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 – *Limited slip differential operation may be checked by removing one rear wheel and holding the opposite wheel with transmission in neutral. Torque of 70 ft. lbs. for new components or at least 40 ft. lbs. for used components should be required to turn axle shaft.*

REMOVAL & INSTALLATION

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

DISASSEMBLY

NOTE – *General Motors does not recommend overhaul of this unit. Procedures given are intended for cleaning and inspection only. If internal parts show signs of excessive wear or damage, entire unit must be replaced.*

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. NOTE – *Side bearings and races are matched parts and must be kept together.* 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 eight case half attaching bolts and separate case from flange. Remove clutch cone/side gears, spring blocks, preload springs, pinion gears and shaft. Mark side gears/clutch cone and pinion gears so they can be installed in their original location.

NOTE – *Shims are used in some units between side gear and brake cone to maintain backlash between pinion gears and side gears.*

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 permissable). Cone surface will duplicate cone seat. If one half of case is worn or damaged, both halves must be replaced.

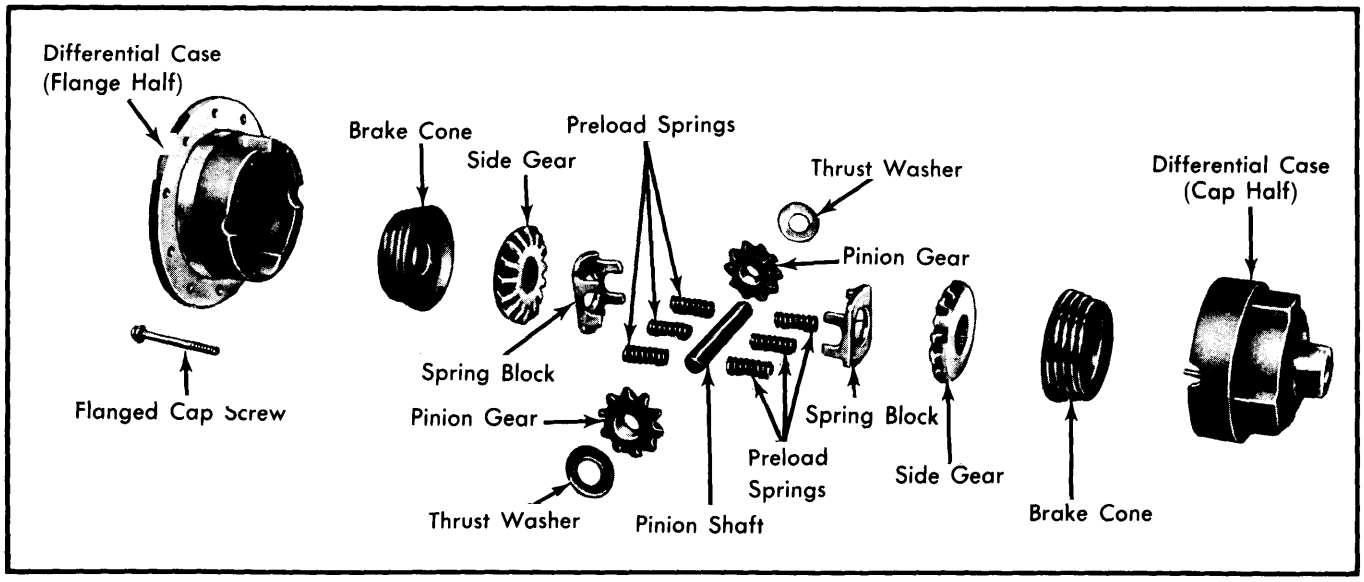

Fig. 1 Exploded View of Warner Cone Type Limited Slip Differential Assembly

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.

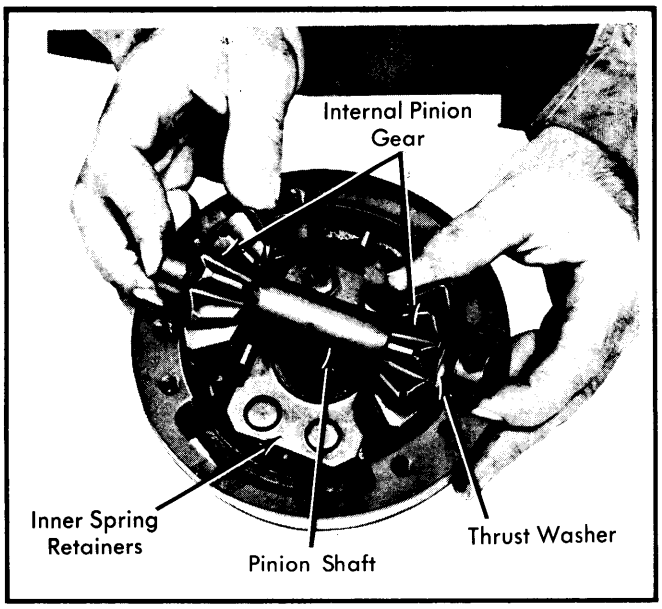

Fig. 2 Removing and Installing Pinion Gears

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 120 ft. lbs.

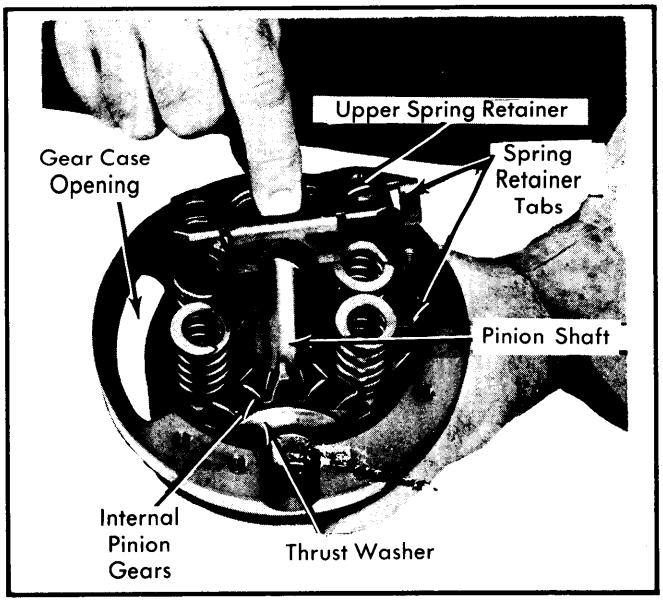

Fig. 3 Removing and Installing Upper Spring Retainer

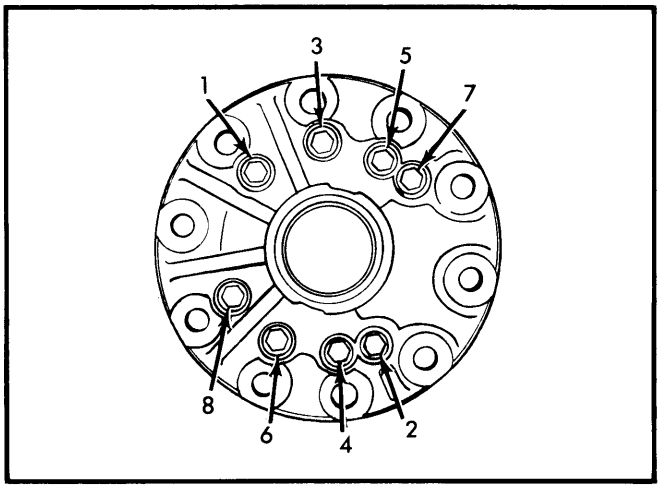

Fig. 4 Cap to Flange Bolt Torquing Sequence