

Positive Traction Differentials

G.M. LIMITED SLIP DIFFERENTIAL – CONE BRAKE TYPE

Buick
Chevrolet
Oldsmobile
Pontiac

NOTE – Some models use other units. See G.M. Limited Slip Differential (Clutch Pack Type) in this section.

DESCRIPTION

Two pinion limited slip differential within a two piece case, using spring loaded cone brakes behind each side gear to direct major driving force to wheel with most traction.

NOTE – To check operation of limited slip, place Auto. Trans. in "P" or Man. Trans. in reverse, release parking brake and raise both rear wheels off ground. No less than 35 ft. lbs. torque should be required to turn one wheel.

REMOVAL & INSTALLATION

NOTE – For procedures involving rear axle removal and installation, ring gear, side bearings, drive pinion or axle shafts, see appropriate rear axle data for each car model.

OVERHAUL

NOTE – If case or brake cone/side gears are damaged, entire unit must be replaced. All other parts are serviceable.

DISASSEMBLY

1) Before disassembling case, check side bearings for visible damage of rollers and outer races. Place outer race onto its

matched roller assembly, and turn slowly applying hand load, if race turns smoothly and no visible damage is found, bearing can be reused. Inspect fit of inner races on case hubs by prying against shoulders at puller recesses. Bearing inner races must be tight on hubs.

NOTE – If either bearing is loose on case, entire case must be replaced.

2) If removing ring gear, clamp case in vise with jaws 90° to pinion shaft holes and remove ten ring gear bolts. Partially install two bolts on opposite sides of ring gear and remove ring gear from case by tapping on bolts.

NOTE – Do not pry between ring gear and case. Ring gear bolts are Left Hand thread. Use NEW bolts when reinstalling ring gear.

3) Remove case half attaching bolts and separate case halves. Remove brake cone/side gears, spring blocks, preload springs, pinion gears and shafts. Mark brake cone/side gears and pinion gears for reinstallation in original location.

CLEANING & INSPECTION

Clean all parts. Inspect pinion and side gears, pinion shaft, and thrust washers for wear or damage. Cone seats in case should be smooth and free from scoring (slight grooves or scratches are permissible). Cone surface will duplicate cone seat. If one half of case is worn or damaged, both halves must be replaced.

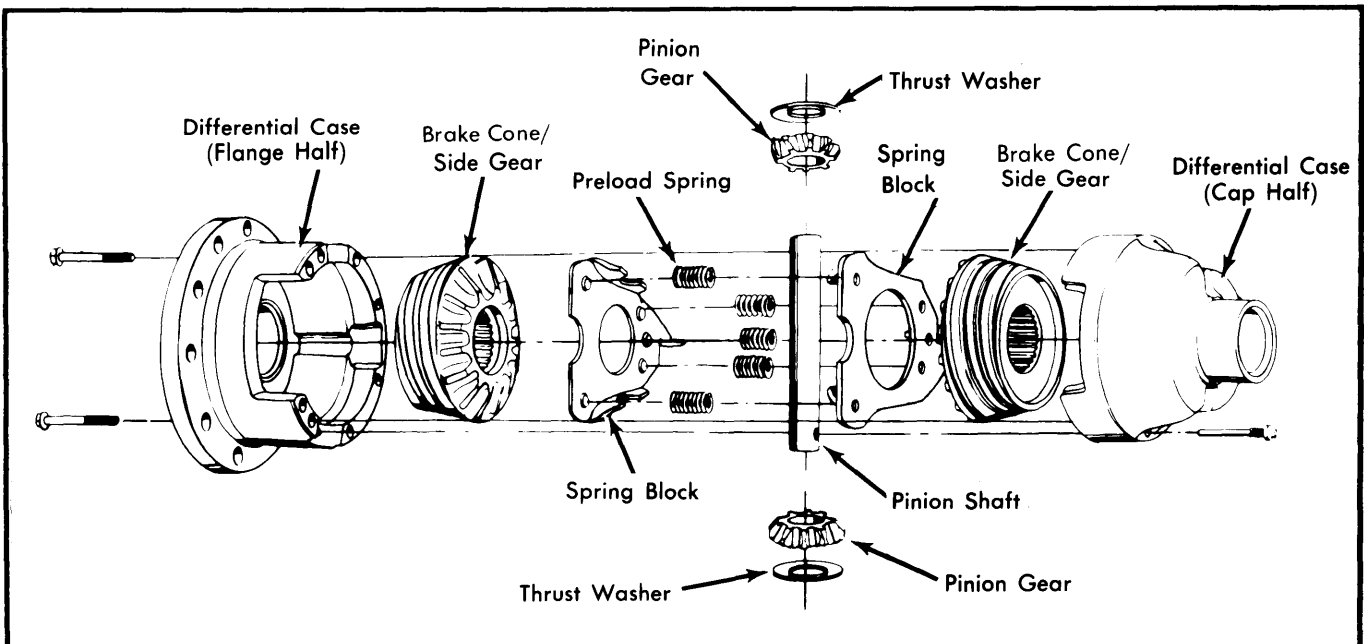


Fig. 1 Exploded View of Warner Cone Type Limited Slip Differential Assembly

G.M. LIMITED SLIP DIFFERENTIAL – CONE BRAKE TYPE (Cont.)

REASSEMBLY

1) All parts must be assembled in their original position. Place one spring block in position over side gear in alignment with pinion shaft grooves. Install pinion shaft, gears and thrust washers into cap half so that pinion shaft dowel may be inserted into differential case.

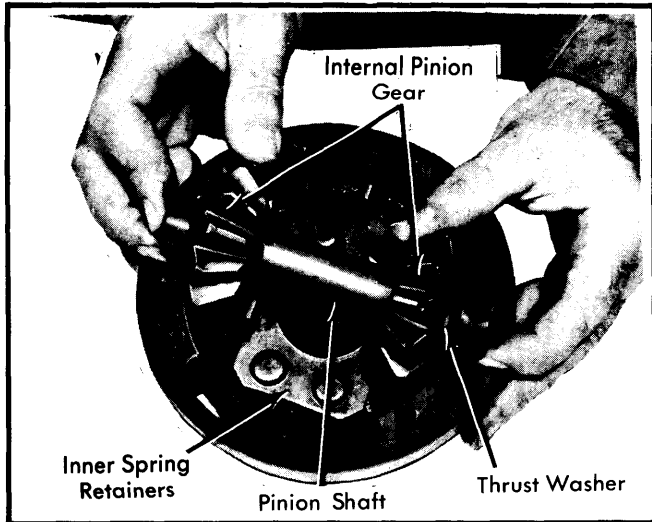


Fig. 2 Removing and Installing Pinion Gears

2) Insert five springs and spring block into case. Install second cone/gear assembly face down on spring block so that gear will mesh with pinion gears. Place flange half over cone and install bolts finger tight. Torque bolts one turn at a time in sequence shown in Fig. 4 to 30 ft. lbs.

3) If side bearings were removed, install with suitable driver. Place ring gear on case and pull into position using new bolts. When all bolts are snug, torque bolts alternately and evenly across diameter to 90 ft. lbs.

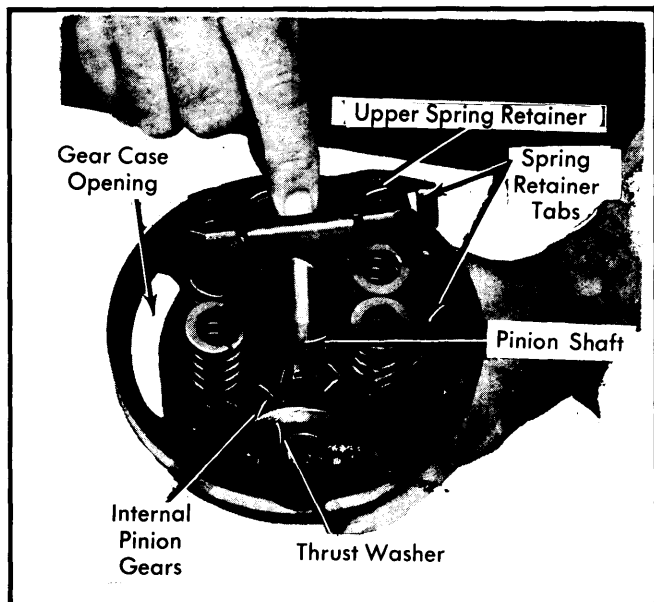


Fig. 3 Removing and Installing Upper Spring Retainer

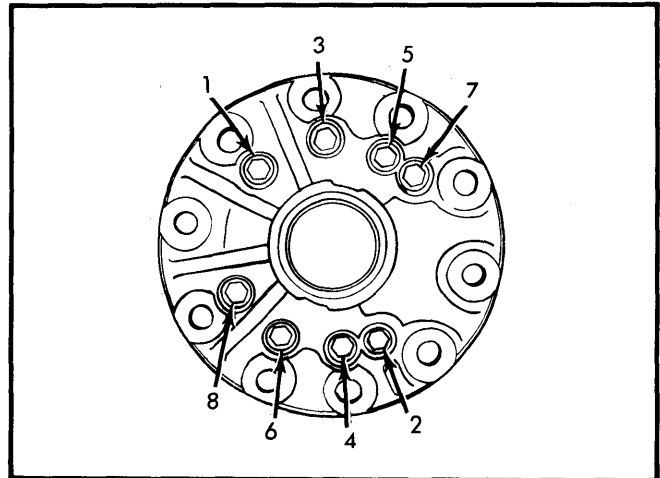


Fig. 4 Cap-to-Flange Bolt Tightening Sequence

ADJUSTMENT SPECIFICATIONS

Application	Specification
Ring Gear-to-Pinion Backlash	
Chevrolet005-.008"
Buick, Pontiac006-.008"
Oldsmobile005-.009"
Side Bearing Preload	
All Models	①Slip Fit Plus .008"
Pinion Bearing Preload②	
Buick	
New Bearings	20-25 INCH Lbs.
Used Bearings	10-15 INCH Lbs.
Chevrolet	
New Bearings	15-30 INCH Lbs.
Used Bearings	10-15 INCH Lbs.
Oldsmobile	
New Bearings	24-32 INCH Lbs.
Used Bearings	8-12 INCH Lbs.
Pontiac	
New Bearings	35-40 INCH Lbs.
Used Bearings	20-25 INCH Lbs.

- ① – Add .004" to each side to preload bearings.
- ② – Measured with new seal without ring gear installed. Rotating torque.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Ring Gear-to-Case Bolts	
Buick, Pontiac	80
All Others	90
Differential Case Bolts	30