cup (5).
13. Using a hammer (1) and punch (2), remove the inner bearing cup (5).



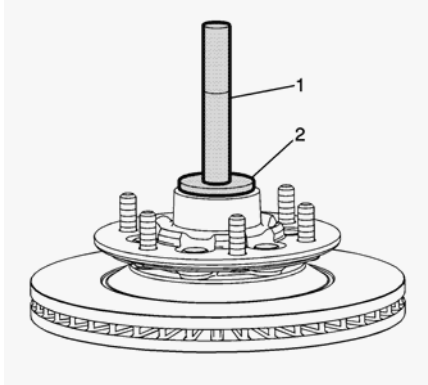
14. Position the brake rotor/wheel bearing hub assembly (3) on 2 blocks of wood (4).
15. Position a punch on the outer bearing cup (5).
16. Using a hammer (1) and punch (2), remove the outer bearing cup (5).
17. If replacing the wheel bearing hub, separate the brake rotor from the wheel bearing hub. Refer to Front Brake Rotor Replacement.

Installation Procedure

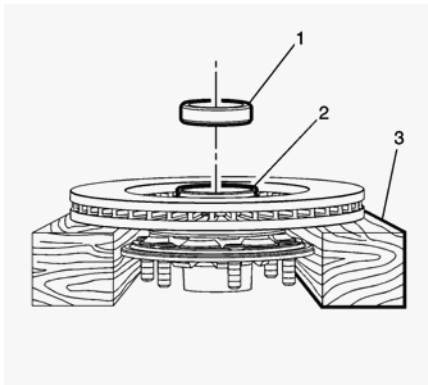
1. Install the wheel bearing hub to the brake rotor, if removed. Refer to Front Brake Rotor Replacement.



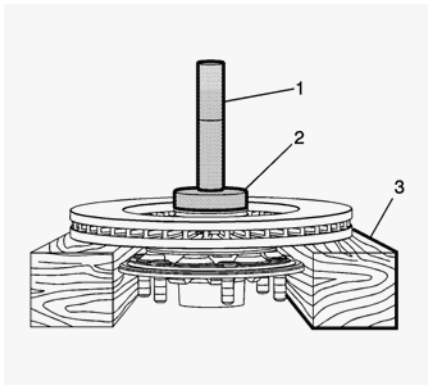
2. Position the outer wheel bearing cup (1) in the brake rotor/wheel bearing hub (2).



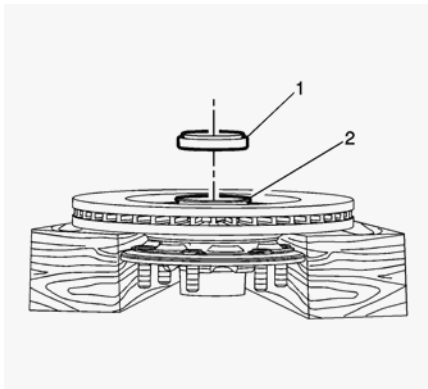
3. Using the *GE-8092* handle (1) and the *CH-50814* installer (2), install the outer bearing cup.



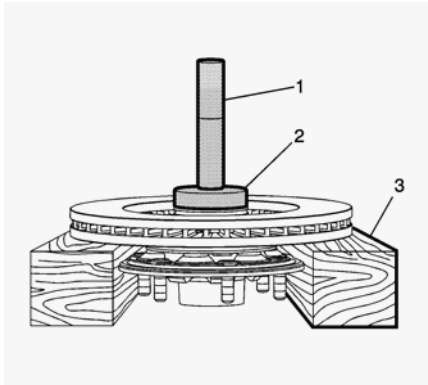
4. Position the inner wheel bearing cup (1) in the wheel bearing hub (2).



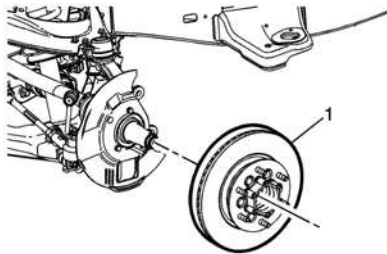
5. Using the *GE-8092* handle (1) and the *CH-50797* installer (2), install the inner wheel bearing cup.
6. Install the inner bearing race in the front brake rotor/wheel hub assembly.
7. Pack the inner wheel bearing race with the proper wheel bearing grease.



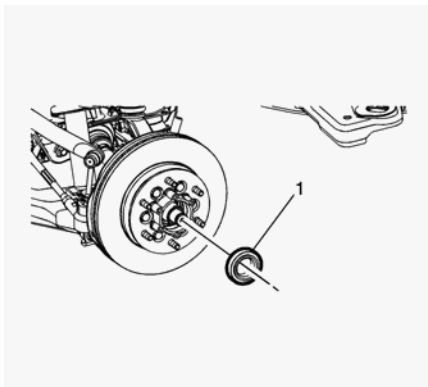
8. Position the wheel bearing seal (1) in the front brake rotor/wheel bearing hub (2).



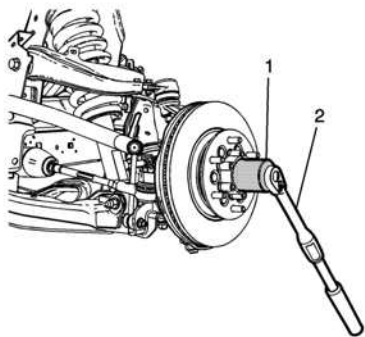
9. Using the *GE-8092* handle (1) and the *CH-50786* installer (2), install the wheel bearing seal.



10. Install the brake rotor/wheel bearing hub assembly (1) on the axle.
 11. Pack the wheel bearing with the proper wheel bearing grease.

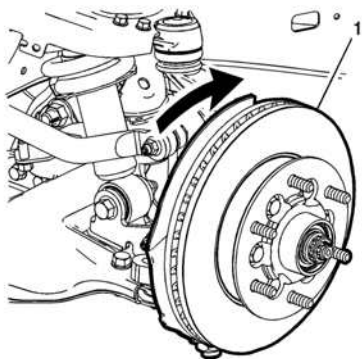


12. Install the outer wheel bearing race (1).

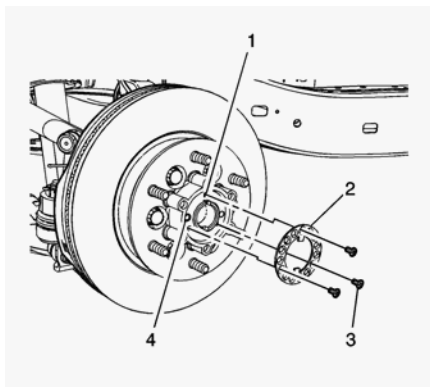


Caution: Refer to Fastener Caution.

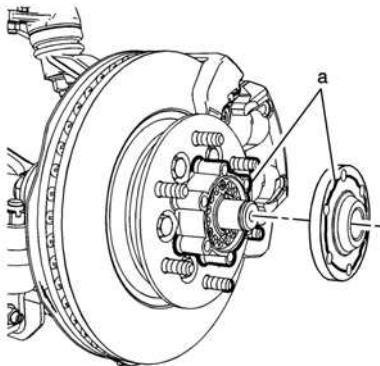
13. Using the *CH-36827* socket (1) and the torque wrench (2), tighten the nut to **30 Y (22 lb ft)** for new bearings and seals.



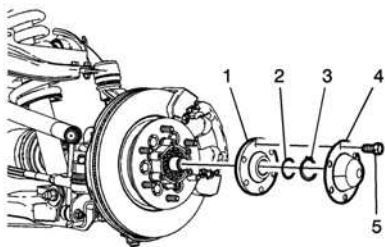
14. Freely turn the disc (1) 10 turns.
15. Loosen the nut half turn.
16. Repeat steps 13, 14 and 15 twice more for a total of three time.



17. Install lock plate (1) and the washer (2).
18. Align the 3 holes in the lock washer (2) with the matching holes in the lock plate (1).
19. If the 3 holes in the lock washer (2) and the lock plate (1) do not align, rotate the lock plate (1) just enough to align the holes.
20. Tighten the retaining screws (3) until the head of the screw is just below the lock washer (2).
21. Install the brake caliper mounting bracket. Refer to Front Brake Caliper Bracket Replacement.



22. Apply a small amount of sealant on the contact surfaces (a) of the wheel hub and the spacer.



23. Install the spacer (1), shim (2), the NEW snap ring (3).
24. Position the front wheel bearing the dust cover (4) on the wheel hub.
25. Install and tighten the bolts (5) to **6 Y (53 in lb)**.
26. Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
27. Remove the support and lower the vehicle.

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

1. Before performing any repair procedures, inspect the following components:

- Hub
 - Inner and Outer Wheel Hub Bearings
 - Wheel Bearing Oil seal
 - Knuckle Spindle (2 and 4 wheel drive vehicles)
 - Brake Disc, refer to Brake Rotor Surface and Wear Inspection
 - Brake Caliper, refer to Brake Caliper Inspection
 - ABS Speed Sensor Reluctor Wheel (if equipped), refer to Front Wheel Speed Sensor Reluctor Wheel Replacement
 - Cap, Hub Flange, Shim, and the Snap Ring (4 Wheel Drive Vehicles)
- If any of the above items are found to be damaged or show signs of excessive wear, replace those components.

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

The factory installed tires are designed to operate satisfactorily with loads up to and including the full rated load capacity when these tires are inflated to the recommended pressures.

The following factors have an important influence on tire life:

- Correct tire pressures
- Correct wheel alignment
- Proper driving techniques
- Tire rotation

The following factors increase tire wear:

- Heavy cornering
- Excessively rapid acceleration
- Heavy braking

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

The front suspension allows each wheel to compensate for changes in the road surface without affecting the opposite wheel. Each wheel independently connects to the frame with a steering knuckle, ball joint assemblies, and upper and lower control arms.

Two tie rods connect to the steering arms on the knuckles and to a steering gear.

The front suspension consists of the following components:

- Control arms
- Stabilizer shaft
- Shock/Coil spring modules

The upper part of each Shock/Coil spring module bolts to the frame. Three insulators, a mounting plate and a nut secure the coil spring to the shock housing. A through bolt and nut secures the lower part of the shock module to the lower control arm.

A spring steel stabilizer shaft controls the side roll of the front suspension. This shaft is mounted in rubber insulators that are held by clamps to the frame side rails. The ends of the stabilizer shaft connect to the lower control arms with link assemblies.

The upper ball joint assembly is bolted to the upper control arm. The assembly attaches to the steering knuckle with a prevailing torque nut.

The lower ball joint assembly is bolted to the lower control arm. The assembly attaches to the steering knuckle with a prevailing torque nut.

The upper control arms have pressed-in bushings. The bolts pass through the bushings and join the arms to the frame.

Ball joint assemblies have rubber grease seals. These seals prevent the entry of moisture and dirt. This prevents damage to the bearing surfaces.

Four-wheel drive models have a front suspension that consists of the following components:

- Control arms
- Stabilizer shaft
- Shock module/Shock absorbers

The upper part of each shock module attaches to the frame by 3 nuts. The lower part of the shock module attaches to the lower control arm by a through bolt and nut.

A spring steel stabilizer shaft controls the side roll of the front suspension. This shaft is mounted in rubber insulators that are held by clamps to the frame side rails. The ends of the stabilizer shaft connect to the lower control arms with link assemblies.

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

These vehicles use a leaf spring and a solid rear axle suspension system.

The rear axle assembly is attached to multi-leaf springs with U-bolts. The front ends of the springs are attached to the frame at the front hangers with bolts and are isolated utilizing rubber bushings. The rear ends of the springs are attached to the frame with bolts at the shackles. The shackles also utilize rubber bushings for isolation. Shackles allow the springs to change position while the vehicle is in motion.

Two direct double-acting shock absorbers provide ride control. The shock absorbers are angle-mounted between the frame. The shock absorbers are attached to the anchor plate.

2013 Chevrolet Colorado

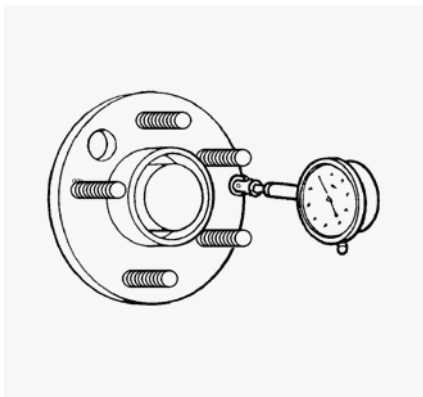
Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

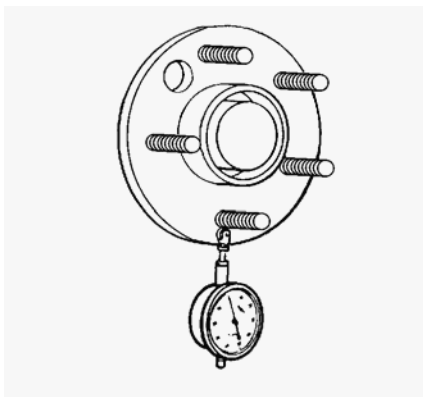
Special Tools

GE-8001 Dial Indicator Set , or equivalent

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 from the vehicle. Refer to Tire and Wheel Removal and Installation.
4. Remove the brake rotors and/or brake drums from the vehicle. Clean the mounting surfaces of the brake rotors, the brake drums, if equipped hub/axle flanges of any loose debris, rust, and corrosion.



5. Position the GE-8001 Dial Indicator Set , or equivalent, on the machined surface of the wheel hub/axle flange outside of the wheel studs.
6. Rotate the hub one complete revolution in order to find the low spot.
7. Set the GE-8001 Dial Indicator Set , or equivalent, to zero at the low spot.
8. Rotate the hub one more complete revolution and measure the total amount of wheel hub/axle flange runout.
Specification – Guideline
Wheel hub/axle flange runout tolerance guideline: 0.132 mm (0.005 in)
9. If the runout of the wheel hub/axle flange IS within specification and the vehicle is equipped with wheel studs, proceed to step 13.
10. If the runout of the wheel hub/axle flange IS within specification and the vehicle is equipped with wheel bolts, proceed to step 19.
11. If the runout of the wheel hub/axle flange is marginal, the wheel hub may or may not be the source of the disturbance.
12. If the runout of the wheel hub/axle flange is excessive, replace the wheel hub/axle flange. Measure the runout of the new wheel hub/axle flange.



13. Position the GE-8001 Dial Indicator Set , or equivalent, in order to contact the wheel mounting studs.
Measure the stud runout as close to the flange as possible.
14. Turn the hub one complete revolution to register on each of the wheel studs.
15. Zero the GE-8001 Dial Indicator Set , or equivalent, on the lowest stud.
16. Rotate the hub one more complete revolution and measure the total amount of wheel stud – stud circle – runout.
Specification – Guideline
Wheel stud runout tolerance guideline: 0.254 mm (0.010 in)
17. If the runout of the wheel studs – stud circle – is marginal, the wheel studs may or may not be contributing to the disturbance.
18. If the runout of the wheel studs – stud circle – is excessive, replace the wheel studs as necessary. Measure the runout of the new wheel studs.
19. Inspect the threads and the tapered seat portion on each of the wheel bolts for damage.
20. Wheel bolts exhibiting damaged threads and/or damaged tapered seats require replacement.
21. Place the threaded portion of each wheel bolt along a straight edge to inspect for straightness.

22. Wheel bolts that are not straight require replacement.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

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.

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

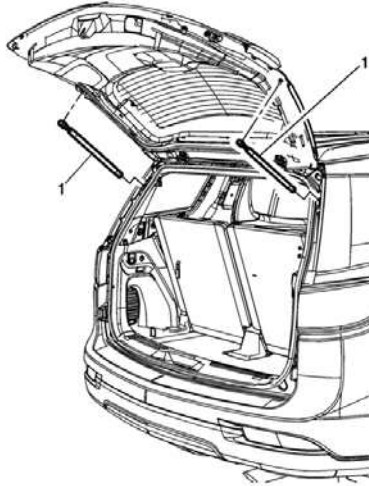
Lead/pull is usually caused by the following factors:

- 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.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Liftgate Strut Replacement

Callout

Component Name

Liftgate Strut

Warning: When a lift gate hold open device is being removed or installed, provide alternate support to avoid the possibility of damage to the vehicle or personal injury.

Caution: Apply pressure only at the end of the liftgate/hood assist rod that you are removing or attaching. Do NOT apply pressure to the middle of the rod because damage or bending will result.

1

Procedure

1. Release the locking tabs on the strut.
2. Ensure the clip is fully seated when the strut is reinstalled. If the clip cannot be fully seated, a new strut should be installed.
3. Ensure the strut shaft is pointing toward the roof structure.

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

Special Tools

CH 8001 Dial Indicator

For equivalent regional tools, refer to Special Tools.



Note:

- 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 support the vehicle. Refer to Lifting and Jacking the Vehicle.
 2. Clean and inspect the ball joint seals for cuts or tears. If the ball joint seals are damaged, replace the ball joint or the lower control as applicable.
 3. Support the lower control arm with a floor stand as far outboard as possible and raise the suspension to just below ride height.
 4. Install the *CH 8001* dial indicator, in a way to measure the vertical lash in the ball joint.

Caution: Do not pry in such a way that the ball joint seal is contacted. Damage to the seal may result.

5. Lift the knuckle towards the lower control arm and record the dial indicator measurement.
6. If the dial indicator reading is more than **0.50 mm (0.020 in)**, replace the lower ball joint or the lower control arm as applicable for this vehicle.

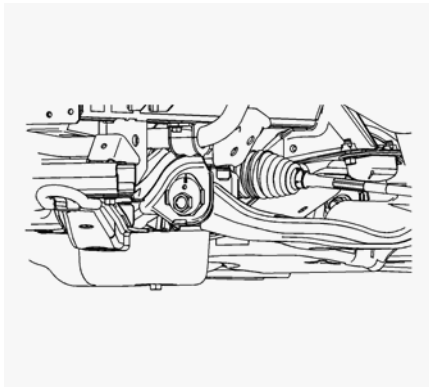
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

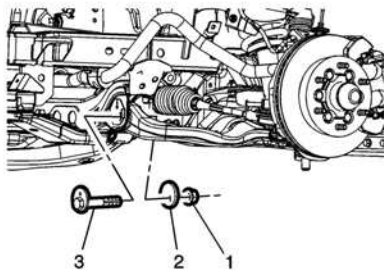
Fuel Delivery: | Fuel:

Removal Procedure

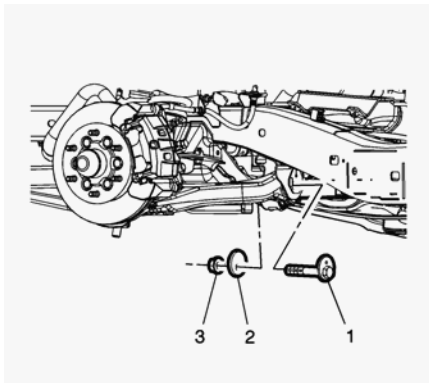
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.



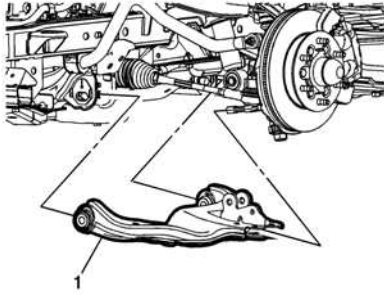
3. Mark both the front and rear alignment cam to the frame.
4. Remove the outer tie rod end from the knuckle. Refer to Steering Linkage Outer Tie Rod Replacement.
5. Remove the lower stabilizer shaft link nut. Refer to Stabilizer Shaft Link Replacement.
6. Remove the lower shock absorber nut and bolt. Refer to Shock Absorber and Spring Removal and Installation.



7. Remove the front cam adjuster nut (1), front cam adjuster (2) and the adjuster bolt (3).



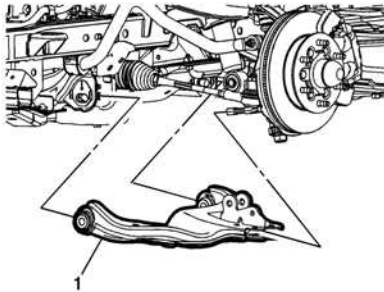
8. Remove the rear cam adjuster nut (3), rear cam adjuster (2) and the adjuster bolt (1).
9. Remove the lower control arm from the lower ball joint. Refer to Front Lower Control Arm Ball Stud Replacement.



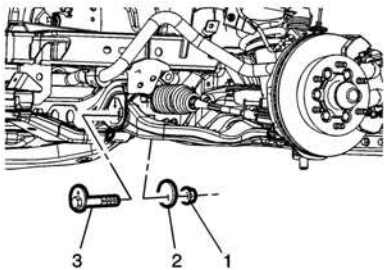
10. Remove the lower control arm (1).

Installation Procedure

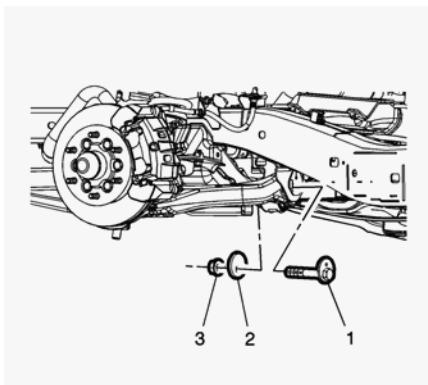
1. Install the lower control arm to the lower ball joint. Refer to Front Lower Control Arm Ball Stud Replacement.



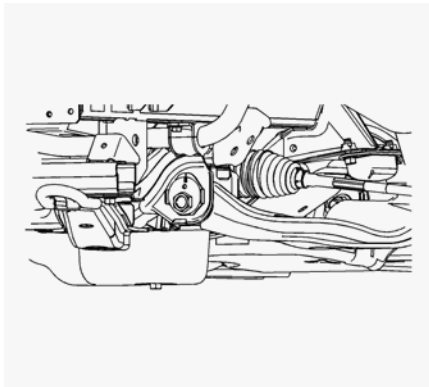
2. Position the lower control arm (1) in the frame.



3. Install the front adjuster bolt (3), front adjuster cam (2) and the adjuster bolt (1).



4. Install the rear adjuster bolt (1), adjuster cam (2) and the adjuster nut (1).

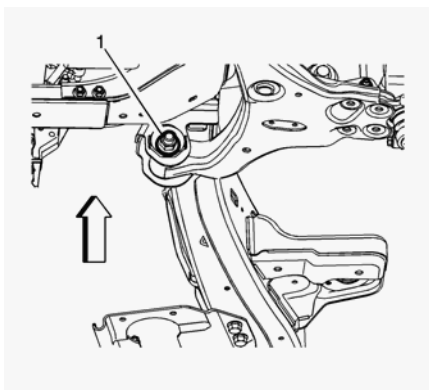


5. Align the reference marks.



Caution: Refer to Fastener Caution.

6. With the reference marks aligned, tighten the front adjuster nut (1) to **186 Y (137 lb ft)**.

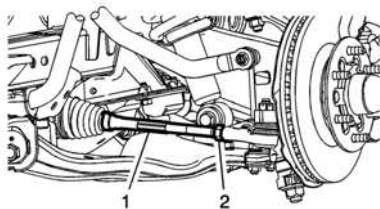


7. With the reference marks aligned, tighten the rear adjuster nut (1) to **186 Y (137 lb ft)**.
8. Install the lower shock absorber nut and bolt. Refer to Shock Absorber and Spring Removal and Installation.
9. Install the lower stabilizer shaft link nut. Refer to Stabilizer Shaft Link Replacement.
10. Install the outer tie rod end to the knuckle. Refer to Steering Linkage Outer Tie Rod Replacement.
11. Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
12. Remove the support and lower the vessel.
13. Verify the front end alignment. Refer to Wheel Alignment Measurement.

2013 Chevrolet Colorado

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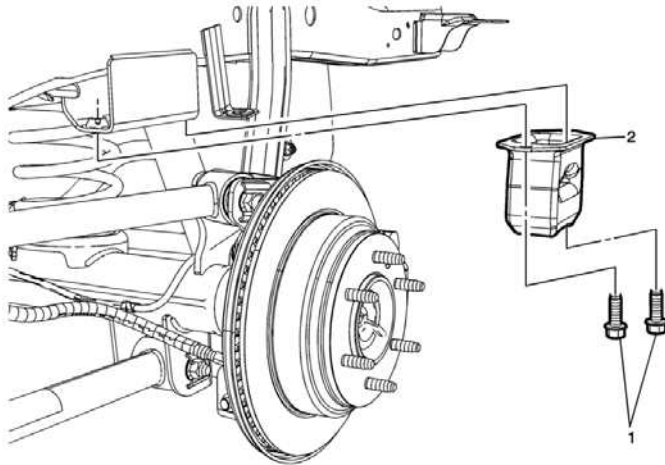
1. Loosen the tie rod nut (2).
2. Rotate the tie rod (1) the required toe specification setting. Refer to Wheel Alignment Measurement.

Caution: Refer to Fastener Caution.

3. Tighten the jam nut on the tie rod to **70 Y (52 lb ft)**.
4. Check the toe setting after tightening.
5. Re-adjust the toe setting if necessary.

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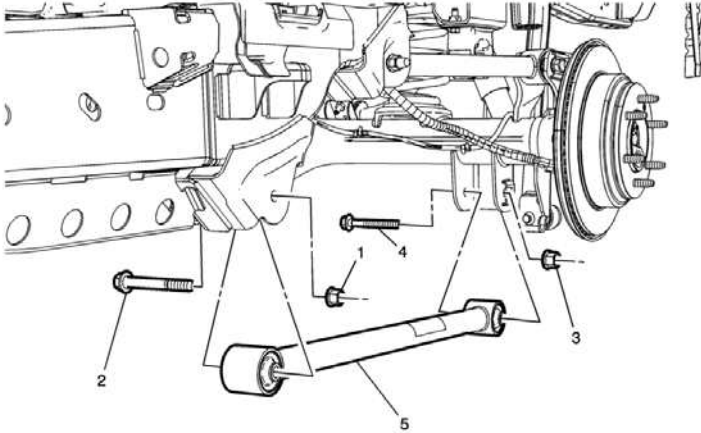


Rear Axle Bumper Replacement

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.	
Rear Axle Bumper Bolt (Qty:2)	
Caution: Refer to Fastener Caution.	
1	Tighten
56 Y (41 lb ft)	
2	Rear Axle Bumper

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Rear Axle Tie Rod Replacement - Lower

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.	
Lower Tie Rod End Nut	
1	Caution: Refer to Fastener Caution. Tighten 137 Y (101 lb ft)
Lower Tie Rod End Bolt	
2	
Lower Tie Rod End Nut	
3	Tighten 137 Y (101 lb ft)
Lower Tie Rod End Bolt	
4	
Lower Tie Rod End	
5	Procedure Support the rear axle with a suitable jack stand.

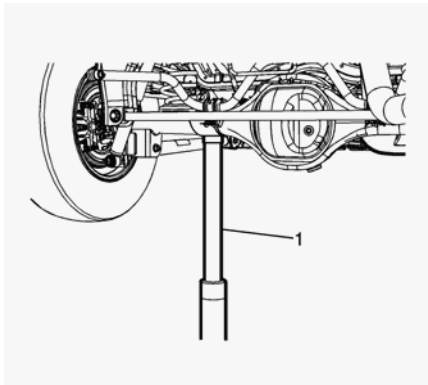
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

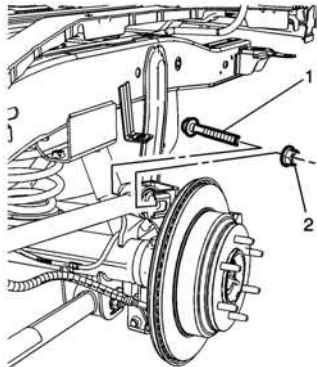
Fuel Delivery: | Fuel:

Removal Procedure

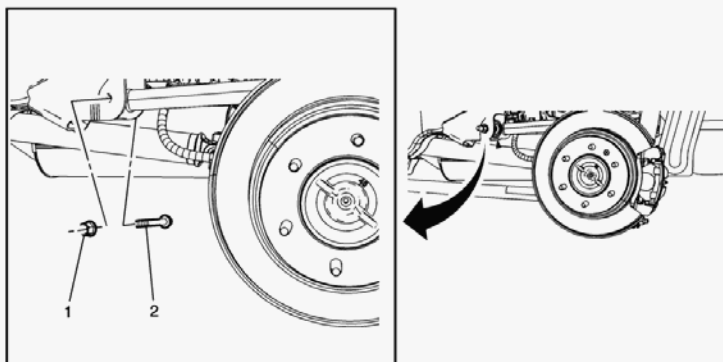
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.



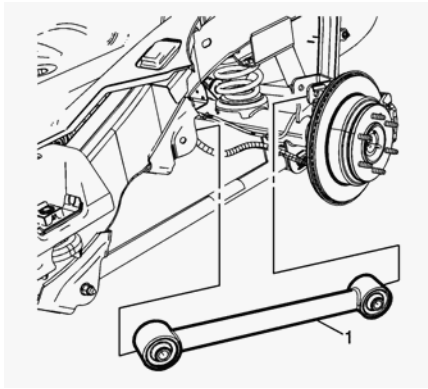
3. Support the rear axle with a suitable jack stand (1).



4. Remove the upper tie rod bolt (1) and nut (2).

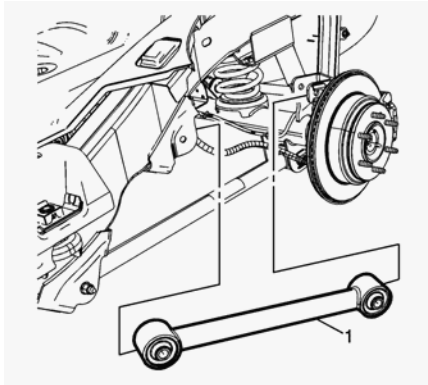


5. Remove the upper tie rod nut (1) and bolt (2).

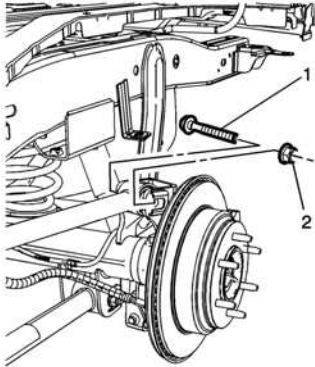


6. Remove the upper tie rod from the rear axle (1).

[Installation Procedure](#)

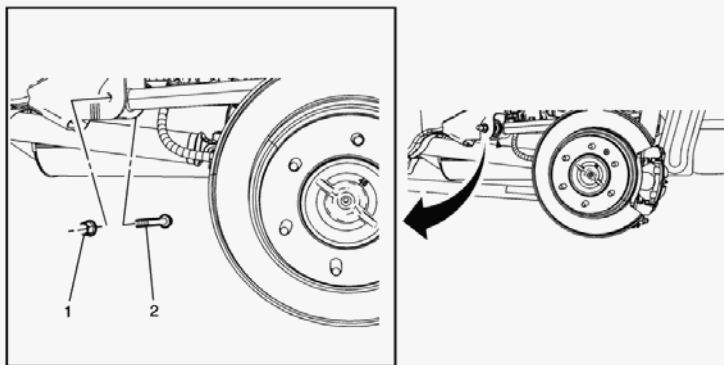


1. Position the upper tie rod (1) in the vehicle.

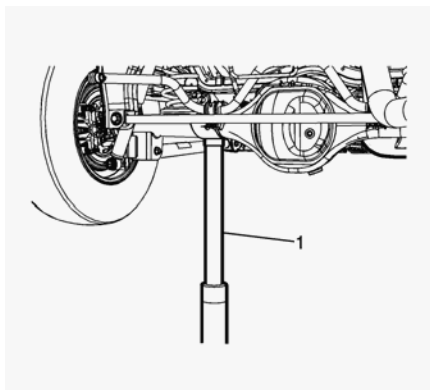


Caution: Refer to Fastener Caution.

2. Install the upper tie rod rear bolt (1) and nut (2) and tighten to **137 Y (101 lb ft)**.



3. Install the tie rod bolt (2) and nut (1) and tighten to **137 Y (101 lb ft)**.
4. Install the tire and wheel. Refer to Tire and Wheel Removal and Installation.

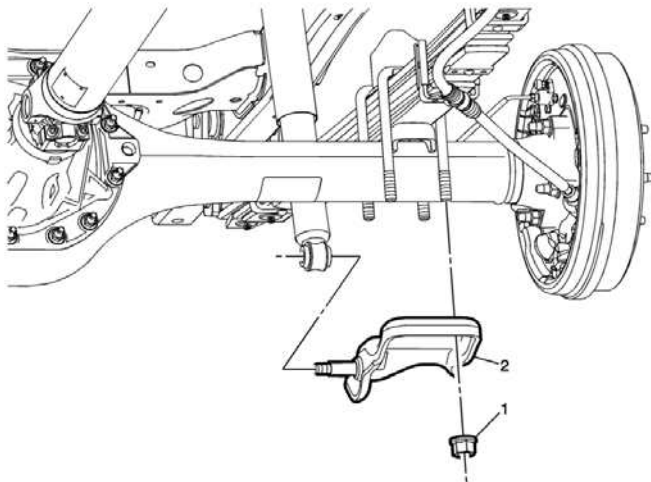


5. Remove the suitable jack stand (1) from the rear axle.
6. Remove the supports and lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Rear Spring Anchor Plate Replacement

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Rear Spring Anchor Plate Nut (Qty: 4)

Caution: Refer to Fastener Caution.

Procedure

1

1. Using a hydraulic jack stand, support the rear axle.
2. Remove the lower shock absorber nut. Refer to Shock Absorber Replacement.

Tighten

78 Y (56 lb ft)

Rear Spring Anchor Plate

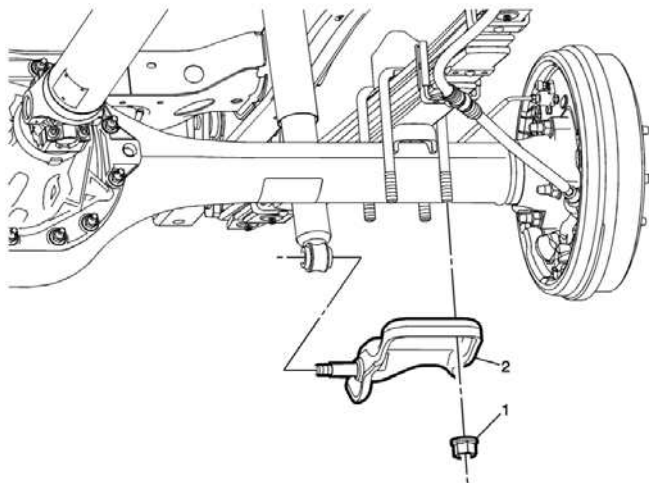
2

Procedure

Replace the u-bolts or the bumper if either are found to be damaged or excessively worn.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Rear Spring Anchor Plate Replacement

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Rear Spring Anchor Plate Nut (Qty: 4)

Caution: Refer to Fastener Caution.

Procedure

1

1. Using a hydraulic jack stand, support the rear axle.
2. Remove the lower shock absorber nut. Refer to Shock Absorber Replacement.

Tighten

120 Y (89 lb ft)

Rear Spring Anchor Plate

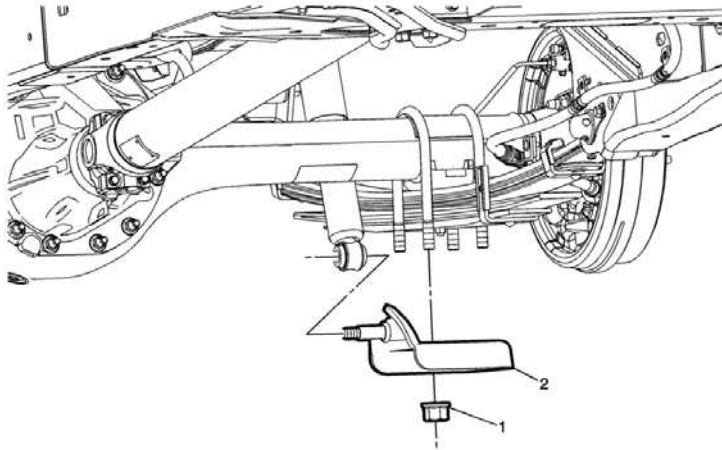
2

Procedure

Replace the u-bolts or the bumper if either are found to be damaged or excessively worn.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Rear Spring Anchor Plate Replacement

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Rear Spring Anchor Plate Nut (Qty: 4)

Caution: Refer to Fastener Caution.

Procedure

- 1
 1. Using a hydraulic jack stand, support the rear axle.
 2. Remove the lower shock absorber nut. Refer to Shock Absorber Replacement.

Tighten

78 Y (56 lb ft)

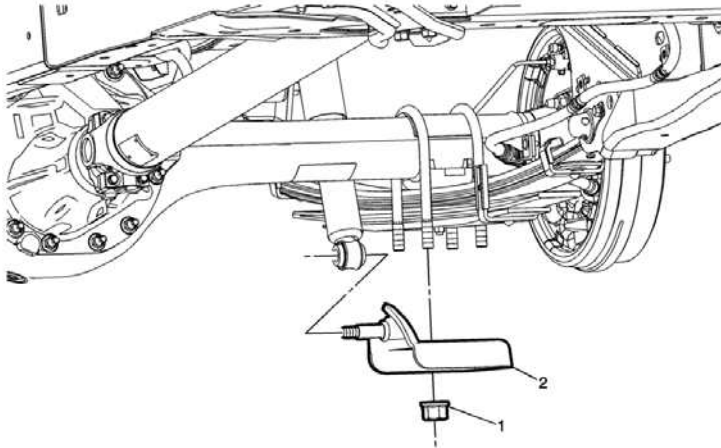
Rear Spring Anchor Plate

- 2
 - Procedure**

Replace the u-bolts if found to be damaged or excessively worn.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Rear Spring Anchor Plate Replacement

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Rear Spring Anchor Plate Nut (Qty: 4)

Caution: Refer to Fastener Caution.

Procedure

1

1. Using a hydraulic jack stand, support the rear axle.
2. Remove the lower shock absorber nut. Refer to Shock Absorber Replacement.

Tighten

120 Y (89 lb ft)

Rear Spring Anchor Plate

2

Procedure

Replace the u-bolts if found to be damaged or excessively worn.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

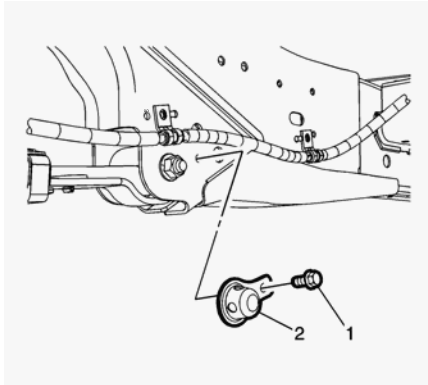
Fuel Delivery: | Fuel:

Removal Procedure

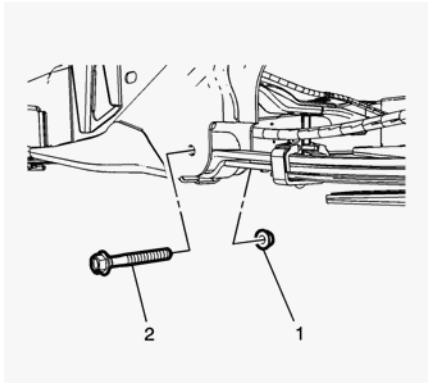
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tires and wheels. Refer to Tire and Wheel Removal and Installation.

Note: DO NOT remove the park brake cables from the vehicle for this procedure. Remove the park brake cables from the mounting bracket.

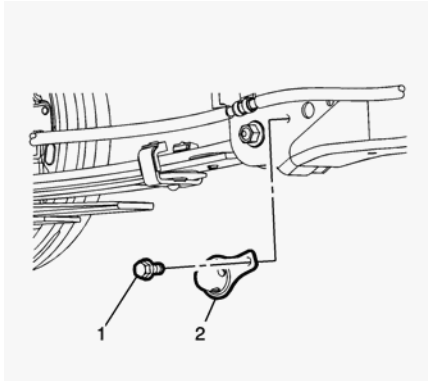
3. Remove the rear park brake cable retaining fastener from the brackets on the rear spring. If servicing the left rear spring, refer to Parking Brake Cable Replacement - Left Side. If servicing the right rear spring, refer to Parking Brake Rear Cable Replacement - Right Side.



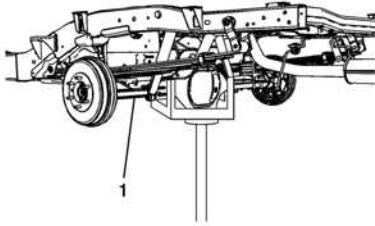
4. Remove the rear spring front protector bolt (1) and the cover (2).



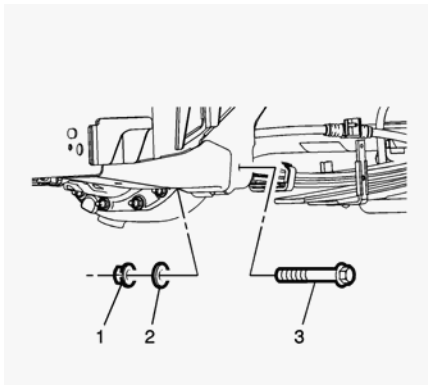
5. Remove the rear spring front bolt (2) and the nut (1).



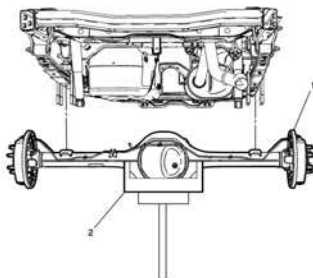
6. Remove the rear spring protector bolt (1) and rear spring protector (2).



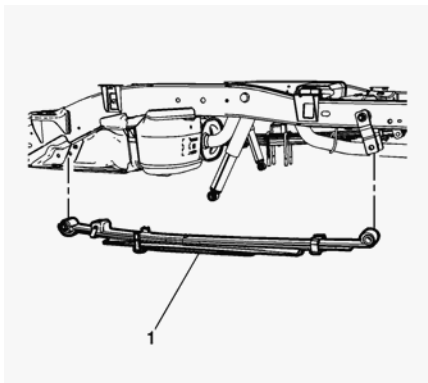
7. Support the rear axle (1) with a hydraulic jack stand.
8. Remove the rear spring anchor plate. Refer to Rear Spring Anchor Plate Replacement.
9. Remove the rear shackle from the rear spring. Refer to Rear Spring Shackle Replacement.



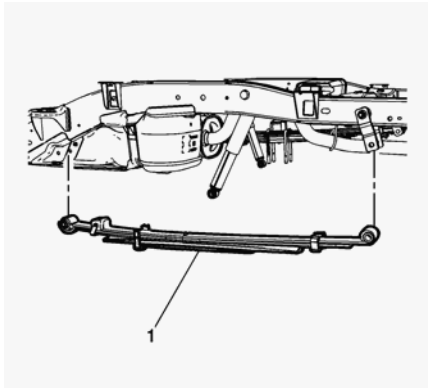
10. Remove the rear spring nut (1), washer (2) and the bolt (3).



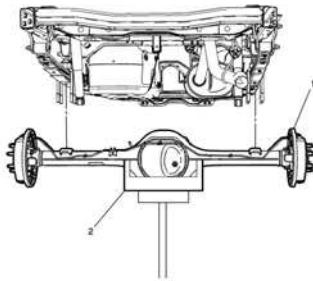
11. Using the a hydraulic jack stand (2), lower the rear axle (1).



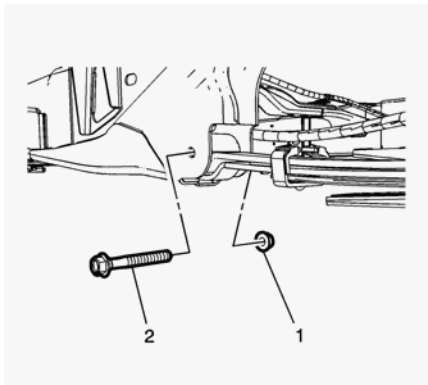
12. With the aid of an assistant, remove the rear spring assembly (1) from the vehicle.



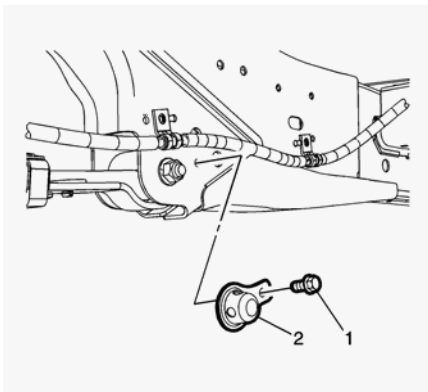
1. With the aid of an assistant, position the rear spring assembly (1) in the vehicle.



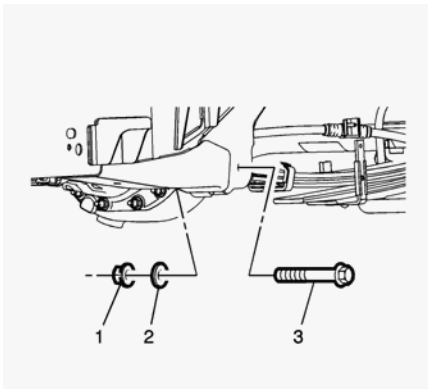
2. Using the hydraulic jack stand (2), raise the rear axle (1) into position.



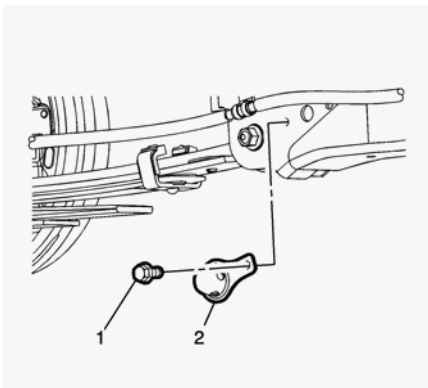
3. Install the rear spring front bolt (2).
- Caution:** Refer to Fastener Caution.
4. Install the rear spring front nut (1) and tighten to:
 - First Pass: **115 Y (85 lb ft).**
 - Final Pass: plus **90 degrees.**
 - Remove the hydraulic jack stand from the rear axle.



- Install the rear spring front protector bolt (1), and the cover (2).
- Tighten the bolt to (1) **20 Y (15 lb ft)**.



- Install the rear spring bolt (3), washer (2) and the nut (1). Then tighten the nut to **152 Y (112 lb ft)**
- Install the rear shackle on the rear spring. Refer to Rear Spring Shackle Replacement.



- Install the rear spring protector (2) and rear spring protector bolt (1). The tighten the bolt to **20 Y (15 lb ft)**.
- Tighten the bolt to (1) **20 Y (15 lb ft)**.
- Install the rear spring anchor plate. Refer to Rear Spring Anchor Plate Replacement.
- Install the rear park brake cable to the rear spring. If servicing the left rear spring, refer to Parking Brake Rear Cable Replacement - Left the right rear spring, refer to Parking Brake Rear Cable Replacement - Right Side
- Install the tires and wheels. Refer to Tire and Wheel Removal and Installation.
- Remove the supports and lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

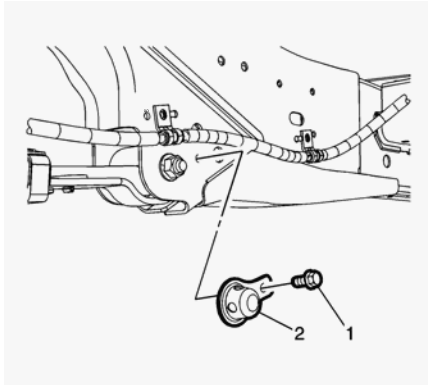
Fuel Delivery: | Fuel:

Removal Procedure

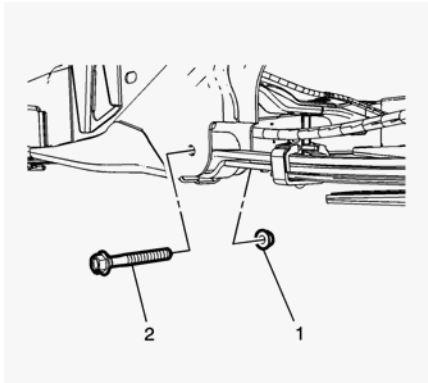
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tires and wheels. Refer to Tire and Wheel Removal and Installation.

Note: DO NOT remove the park brake cables from the vehicle for this procedure. Remove the park brake cables from the mounting bracket.

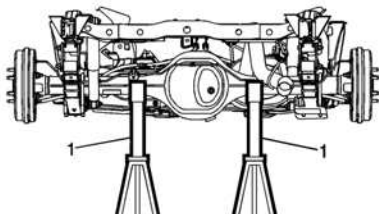
3. Remove the rear park brake cable retaining fastener from the brackets on the rear spring. If servicing the left rear spring, refer to Parking Brake Cable Replacement - Left Side. If servicing the right rear spring, refer to Parking Brake Rear Cable Replacement - Right Side.



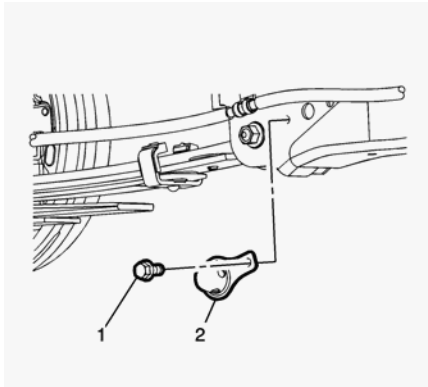
4. Remove the rear spring front protector bolt (1) and the cover (2).



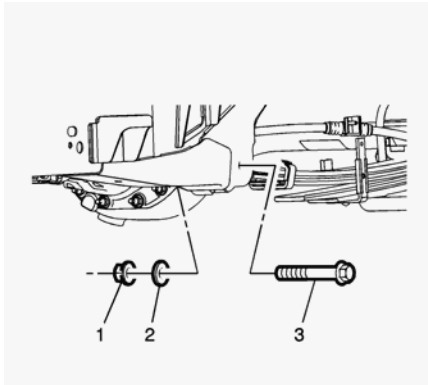
5. Remove the rear spring front bolt (2) and the nut (1).



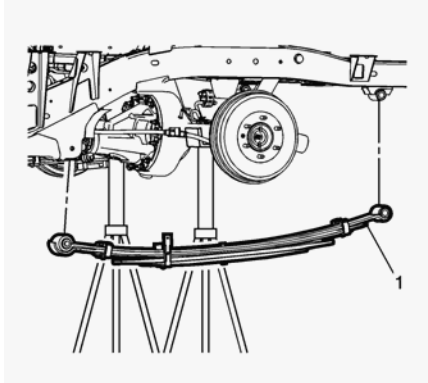
6. Using the proper jack stands (1), support the rear axle assembly.



7. Remove the rear spring protector bolt (1) and rear spring protector (2).
8. Remove the rear spring anchor plate. Refer to Rear Spring Anchor Plate Replacement.
9. Remove the rear shackle from the rear spring. Refer to Rear Spring Shackle Replacement.

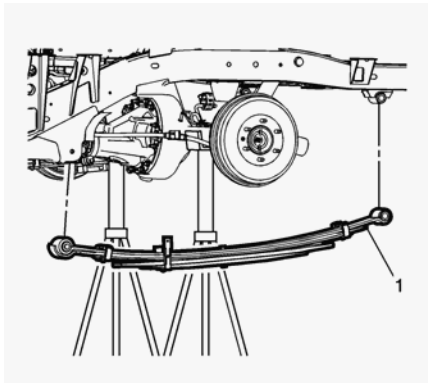


10. Remove the rear spring nut (1), washer (2) and the bolt (3).

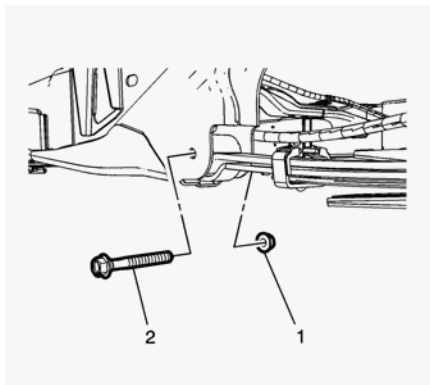


11. With the aid of an assistant, remove the rear spring assembly (1) from the vehicle.

[Installation Procedure](#)



1. With the aid of an assistant, position the rear spring assembly (1) in the vehicle.

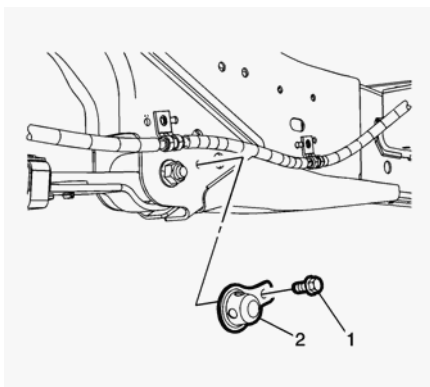


2. Install the rear spring front bolt (2).

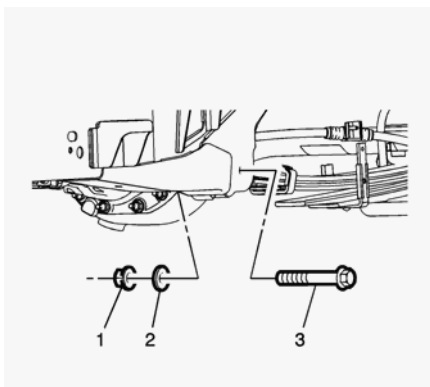
Caution: Refer to Fastener Caution.

3. Install the rear spring front nut (1) and tighten to:

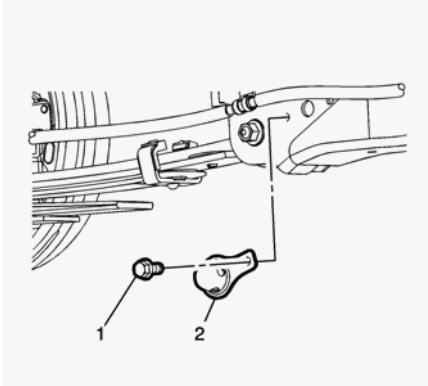
- First Pass: **115 Y (85 lb ft)**.
- Final Pass: plus **90 degrees**.



- Install the rear spring front protector bolt (1). and the cover (2).
- Tighten the bolt to (1) **20 Y (15 lb ft)**.



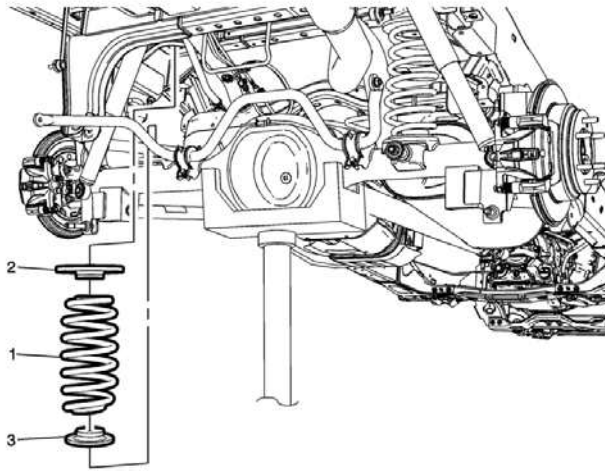
- Install the rear spring bolt (3), washer (2) and the nut (1) . Then tighten the nut to **152 Y (112 lb ft)**
- Install the rear shackle from the rear spring. Refer to Rear Spring Shackle Replacement.



- Install the rear spring protector (2) and rear spring protector bolt (1). Tighten the bolt to **20 Y (15 lb ft)**.
- Tighten the bolt to (1) **20 Y (15 lb ft)**.
- Install the rear spring anchor plate. Refer to Rear Spring Anchor Plate Replacement.
- Install the rear park brake cable to the rear spring. If servicing the left rear spring, refer to Parking Brake Rear Cable Replacement - Left the right rear spring, refer to Parking Brake Rear Cable Replacement - Right Side
- Install the tires and wheels. Refer to Tire and Wheel Removal and Installation.
- Remove the jack stands
- Remove the supports and lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Rear Spring Replacement

Callout Preliminary Procedure

1. Raise and support the vehicles. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
3. Support the rear axle with a hydraulic transmission jack.

Rear Spring Procedure

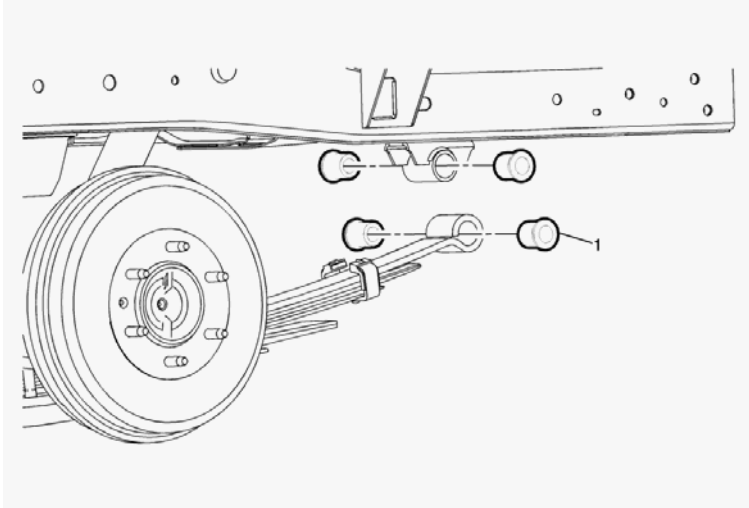
1. Remove the stabilizer links from the stabilizer shaft. Refer to Stabilizer Shaft Link Replacement.
2. Remove the speed sensor electrical harness from the rear axle housing, if needed. Refer to Rear Wheel Speed Sensor Replacement.
3. Remove the shock absorber from the rear axle housing. Refer to Shock Absorber Replacement.
4. Remove the rear spring travel limiting link. Refer to Rear Spring Travel Limiting Link Replacement.
5. Lower the rear axle enough to remove the rear spring.

2 Rear Spring Upper Insulator

3 Rear Spring Lower Insulator

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Rear Spring Shackle Bushing 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.

Rear Spring Shackle Bushing (Qty: 4)

Procedure

1

1. Remove the rear spring shackle. Refer to Rear Spring Shackle Replacement.
2. Support the rear axle.
3. Using the *CH 50815* remover, remove the rear spring shackle bushings.
4. Apply a small amount of rubber grease to the inside of the bushings.
5. Using the *CH 50815* installer, install the rear spring shackle bushings.

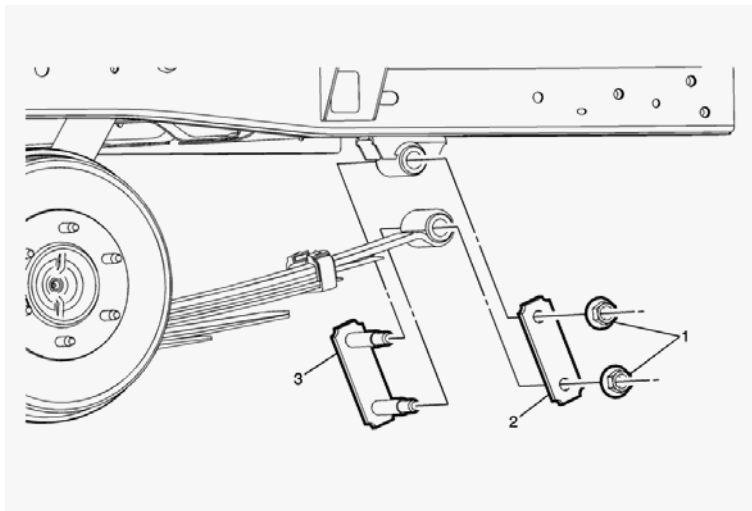
Special Tools

CH 50815 Remover/Installer

For regional equivalent tools, refer to Special Tools.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Rear Spring Shackle Replacement

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Rear Spring Shackle Nut (Qty: 2)

Caution: Refer to Fastener Caution.

Procedure

- 1 Using the proper jack stand, support the rear axle.

Tighten

98 Y (72 lb ft)

- 2 Rear Spring Shackle Plate

Rear Shackle Pin

- 3 **Procedure**

Apply a small amount of rubber grease to the inside of the bushings.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

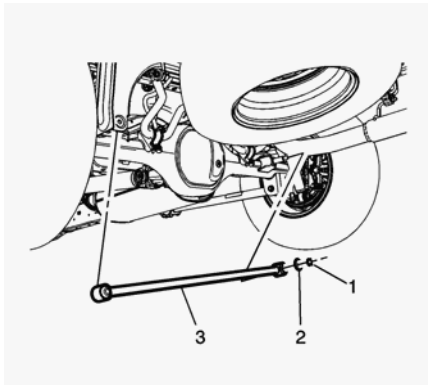
Fuel Delivery: | Fuel:

Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

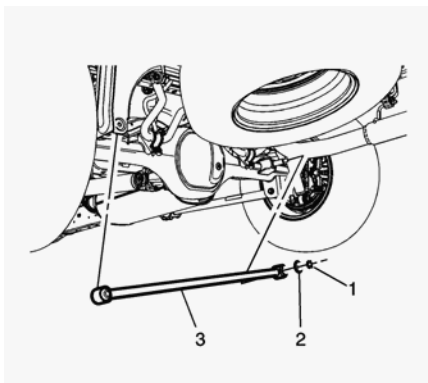


2. Remove the bolt (1) and nut (2).



3. Remove the nut (1) and washer (2).
4. Remove the rear spring travel limiting link (3).

Installation Procedure



1. Position the rear spring travel limiting link (3) in the vehicle.
2. Loosely install the bolt and nut to the left side of the rear spring travel limiting link.
3. Install the washer (2) and nut (1) to the right side of the rear spring travel limiting link .

Caution: Refer to Fastener Caution.

4. Tighten the nut (1) to 137 Y (101 lb ft).



5. Tighten the bolt (1) to 137 Y (101 lb ft).
6. Remove the supports and lower the vehicle.

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

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.

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**
Fuel Delivery: | **Fuel:**

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.

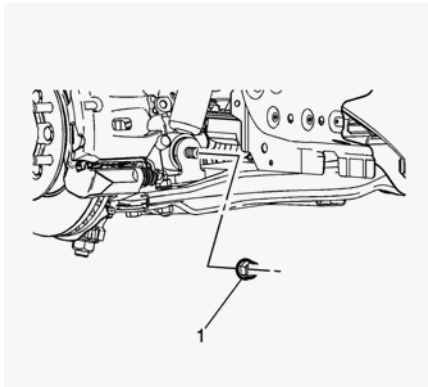
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

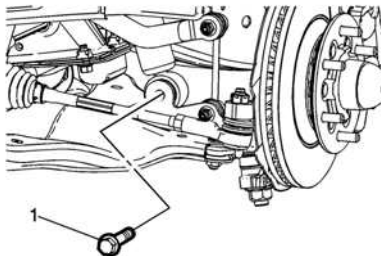
Fuel Delivery: | Fuel:

Removal Procedure

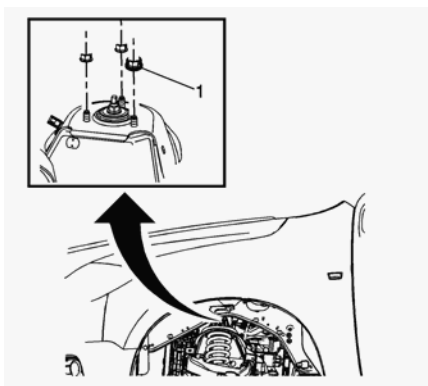
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.



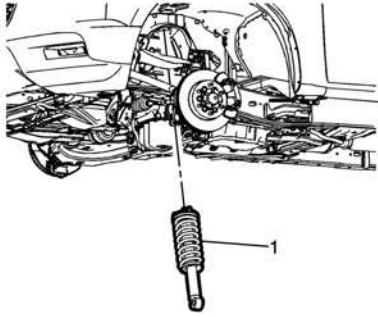
3. Remove the lower shock absorber nut (1).



4. Remove the lower shock absorber bolt (1).
5. Remove the lower control arm. Refer to Lower Control Arm Replacement.

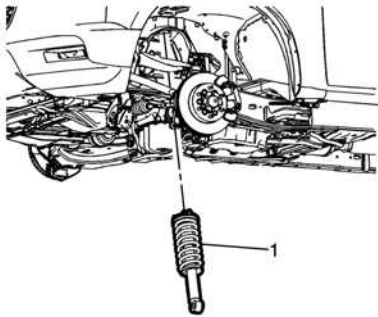


6. Remove the front shock absorber mounting nuts (1).

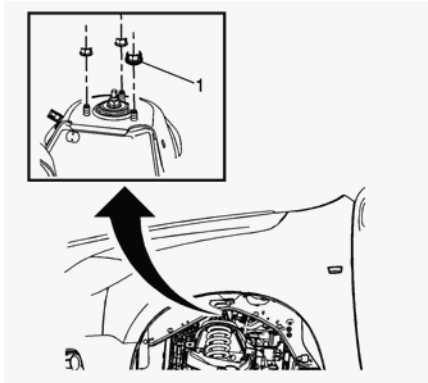


7. Remove the front shock absorber assembly (1) from the shock suspension bracket.

Installation Procedure

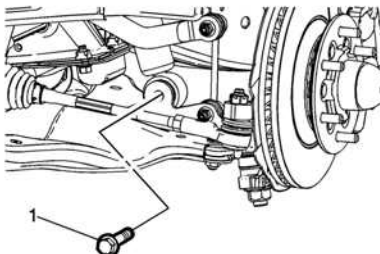


1. Position the front shock absorber (1) in the shock suspension bracket.

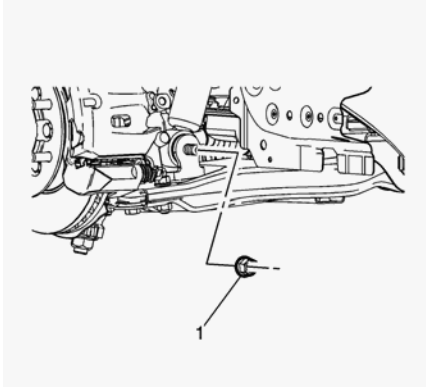


Caution: Refer to Fastener Caution.

2. Install and tighten the front shock absorber mounting nuts (1) to **55 Y (41 lb ft)**.
3. Install the lower control arm assembly. Refer to Lower Control Arm Replacement.



4. Install the lower shock absorber bolt (1).



5. Install the lower shock absorber nut (1) and tighten the nut to **137 Y (101 lb ft)**.
6. Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
7. Remove the support and lower the vehicle.

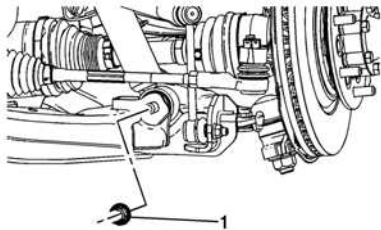
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

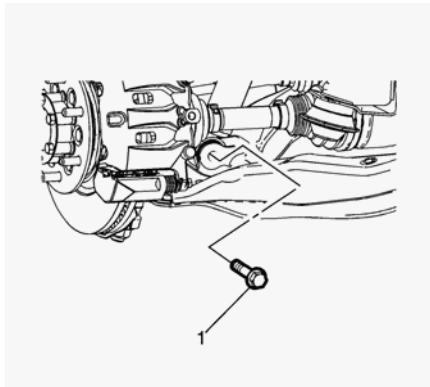
Fuel Delivery: | Fuel:

Removal Procedure

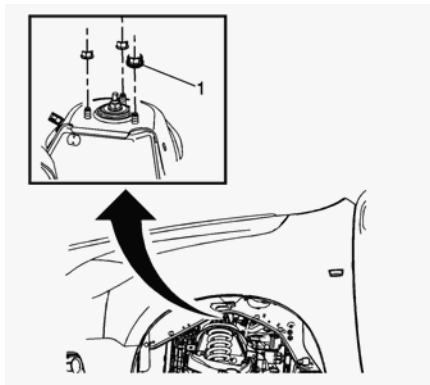
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.



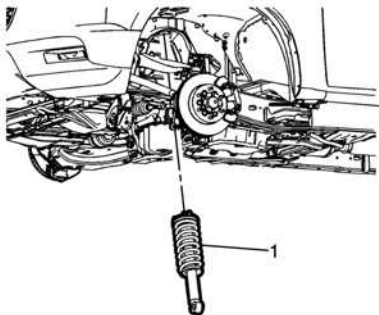
3. Remove the lower shock absorber nut (1).



4. Remove the lower shock absorber bolt (1).
5. Remove the lower control arm. Refer to Lower Control Arm Replacement.

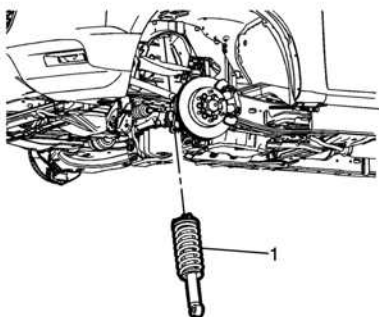


6. Remove the front shock absorber mounting nuts (1).

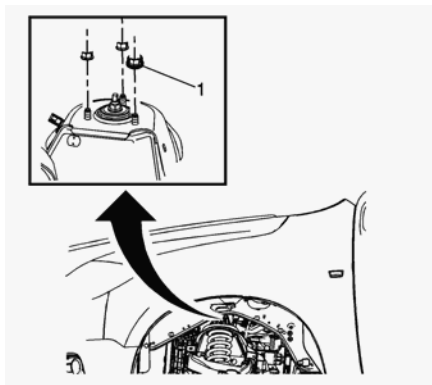


7. Remove the front shock absorber assembly (1) from the shock suspension bracket.

Installation Procedure

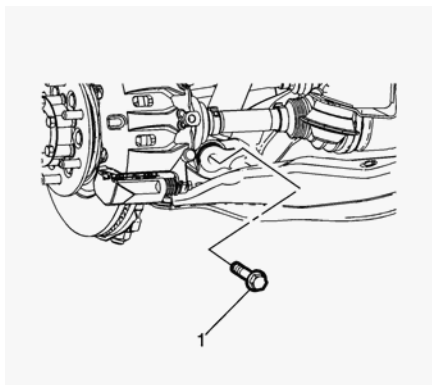


1. Position the front shock absorber (1) in the shock suspension bracket.

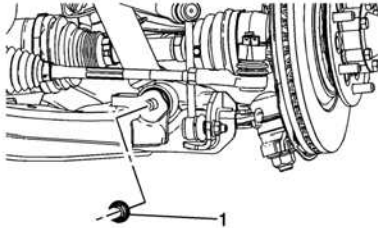


Caution: Refer to Fastener Caution.

2. Install and tighten the front shock absorber mounting nuts (1) to **55 Y (41 lb ft)**.
3. Install the lower control arm assembly. Refer to Lower Control Arm Replacement.



4. Install the lower shock absorber bolt (1).



5. Install the lower shock absorber nut (1) and tighten the nut to **93 Y (69 lb ft)**.
6. Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
7. Remove the support and lower the vehicle.

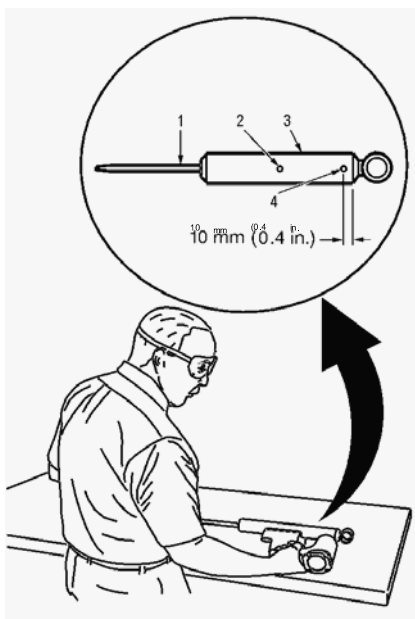
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

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 at the centerpunch.

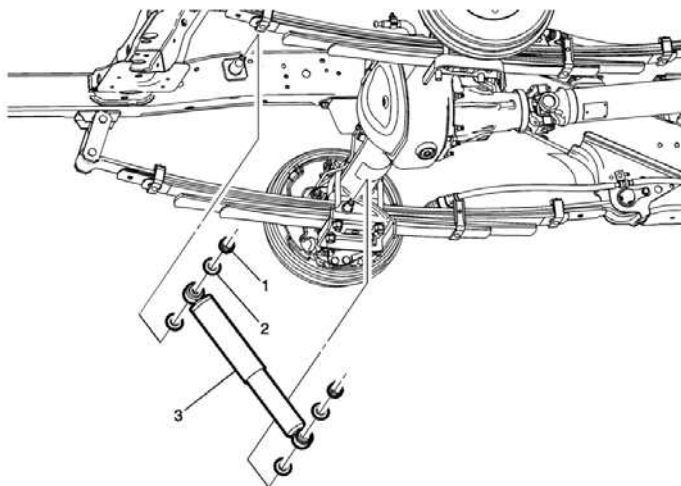


1. Make an indentation 10 mm (0.4 in) from the bottom (4) of the tube (3) using a centerpunch.
2. Clamp the shock absorber in a vise horizontally with the shock absorber rod (1) completely extended.
3. Drill a hole in the shock absorber at the centerpunch (4) using a 5 mm (3/16 in) drill bit. Gas or 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 (3) to completely drain the oil from the shock absorber.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Shock Absorber Replacement

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Shock Absorber Nut (Qty: 2)

Caution: Refer to Fastener Caution.

Procedure

1

Support the rear axle with a hydraulic transmission stand.

Tighten

39 Y (29 lb ft)

2

Shock Absorber Washers (Qty: 4)

3

Shock Absorber

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

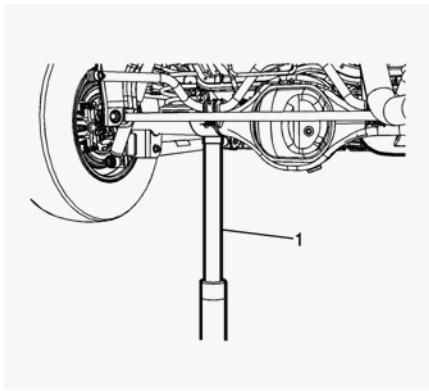
Special Tools

CH-50994 Shock Absorber Remover

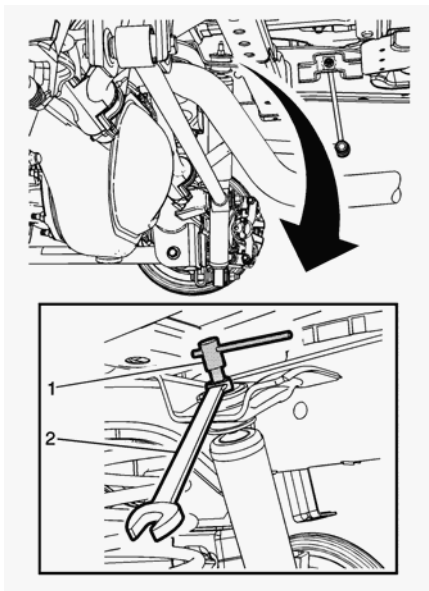
For equivalent regional tools, refer to Special Tools.

[Removal Procedure](#)

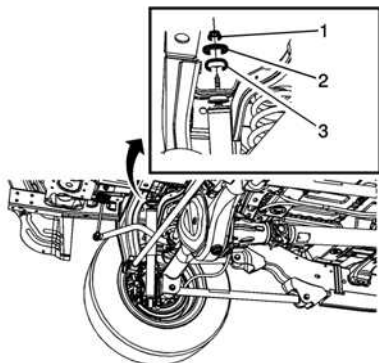
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



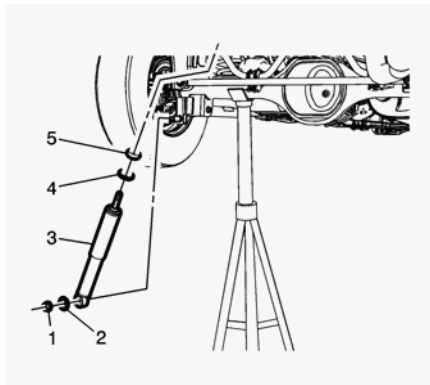
2. Support the rear axle with a suitable jack stand (1).



3. Using the CH-50994 remover (1) and the proper size wrench (2), loosen the shock absorber nut.

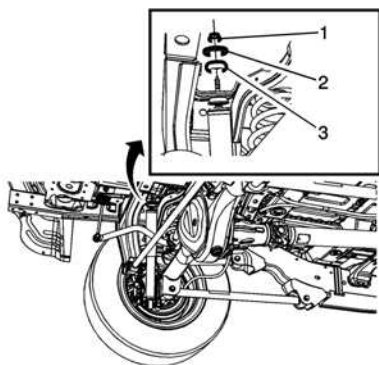


4. Remove the upper shock absorber nut (1), washer (2), and the bushing (3).

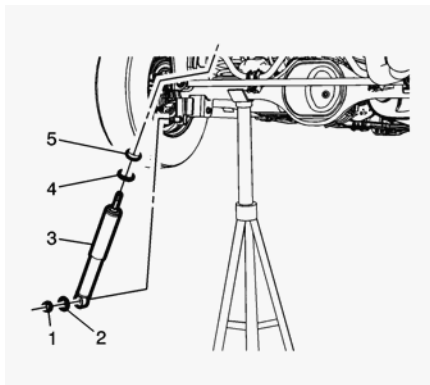


5. Remove the lower shock absorber nut (1), washer (2).
6. Remove the shock absorber (3), washer (4), and the bushing (5).

[Installation Procedure](#)



1. Install the upper shock absorber nut (1), washer (2), and the bushing (3).

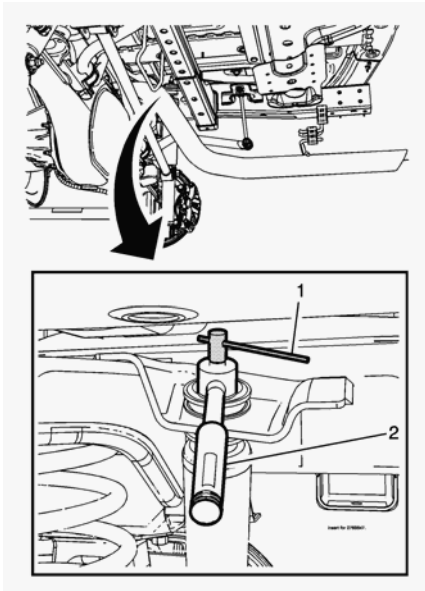


2. Install the washer (4) and the bushing (5) on the shock absorber (3).

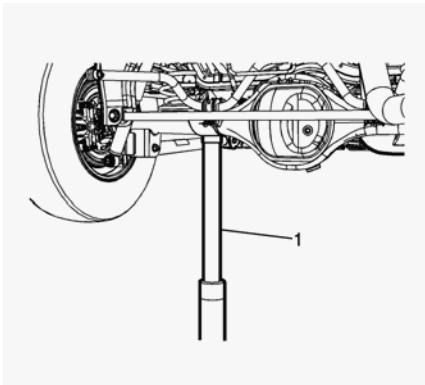
3. Position the shock absorber (3) in the vehicle.
4. Install the washer (2) and the nut (1).

Caution: Refer to Fastener Caution.

5. Install the washer (2) and the nut (1) then tighten the nut (1) to **39 Y (29 lb ft)**.



6. Using the *CH-50994* remover (1) and the appropriate torque wrench (2), tighten the nut to **39 Y (29 lb ft)**.



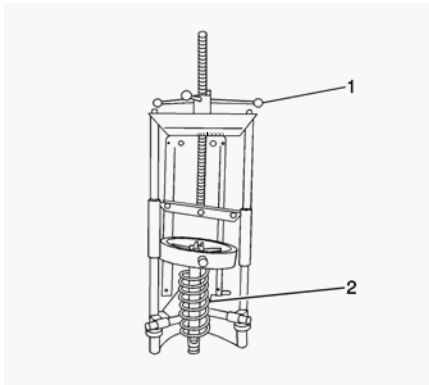
7. Remove the jack stand (1).
8. Remove the supports and lower the vehicle.

2013 Chevrolet Colorado

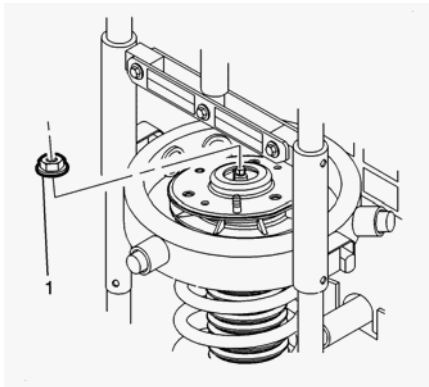
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

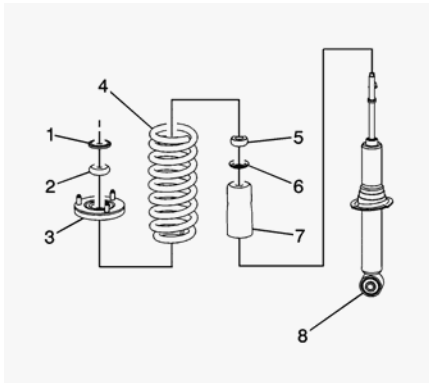
1. Remove the shock absorber assembly. Refer to Shock Absorber and Spring Removal and Installation.



2. Position the shock assembly (2) in the spring compressor (1).
3. Compress the spring until there is a gap between the upper mount and the nut.

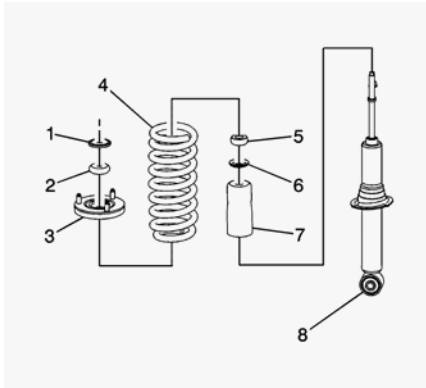


4. Remove the nut (1) from the shock.

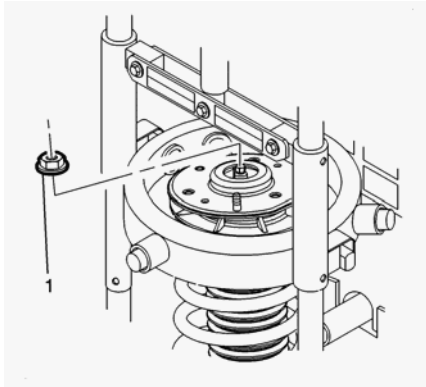


5. Remove the washer (1), bushing (2), upper mount (3).
6. Loosen the spring compressor in order to remove the spring (4), if servicing the spring.
7. Remove the shock absorber (8) from the spring compressor.
8. Remove the bushing (5), washer (6) and the dust shield (7).

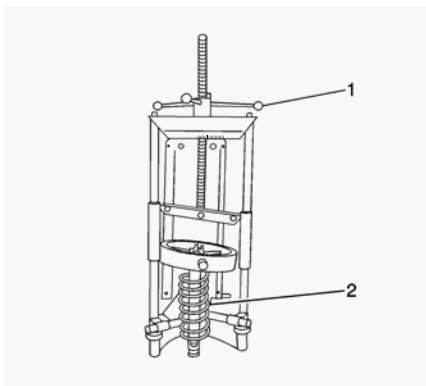
Installation Procedure



1. Install the dust shield (7), washer (6) and the bushing (5).
2. Install the spring (4), if removed.
3. Using the spring compressor, compress the spring.
4. Install the upper mount (3), bushing (2) and the washer (1).



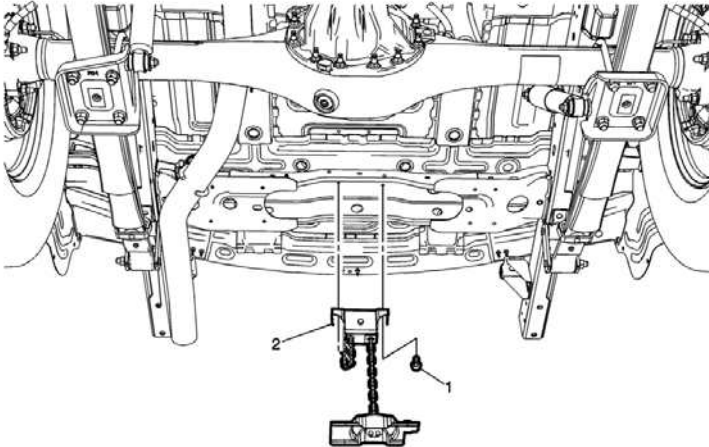
5. Using appropriate tools, install the nut (1) and tighten to **25 Y (18 lb ft)**.



6. Loosen the spring compressor (2) and remove the shock absorber assembly (18).
7. Install the shock absorber assembly. Refer to Shock Absorber and Spring Removal and Installation.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

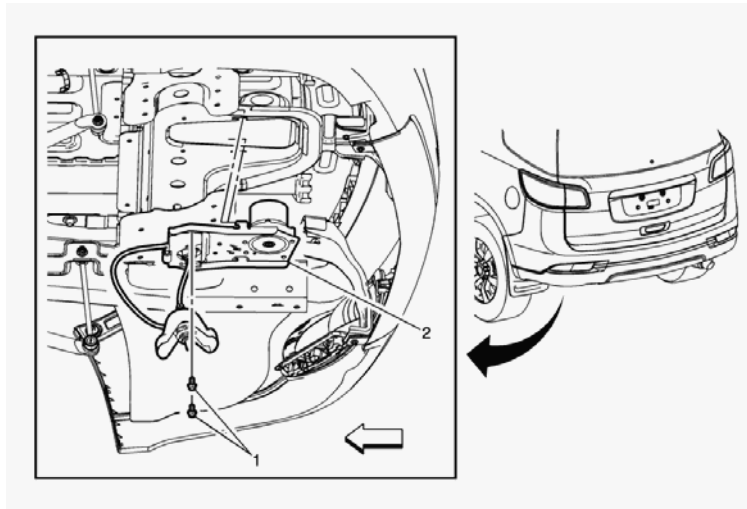


Spare Wheel Carrier Hanger Replacement

Callout	Component Name
Preliminary Procedure	
1.	Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2.	Remove the spare tire.
	Spare Wheel Carrier Hanger Bolt (Qty: 2)
	Caution: Refer to Fastener Caution.
1	Tighten
	22 Y (16 lb ft)
2	Spare Wheel Carrier Hanger

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Spare Wheel Carrier Hanger Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the spare tire.

Spare Wheel Carrier Hanger Bolt (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

22 Y (16 lb ft)

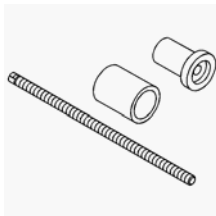
2

Spare Wheel Carrier Hanger

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Illustration



Tool Number/ Description

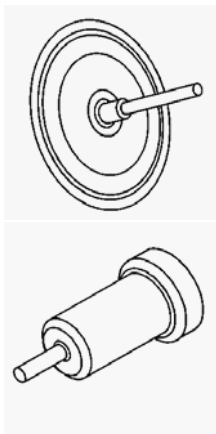
CH-50815
Remover/Installer

CH-50994
Rear Shock Absorber Remover

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Illustration



Tool Number/ Description

CH 41013

J 41013

Rotor Resurfacing kit

CH 42450-A

J 42450-A

Wheel Hub Resurfacing Kit

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

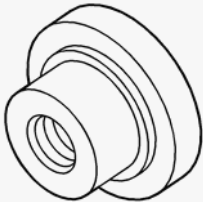
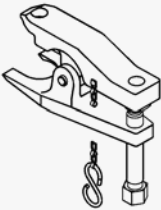
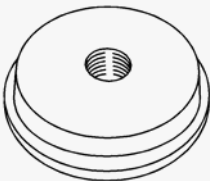
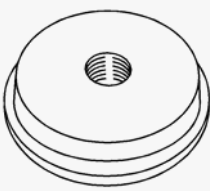
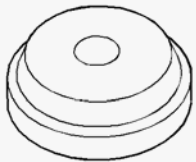
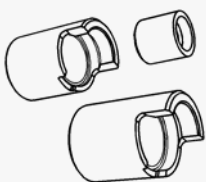
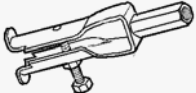
Illustration	Tool Number/ Description
	CH 36827 Bearing Installer
	CH 36838 Bearing Installer
	CH 47975-B Ball Joint Separator
	CH 50786 Seal Installer
	CH 50798 Outer Bearing Cup Installer
	CH 50799 Inner Bearing Cup Installer
	CH 50800 Control Arm Bushing Remover/Installer

Illustration	Tool Number/ Description
	CH 50819 Inner Dust Seal Installer
	DT 29369-1 Bearing Remover
	EN 45000 Seal Remover
	GE 8092 M_840911-A Universal Driver
	GE 23907-1 J 23907 Slide Hammer

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Illustration



Tool Number/ Description

CH 8001

DT-571-B

EN-571-B

EN-48001

GE-571-B

GE-8001

GE-8001-3

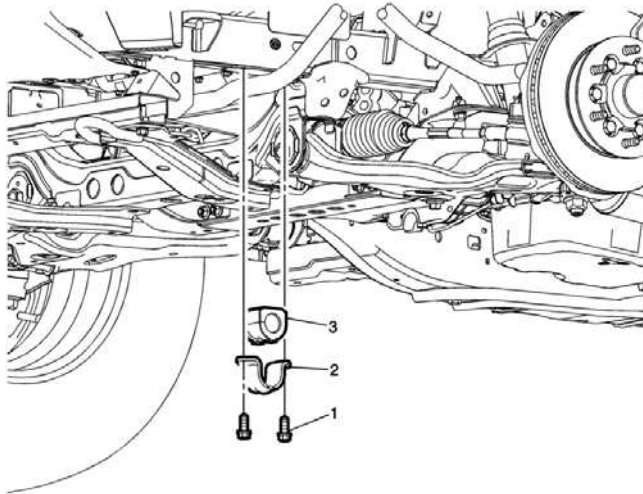
GE-49690

J-8001

Dial Indicator

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



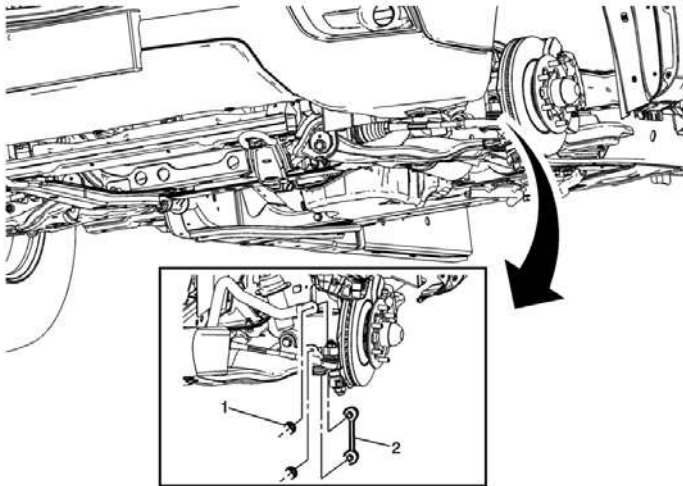
Stabilizer Shaft Insulator Replacement

Callout	Component Name
Preliminary Procedure	
1. raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.	
2. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.	
Front Stabilizer Shaft Insulator Bolt (Qty: 2)	
Caution: Refer to Fastener Caution.	
1	Tighten 25Y(18 lb ft).
2	Front Stabilizer Shaft Clamp
3	Front Stabilizer Shaft Insulator

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



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.

Stabilizer Shaft Link Nut (Qty: 2)

Caution: Refer to Fastener Caution.

Procedure

1

Use the proper size Allen wrench to hold the stabilizer shaft link stud from rotating while loosening the stabilizer shaft link nut.

Tighten

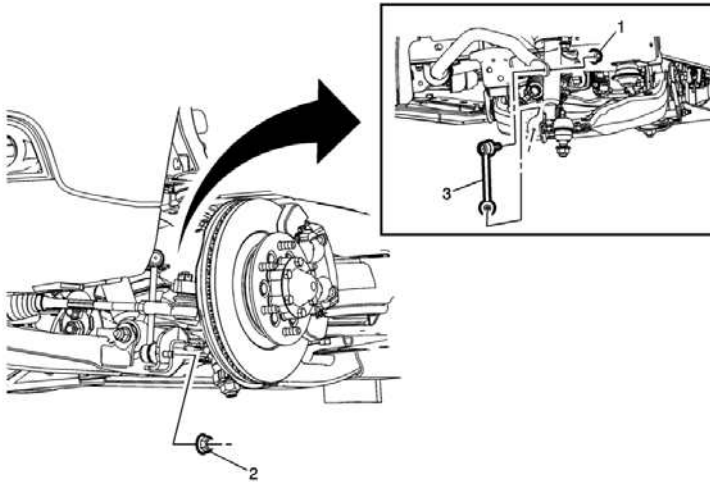
50 Y (37 lb ft).

2

Stabilizer Shaft Link

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



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 assemblies. Refer to Tire and Wheel Removal and Installation.

Front Stabilizer Shaft Link Nut

Caution: Refer to Fastener Caution.

Procedure

1

Use the proper size Allen wrench to hold the stabilizer shaft link stud from rotating while loosening the stabilizer shaft link nut.

Tighten

50 Y (37 lb ft).

Front Stabilizer Shaft Nut

Procedure

2

Use the proper size Allen wrench to hold the stabilizer shaft link stud from rotating while loosening the stabilizer shaft link nut.

Tighten

50 Y (37 lb ft).

3

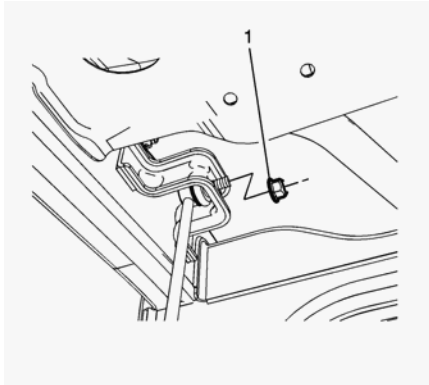
Front Stabilizer Shaft Link

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

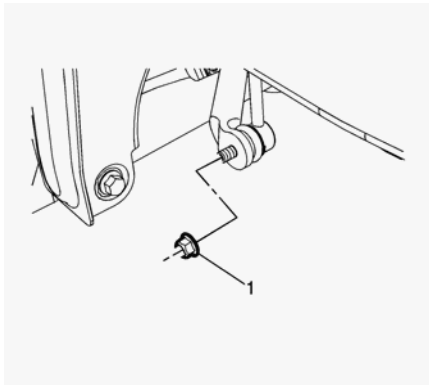
Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



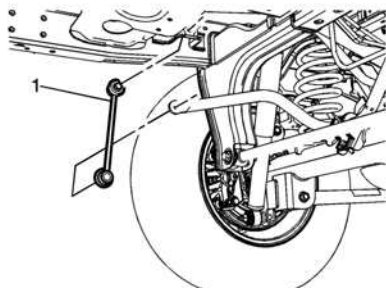
Note: Use the proper size allen wrench to ball stud while removing the nut.

2. Remove the upper stabilizer shaft link nut (1).



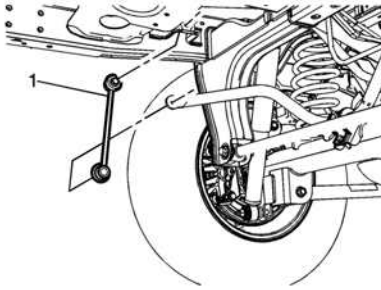
Note: Use the proper size allen wrench to ball stud while removing the nut.

3. Remove the lower stabilizer shaft link nut (1).

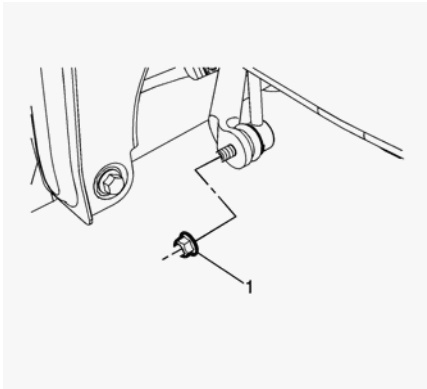


4. Remove the stabilizer shaft link (1).

[Installation procedure](#)



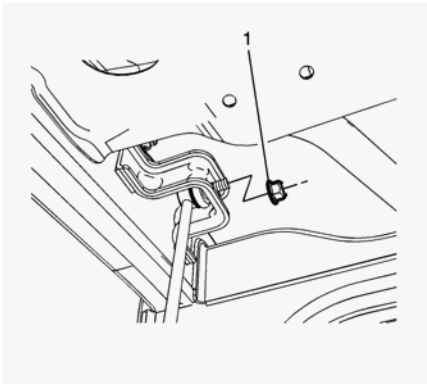
1. Position the stabilizer link in the vehicle (1).



Caution: Refer to Fastener Caution.

Note: Use the proper size allen wrench to hold the ball stud while torquing the nut to specifications.

2. Install the lower stabilizer link nut (1) and tighten to **61 Y (45 lb ft)**.

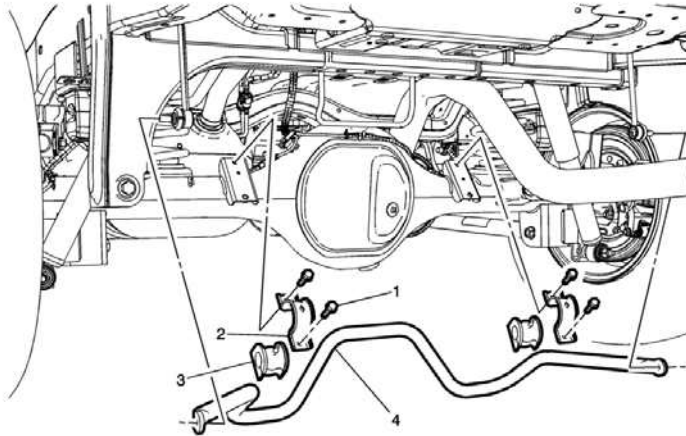


Note: Use the proper size allen wrench to hold the ball stud while torquing the nut to specifications.

3. Install the upper stabilizer link nut (1) and tighten to **61 Y (45 lb ft)**.
4. Remove the support and lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



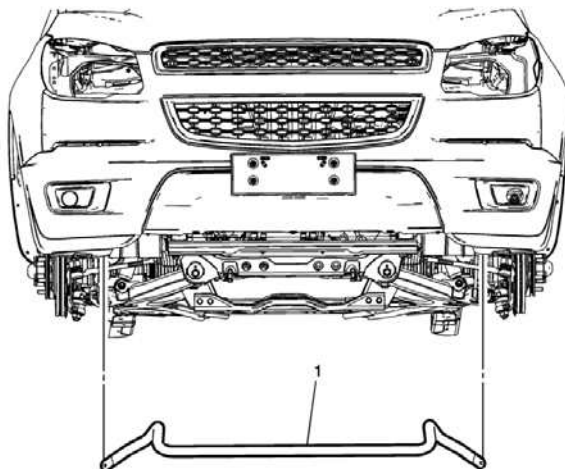
Stabilizer Shaft Replacement

Callout	Component Name
Preliminary Procedure	
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle. 2. Remove the rear spring travel limiting link. Refer to Rear Spring Travel Limiting Link Replacement. 3. Disconnect the stabilizer shaft links from the stabilizer shaft. Refer to Stabilizer Shaft Link Replacement.	
Rear Stabilizer Shaft Bolts (Qty: 4)	
Caution: Refer to Fastener Caution.	
Tighten	
1	• First pass 65 Y (48 lb. ft.) • Final pass 30 Degrees
2	Rear Stabilizer Shaft Insulator Clamp (Qty: 2)
3	Rear Stabilizer Shaft Insulator (Qty: 2)
4	Rear Stabilizer Shaft

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Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Stabilizer Shaft 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 assemblies. Refer to Tire and Wheel Removal and Installation.

Front Stabilizer Shaft.

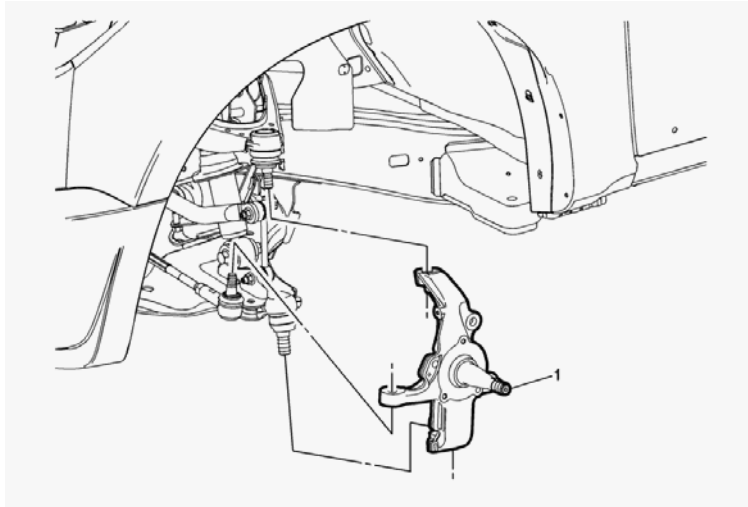
Procedure

1

1. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.
2. Remove the stabilizer links from the front stabilizer shaft. Refer to Stabilizer Shaft Link Replacement.
3. Remove the front stabilizer shaft insulators. Refer to Stabilizer Shaft Insulator Replacement.

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Steering Knuckle 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.
3. Remove the speed sensor from the steering knuckle. Refer to Front Wheel Speed Sensor Replacement
4. Remove steering linkage outer tie rod from the steering knuckle. Refer to Steering Linkage Outer Tie Rod Replacement.
5. Remove the front brake shield. Refer to Front Brake Shield Replacement.

Steering Knuckle

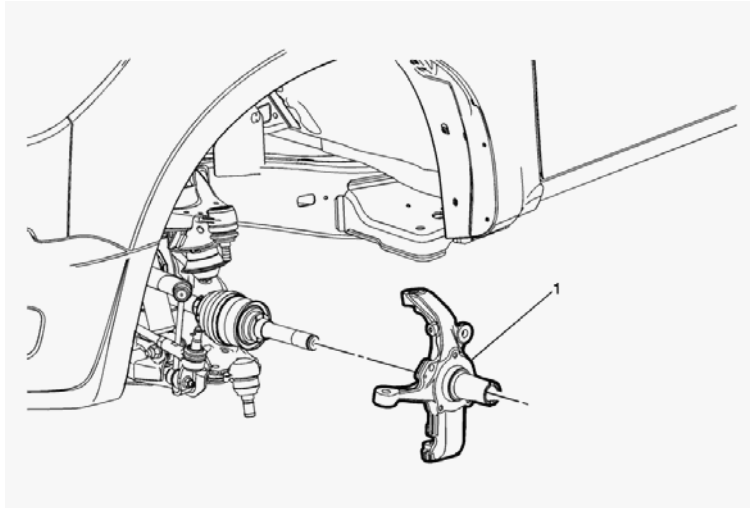
Procedure

1

1. Separate the lower ball joint from the steering knuckle. Refer to Front Lower Control Arm Ball Stud Replacement.
2. Separate the upper ball joint from the steering knuckle. Refer to Front Upper Control Arm Ball Stud Replacement.

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Steering Knuckle 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.
3. Remove the speed sensor from the steering knuckle. Refer to Front Wheel Speed Sensor Replacement.
4. Remove steering linkage outer tie rod from the steering knuckle. Refer to Steering Linkage Outer Tie Rod Replacement.
5. Remove the front brake shield. Refer to Front Brake Shield Replacement.

Steering Knuckle

Procedure

1

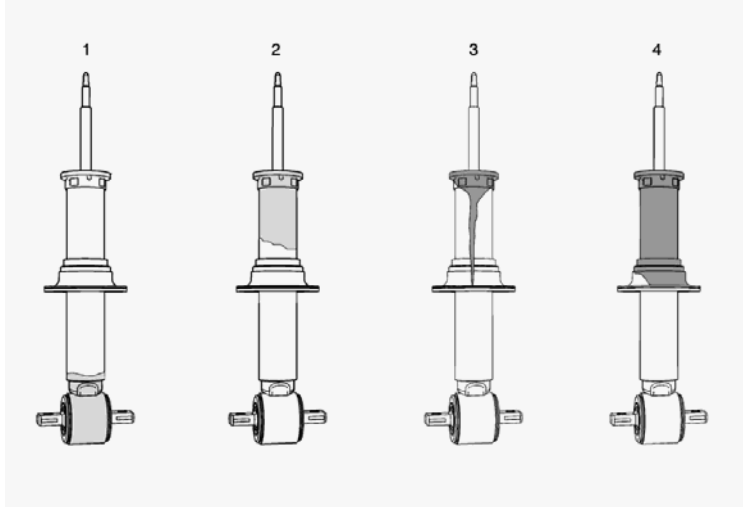
1. Separate the lower ball joint from the steering knuckle. Refer to Front Lower Control Arm Ball Stud Replacement.
2. Separate the upper ball joint from the steering knuckle. Refer to Front Upper Control Arm Ball Stud Replacement.

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Submodel: | **Engine Type:** | **Liters:**
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Note: The coil over shock 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 shock absorber tube is normal. DO NOT replace the shock absorber for this condition.



Condition 1

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

Condition 2

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

Condition 3

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

Condition 4

An extreme wet film of oil covering the shock absorber tube and pooling in the spring seat and originating from the shaft seal, 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 normally.

Note: The shock 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.
- If equipped with electronic suspension control system, ensure that the system is working properly. Refer to Diagnostic Starting Point-Electronic Control.
- 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 cycles, replace the shock absorber. If the shock absorber does not exceed 2 cycles, NO repair is necessary.

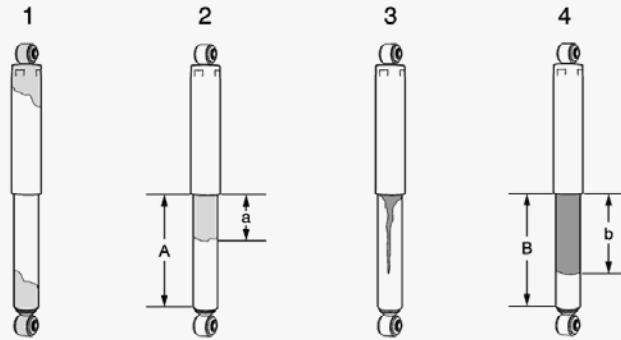
2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

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. DC 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 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 (B) and originating from the shaft seal (B), is an ABNORMAL condition. Replace 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 normally.

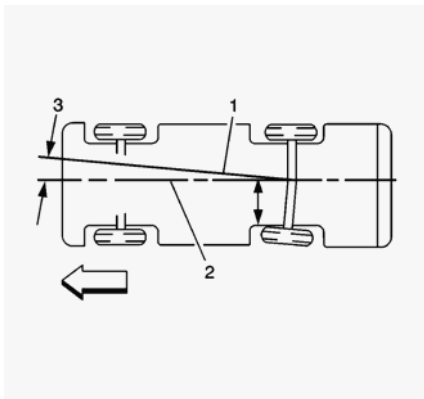
Note: The shock absorber assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.

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.
- If equipped with electronic suspension control system, ensure that the system is working properly. Refer to Diagnostic Starting Point – Electron Control.
- 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 cycles, replace the shock absorber. If the shock absorber does not exceed 2 cycles, NO repair is necessary.

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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 angle the thrust line (1) takes. 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.

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Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

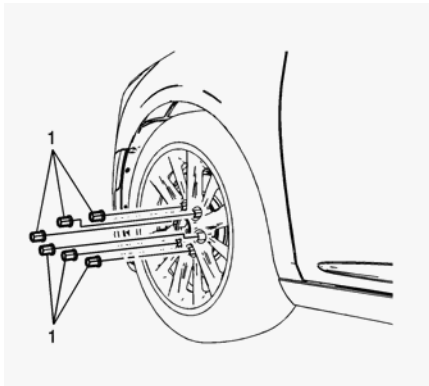
Special Tools

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

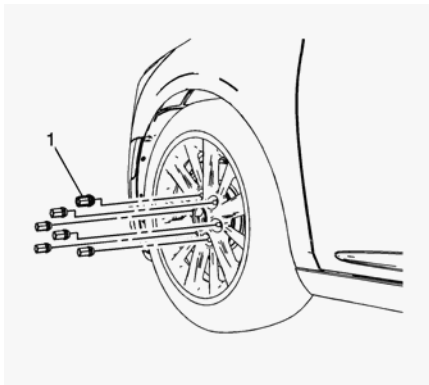
For equivalent regional tools, refer to Special Tools.

Removal Procedure

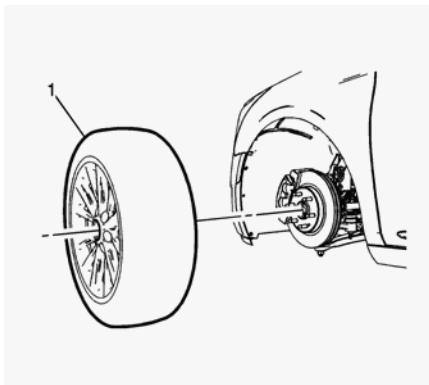
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the wheel center cap, if equipped.



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



4. Remove the wheel nuts (1).



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 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 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:

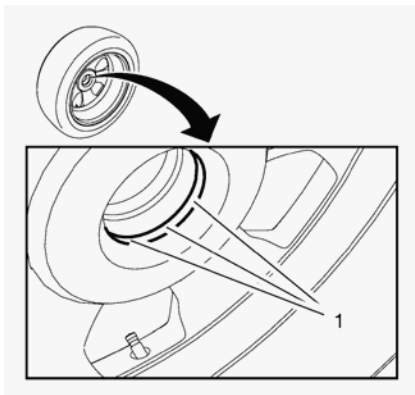
- Hand install the wheel nuts.
- Loosen the wheel nuts 2 complete turns.
- Lower the vehicle.
- Rock the vehicle from side to side.
- Repeat the procedure if necessary.
- When the tire and wheel assembly loosens, raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
- Remove the wheel nuts.
- Remove the tire and wheel assembly.

Installation Procedure

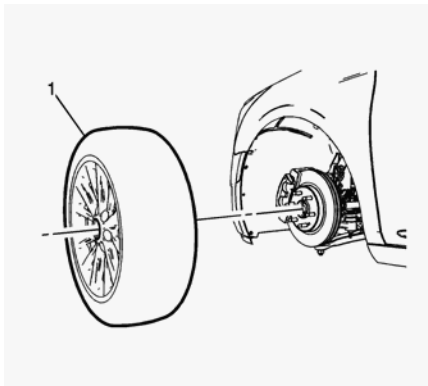
Warning: Before installing the wheels, remove any buildup of corrosion on the wheel mounting surface and brake drum or disc mounting. Installing wheels with poor metal-to-metal contact at the mounting surfaces can cause wheel nuts to loosen. This can cause a wheel to move while the vehicle is moving, 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.

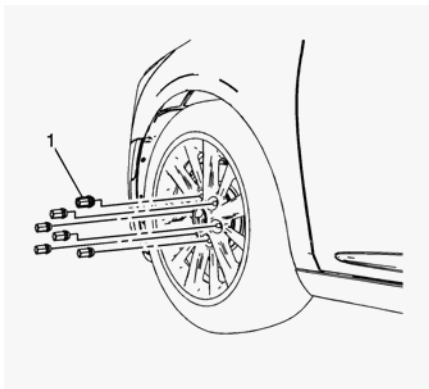
1. Using a wire brush or wire wheel, clean the wheel to brake rotor or drum mating surface.
2. Using the *CH-41013* Rotor Resurfacing Kit, clean the rotor or drum to wheel contact area.
3. Using the *CH-42450-A* Wheel Hub Resurfacing Kit, clean the surfaces around the wheel studs.
4. Clean the threads of the wheel studs.
5. If the threads of the wheel stud are damaged, replace the wheel stud. Refer to Wheel Stud Replacement 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. Refer to Wheel Mounting Surface Check.



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. Refer to Fluids, Lubricants, and Sealers.

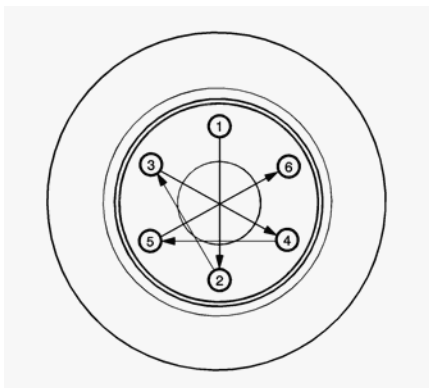


9. Install the tire and wheel assembly (1).



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

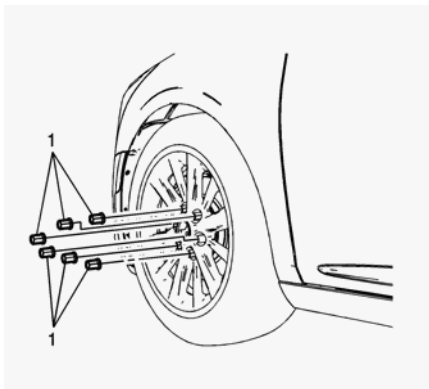
10. Hand install the wheel nuts (1).



Caution: Improperly tightened wheel bolts or nuts can lead to brake pulsation and rotor damage. In order to avoid expensive brake repair, 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 **118 Y (87 lb ft)** in the sequence illustrated.



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

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

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. Dismounting the tire by hand could result in injury to the operator or damage to the tire or the wheel rim.

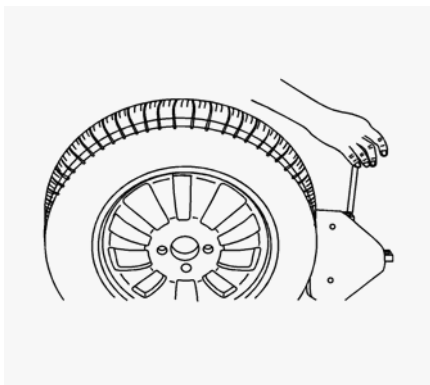
Caution: Do not scratch or damage the clear coating on aluminum wheels with the tire changing equipment. Scratching the clear coating could cause the wheel to corrode and the clear coating to peel from the wheel.

Caution: Damage to either the tire bead or the wheel mounting holes can result from the use of improper wheel attachment or tire mounting procedure. Failure to follow the proper procedures could cause the tire changer to apply too much 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 tire cracking.

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

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

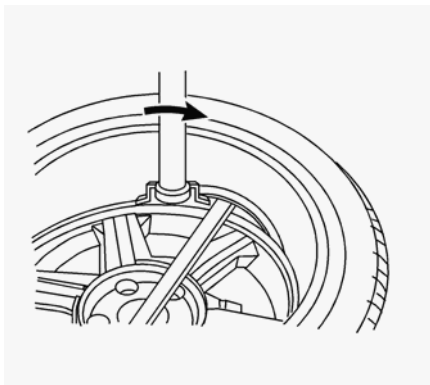
3. Use the tire changer in order to remove the tire from the wheel. Follow steps 4–7 to remove the tire from the wheel.



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.

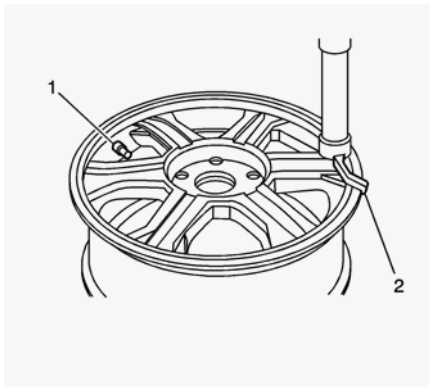
5. Position the wheel and tire so the valve stem is at the 7 o'clock position relative to the head. The tire iron or pry bar can be inserted when pry bead up and over the mounting/dismounting head.



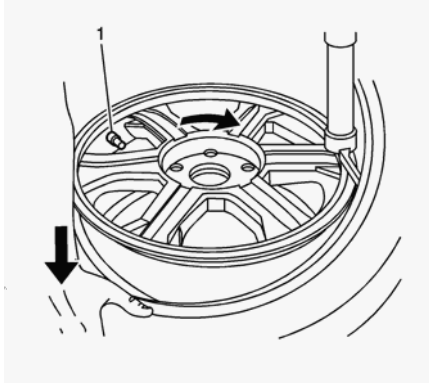
6. Position the wheel and tire so the valve stem is again at the 7 o'clock position relative to the head. The tire iron or pry bar can be inserted when pry inner tire bead up and over the mounting/dismounting head.
7. Remove all residual liquid sealant from the inside of the tire and wheel surfaces.
8. Use a wire brush or coarse 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 or 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.

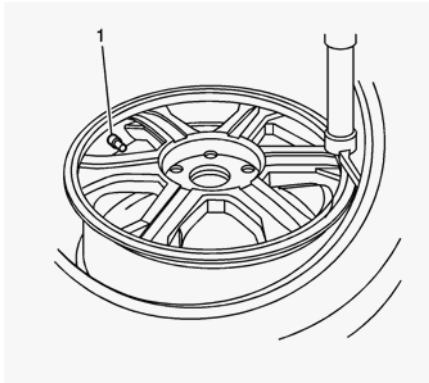
9. Apply mounting lubricant to the tire bead and the wheel rim.



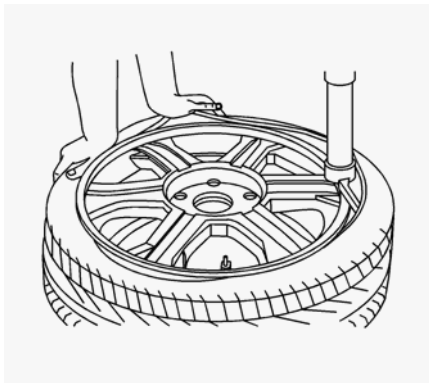
10. Position the rim so the valve stem (1) is at the 7 o'clock position relative to the head (2). This will protect the sensor when the bottom bead se



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 th is at the 7 o'clock position.



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. the sensor while mounting the tire bead to the outside of the wheel.



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 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, re 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.

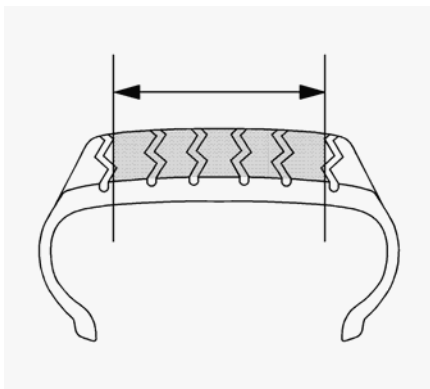
15. Install the valve core to the valve core stem.
16. Inflate the tire to the proper air pressure.
17. Ensure that the locating rings are visible on both sides of the tire in order to verify that the tire bead is fully seated on the wheel.

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**
Fuel Delivery: | **Fuel:**

Warning:

- Tire changing can be dangerous and should be done by trained professionals using proper tools and procedures. Always read and understand any warnings contained in their customers literature or molded into the tire sidewall.
- Serious eye and ear injury may result from not wearing adequate eye and ear protection while repairing tires.
- NEVER inflate beyond 275 kPa (40 pounds) pressure to seat beads.
- NEVER stand, lean or reach over the assembly during inflation.



Repairable area on a radial tire.

Note:

- NEVER repair tires worn to the tread indicators 1.59 mm (2/32 in) remaining depth.
- NEVER repair tires with a tread puncture larger than 6.35 mm (1/4 in).
- NEVER substitute an inner tube for a permissible or non-permissible repair.
- NEVER perform an outside-in tire repair (plug only, on the wheel).
- Every tire must be removed from the wheel for proper inspection and repair.
- Regardless of the type of repair used, the repair must seal the inner liner and fill the injury.
- Consult with repair material supplier/manufacturer for repair unit application procedures and repair tools/repair material recommendations.

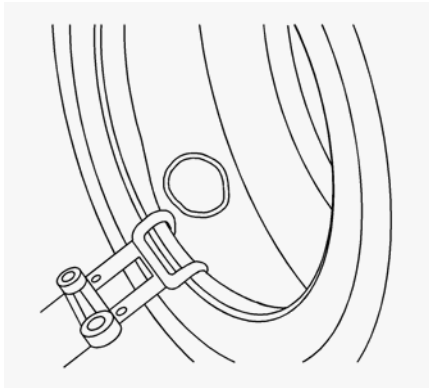
Three basic steps for tire puncture repair:

1. Remove the tire from the wheel for inspection and repair.
2. Fill the injury (puncture) to keep moisture out.
3. Seal the inner liner with a repair unit to prevent air loss.

External Inspection

1. Prior to demounting, inspect the tire surface, the valve and the wheel for the source of the leak by using a water and soap solution. Mi area and totally deflate the tire by removing the valve core.
2. Demount the tire from the wheel and place the tire on a well-lighted spreader.

Internal Inspection



1. Spread the beads and mark the puncture with a tire crayon.
2. Inspect the inner tire for any signs of internal damage.
3. Remove the puncturing object, noting the direction of the penetration.
4. Probe the injury with a blunt awl in order to determine the extent and direction of the injury.
5. Remove any loose foreign material from the injury.
6. Punctures exceeding 6.35 mm (1/4 in) should not be repaired.

Cleaning



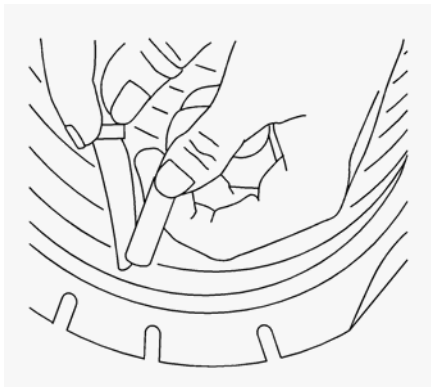
1. Clean the area around the puncture thoroughly with a proper liner cleaner, clean cloth and a scraper. This step serves to remove dirt and lubricants to insure proper adhesion and non-contamination of the buffing tool.
2. Refer to information on the product or manufacturer's Material Safety Data Sheet and follow guidelines for handling and disposal.

Clean the Injury Channel



1. Use a proper hand reamer, carbide cutter or drill bit to ream the puncture channel from the inside of the tire in order to clean the injury.
2. Remove steel wires protruding above the liner surface to prevent damage to the repair unit.
3. Consult your repair material supplier for recommended reaming tool(s).

Fill the Injury



1. It is necessary to fill the injury channel to provide back up for the repair unit and to prevent moisture from entering the tire fabric and s
2. For combination repair/plug units skip this step. Cement the injured channel and fill the injury from the inside of the tire with the repair material manufacturer's recommendations. Without stretching the plug, cut the plug off just above the inside tire surface.
3. Consult your repair material supplier for proper repair material selection.

Repair Unit Selection



Note: Do not install the repair unit in this step.

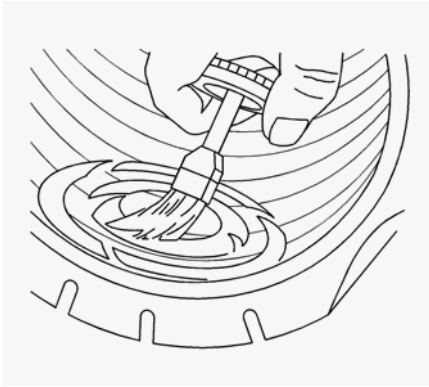
1. Center the repair unit over the injury as a reference and outline an area larger than the unit so that buffing will not remove the crayon m
2. Remove the repair unit.
3. DO NOT overlap previous or multiple repair units.
4. Consult your repair material supplier for proper repair unit selection.

Buffing



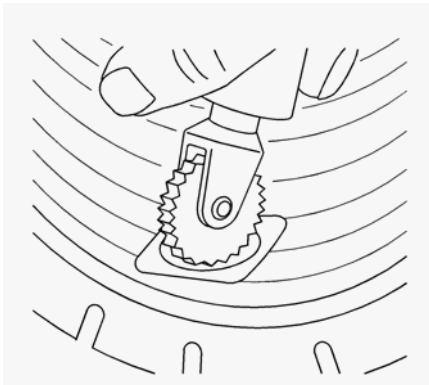
1. To prevent contamination and preserve the outline, buff within the marked area thoroughly and evenly with a low speed buffing tool usi brush or gritted rasp.
2. Buff to a smooth velvet surface (RMA #1 or #2 buffed texture).
3. Use caution not to gouge the inner liner or expose casing fabric.
4. Remove any buffing dust with a vacuum cleaner.
5. Consult your repair material supplier for a proper buffing tool.

Cementing



Apply chemical cement according to the repair material manufacturer's procedures.

Repair Unit Application



The tire must be in the relaxed position when the repair unit is installed. Do not spread the beads excessively.

Two-Piece Plug and Repair Units

1. If applicable, install the repair unit so that the alignment is correct.
2. Center the repair unit over the injury and stitch down thoroughly with the stitching tool, working from the center out.



3. Being careful not to stretch the plug material, cut the plug flush with the outer tread.

Combination Repair/Plug Units

1. Pull the plug through the injury until the repair just reaches the liner. Stitch down thoroughly.
2. Follow the repair material manufacturer's recommendations for further installation instructions.

Consult your repair material supplier for the proper stitching tool.

Safety Cage



Some run flat tires may require more than 275 kPa (40 psi) to seat the bead. In such a case, a tire safety cage must be used. Consult the tire manufacturer's individual repair policy.

Final Inspection



1. After remounting and inflating the tire, check both beads, the repair and the valve with a water and soap solution in order to detect leaks.
2. If the tire continues to lose air, the tire must be demounted and reinspected.
3. Balance the tire and wheel assembly. Refer to Tire and Wheel Assembly Balancing - Off Vehicle.

For additional tire puncture repair information, contact:

Rubber Manufacturers Association (RMA)
1400 K Street, N.W., Suite 900
Washington, DC 20005-2403
Telephone: 202-682-4800
E-mail: info@rma.org

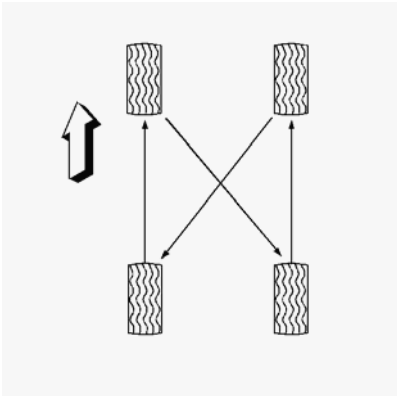
Website: www.rma.org

2013 Chevrolet Colorado

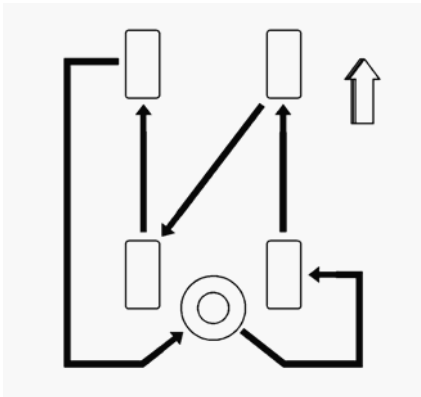
Submodel: | **Engine Type:** | **Liters:**
Fuel Delivery: | **Fuel:**

In order to equalize wear, rotate the tires at the specified intervals. Also, rotate the tire and wheel assembly whenever you notice uneven tire wear.

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



- For vehicles with single rear wheels (4 tires), rotate the tires as shown.



- For vehicles with single rear wheels (5 tires), rotate the tires as shown.

2013 Chevrolet Colorado

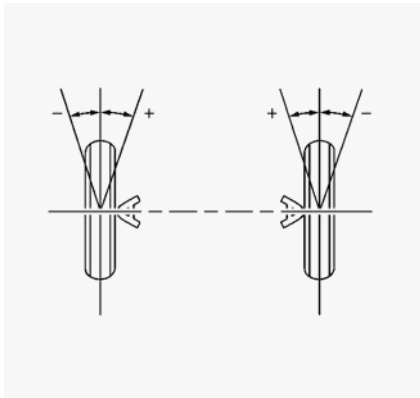
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Note: After remounting a tire and wheel assembly to a hub/axle flange, remeasure the tire and wheel assembly on-vehicle runout in order to verify that the amount of runout has been reduced and brought to within tolerances.

1. Mark the location of the high spot on the tire and wheel assembly as determined during the on-vehicle tire and wheel assembly runout measurement.
 2. Place a reference mark on the wheel stud that is located closest to the wheel valve stem.
-
- Always refer to the reference mark on the wheel stud as the 12 o'clock position.
 - Refer to the location of the high spot by its clock position on the tire and wheel assembly, relative to the marked wheel stud.
 - Remove the tire and wheel assembly from the hub/axle flange. Refer to Tire and Wheel Removal and Installation.
 - Rotate the tire and wheel assembly as close to 180 degrees as possible on the hub/axle flange, so that the wheel valve stem is now approximately at the 6 o'clock position in relation to the marked wheel stud.
 - Reinstall the wheel lug nuts to secure the tire and wheel assembly in the new position. Refer to Tire and Wheel Removal and Installation.
 - Remeasure the tire and wheel assembly on-vehicle runout. Mark the new location of the assembly on-vehicle runout high spot on the tire. Refer to Tire and Wheel Assembly Runout Measurement - On-Vehicle.
 - If the assembly on-vehicle runout has been reduced and is within tolerance, no further steps are necessary.
 - If the assembly runout has NOT been reduced, perform the following steps:
1. If the clock location of the high spot remained at or near the original clock location of the high spot, the hub/axle flange and/or the brake rotor/drum mounting flange is the major contributor to the assembly on-vehicle runout concern.
 2. If the clock location of the high spot is now at or near a position 180 degrees from the original clock location of the high spot, the tire and wheel assembly is the major contributor to the assembly on-vehicle runout concern.
 3. If the clock location of the high spot is now in-between the 2 extremes, then both the tire and wheel assembly and the hub/axle flange are contributing to the assembly on-vehicle runout concern. Rotate the tire and wheel assembly as close to an additional 90 degrees as possible in both the clockwise and the counterclockwise directions to obtain the lowest amount of assembly on-vehicle runout.

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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 the wheels are 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's 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.

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Trim Height Measurement

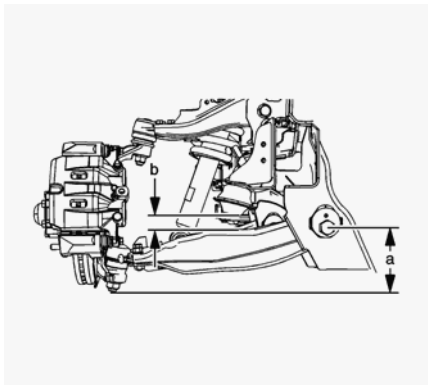
Trim height is a predetermined measurement relating to vehicle ride height. Incorrect trim heights can cause the vehicle to bottom out over bumpy suspension components and symptoms similar to wheel alignment problems. Check the trim heights when diagnosing suspension concerns and the wheel alignment.

Perform the following before measuring the trim heights:

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 Z Dimension



Measurement Definitions

The Z Height: The vertical distance from the center of the adjuster bolt head to the center of the ball joint (a).

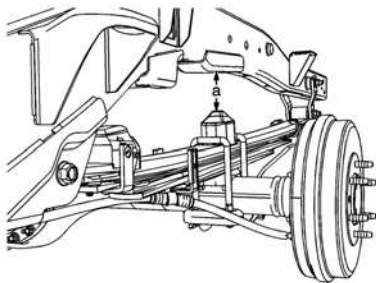
Use the following procedures to measure the Z dimensions:

Note: The left and right Z height differences should be no more than the specification listed in the specification table.

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



Measurement Definitions

The D Height: The vertical distance (a) from the top of the jounce bumper to the bottom of the frame rail directly above the jounce bumper.

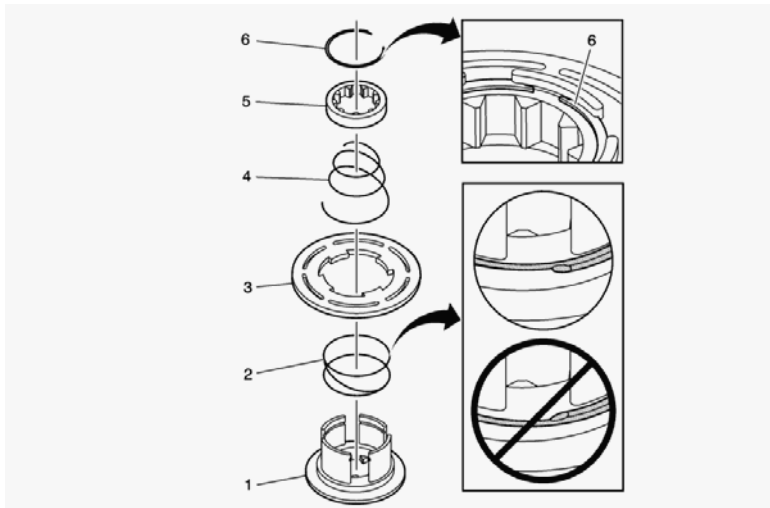
Use the following procedure to check the D dimension:

Note: The left and right D height difference should be no more than the specification listed the specification table.

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

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Two/Four Wheel Drive Synchronizer Hub Assemble

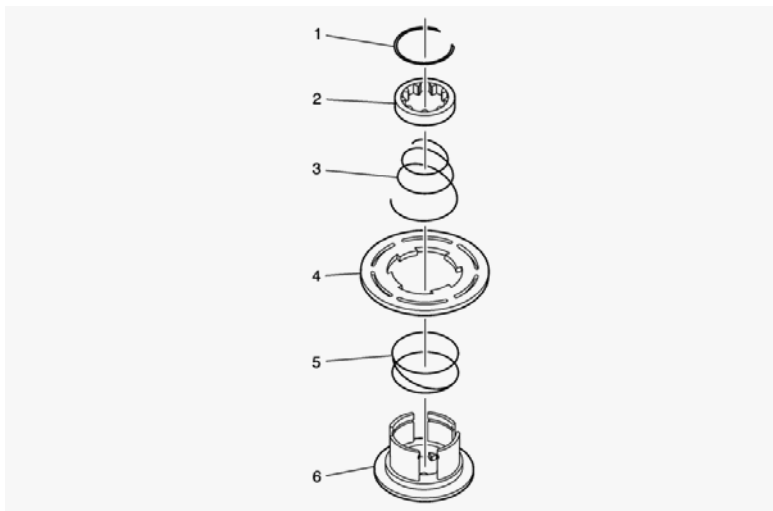
Callout

Component Name

- | | |
|---|---|
| 1 | Two/Four Wheel Drive Clutch Coil Housing |
| 2 | Two/Four Wheel Drive Synchronizer Hub Outer Spring |
| 3 | Four Wheel Drive Armature Plate |
| 4 | Two/Four Wheel Drive Synchronizer Hub Inner Spring |
| 5 | Synchronizer Collar |
| 6 | Lockup Retaining Ring |
| 6 | Note: Ensure the ends of the retaining ring are to be positioned as indicated (6). The ends of the ring should NOT be positioned in an open area of the housing. |

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Two/Four Wheel Drive Synchronizer Hub Disassemble

Callout

Component Name

- | | |
|---|--|
| 1 | Lockup Retaining Ring |
| 2 | Synchronizer Collar |
| 3 | Two/Four Wheel Drive Synchronizer Hub Inner Spring |
| 4 | Four Wheel Drive Armature Plate |
| 5 | Two/Four Wheel Drive Synchronizer Hub Outer Spring |
| 6 | Two/Four Wheel Drive Clutch Coil Housing |

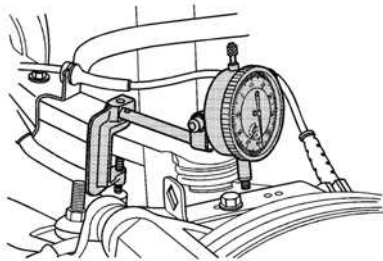
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Special Tools

CH 8001 Dial Indicator Set

For equivalent regional tools, refer to Special Tools.



Note:

- The vehicle must rest on a level surface.
 - The vehicle must be stable. Do not rock the vehicle on the floor stands.
 - This procedure was developed for checking the vertical movement of the upper ball joint. If there is movement in the horizontal or any other greater than the below specification, replace the upper control arm ball joint or upper control arm as applicable for this vehicle.
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 ball joint or upper control arm as applicable.
 3. Support the lower control arm with a floor stand as far outboard as possible and raise the suspension until the lower control arm moves **25 mm**.
 4. Install the *CH 8001* dial indicator, or suitable dial indicator, to measure the vertical lash in the ball joint.

Caution: Do not pry in such a way that the ball joint seal is contacted. Damage to the seal may result.

5. Apply downward force to the upper control arm and zero the indicator.
6. Apply upward force to the upper control arm and check the dial indicator. Record the measurement.
7. If the dial indicator reading is more than **0.50 mm (0.020 in)**, replace the ball joint or the upper control arm as applicable for this vehicle.

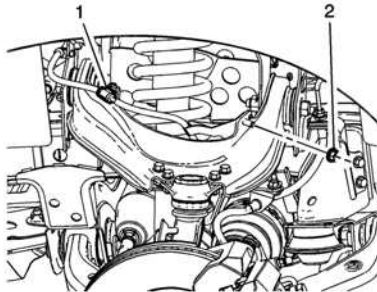
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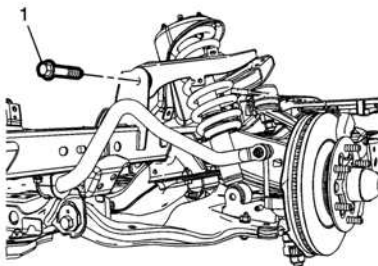
Fuel Delivery: | Fuel:

Removal Procedure

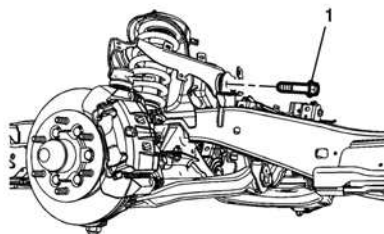
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
3. Remove the front brake hose mounting bracket from the upper control arm. Refer to Front Brake Hose Replacement.



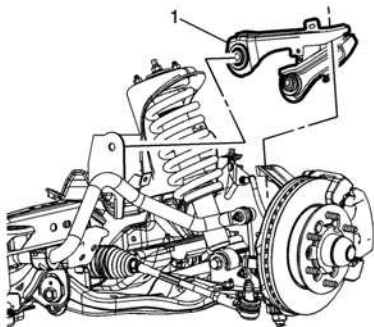
4. Remove the front wheel speed sensor harness (1) and mounting bracket nut (2) from the upper control arm.
5. Separate the upper control arm from the ball stud. Refer to Front Upper Control Arm Ball Stud Replacement.



6. Remove the front upper control arm bolt (1).

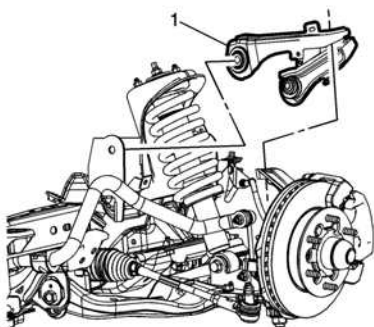


7. Remove the rear upper control arm bolt (1).

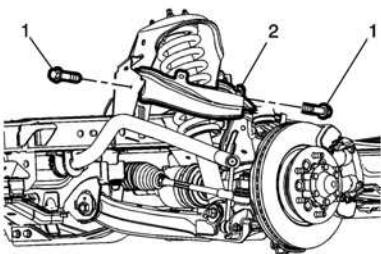


8. Remove the upper control arm (1).

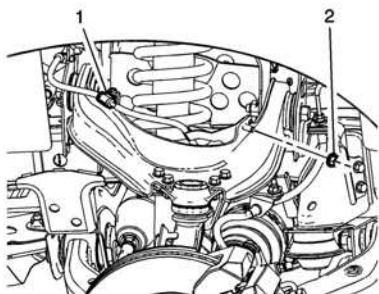
[Installation Procedure](#)



1. Position the upper control arm (1) in the frame.



2. Install the upper control arm bolts (1) and tighten to **137 Y (101 lb ft)**.
3. Install the upper control arm to the ball stud. Refer to Front Upper Control Arm Ball Stud Replacement.



4. Install the front wheel speed sensor harness (1) and mounting bracket nut (2) to the upper control arm.

5. Install the front brake hose mounting bracket to the upper control arm. Refer to Front Brake Hose Replacement.
6. Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
7. Remove the support and lower the vehicle. Refer to Lifting and Jacking the Vehicle.

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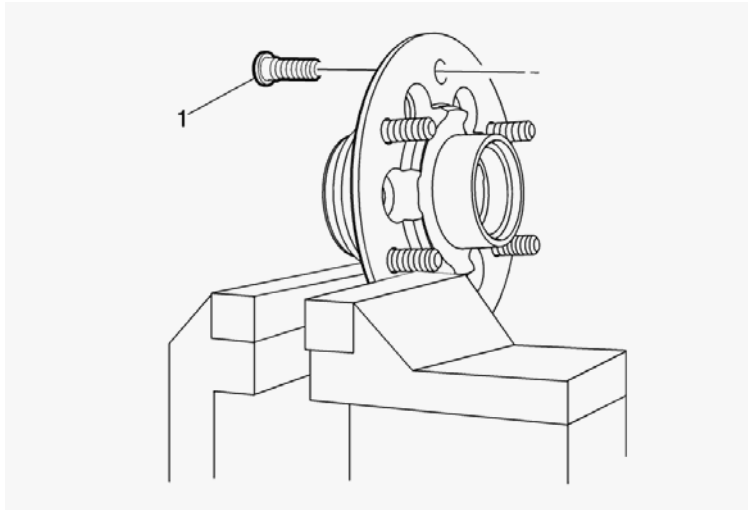
Submodel: | **Engine Type:** | **Liters:**
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Wander is the undesired drifting or deviation of a vehicle to either side from a straight path with hand pressure on the steering wheel. Wander is a symptom of the vehicle's sensitivity to external disturbances,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

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Wheel Stud 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.
3. Remove the front brake rotor from the vehicle. Refer to Front Brake Rotor Replacement.

Wheel Stud

Procedure

1

1. Position the wheel hub in a vise.
2. Using a hammer, remove the wheel stud from the wheel hub.
3. Position the wheel stud in the wheel hub.

Note: When installing the wheel nut, reverse the wheel nut so that the flat part of the wheel nut is against the washers.

4. Using 4 or 5 flat washers and a wheel nut, tighten the wheel nut until the wheel stud is fully seated in the wheel hub.

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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's straight path. Lead is the vehicle deviation from a straight path on a level road without pressure on the steering wheel. Refer to Radial Tire Lead/Pull Correction in order to determine if the vehicle has a tire lead problem.

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

- Inspect for visible damage to the suspension components and replace as necessary.
- Inspect the tires for the proper inflation and irregular tire wear. Refer to Vehicle Certification, Tire Placard, Anti-Theft, and Service Parts ID Label and Tire Diagnosis - Irregular or Premature Wear.
- Inspect the runout of the wheels and the tires. Refer to Tire and Wheel Runout Specifications.
- Inspect the wheel bearings for backlash and excessive play. Refer to Wheel Bearings Diagnosis.
- Inspect the ball joints for looseness or wear.
- Inspect the 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 Tightening 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.
- Inspect the fuel level. The fuel tank should be full or the vehicle should have a compensating load added.

Give consideration to excess loads, such as tool boxes, sample cases, etc. If normally carried in the vehicle, these items should remain in the vehicle during alignment adjustments. Give consideration also to the condition of the equipment being used for the alignment. Follow the equipment manufacturer's 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's 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.

Note:

- Record the "Before" and "After" alignment measurements.
- When performing adjustments to vehicles requiring a 4-wheel alignment, set the rear toe adjustment first in order to obtain proper front alignment angles.
4. Adjust alignment angles to vehicle specification, if necessary. Refer to Wheel Alignment Specifications.