

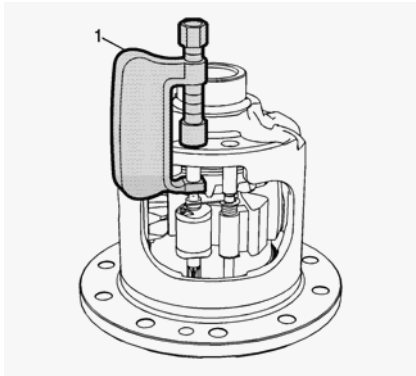
2013 Chevrolet Colorado

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

Tools Required

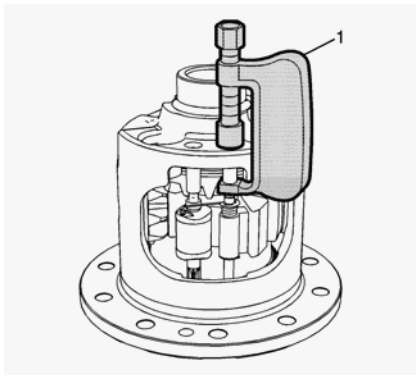
Locking Differential Governor Remover

[Disassemble Locking Differential](#)



1. Using the (1) remove the governor bushing.
2. Remove the governor assembly.

To aid in the removal of the governor assembly, turn the side gear as necessary to position the governor assembly between two of the side gear teeth.



3. bushing Using the (1) remove the latching bracket assembly.

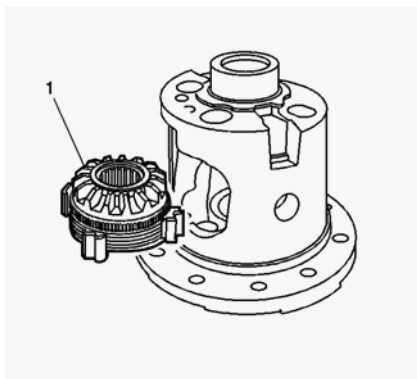
To aid in the removal of the latching bracket assembly, turn the side gear as necessary to position the latching bracket assembly between two of the side gear teeth.

4. Remove the pinion shaft lock bolt.
5. Remove the pinion shaft.
6. Remove the differential pinion gears and the thrust washers.

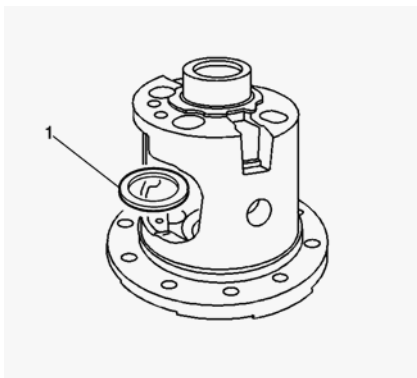
Rotate the pinion gears and roll the pinion gears and the thrust washers out of the case through the differential window.

Mark the pinion gears and thrust washers accordingly for re-assembly.

7. Remove the thrust block.
8. Remove the right side gear and clutch discs assembly.
9. Remove the right side shim.

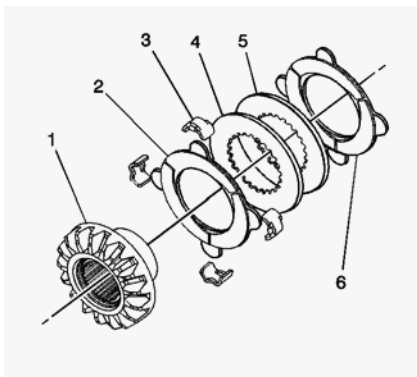


10. Remove the left side gear (cam unit) and clutch discs assembly.



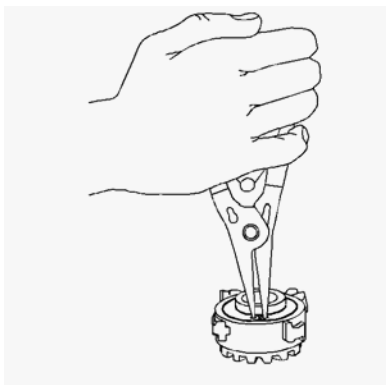
11. Remove the left side gear thrust washer.

[Disassemble Locking Differential Clutch Disc Assembly](#)

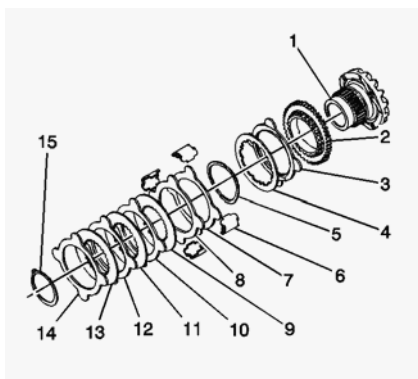


1. Remove the guide clips (3).
2. Remove the clutch discs and the splined discs (2, 4–6) from the locking differential side gear (1).

[Disassemble Locking Differential Cam Unit](#)



1. Remove the retaining ring.



2. Disassemble the cam unit and clutch disc assembly as follows:

1. Remove the guide clips (6).
2. Remove the clutch discs and the splined discs (7–14).
3. Remove the wave washer (5).
4. Remove the fuse disc (4).
5. Remove the carbon eared disc (3).
6. Disassemble the cam plate (2) from the cam side gear (1).

Clean and Inspect Locking Differential

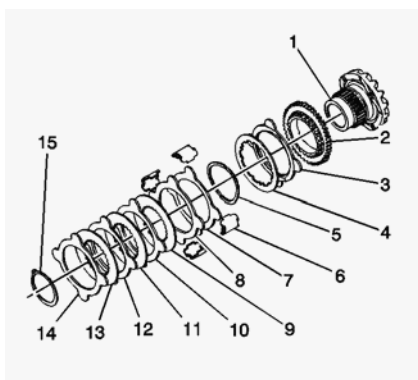
1. Clean all the parts with an approved solvent.
2. Visually inspect all the parts for excessive wear or breakage. Replace the parts if necessary.
3. Inspect the pinion gear and the side gear teeth for any the following conditions:

- Wear
- Cracks
- Scoring
- Spalling
- Inspect the thrust washer and shim for wear.
- Inspect the fit of the side gears on the axle shafts.
- Inspect the differential case for cracks and scoring. Replace the differential if any damage to the case is found.
- Inspect the side gear bore for scoring. If scoring is present, replace the differential.

Important: Do not replace the thrust block unless it is necessary.

- Inspect the thrust block for excessive wear.

Assemble Locking Differential Cam Unit



1. Apply recommended axle lubricant, to the surface of each disc.
2. Assemble the left side or the flange-end side cam unit and clutch disc assembly as follows:

1. Install the cam plate (2) to the cam side gear (1).
2. Install the carbon-faced eared disc (3).
3. Install the fuse disc (4).
4. Install the 1st non-carbon eared disc (7).
5. Install the 2nd non-carbon eared disc (8).
6. Install the wave washer (5).
7. Install the 1st splined disc (9).
8. Install the 3rd non-carbon eared disc (10).
9. Install the 2nd splined disc (11).
10. Install the 4th non-carbon eared disc (12).
11. Install the 3rd splined disc (13).
12. Install the 5th non-carbon eared disc (14).

13. Install the retaining ring (15).

Compress the clutch disc pack and align the teeth on the 3rd splined disc with the teeth on the cam plate in order to seat the retaining ring in the groove on the cam side gear.

14. Install the guide clips (2) to the clutch disc pack.

Apply grease to the guide clips in order to hold the clips in place on the disc ears.

[Locking Differential Adjustment](#)

Special Tools

- Magnetic Base Dial Indicator
- Dial Indicator Sleeve
- Dial Indicator

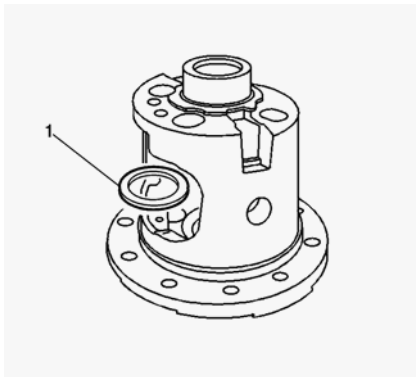
[Adjustment of the Differential](#)

Note: If it is necessary to replace the left side gear (cam unit) and disc assembly, the right side gear and disc assembly, or the thrust block, the entire differential must be adjusted. The differential is adjusted using selective thickness thrust washers between the clutch pack assemblies and the case and/or different selective thickness thrust blocks.

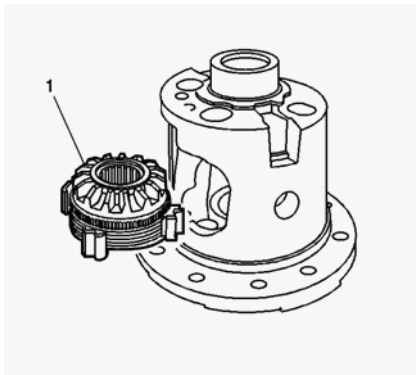
When adjusting the differential, note the following:

- Build up the clutch disc packs properly.
Proper clearance between parts is critical to the operation of the unit.
- Adjust the backlash and thrust block clearance in the following order:
 1. The left side gear backlash
 2. The right side gear backlash
 3. The thrust block clearance

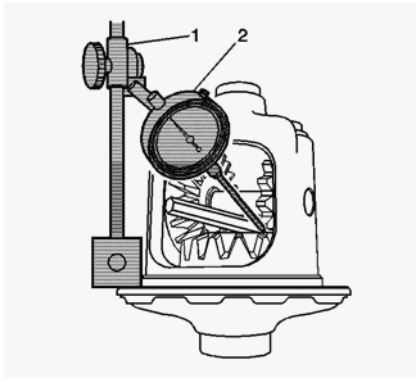
[Left Side Gear Backlash Adjustment](#)



1. Install the new left side thrust washer into the flange end of the differential case.



2. Install the left side gear (cam unit) and clutch pack assembly into the differential case.
3. Install the pinion gears with the pinion thrust washers into the differential case.
Align the openings of the pinion gears and the pinion thrust washer to the pinion shaft opening in the differential case.
4. Install the pinion shaft. It may be necessary to press down on the side gear in order to align the pinion gear shaft opening with the pinion shaft opening in the differential case.
If the pinion shaft cannot be installed after pressing on the side gear, replace the side gear thrust washer with a thinner washer.
- Caution:** Refer to Fastener Caution.
5. Install the pinion shaft lock bolt.
Tighten the pinion shaft lock bolt finger tight.
6. Rotate the pinion gear closest to the lock bolt so that one of the teeth is pointing downward, perpendicular to the ring gear flange.
7. Install a brass drift between the side gear and the pinion shaft.
Press the brass drift in far enough in order to compress the clutch discs.



8. Measure the backlash of the pinion gear and the side gear by doing the following:

1. Install the (1) to the ring gear flange.
2. Loosely clamp the (2) onto the stem on the (1).
3. Place the contact pad of the on one of the teeth of the pinion gear closest to the pinion shaft lock bolt.
Turn the dial of the until the needle and the dial face indicate zero.

Tighten

Tighten the lock nut of the finger tight.

4. Pull the pinion gear firmly into the differential case seat.
 5. Rotate the pinion gear back and forth.
 6. Measure the backlash.
- Specification**
The backlash for the pinion gears should be 0.000–0.076 mm (0.000–0.003 in).
9. If the backlash is too large, install a thicker side gear thrust washer and inspect the backlash.
 10. If the backlash is too small, install a thinner side gear thrust washer and inspect the backlash.

Left side gear thrust washers are available in the following sizes:

Washer Sizes

- o 0.56 mm (0.022 in)
- o 0.68 mm (0.027 in)
- o 0.81 mm (0.032 in)
- o 0.91 mm (0.036 in)
- o 1.02 mm (0.040 in)
- o 1.12 mm (0.044 in)
- o 1.22 mm (0.048 in)
- o 1.32 mm (0.052 in)

Right Side Gear Backlash Adjustment

1. If necessary, remove the following from the differential case:

1. The pinion lock shaft bolt
2. The pinion shaft
3. The pinion gears
4. The pinion gear thrust washers
5. The left side gear (cam unit) and clutch disc assembly

2. Install the right side gear thrust washer into the bell-end of the differential case.
3. Install the right side gear and clutch pack assembly into the differential case.
4. Install the pinion gears with the pinion thrust washers into the differential case.

Align the openings of the pinion gears and the pinion thrust washer to the pinion shaft opening in the differential case.

5. Press down on the side gear and install the pinion shaft.

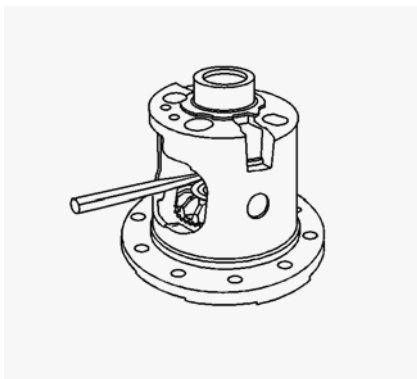
If the side gear cannot be pressed down far enough to install the pinion shaft, replace the side gear shim with a thinner shim.

6. Install the pinion shaft lock bolt.

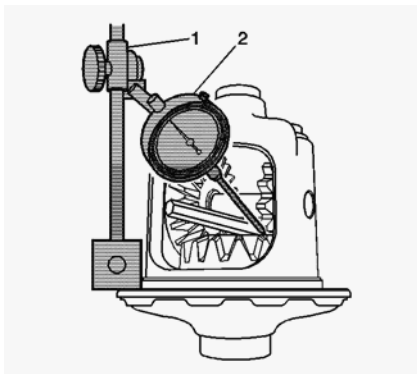
Tighten

Tighten the pinion shaft lock bolt finger tight.

7. Rotate the pinion gear so that one of the teeth is pointing downward, perpendicular to the ring gear flange.



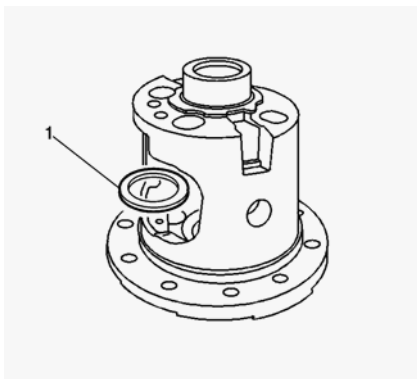
8. Install a brass drift between the side gear and the pinion shaft.
Press the brass drift in enough, in order to compress the clutch discs.



9. Measure the backlash of the pinion gear and the right side gear by doing the following:
 1. Install the (1) to the ring gear flange.
 2. Loosely clamp the (2) onto the stem on the (1).
 3. Place the contact pad of the on one of the teeth of the pinion gear closest to the pinion shaft lock bolt.
Turn the dial of the until the needle and the dial face indicate zero.
 4. Tighten the lock nut of the finger tight.
 5. Pull the pinion gear firmly into the differential case seat.
 6. Rotate the pinion gear back and forth.
 7. Measure the backlash.

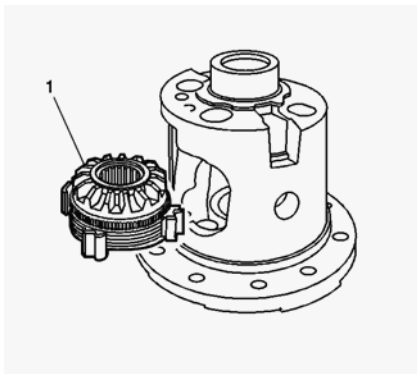
Specification
The backlash for the pinion gears should be 0.000–0.076 mm (0.000–0.003 in).
10. Right side gear shims are available in the following sizes:
Shim Sizes
 - 0.254 mm (0.010 in)
 - 0.381 mm (0.015 in)
 - 0.508 mm (0.020 in)
 - 0.635 mm (0.025 in)
 - 0.762 mm (0.030 in)
 - 0.899 mm (0.035 in)
 - 1.016 mm (0.040 in)
 - 1.143 mm (0.045 in)
11. If the backlash is too large, install a thicker side gear shim and recheck the backlash.
12. If the backlash is too small, install a thinner side gear shim and recheck the backlash again.

[Thrust Block Clearance Adjustment](#)



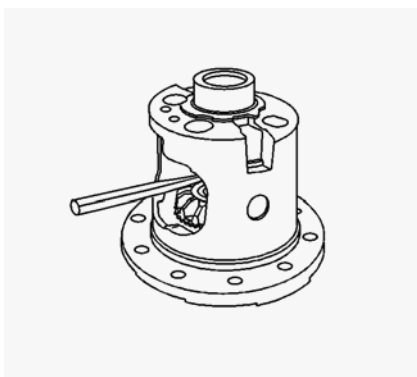
Note: The left and right side gear backlash measurements must be done before the thrust block measurement can be completed.

1. Install the left side gear thrust washer into the differential case.

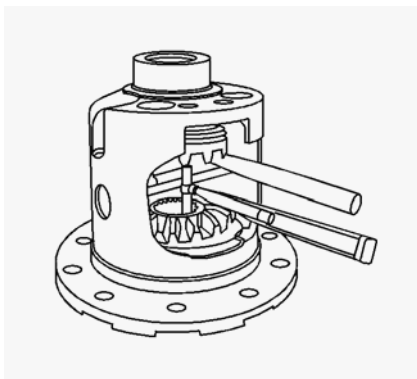


2. Install the left side gear (cam unit) and clutch disc assembly into the differential case.
3. Install the right side shim into the differential case.
4. Install the right side gear and clutch disc assembly into the differential case.
5. Install the pinion shaft.
6. Install the pinion shaft bolt.

Tighten the pinion shaft bolt finger tight.



7. Install a brass drift between the left side gear and the pinion shaft.
Press the brass drift in far enough in order to compress the clutch disc assembly and hold the left side gear assembly in place.
8. Install a brass drift between the right side gear and the pinion shaft.
Press the brass drift in far enough, in order to hold the right side gear assembly in place.



Note: Do not measure the distance between the side gear teeth.

9. Measure the distance between the side gear faces using a 25.4–50.8 mm (1–2 in) telescoping gauge.
10. Remove the telescoping gauge.
11. Measure the telescoping gauge with a micrometer. Record the measurement.
12. Compare the measurement obtained in step 11 to the thrust block sizes available. If the measurement is equal to one of the thrust blocks sizes available, then select that thrust block.
13. If the measurement obtained in step 11 is not equal to one of the thrust blocks sizes available, then select the thrust block that is smaller than the measurement.

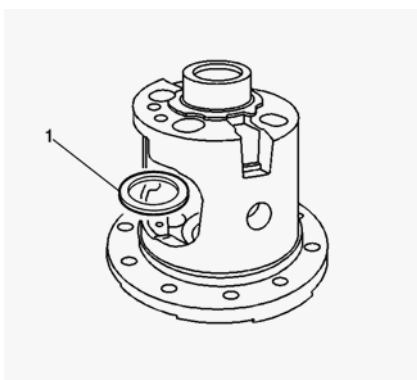
For example, if the measurement is 32.13 mm (1.265 in), select the 32.05 mm (1.262 in) thrust block.

Note: The backlash must be rechecked and adjusted to specification anytime the left and/or the right thrust washers are replaced.

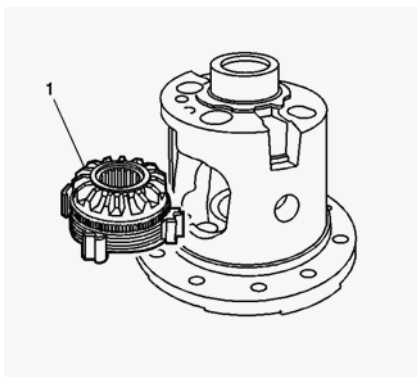
14. If the measurement obtained in step 11 is less than 33.58 mm (1.32 in), then reduce the left side gear thrust washer or the right side gear shim thickness in order to increase the thrust block opening.
15. If the measurement obtained in step 11 is greater than 34.19 mm (1.34 in), then increase the left side gear thrust washer or the right side gear shim thickness in order to decrease the thrust block opening.
16. Inspect the left and/or right side gear backlash and adjust as necessary.
17. Inspect the thrust block clearance and adjust as necessary.

Assemble Locking Differential

Note: The left and right side gear backlash and thrust block thickness measurement must be completed before the components of the locking differential can be assembled.



1. Install the left side gear thrust washer.



2. Install the left side gear (cam unit) and clutch disc assembly.
3. Install the right side gear thrust washer.
4. Install the right side clutch pack assembly.
5. Install the right side gear.

Note: If the original pinion gears and thrust washers are being re-used, install the pinion gears and thrust washers on the same side as when removed.

6. Install the pinion gear and the pinion thrust washers.

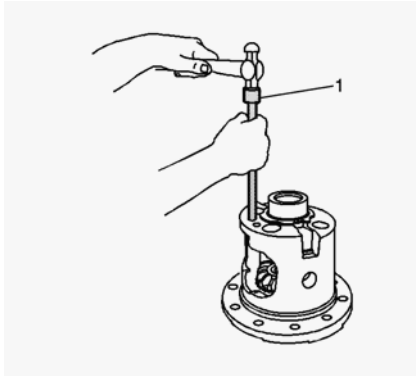
Place the pinion gears and the pinion thrust washers 180 degrees apart.

7. Rotate the pinion gears and the pinion thrust washers 90 degrees and align the pinion gears with the pinion shaft opening in the differential case.
8. Install the thrust block.

The open side of the thrust block must face the window opening.

9. Install the pinion shaft.
10. Install the new pinion shaft lock bolt.

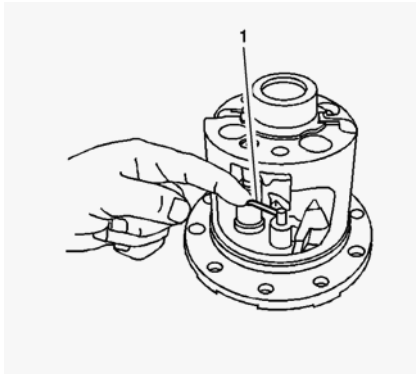
Tighten the pinion shaft lock bolt finger tight.



11. Install the governor assembly.
12. Install the governor bushing using a hammer and a brass drift.

Specification

Press the bushing into place until there is 0.25–1.27 mm (0.010–0.050 in) of shaft end play.



13. Install the latching bracket assembly.

The straight end of the latching bracket spring must be over and outside the governor assembly shaft.

14. Install the latching bracket bushing using a hammer and a brass drift.

Specification

Press the bushing into place until there is 0.000–0.051 mm (0.000–0.002 in) of shaft end play.

Caution: Refer to Fastener Caution.

15. Tighten the pinion shaft lock bolt.

Tighten

Tighten the pinion shaft lock bolt to 36 Y (27 lb ft).

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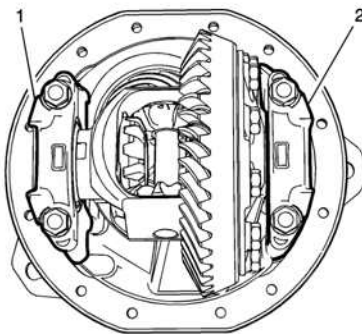
Special Tools

- GE-8092 Driver Handle
- DT-8107-4 Bearing Washer Puller
- DT-21784 Side Bearing Installer
- DT-22888-20A Bearing Puller

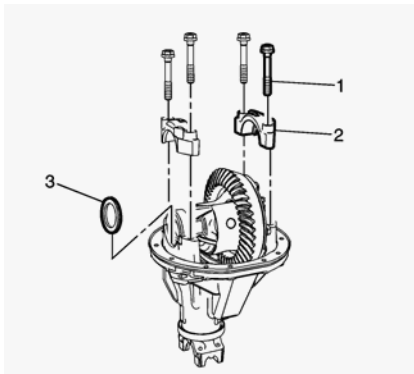
For regional equivalent tools, refer to Special Tools.

Removal Procedure

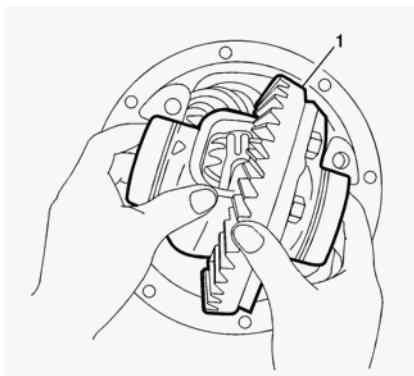
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.
3. Install the differential carrier in a suitable holding fixture.



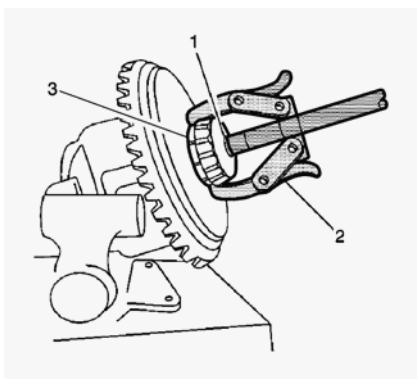
4. Mark the left (1) and right (2) bearing caps before removing from the differential carrier.



5. Remove the bearing cap bolts (1).
6. Remove the left and the right bearing caps (2).
7. Remove the shim (3).

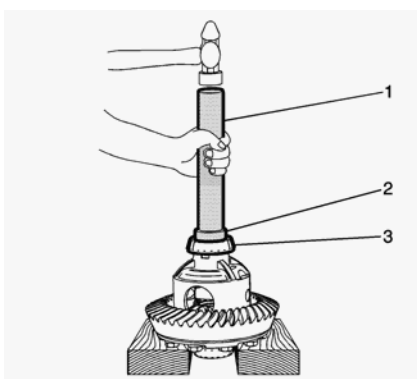


8. Remove the differential case (1).

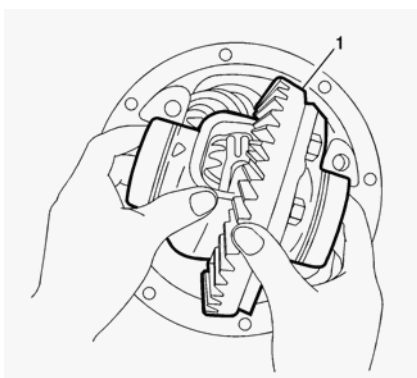


9. Install the differential case in a soft jawed vise.
10. Using the DT-8107-4 puller (2) and the DT-22888-20A puller (2) remove the differential case side bearing (3).

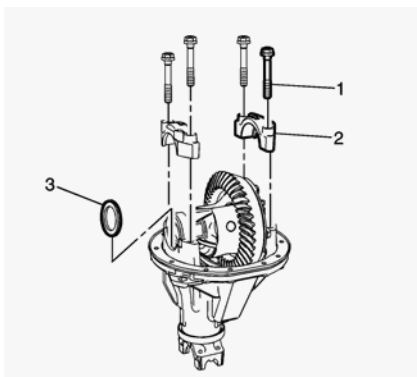
[Install Procedure](#)



1. Using the GE-8092 handle (1) and the DT-21784 installer (2), install the differential case bearing (3).



2. Install the differential case assembly (1) into the differential carrier.



Note: Ensure that the reference marks for the left and right bearing caps are installed correctly.

3. Install the bearing shims (3) and the bearing caps (2).
4. Install and tighten the bearing cap bolts to **98 Y (72 lb ft)**
5. Adjust the back lash. Refer to Backlash Adjustment.
6. Remove the differential carrier in a suitable holding fixture.

Differential Bearing Replacement

7. Install the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.
8. Remove the supports and lower the vehicle.

2013 Chevrolet Colorado

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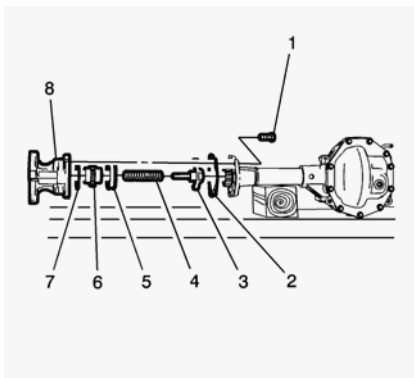
Special Tools

- DT 50813 Pinion Gear Remover
- DT 7817 Outer Pinion Bearing Cup Installer
- GE 8092 Driver Handle
- DT 29609 Inner Pinion Bearing Cup Installer
- DT 5590 Inner Pinion Bearing Installer
- DT 08614-A Pinion Flange Holder and Remover
- EN 21128 Axle Seal Installer
- DT-21784 Bearing Installer

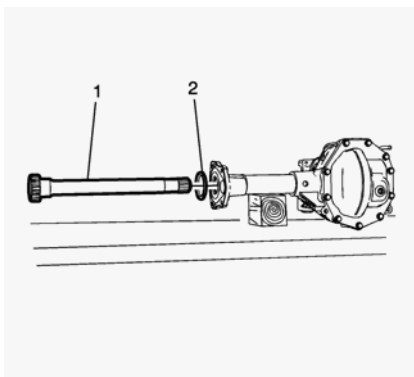
For regional equivalent tools, refer to Special Tools.

Removal Procedure

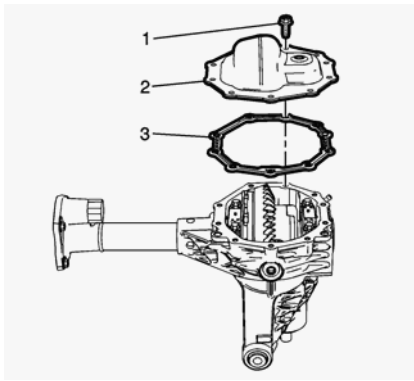
1. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the drive pinion yoke and the oil seal. Refer to Front Differential Drive Pinion Gear Yoke Replacement.
3. Remove the front drive actuator. Refer to Front Drive Axle Actuator Replacement.
4. Remove the front differential carrier assembly. Refer to Differential Carrier Assembly Replacement.



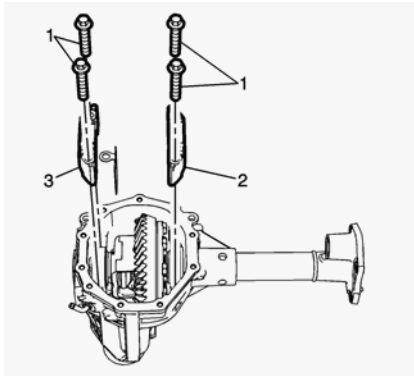
5. Remove the mounting bolt (1), actuator housing (8), shim (7), clutch gear (6), clutch sleeve (5), clutch fork spring (4), clutch fork (3) and the gasket (2) from the front differential carrier.



6. Remove the axle shaft (1) and shim (2) from the front differential carrier.

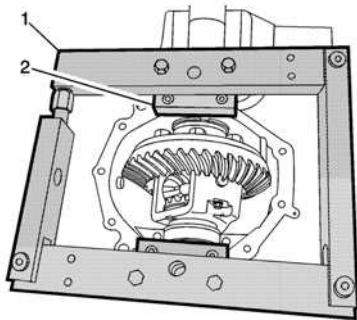


7. Remove the 10 differential cover bolts (1), differential cover (3) and the gasket (2) from the differential carrier.

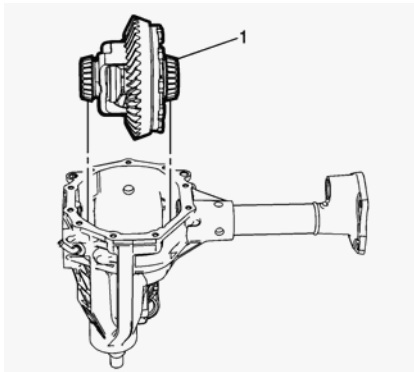


Note: Ensure that you mark the left and right bearing caps for the differential case before removing the bearing caps.

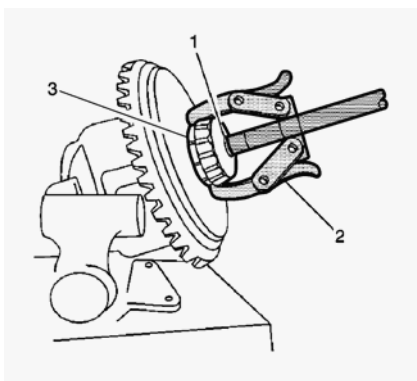
8. Remove the left and right bearing cap bolts (1) from the differential case.
9. Remove the left (3) and right (2) differential bearing caps.



10. Using the J 45222 spreader (1) and the J 45222-20 adapter (2), adjust the spreader 0.250 mm to allow the removal of the differential case.

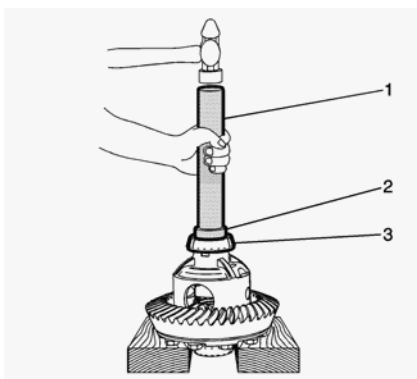


11. Remove the differential case (1) from the rear axle housing.

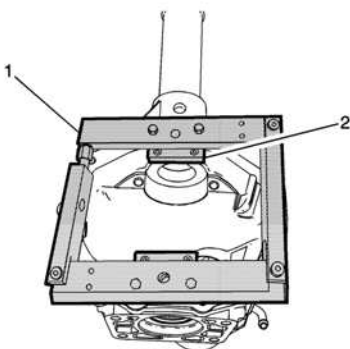


12. Install the differential case in a soft jawed vise.
13. Using the DT-8107-4 puller (2) and the DT-22888-20A puller (2) remove the differential case side bearings (3).

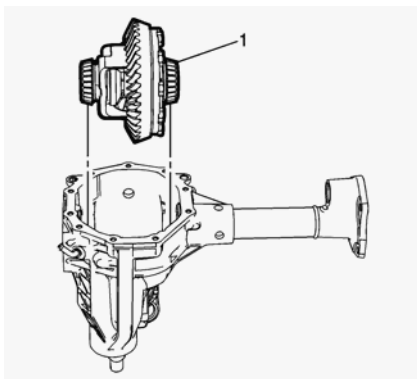
[Installation Procedure](#)



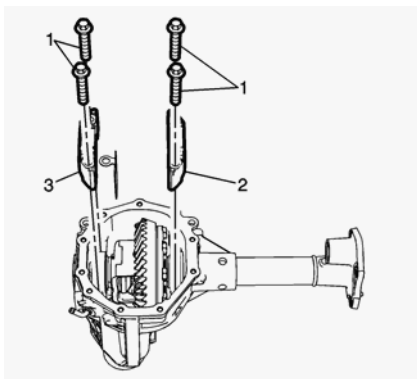
1. Using the GE 8092 handle (1) and the DT-21784 installer (2) install the differential side case bearing (3).



2. Using the J 45222 spreader (1) and the J 45222-20 adapter (2), adjust the spreader 0.250 mm to install in the differential case.

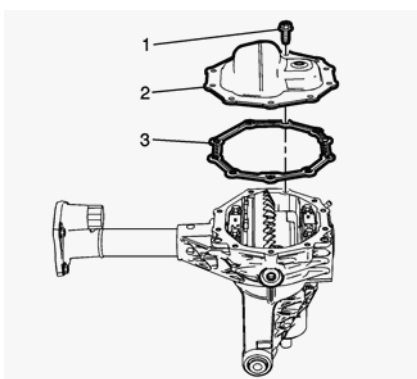


3. Position the differential case (1) in the differential carrier.
4. Remove the case spreader and adapter.

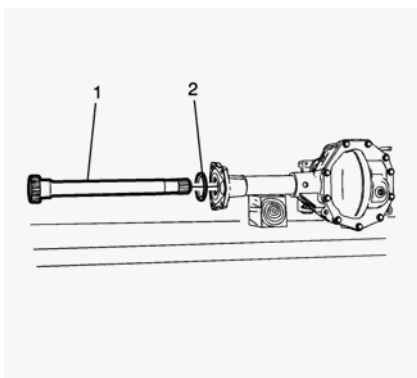


Note: Ensure that the case bearing caps and shims are installed as they were removed.

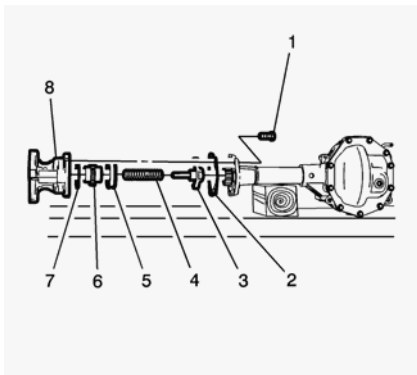
5. Position the left (3) and the right (2) bearing caps in the differential carrier.
6. Install the differential case bearing cap bolts (1) and tighten to **98 Y (72 lb ft)**.
7. Adjust the backlash. Refer to Backlash Inspection and Adjustment.
8. Once the differential side bearing preload and backlash is correct, perform a gear tooth contact pattern check in order to ensure proper alignment between the ring and pinion gears. Refer to Gear Tooth Contact Pattern Inspection.



9. Install the differential cover gasket (3) and the cover (2).
10. Install the 10 differential cover bolts (1) and tighten to **30 Y (22 lb ft)**.



11. Install the wheel drive shaft (1) and shim (2) in the differential carrier.



12. Install the clutch sleeve (5), clutch gear (6), clutch fork spring (4), clutch fork (3), shim (7), gasket (2) and the housing (8).
13. Tighten the clutch housing bolts to **47 Y (35 lb ft)**.

Differential Bearing Replacement

14. Install the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.
15. Install the front drive actuator. Refer to Front Drive Axle Actuator Replacement.
16. Fill up the axle fluid in the differential carrier. Refer to Front Axle Lubricant Replacement.
17. Lower the vehicle.

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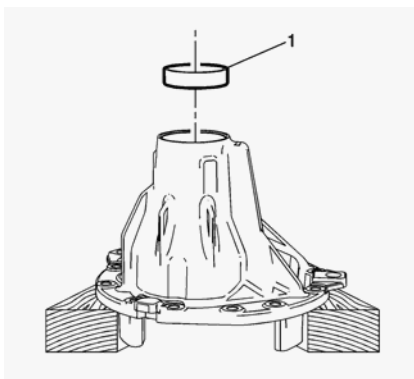
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Special Tools

- DT-7817 Pinion Bearing Cup Installer
- DT-08614-A Flange Remover Installer
- DT-28677 Pinion Bearing Cup Installer
- DT-38694 Seal Installer
- DT-49032 Bearing Installer
- GE-8092 Driver Handle

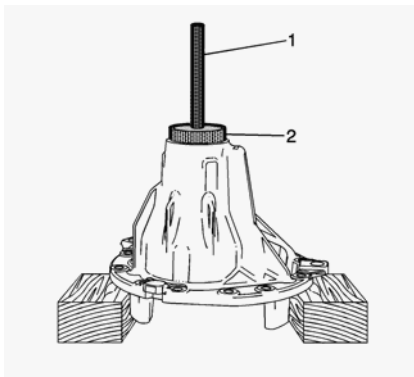
For regional equivalent tools, refer to Special Tools.

[Assemble Procedure](#)

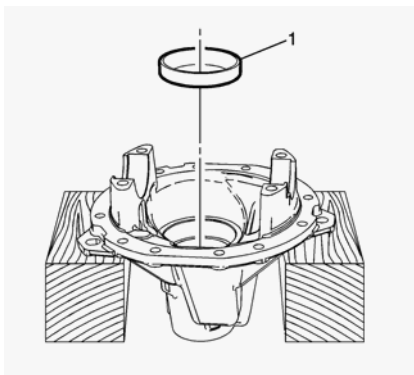


Note: Ensure that the bearing cup is even in the differential carrier.

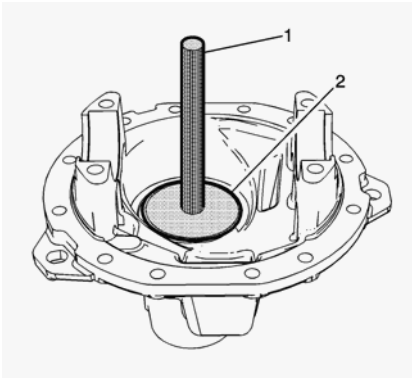
1. Position the outer pinion bearing cup (1) in the differential carrier.



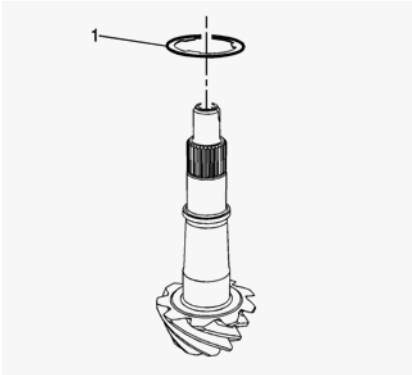
2. Using the GE-8092 handle (1), DT-28677 installer (2) and the hammer, install the outer bearing cup.



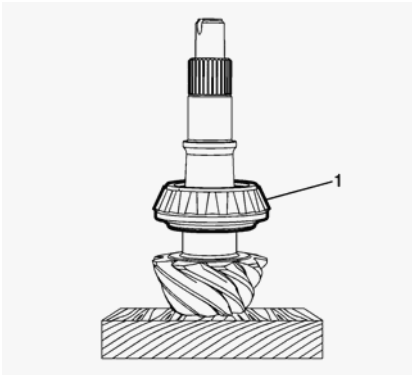
3. Position the inner pinion gear bearing cup (1) in the differential case



4. Using the GE-8092 handle (1) ,DT-49032 installer (2) and the hammer, install the inner differential bearing cup.
5. Set the pinion depth. Refer to Pinion Depth Adjustment.

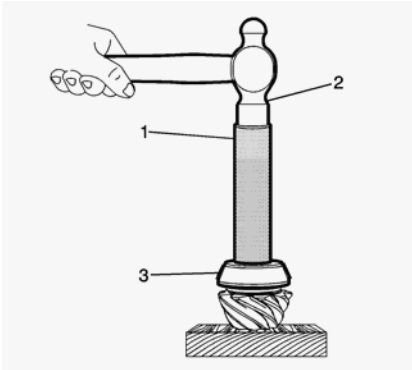


6. Install the correct pinion gear shim (1).

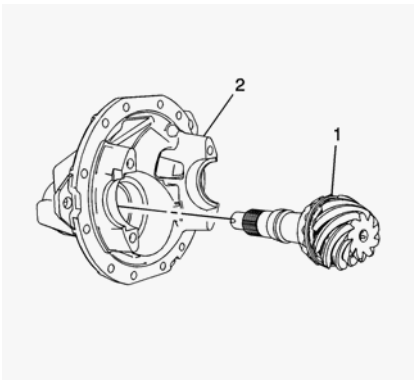


Note: Ensure that the pinon bearing is even on the pinion gear.

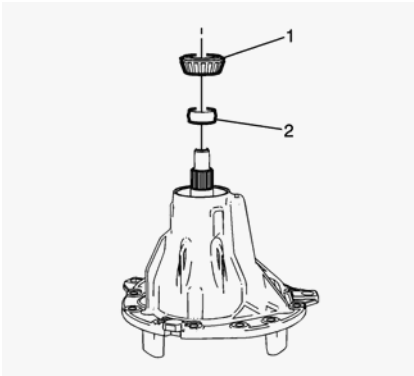
7. Position the pinon inner bearing (1) on the pinion gear.



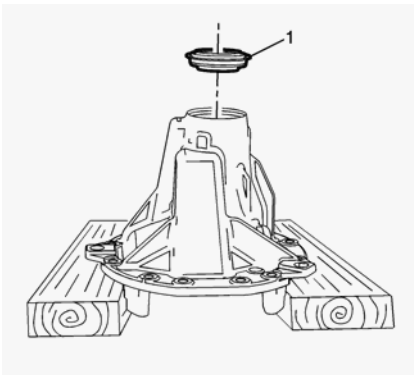
8. Using the DT-7817 installer (1) and a hammer (2), install the inner pinion bearing (3).



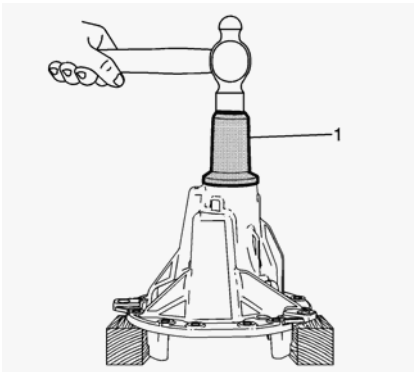
9. Install the pinion gear (1) in the differential carrier (3).



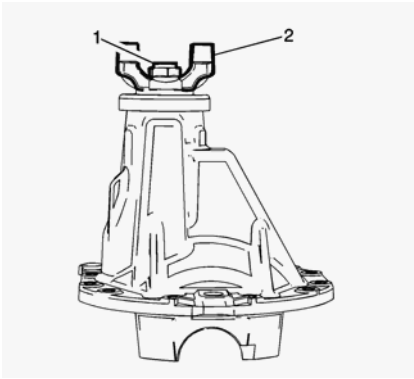
10. Position the New collapsible spacer (2) and the outer pinion bearing (1) on the pinion gear.



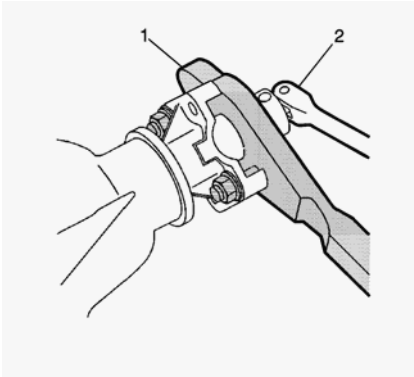
11. Position the pinion gear seal (1) on the differential carrier.



12. Using the DT-38694 installer (1) and the hammer, install the pinion gear seal.



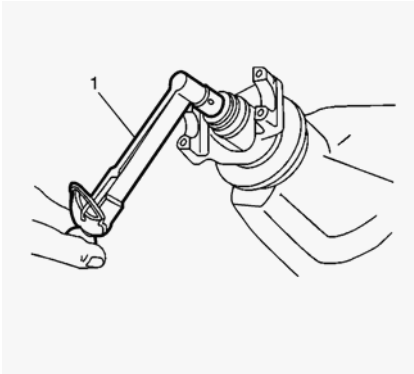
13. Install the NEW pinion nut (1) and the flange (2).
14. Hand tighten the NEW pinion nut (1).



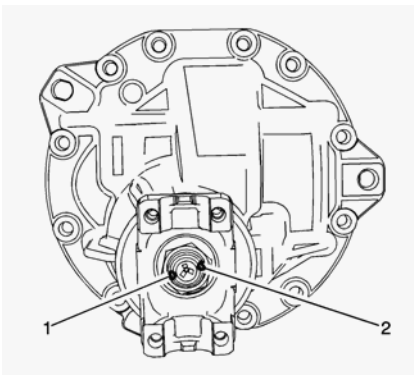
Caution: Refer to Fastener Caution.

Note: In the following procedures, DO NOT loosen and retighten the pinion nut.

15. Using the DT-08614-A installer (1) and (2), tighten the pinion gear nut to **245 – 294 Y (181 – 217 lb ft)** or until the end play is gone.

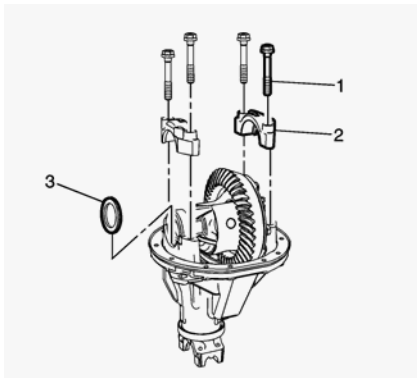


16. Using the inch pound torque wrench and the proper size socket (1), measure the rotational torque of the pinion gear which should be **0.7 – 1.1 Y (6–10 lb in)**.



17. Using the appropriate tools, stake the pinion gear nut (1).
18. Adjust the pinion depth. Refer to Pinion Depth Adjustment.

Differential Carrier Assembly Assemble (.)



19. Install the differential bearing caps (2) and the bolts (1) and tighten to **108 Y (80 lb ft)**.
20. Adjust the backlash. Refer to Backlash Adjustment.

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Submodel: | Engine Type: | Liters:
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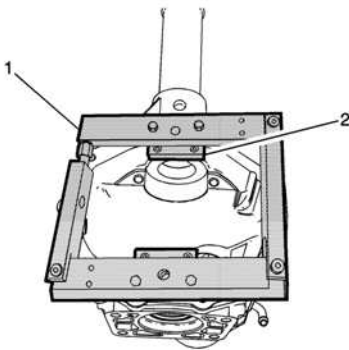
Special Tools

- J 45222 Axle Housing Spreader
- J 45222-20 Axle Housing Spreader Adapter

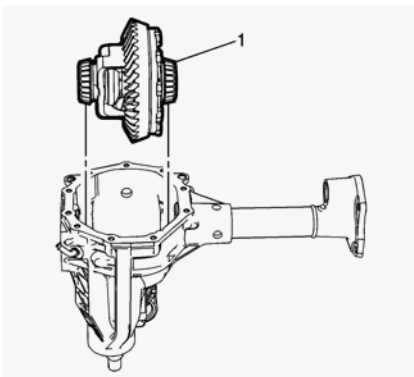
For regional equivalent tools, refer to Special Tools.

Assemble Procedure

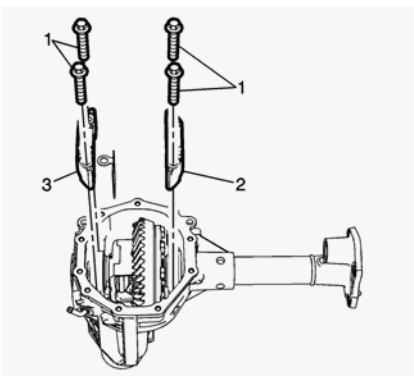
1. Install the pinion gear in the differential carrier. Refer to Differential Drive Pinion Gear Bearing Replacement



2. Install the J 45222 spreader (1) and the J 45222-20 adapter (2), and adjust the spreader 0.250 mm to install in the differential case, if removed.



3. Position the differential case (1) in the differential carrier.
4. Remove the case spreader and adapter.

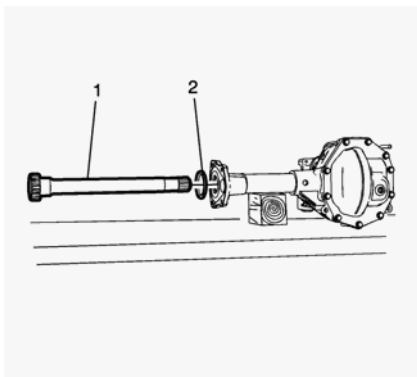


Note: Ensure that the case bearing caps and shims are installed as they were removed.

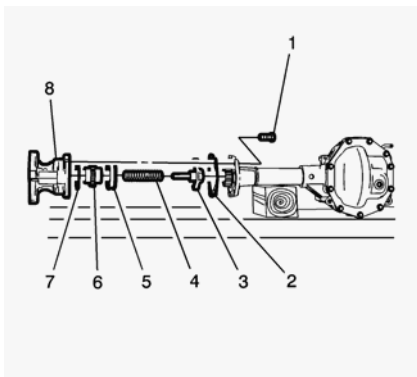
5. Position the left (3) and the right (2) bearing caps in the differential carrier.

Caution: Refer to Fastener Caution.

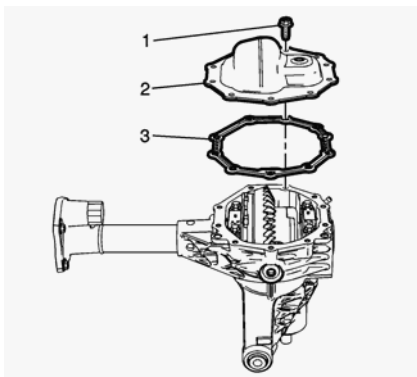
6. Install the differential case bearing cap bolts (1) and tighten to **98 Y (72 lb ft)**.



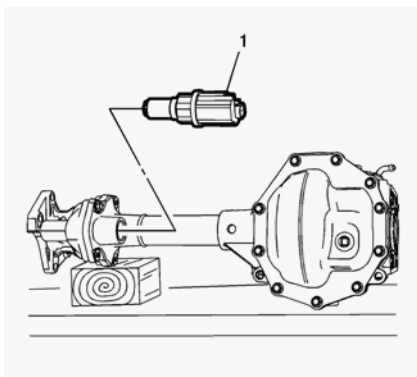
7. Install the wheel drive shaft (1) and shim (2) in the differential carrier.



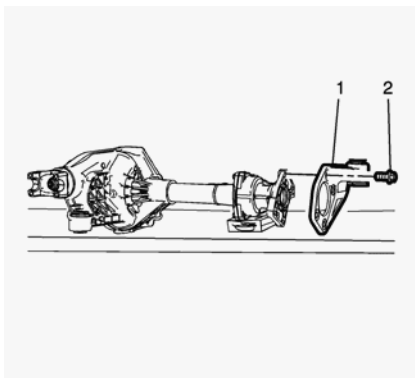
8. Install the clutch sleeve (5), clutch gear (6), clutch fork spring (4), clutch fork (3), shim (7), gasket (2) and the housing (8).
9. Install the 4 bolts housing bolts (1) and tighten to **47 Y (35 lb ft)**.



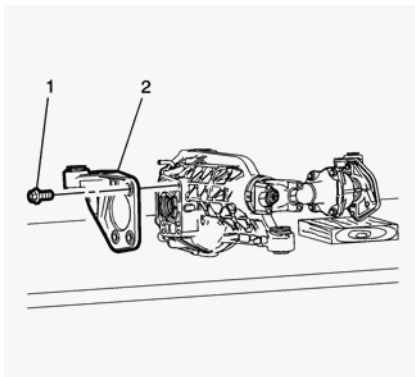
10. Install the differential cover gasket (3) and the cover (2).
11. Install the 10 differential cover bolts (1) and tighten to **30 Y (22 lb ft)**.



12. Install the actuator (1). Tighten the actuator to **30 Y (22 lb ft)**.



13. Install the right mounting bracket (1) and the 4 bolt (2). Tighten the bolts (1) to **160 Y (118 lb ft)**.



14. Install the left mounting bracket (1) and the 4 bolt (2). Tighten the bolts (1) to **160 Y (118 lb ft)**.
15. Install the front differential carrier in the vehicle. Refer to Differential Carrier Assembly Replacement.

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Fuel Delivery: | Fuel:

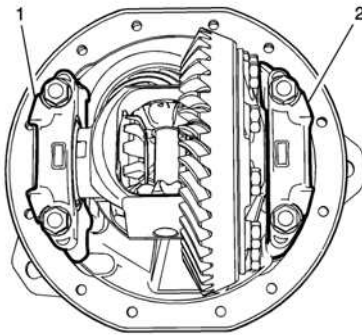
Special Tools

- DT-22912—A Split Plate Bearing Puller
- DT-50813 Pinion Remover Installer
- DT-08614—A Flange Remover Installer
- DT-49275 Pinion Bearing Remover
- EN-45000 Seal Remover

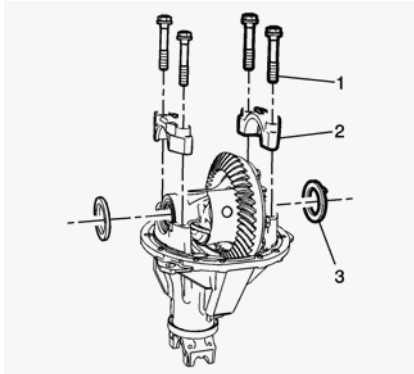
For regional equivalent tools, refer to Special Tools.

[Disassemble Procedure](#)

1. Install the differential carrier in a suitable holding fixture.



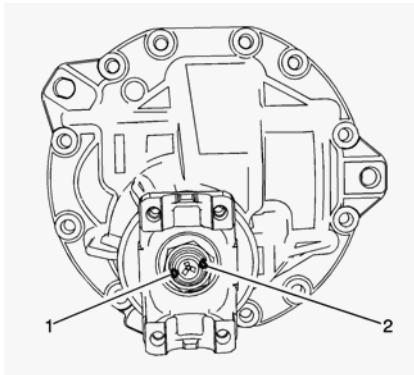
2. Mark the left (1) and right (2) case bearing caps.



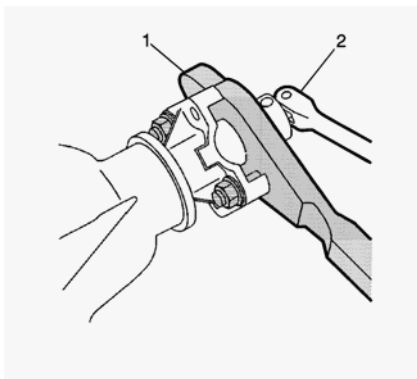
3. Remove the bearing cap bolt (1).

Note: Ensure that the left and right bearing caps and the adjusters are not mixed together. The bearing caps and adjusters are NOT interchangeable.

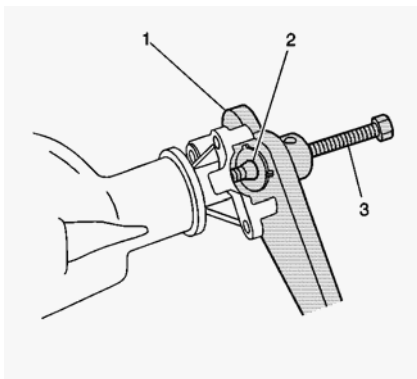
4. Remove the bearing caps (2).
5. Remove the adjusters (3).



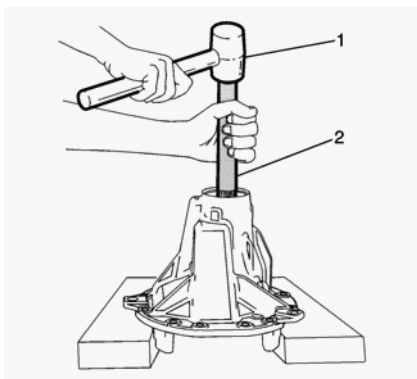
6. Using the appropriate tools, remove the stakes (1) and (2) from the pinion nut.



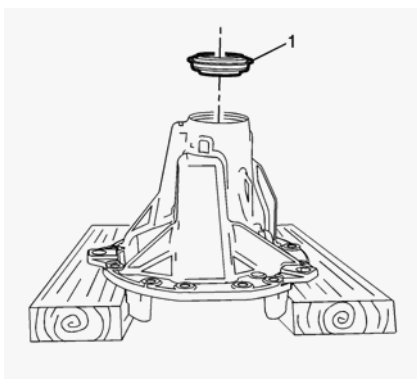
7. Using the *DT-08614-A* remover (1) and (2), remove the pinion flange nut.



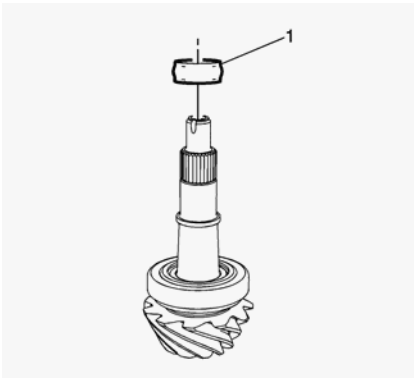
8. Using the *DT-08614-A* remover (1), (2) and (3), remove the pinion flange.



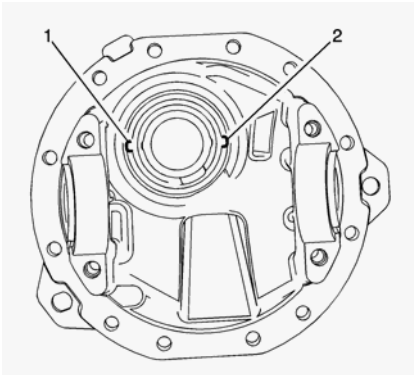
9. Using a hammer (1), and *DT-50813* remover (2), remove the pinion gear assembly.



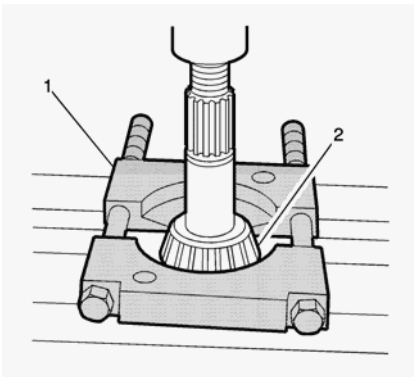
10. Using the *EN-45000* remover, remove the pinion seal (1).



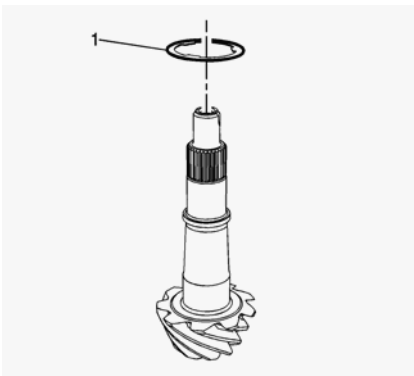
11. Remove the collapsible spacer (1).



12. Using a brass drift and a hammer alternating between slot (1) and (2), remove the outer and inner pinion bearing caps.



13. Using the DT-49275 puller (1), and a hydraulic press, remove the pinion gear bearing (2).



14. Remove the pinion gear shim (1).

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Submodel: | Engine Type: | Liters:
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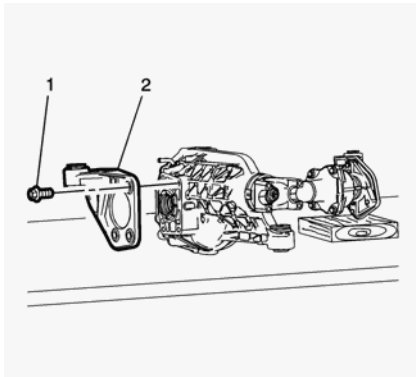
Special Tools

- J 45222 Axle Housing Spreader
- J 45222-20 Axle Housing Spreader Adapter

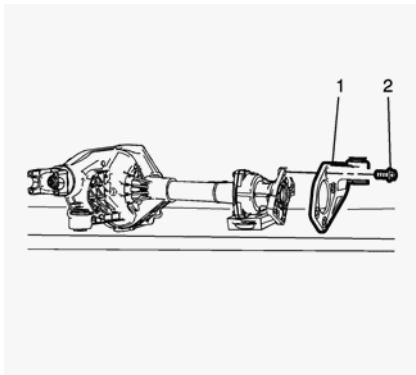
For regional equivalent tools, refer to Special Tools.

[Disassemble Procedure](#)

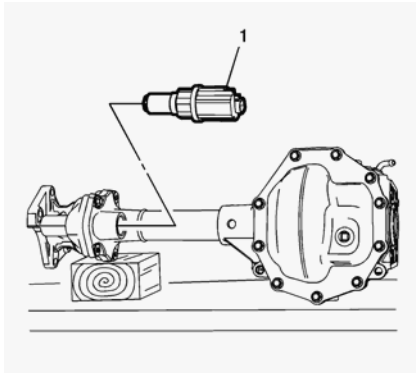
1. Remove the front differential carrier from the vehicle. Refer to Differential Carrier Assembly Replacement
2. Position the front differential in a suitable work area.



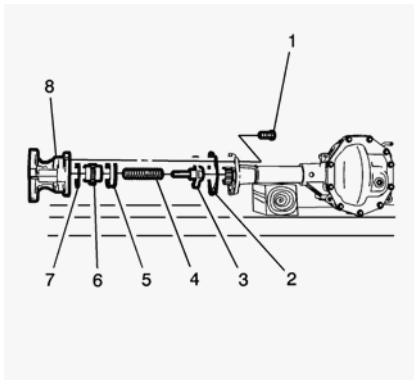
3. Remove the left mounting bracket (2) and the 2 bolts (1) from the differential carrier.



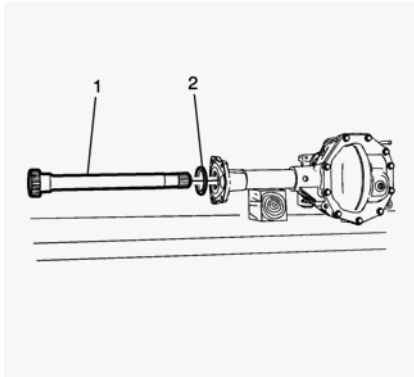
4. Remove the right mounting bracket (1) and the 2 bolts (2) from the differential carrier.



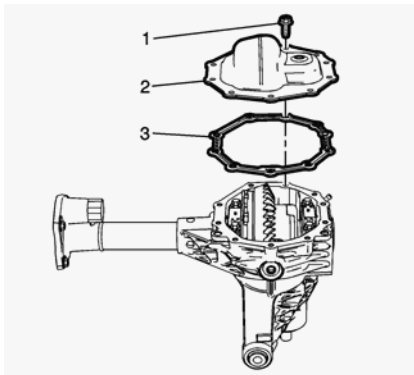
5. Remove the front drive actuator (1) from the front differential carrier.



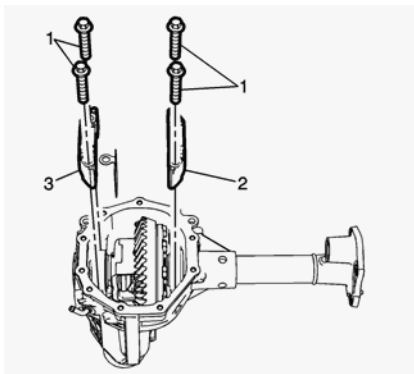
6. Remove the mounting bolt (1), actuator housing (8), shim (7), clutch gear (6), clutch sleeve (5), clutch fork spring (4), clutch fork (3) and the gasket (2) from the front differential carrier.



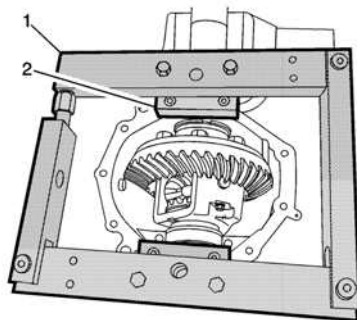
7. Remove the axle shaft (1) and shim (2) from the front differential carrier.



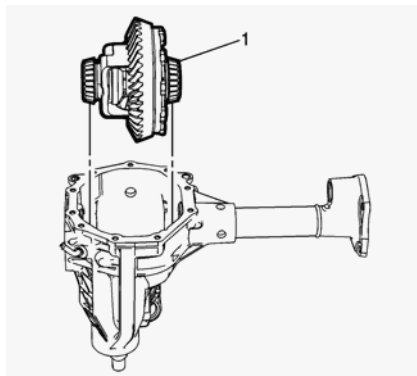
8. Remove the 10 differential cover bolts (1), differential cover (3) and the gasket (2) from the differential carrier.



- Note:** Ensure that you mark the left and right bearing caps for the differential case before removing the bearing caps.
9. Remove the left and right bearing cap bolts (1) from the differential case.
10. Remove the left (3) and right (2) differential bearing caps



11. Using the *J 45222* spreader (1) and the *J 45222-20* adapter (2), adjust the spreader 0.250 mm to allow the removal of the differential case.



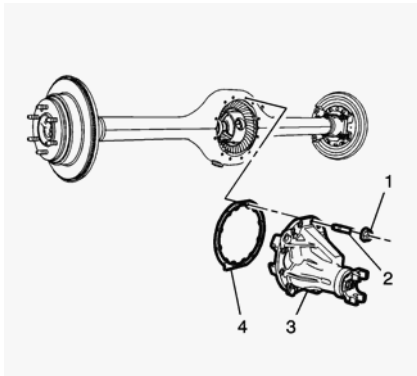
12. Remove the differential case assembly (1) from the differential carrier.
13. Remove the pinion gear from the differential carrier. Refer to Differential Drive Pinion Gear Bearing Replacement.

2013 Chevrolet Colorado

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

Removal Procedure

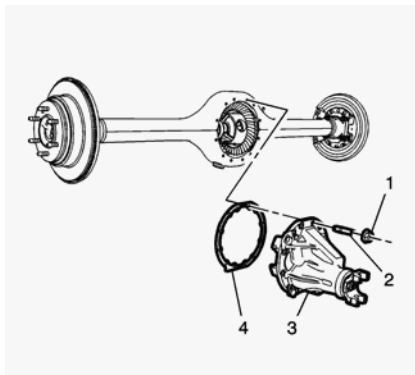
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
 2. Drain the rear axle assembly. Refer to Differential Oil Replacement.
 3. Remove the rear propeller shaft.
- For those vehicles equipped with the one piece propeller shaft, refer to One-Piece Propeller Shaft Replacement
 - For those vehicles equipped with the 2 piece propeller shaft, refer to Two-Piece Rear Propeller Shaft Replacement
 - Remove the rear axle shafts assembly from the rear axle. Refer to Rear Axle Shaft Replacement.



- Remove the 12 rear axle carrier nuts (1).
- Remove the differential carrier stud (2), if needed.
- Remove the differential carrier assembly (3).
- Remove the differential carrier gasket (4).

Installation Procedure

1. Clean the gasket area on the rear axle housing and the differential carrier.



Caution: Refer to Fastener Caution.

2. Install the differential carrier stud (2), if needed and tighten to:
 - For the 194 mm axle **25 Y (16 lb ft)**
 - For the 220 mm axle **65 Y (47 lb ft)**
- Install the differential carrier gasket (4) on the rear axle housing.
- Install the differential carrier assembly (3) on the rear axle housing.
- Install the 12 differential carrier nuts (1) and tighten to:
 - For the 194 mm axle **37 Y (27 lb ft)**
 - For the 220 mm axle **44 Y (33 lb ft)**
- Install the rear axle shafts assembly from the rear axle. Refer to Rear Axle Shaft Replacement.
- Install the rear propeller shaft.
- For those vehicles equipped with the one piece propeller shaft, refer to One-Piece Propeller Shaft Replacement
- For those vehicles equipped with the 2 piece propeller shaft, refer to Two-Piece Rear Propeller Shaft Replacement

Differential Carrier Assembly Replacement

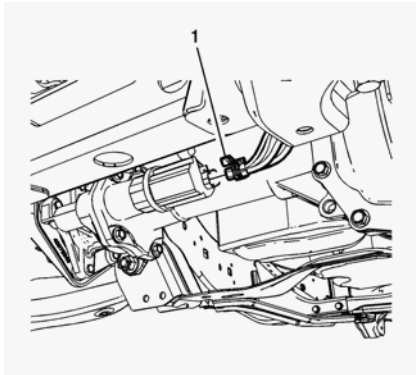
- Fill the rear axle assembly. Refer to Differential Oil Replacement.
- Remove the supports and lower the vehicle.

2013 Chevrolet Colorado

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

[Removal Procedure](#)

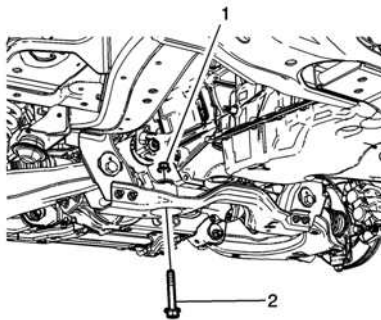
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Drain the front differential. Refer to Front Axle Lubricant Replacement.
3. Remove the front propeller shaft. Refer to Front Propeller Shaft Replacement.



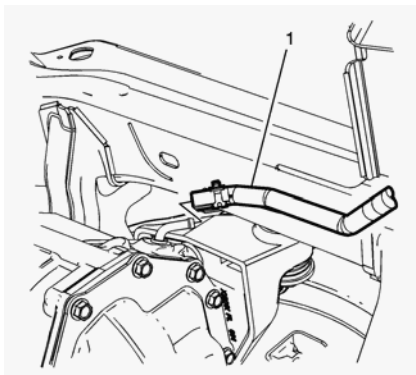
4. Remove the electrical connector (1) from the front actuator.
5. Remove the front wheel drive shafts. Refer to Front Wheel Drive Shaft Replacement.

Note: Ensure that the front differential assembly is securely attach to the transmission jack stand.

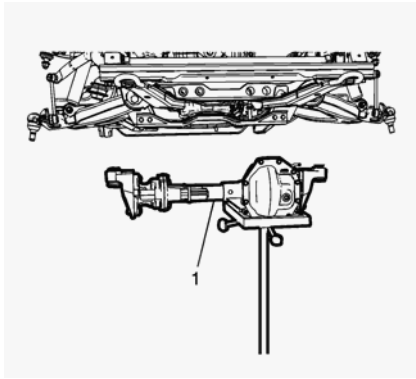
6. Support the front differential with a transmission jack stand.



7. Remove the bolt (2) and nut from the crossmember to the front differential.
8. Remove the crossmember. Refer to Drivetrain and Front Suspension Frame Front Crossmember Replacement.
9. Remove the bolts from the front differential bracket to the frame. Refer to Front Differential Carrier Bushing and Bracket Replacement.

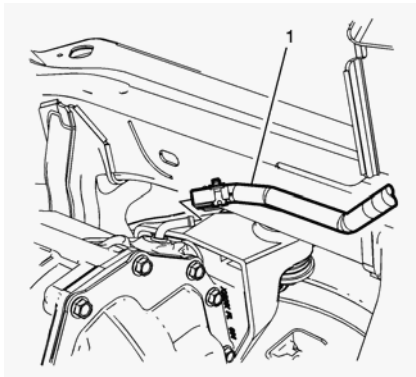


10. Remove the vent hose (1).

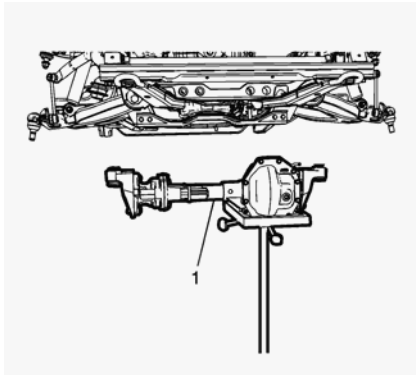


11. Remove the front differential assembly (1).

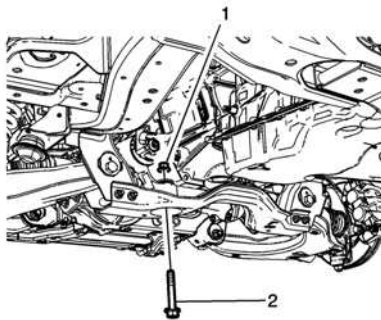
[Installation Procedure](#)



1. Install the vent hose (1) to the front differential.



2. Position the front differential (1) in the vehicle.
3. Install the bolts from the front differential bracket to the frame. Refer to Front Differential Carrier Bushing and Bracket Replacement.
4. Remove the transmission jack stand from the front differential.
5. Install the crossmember. Refer to Drivetrain and Front Suspension Frame Front Crossmember Replacement.

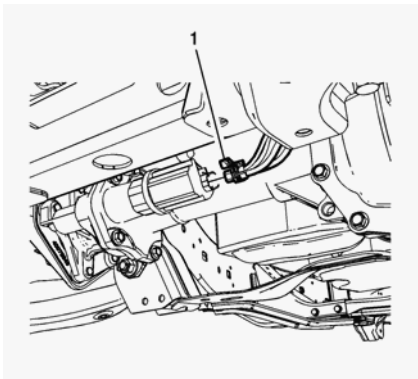


Caution: Refer to Fastener Caution.

6. Install the bolt (2) and nut from the crossmember to the front differential and tighten to **160 Y (118 lb ft)**.
7. Install the front wheel drive shafts. Refer to Front Wheel Drive Shaft Replacement.

Differential Carrier Assembly Replacement

8. Install the front propeller shaft. Refer to Front Propeller Shaft Replacement.



9. Install the electrical connector (1) to the front actuator.
10. Fill the front differential with lubricant. Refer to Front Axle Lubricant Replacement.
11. Remove the supports and lower the vehicle.

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

1. Inspect the following components for excessive wear and/or fit:
 - The pinion gear shaft
 - The thrust washers
 - The differential case for wear, cracks and scoring
 - The fit of the pinion gear shaft in the differential case
 - The fit of the differential side gears in the differential case
 - The fit of the side gears on the axle shafts
- Inspect the teeth of the pinion gears and the differential side gears for the following conditions:
 - Wear
 - Cracks
 - Scoring
 - Spalling
- Replace any worn or poor fitting components as necessary.

2013 Chevrolet Colorado

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

Fuel Delivery: | **Fuel:**

Important:

- When replacing the worn or cracked bearings and the cups, replace the bearings in sets.
- The low mileage bearings may have very small scratches and pits on the rollers and the bearing cups from the initial preload.

Do not replace a bearing for this reason.

1. Inspect the bearings for smooth rotation after oiling.
2. Inspect the bearing rollers for wear.
3. Inspect the bearing cups for the following conditions:

- Wear
- Cracks
- Brinelling
- Scoring

2013 Chevrolet Colorado

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

Warning: To prevent personal injury and/or component damage, support the differential case when removing the case from the axle housing. If the case is not supported, the differential case could fall and cause personal injury or damage to the differential case.

2013 Chevrolet Colorado

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

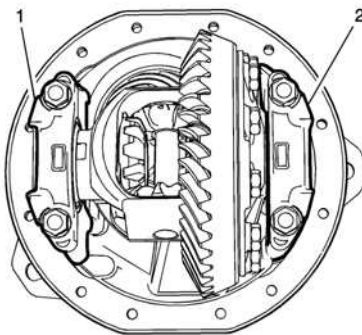
Special Tools

- DT-8092 Driver Handle
- DT-8107-4 Bearing Washer Puller
- DT-21784 Side Bearing Installer
- DT-22888-20A Bearing Puller

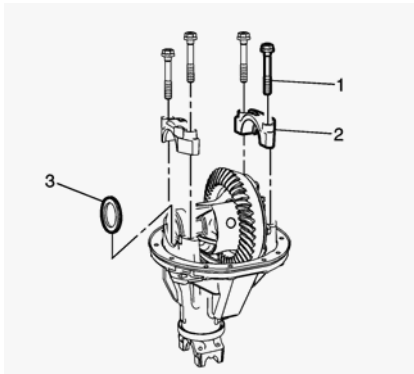
For regional equivalent tools, refer to Special Tools.

Disassemble Procedure

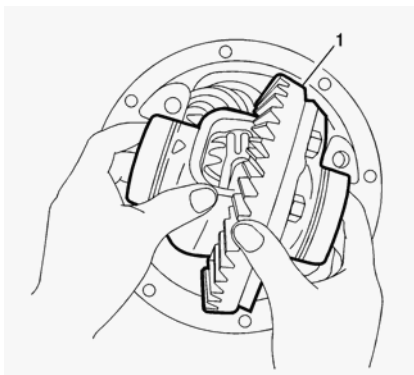
1. Remove the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.
2. Install the differential carrier in a suitable handling devise.



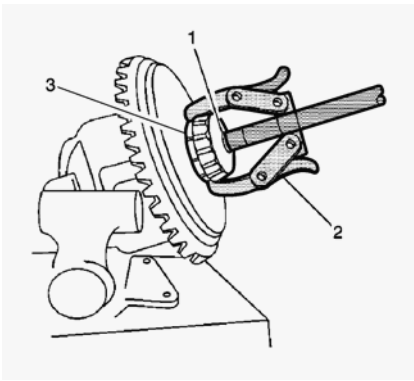
3. Mark the left (1) and the right (2) bearing caps.



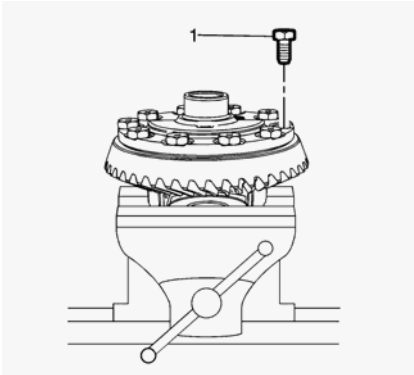
4. Remove the bearing cap bolts (1).
5. Remove the left and the right bearing caps (2).
6. Remove the shim (3).



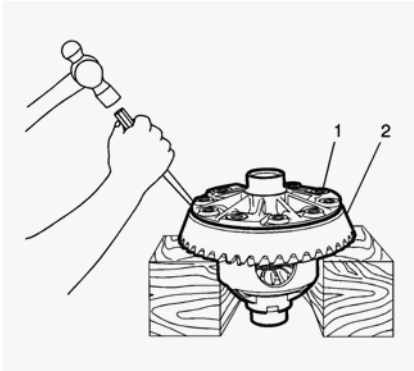
7. Remove the differential case (1).



8. Install the differential case in a soft jawed vise.
9. Using the DT-8107-4 puller (2) and the DT-22888-20A puller (2) , remove the differential case side bearings (3).

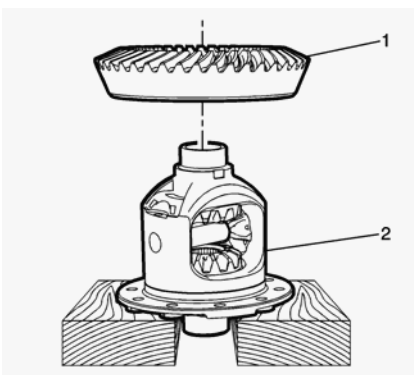


10. Position the differential case in a soft jawed vise.
11. Remove the 10 ring gear bolts (1).
12. Remove the differential case from the soft jawed vise.



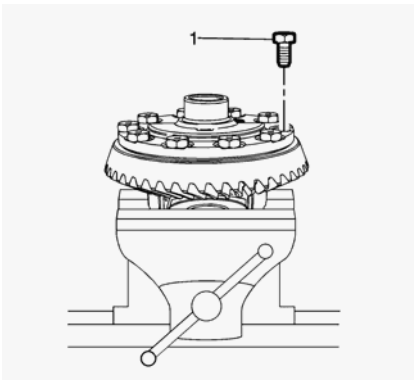
13. Position the differential case on two pieces of wood.
14. Using a hammer and a brass drift (2), remove the ring gear (2) from the differential case (1).

[Assemble Procedure](#)

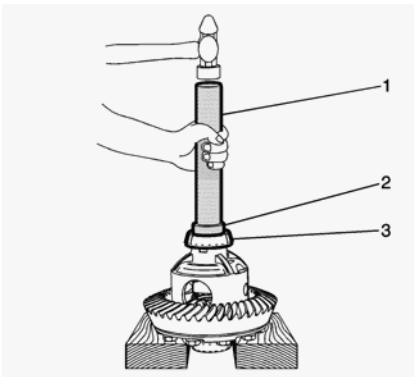


Note: Use a drift or punch to help align the holes in the ring gear and the differential case.

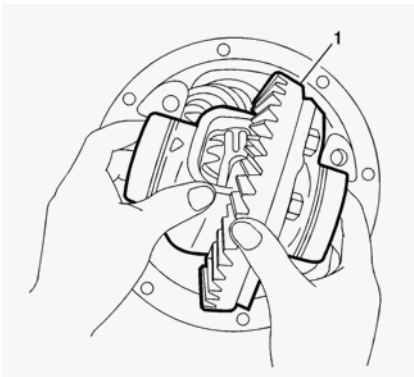
1. Position the ring gear (1) on the differential case (2).



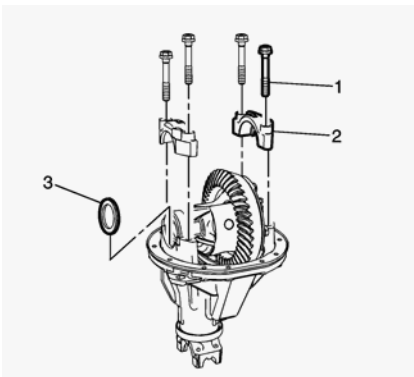
2. Install the differential case in a soft jawed vise.
 3. Finger start the 10 ring gear bolts (1).
- Note:** Tighten the ring gear bolts in a criss cross pattern to ensure that the ring gear is flat against the differential case.
4. Install the 10 ring gear bolts (1) and tighten to **108 Y (80 lb ft)**.



5. Using the DT-8092 handle (1) and the DT-21784 installer (2), install the differential case bearing (3).



6. Install the differential case (1).



- Note:** Ensure that the reference marks for the left and right are bearing caps are installed correctly.
7. Install the bearing cap shims (3) and the bearing caps (2).
 8. Install and tighten the bearing cap bolts (1) to **108 Y (80 lb ft)**.
 9. Remove the differential carrier from the holding devise.

Differential Case Replacement (With G80)

10. Install the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
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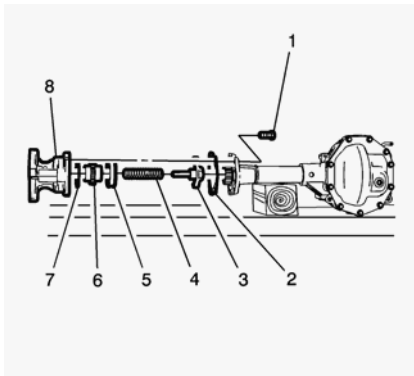
Special Tools

- DT 50813 Pinion Gear Remover
- DT 7817 Outer Pinion Bearing Cup Installer
- GE 8092 Driver Handle
- DT 29609 Inner Pinion Bearing Cup Installer
- DT 5590 Inner Pinion Bearing Installer
- DT 08614-A Pinion Flange Holder and Remover
- EN 21128 Axle Seal Installer
- DT-21784 Bearing Installer

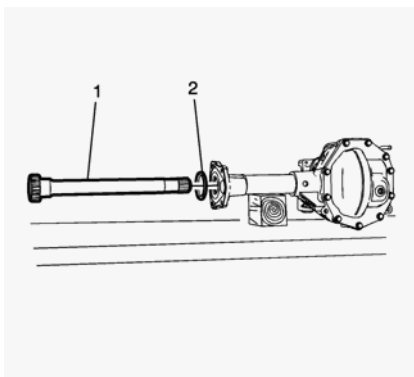
For regional equivalent tools, refer to Special Tools.

Removal Procedure

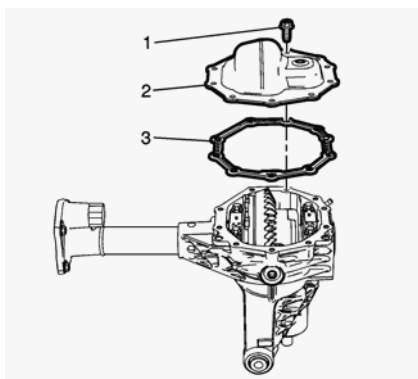
1. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the drive pinion yoke and the oil seal. Refer to Front Differential Drive Pinion Gear Yoke Replacement.
3. Remove the front drive actuator. Refer to Front Drive Axle Actuator Replacement.
4. Remove the front differential carrier assembly. Refer to Differential Carrier Assembly Disassemble.



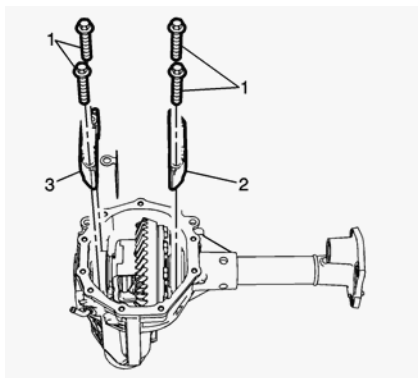
5. Remove the mounting bolt (1), actuator housing (8), shim (7), clutch gear (6), clutch sleeve (5), clutch fork spring (4), clutch fork (3) and the gasket (2) from the front differential carrier.



6. Remove the axle shaft (1) and shim (2) from the front differential carrier.

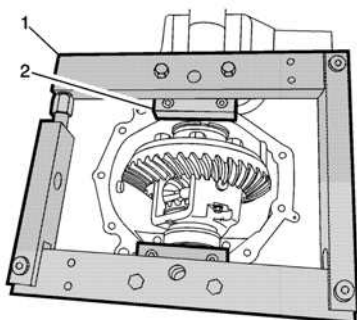


7. Remove the 10 differential cover bolts (1), differential cover (3) and the gasket (2) from the differential carrier.

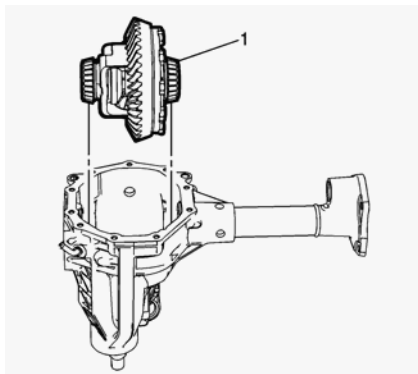


Note: Ensure that you mark the left and right bearing caps for the differential case before removing the bearing caps.

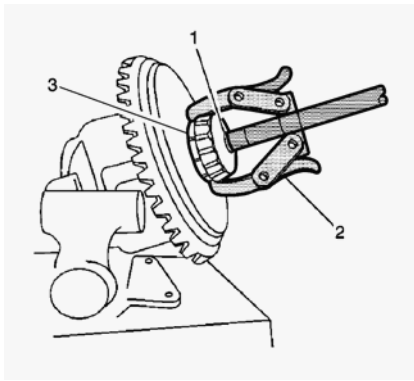
8. Remove the left and right bearing cap bolts (1) from the differential case.
9. Remove the left (3) and right (2) differential bearing caps.



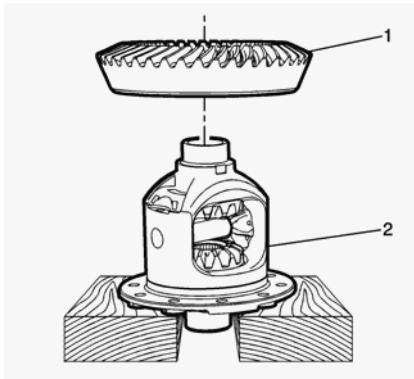
10. Using the J 45222 spreader (1) and the J 45222-20 adapter (2), adjust the spreader 0.250 mm to allow the removal of the differential case.



11. Remove the differential case (1) from the rear axle housing.

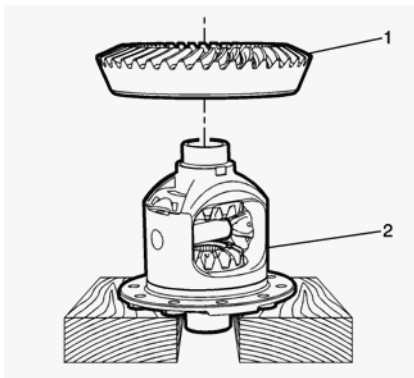


12. Install the differential case in a soft jawed vise.
13. Using the DT-8107-4 puller (2) and the DT-22888-20A puller (2) remove the differential case side bearings (3).



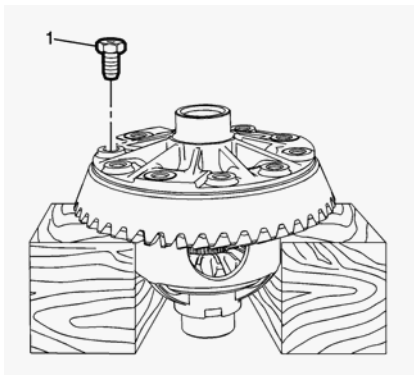
14. Remove the ring gear (1) from the differential case (2). Refer to Front Differential Case Disassemble.

[Installation Procedure](#)



Note: The mating surface of the ring gear and the differential case must be clean and free of burrs before installing the ring gear.

1. Install the ring gear (1) to the differential case (2).

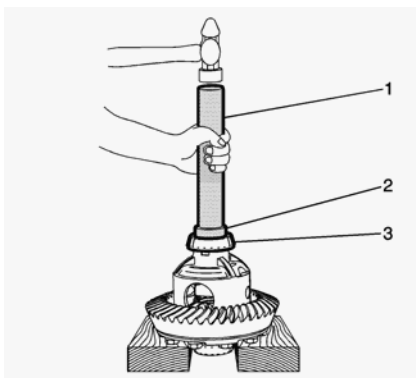


Note: The ring gear bolts have left-handed threads.

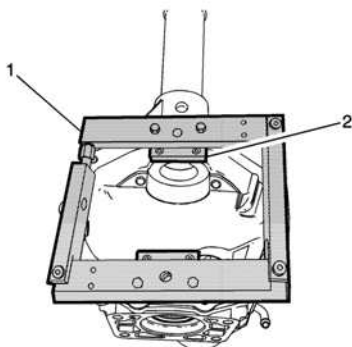
2. Install the NEW ring gear bolts (1).

Caution: Refer to Fastener Caution.

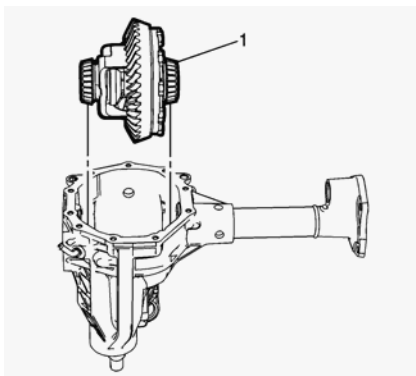
3. Tighten the NEW ring gear bolts alternately and in stages, gradually pulling the ring gear onto the differential case. Tighten the ring gear bolts in sequence to **120 Y (89 lb ft)**.



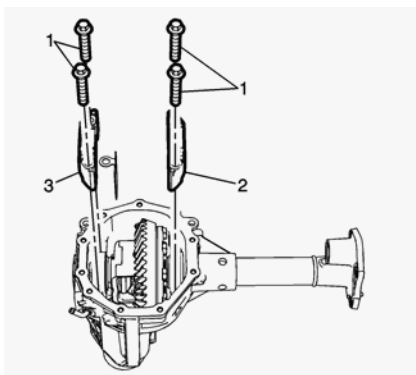
4. Using the GE 8092 handle (1) and the DT-21784 installer (2) install the differential side case bearing (3).



5. Using the J 45222 spreader (1) and the J 45222-20 adapter (2), adjust the spreader 0.250 mm to install in the differential case.



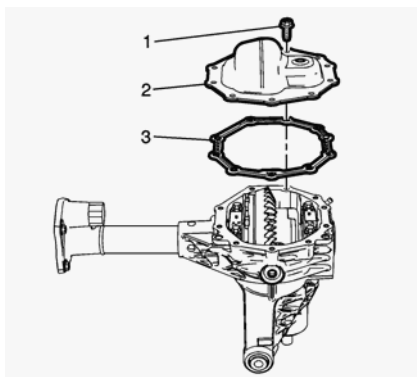
6. Position the differential case (1) in the differential carrier.
7. Remove the case spreader and adapter.



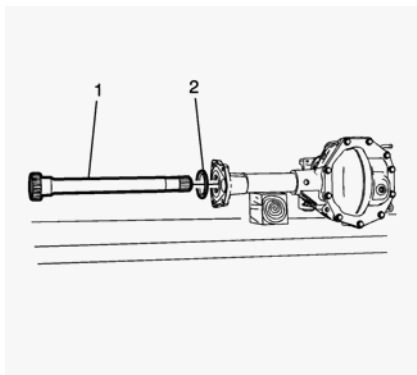
Note: Ensure that the case bearing caps and shims are installed as they were removed.

8. Position the left (3) and the right (2) bearing caps in the differential carrier.
9. Install the differential case bearing cap bolts (1) and tighten to **98 Y (72 lb ft)**.
10. Adjust the backlash. Refer to Backlash Inspection and Adjustment.

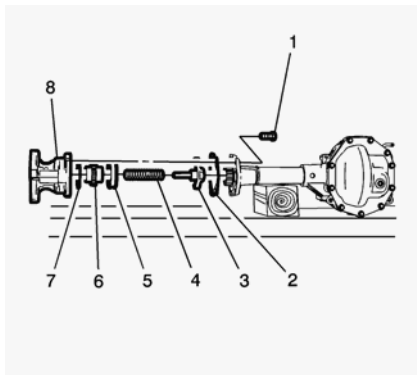
11. Once the differential side bearing preload and backlash is correct, perform a gear tooth contact pattern check in order to ensure proper alignment between the ring and pinion gears. Refer to Gear Tooth Contact Pattern Inspection.



12. Install the differential cover gasket (3) and the cover (2).
13. Install the 10 differential cover bolts (1) and tighten to **30 Y (22 lb ft)**.



14. Install the wheel drive shaft (1) and shim (2) in the differential carrier.



15. Install the clutch sleeve (5), clutch gear (6), clutch fork spring (4), clutch fork (3), shim (7), gasket (2) and the housing (8).
16. Tighten the clutch housing bolts to **47 Y (35 lb ft)**.
17. Install the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.
18. Install the front drive actuator. Refer to Front Drive Axle Actuator Replacement.
19. Fill up the axle fluid in the differential carrier. Refer to Front Axle Lubricant Replacement.
20. Lower the vehicle.

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

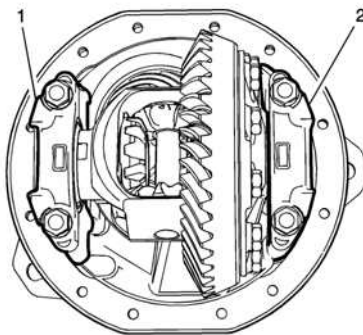
Special Tools

- DT-8092 Driver Handle
- DT-8107-4 Bearing Washer Puller
- DT-21784 Side Bearing Installer
- DT-22888-20A Bearing Puller

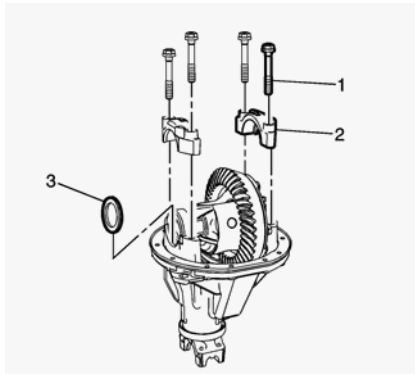
For regional equivalent tools, refer to Special Tools.

Disassemble Procedure

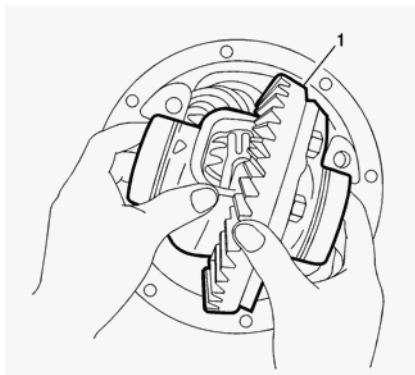
1. Remove the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.
2. Install the differential carrier in a suitable handling devise.



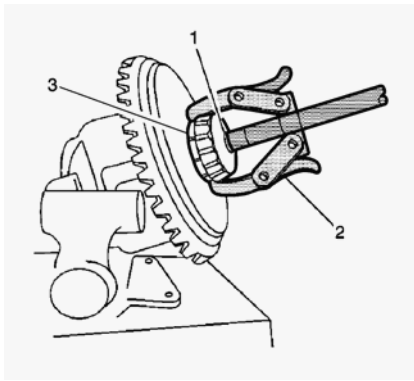
3. Mark the left (1) and the right (2) bearing caps.



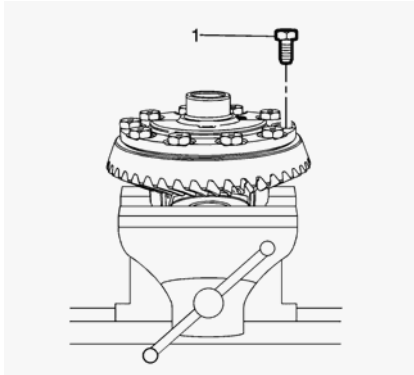
4. Remove the bearing cap bolts (1).
5. Remove the left and the right bearing caps (2).
6. Remove the shim (3).



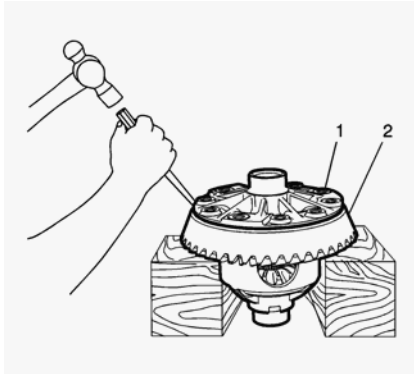
7. Remove the differential case (1).



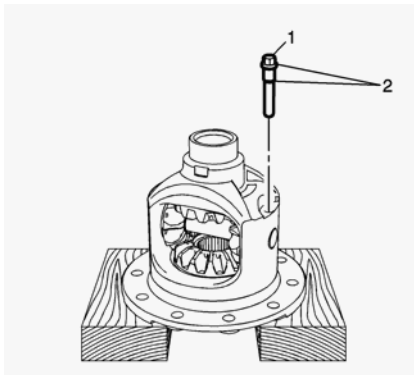
8. Install the differential case in a soft jawed vise.
9. Using the DT-8107-4 puller (2) and the DT-22888-20A puller (2) , remove the differential case side bearings (3).



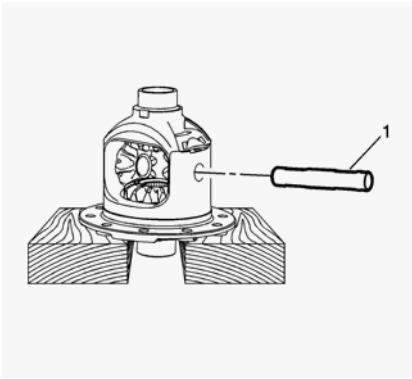
10. Position the differential case in a soft jawed vise.
11. Remove the 10 ring gear bolts (1).
12. Remove the differential case from the soft jawed vise.



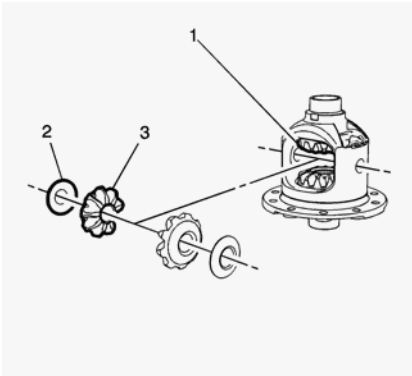
13. Position the differential case on two pieces of wood.
14. Using a hammer and a brass drift, remove the ring gear (2) from the differential case (1).



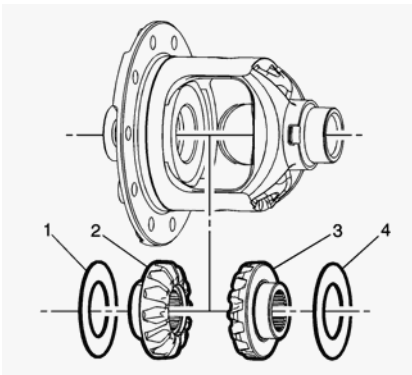
15. Remove the pinion gear lock bolt (1).



16. Remove the differential pinion gear shaft (1).

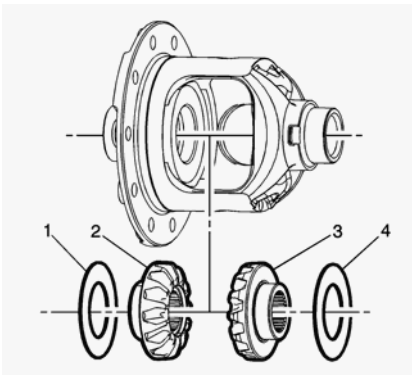


17. Rotate the pinion side gears (1) to allow the removal of the pinion gears (3) and the shims (2).

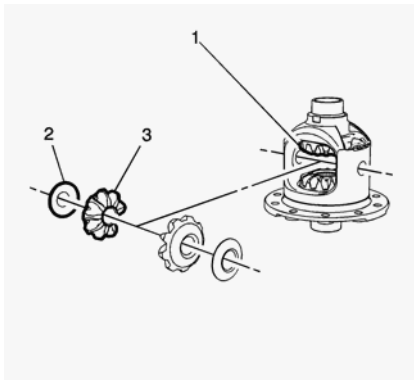


18. Remove the pinion side gears (2) and the shims (1).

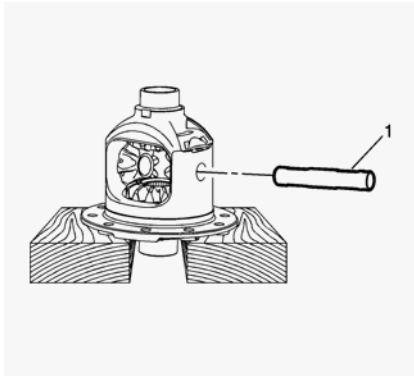
[Assemble Procedure](#)



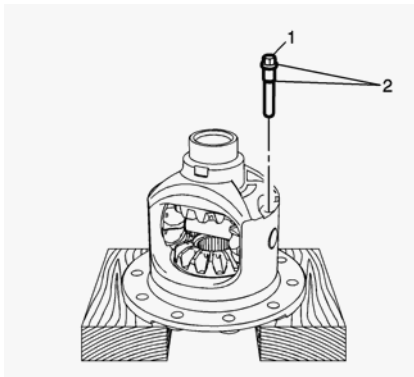
1. Position the pinion side gears (2) and the shims (1) in the differential case.



2. Rotate the pinion side gears to (1) to allow the installation of the pinion gears (3) and the shims (2).

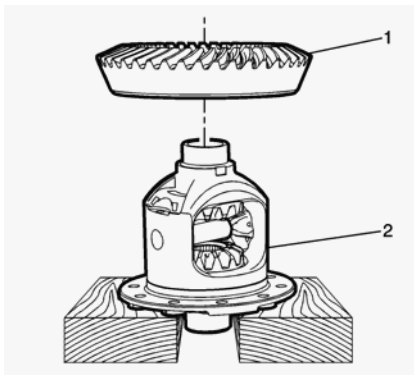


3. Install the differential pinion gear shaft (1).



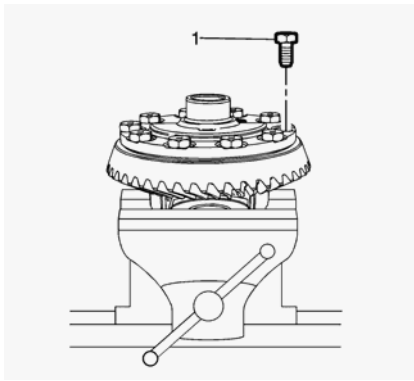
Caution: Refer to Fastener Caution.

4. Install the pinion gear lock bolt (1) and tighten to 50 Y (37 lb ft).



Note: Use a drift or punch to help align the holes in the ring gear and the differential case.

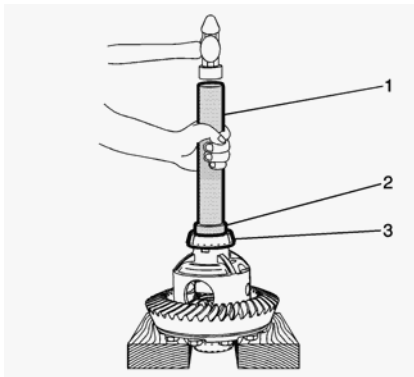
5. Position the ring gear (1) on the differential case (2).



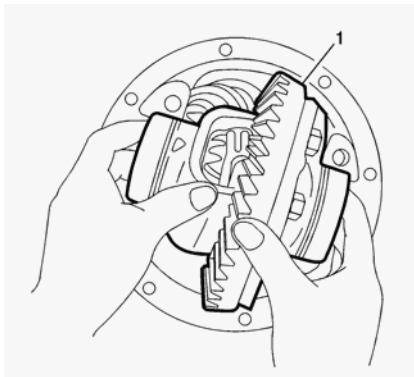
6. Install the differential case in a soft jawed vise.
7. Hand start the 10 ring gear bolts (1).

Note: Tighten the ring gear bolts in a criss cross pattern to ensure that the ring gear is flat against the differential case.

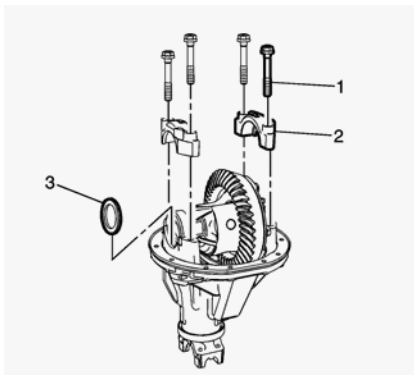
8. Install the 10 ring gear bolts (1) and tighten to **108 Y (80 lb ft)**.



9. Using the DT-8092 handle (1) and the DT-21784 installer (2), install the differential case bearing (3).



10. Install the differential case (1).



Note: Ensure that the reference marks for the left and right are bearing caps are installed correctly.

11. Install the bearing cap shims (3) and the bearing caps (2).
12. Install and tighten the bearing cap bolts (1) to **108 Y (80 lb ft)**.
13. Remove the differential carrier from the holding devise.

Differential Case Replacement

14. Install the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.

2013 Chevrolet Colorado

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Fuel Delivery: | Fuel:

Caution: When removing the differential case from the axle housing, do not damage the cover gasket surface. If the cover gasket surface is damaged, lubricant may leak from the axle and cause premature failure of the axle assembly.

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

Special Tools

- DT-45222 Axle Housing Spreader
- DT-45222-20 Axle Housing Spreader Adaptor
- DT-21777-B Pinion Gauge Set
- DT-45222-20 Dial Indicator Set

For regional equivalent tools, refer to Special Tools.

Front Differential Bearing Adjustment

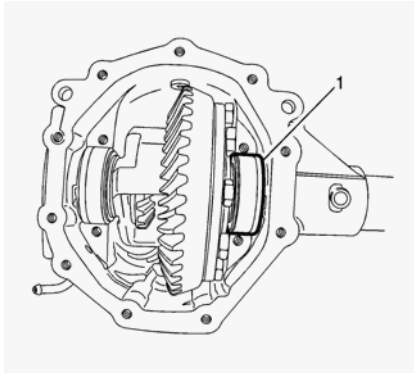
Note:

- The differential side bearing preload adjustment must be completed before the backlash adjustment can be started.
- In order to maintain the original backlash, adjust the differential case side bearing preload by changing the thickness of the left and the right side shim packs equally.
- Measure the service shims and the spacers one at a time. Add the measurements together in order to obtain the total thickness of the left or the right side shim pack.
- Do not use or reuse the original cast iron production shims. Use service shims and spacers instead.

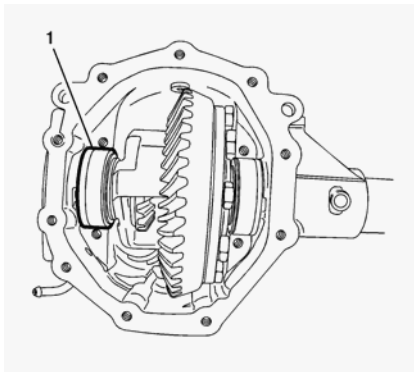
1. Install the drive pinion, if necessary. Refer to Drive Pinion and Ring Gear Replacement.
2. Using an inch-pound torque wrench, measure and record the measurement the rotating torque of the drive pinion gear **1.7–3.4 Y (15–30 lb in) for new bearings or 1.1–2.3 Y (10–20 lb in) for used bearings**.

Note: Before installation of the differential assembly, ensure that the side bearing surfaces in the axle housing are clean and free of burrs. If the original bearings are to be reused, the original bearing cups must also be used.

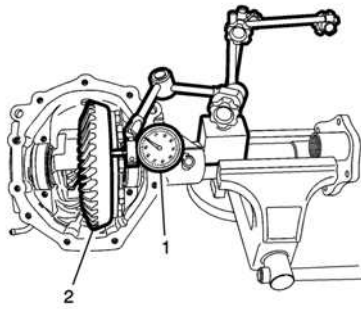
3. Install the differential assembly with the side bearings and bearing cups into the axle housing.



4. Insert one **5.334 mm (0.2100 in) (1)** thick service spacer into the left side of the axle housing.
5. Check the schedule of shims. Refer to Axle Spacer and Shim Specifications.
6. Slide the differential assembly towards the service spacer in order to hold the spacer in place.

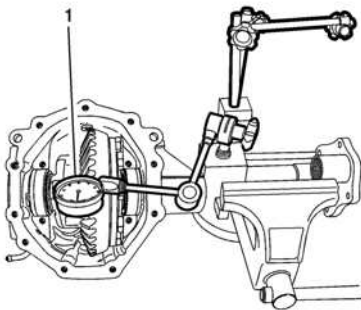


7. Insert one **6.655 mm (0.2620 in) (1)** thick service spacer into the left side of the axle housing.
8. Check the schedule of shims. Refer to Axle Spacer and Shim Specifications.



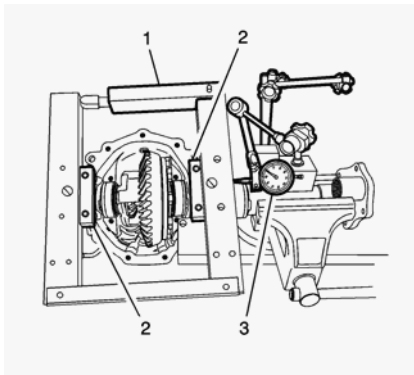
Note: The resulting value is the total service shim thickness without preload for the axle.

9. Position the *GE 8001* indicator (1) from the *DT 21777-B* set.
10. Preload the *GE 8001* indicator (1) and set the gauge to zero. Move the differential case (2) to the left and right sides, and verify the value on the *GE 8001* indicator (1).
11. Add shims to fill both sides without preload.



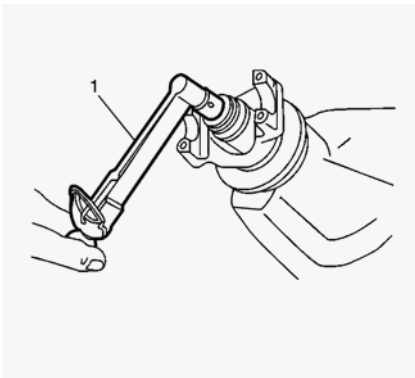
Note: Moving 0.10 Y (0.004 in) of shim thickness from the right side to the left side of the differential will change the backlash adjustment approximately 0.05 Y (0.002 in).

12. Position the *GE 8001* indicator (1) from the *DT 21777-B* set so that it is on the heel of the ring gear.
13. While holding the drive pinion stationary, move the ring gear back and forth. Measure and record the backlash.
14. Repeat the measuring procedure at eight points around the ring gear.
15. Move **0.10 mm (0.004 in)** of shim thickness from the right side to the left side of the differential until there is approximately **0.13-0.18 mm (0.005-0.007 in)** of backlash between the ring gear and the drive pinion.



16. Using the *DT-45222* spreader (1) and the *DT-45222-20* adaptor (2), adjust the spreader using a *GE 8001* indicator (3) until **0.250 mm (0.010 in)** to allow the install of the shims.
17. In order to initially set the preload of the differential side bearings and the backlash to approximately **0.130-0.230 mm (0.005-0.009 in)**, take the value determined in Step 15 and add **0.203 mm (0.008 in)** service shim thickness to this amount.
18. Install the differential bearing caps and tighten the bolts to **98 Y (72 lb ft)**.

Front Differential Bearing Adjustment



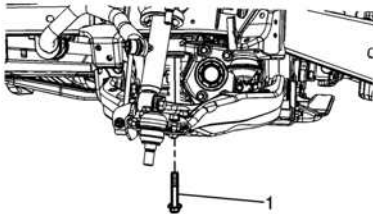
19. Using an inch-pound torque wrench (1), measure the drive pinion and differential side bearing preload. The rotational torque should be **3.9-6.2 Y (30-55 lb in) for new bearings or 2.8-5.1 Y (25-45 lb in) for used bearings**. Record this measurement
20. If the differential side bearing preload is not within specifications, add or subtract shim thickness equally from each shim pack as necessary in order to increase/decrease the side bearing preload.
21. Once the differential side bearing preload is correct, measure the backlash and adjust, if necessary. Refer to Backlash Inspection and Adjustment.
22. Once the differential side bearing preload and backlash is correct, perform a gear tooth contact pattern check in order to ensure proper alignment between the ring and pinion gears. Refer to Gear Tooth Contact Pattern Inspection.

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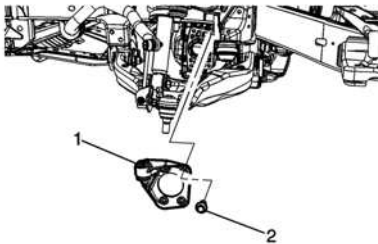
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the wheel drive shaft from the vehicle. Refer to Front Wheel Drive Shaft Replacement.
3. Support the front drive axle with a suitable jack stand.

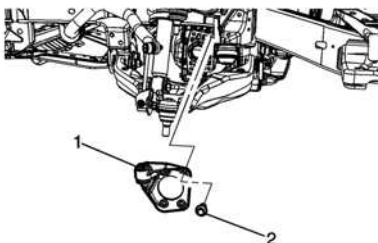


4. Remove the bolt from the carrier bracket (1) to the frame.



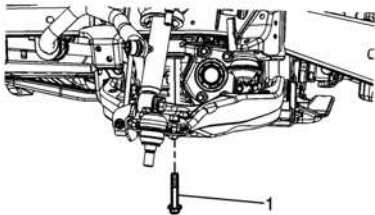
5. Remove the 4 bolts (2) from the carrier bracket to the front axle.
6. Remove the carrier bracket (1) from the vehicle.

[Installation Procedure](#)



1. Position the carrier bracket (1) on the front drive axle.
Caution: Refer to Fastener Caution.
Note: Hand tighten the bolts.
2. Install the 4 bracket bolts (2) and tighten to **130 Y (96 lb ft)**.

Front Differential Carrier Bushing and Bracket Replacement

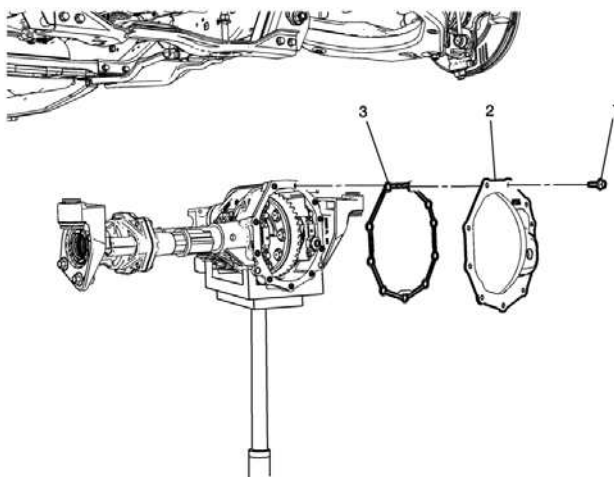


3. Install the carrier bracket bolt (1) and tighten to **160 Y (118 lb ft)**.
4. Install the wheel drive shaft. Refer to Front Wheel Drive Shaft Replacement.
5. Remove the support and lower the vehicle.

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Front Differential Carrier Cover and Gasket Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle
2. Remove the front differential carrier assembly. Refer to Differential Carrier Assembly Replacement

Front Differential Carrier Cover Bolt (Qty: 10)

Caution: Refer to Fastener Caution.

1

Tighten

30 Y (22 lb ft)

2

Front Differential Carrier Cover

3

Front Differential Carrier Cover Gasket

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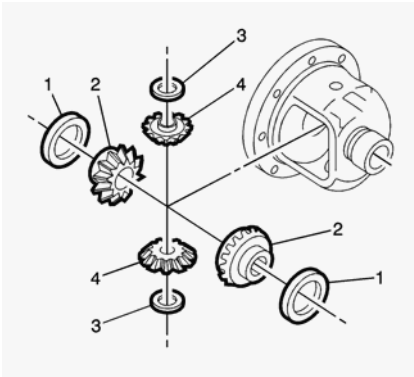
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Special Tools

- GE 8092 Universal Driver Handle – ¾ in – 10
- DT 25299 Differential Side Bearing Installer

For equivalent regional tools, refer to Special Tools.

1. Apply a small amount of lubricate the pinion and side gears.

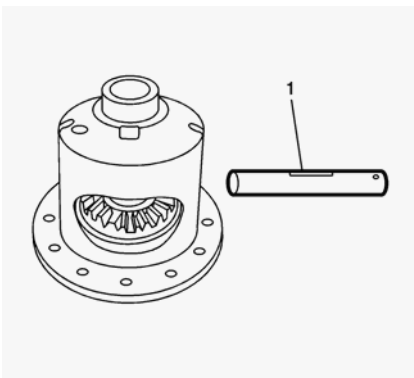


Note: If reusing the side gears and washers, ensure that they are installed in their original positions.

2. Install the differential side gears (2) and thrust washers (1) into the differential case.
3. Install the differential pinion gears (4) and thrust washers (3) by performing the following steps:
 1. Position one pinion gear between the differential side gears.
 2. Position the second pinion gear between the differential side gear directly opposite of the first gear.
 3. Rotate the differential side gears until the pinion gears are directly opposite the opening in the differential case.

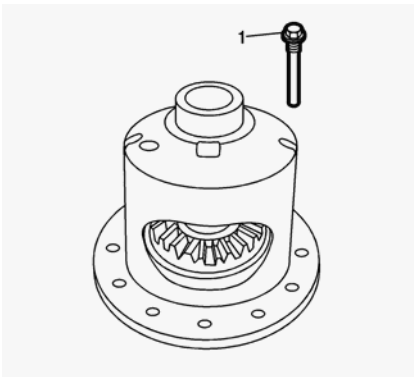
Note: Rotate the pinion gears toward the differential case opening in order to permit the sliding in of the thrust washers.

4. Install the thrust washers.

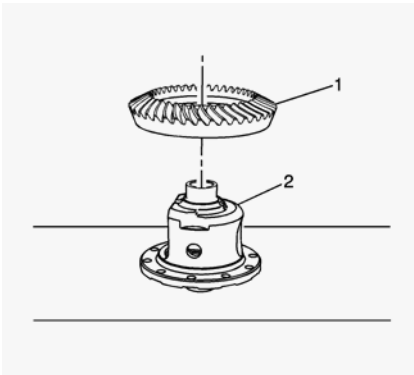


Caution: Refer to Fastener Caution.

4. Install the pinion gear shaft (1).

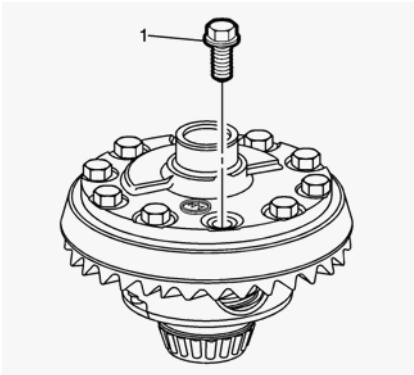


5. Install the new pinion gear shaft lock bolt (1) and tighten to **25 Y (18 lb ft)**.



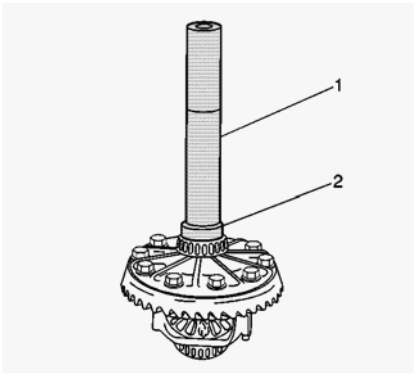
Note: The mating surface of the ring gear and the differential case must be clean and free of burrs before installing the ring gear.

6. Install the ring gear (1) onto the differential case (2).



Note:

- The ring gear bolts have left-hand threads.
 - Hand start each of the ring gear bolts.
7. Install the NEW ring gear bolts and tighten in sequence to **108 Y (80 lb ft)**.
8. Support the differential case with 2 pieces of wood.



9. Using the GE 8092 handle (1) and the DT 25299 installer (2), install the differential case bearings

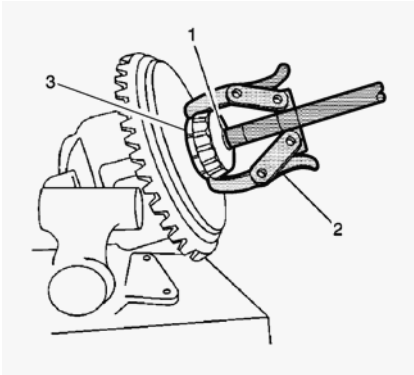
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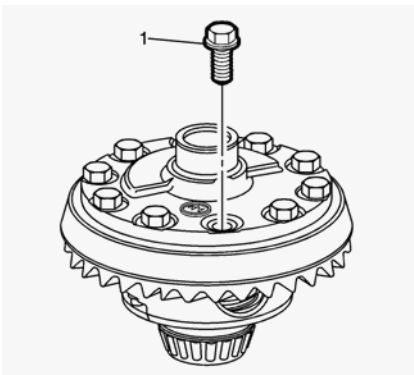
Special Tools

- DT 8107-2 Side Bearing Puller Pilot
- DT 22888-D Side Bearing Remover Kit

For regional equivalent tools, refer to Special Tools



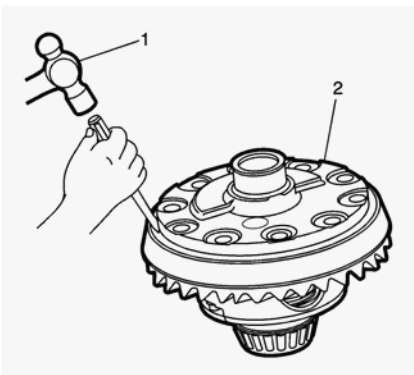
1. Place the differential case in a vise.
2. Using the DT 8107-2 pilot (1) with the J 22888-20A and J 22888-35 (2), remove the differential side bearings.



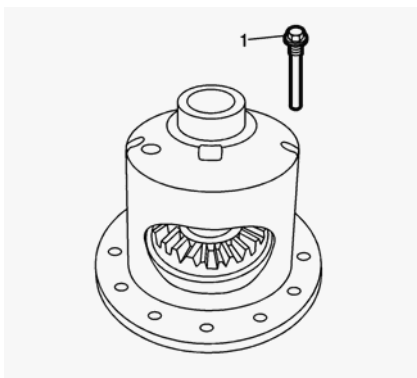
Caution: Do not pry the ring gear from the differential case. Prying the ring gear from the differential case may cause damage to the ring gear and/or the differential case.

Note: The ring gear bolts have left-handed threads.

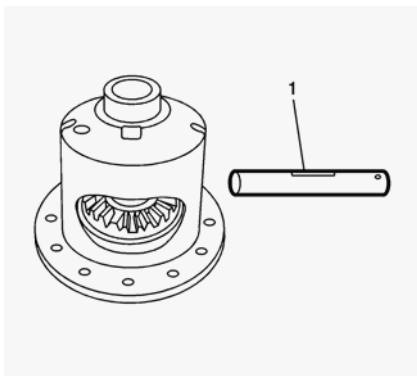
3. Remove the ring gear bolts (1).



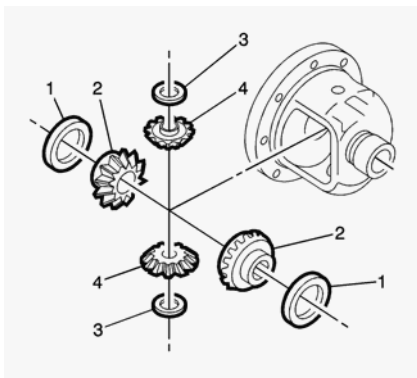
4. Using a hammer and a brass drift (1), remove the ring gear (2).



5. Remove the pinion shaft lock bolt (1).



6. Remove the pinion shaft (1).



Note: Mark the position of each of the pinion and side gears for the proper installation.

7. Remove the differential pinion gears (4) and the washers (3).
8. Remove the differential side gears (2) and the washers (1).

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Special Tools

DT-08614-A Pinion Flange Holder and Remover

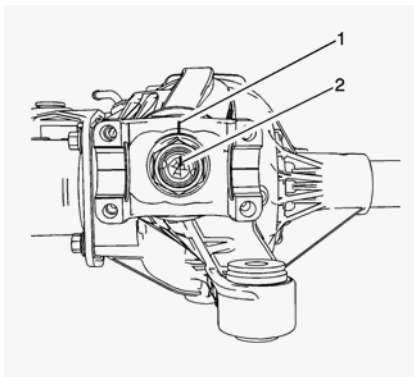
For equivalent regional tools, refer to Special Tools.

Removal Procedure

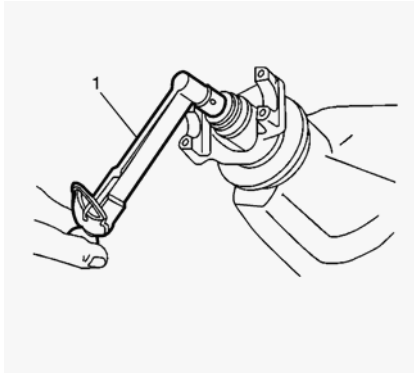
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle
2. Remove the tires and wheels. Refer to Tire and Wheel Removal and Installation.

Note: Removing the front brake pads will eliminate the drag on the front drive axle when measuring the rotational torque of the internal components.

3. Remove the front brake pads. Refer to Front Disc Brake Pads Replacement.
4. Remove the front propeller shaft. Refer to Front Propeller Shaft Replacement.

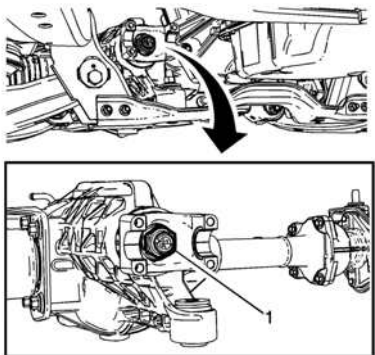


5. Mark the relationship of the pinion gear (2) to the pinion yoke (1).



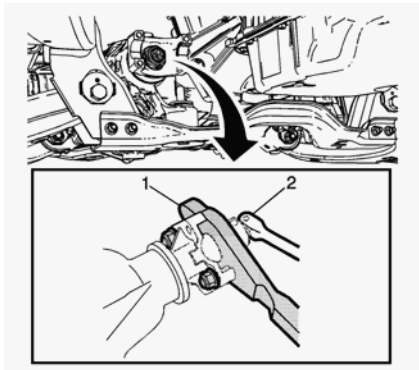
6. Using an inch pound torque wrench (1), record the rotational torque of the front pinion gear. This will give the combined preload for the following components:

- The pinion bearings
- The pinion seal
- The carrier bearings
- The axle bearing
- The axle seals

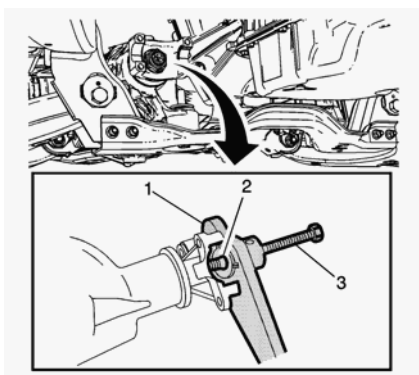


Note: DO NOT reuse the pinion nut. Discard and replace with NEW only.

- Using the proper tools, remove the stake (1) from the front differential pinion nut.

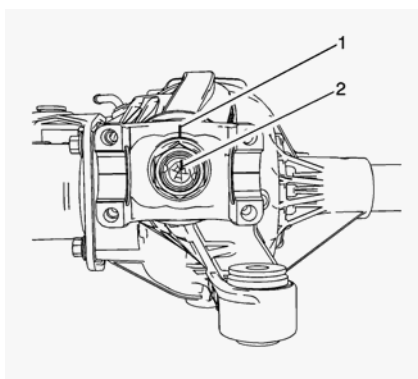


- Using the DT-08614-A remover (1) and the proper size socket and breaker bar (2), remove the pinion flange nut.

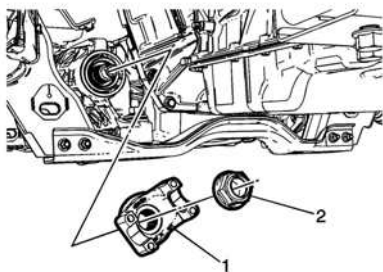


- Using the DT-08614-A remover (1), (2) (3), remove the pinion flange.

[Installation Procedure](#)

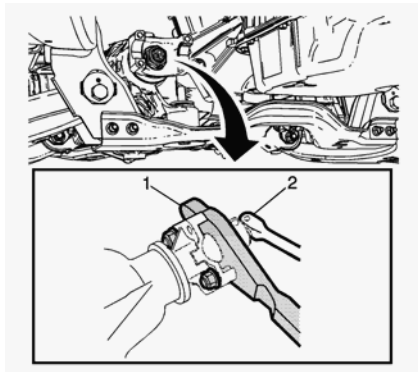


1. Align the reference marks on the pinion gear (2) and the pinion yoke (1).

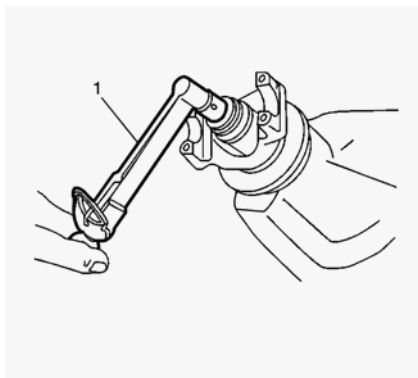


Note: Tighten the NEW pinion nut by hand.

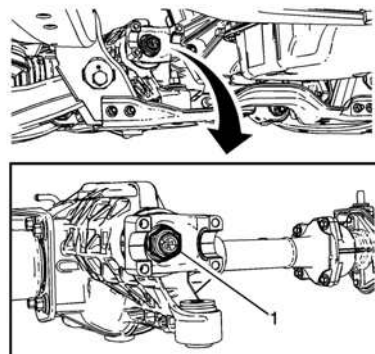
2. Install the pinion flange (1) and the NEW nut (2) pinon the pinion gear shaft.



3. Using the DT-08614-A holder (1) and the proper size socket and torque wrench (2), tighten the pinion nut until the end play is taken up. Rotate the pinion while tightening the pinion nut to seat the bearings.
4. Remove the DT-08614-A holder (1) and the socket and torque wrench (2).



5. Using an inch pound torque wrench (1) the rotational torque should be **0.63 to 1.13 Y (5 to 10 in lb)**. If not, reinstall the tool and tighten in small increments until the torque of **0.63 to 1.13 Y (5 to 10 in lb)** is achieved.
6. If the rotational torque exceeds the **0.63 to 1.13 Y (5 to 10 in lb)**, replace the collapsible spacer.



7. Using the appropriate tools, stake NEW the pinion nut (1).
8. Install the front propeller shaft. Refer to Front Propeller Shaft Replacement.
9. Install the tires and wheels. Refer to Tire and Wheel Removal and Installation.

Front Differential Drive Pinion Gear Yoke Replacement

10. Remove the support and lower the vehicle. Refer to Lifting and Jacking the Vehicle