

Drive Axles

GENERAL MOTORS 10½" RING GEAR

**Chevrolet & GMC, Rear Axle:
C20/30 Models, G30 Models, K20/30
Models, P20/30 Models**

NOTE: The vehicle series numbers used in this article have been abbreviated for common reference to both Chevrolet and GMC models. Chevrolet models use numerical designations as listed; GMC models are identified as follows: 10 = 1500; 20 = 2500; 30 = 3500.

NOTE: The 10½" ring gear is not used on vehicles with dual rear wheels. Some models may use Spicer (Dana) axles. See appropriate articles in this section.

DESCRIPTION

The axle assembly is the hypoid gear type with integral carrier housing. It is used with full floating axles.

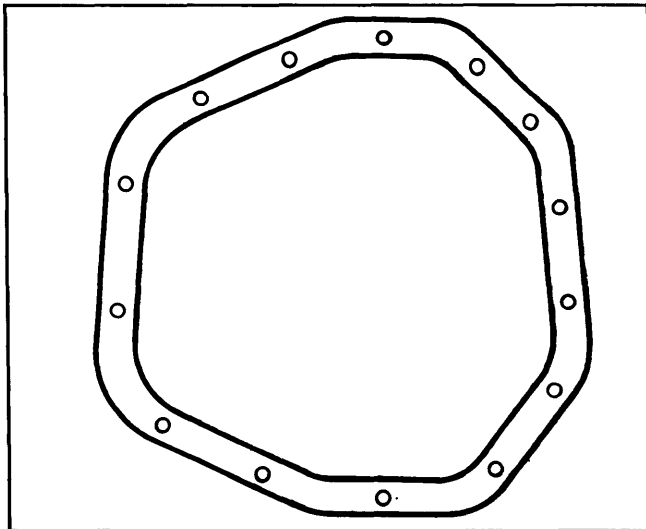
The drive pinion bearing preload adjustment is made with a collapsible spacer. The differential side bearing preload adjustment and the drive pinion depth adjustment are made by side bearing adjusting nuts.

A removable 14-bolt housing cover permits inspection and minor servicing of differential without removal from vehicle.

AXLE RATIO & IDENTIFICATION

General Motors uses several types of axles in its vehicles. The 10½" ring gear axle can be distinguished from the others by the configuration of its housing cover and by the number of attaching bolts. See Fig. 1. To determine drive axle ratio, refer to Drive Axle Ratio Identification in this Section.

Fig. 1: 10½" Ring Gear Housing Cover Gasket



REMOVAL & INSTALLATION

AXLE SHAFTS

1) Remove axle shaft attaching bolts from wheel hub, and hit flange on axle shaft with a soft faced hammer to loosen shaft.

2) Grip rib on end of flange with pliers, and twist axle shaft to begin removal. When shaft is loose, remove it from housing. To install, reverse removal procedure, using new gaskets.

WHEEL HUB & SEAL

1) Remove axle shaft. Remove lock nut retainer, lock nut, adjusting nut retainer, adjusting nut and thrust washer from axle housing.

2) Pull hub and drum assembly straight off axle housing. Pry old oil seal from wheel hub, using care not to damage bore surface. Thoroughly clean seal contact area.

3) Pack cavity between seal lips with high melting point wheel bearing lubricant. Position seal in hub bore. Using seal installer (J-24428), carefully press seal into hub, until seal is flush with edge of hub. Install hub onto axle housing and install axle shaft.

WHEEL BEARINGS

1) With wheel hub removed from vehicle, use a long drift or punch to drive inner bearing, cup, and oil seal from hub. Remove outer bearing retaining ring. Drive outer bearing out of hub, using outer bearing cup tool (J-24426).

CAUTION: Inner bearing cup and outer bearing retaining ring must be removed before attempting to remove outer bearing cup.

2) Place outer bearing assembly into hub. Using bearing cup installer (J-8608), drive bearing past retaining ring groove in hub.

NOTE: Be sure chamfer of bearing cup installer (J-8608) does not contact bearing cup.

3) Install outer bearing retaining ring, and drive outer bearing cup back against ring until seated. Place inner bearing cup into hub.

4) Using bearing cup driver (J-24427), drive cup into hub until seated against shoulder. Install new oil seal with oil seal installer (J-24428). Place hub assembly onto axle housing. Install adjusting nut, and adjust rear wheel bearing. See Rear Wheel Bearing Adjustment in SUSPENSION Section.

PINION FLANGE & SEAL

1) Disconnect propeller shaft, and tie out of the way. Scribe a line down pinion stem and pinion flange for reassembly reference.

2) Remove pinion nut and pull pinion flange from stem. Pry oil seal from bore, using care not to damage machined surfaces. Clean area thoroughly. Pack cavity between seal lips with high melting point bearing lubricant.

3) Place new seal into bore, and drive seal in until it bottoms against inner shoulder. Install pinion flange, pinion nut and propeller shaft.

AXLE ASSEMBLY

1) Raise vehicle and support weight at frame side rails. Remove rear wheels. Disconnect propeller shaft and tie out of the way. Remove wheel hub. Disconnect parking brake cable at lever and at flange plate.

2) Disconnect hydraulic brake hose at connector on axle housing. Disconnect shock absorbers at axle brackets. Raise axle assembly slightly to relieve tension

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on springs. Remove spring "U" bolts, and lower axle assembly to floor. To install, reverse removal procedure.

OVERHAUL

DISASSEMBLY

- 1) Drain lubricant. Remove housing cover and axle shafts. Note and record ring gear backlash and pinion bearing preload for reassembly reference.
- 2) Remove adjusting nut lock retainers from bearing caps. Mark bearing caps for reassembly reference. Remove bearing caps. Loosen side bearing adjusting nuts and remove differential case assembly from axle housing.
- 3) Remove pinion bearing retainer bolts. Remove pinion and bearing retainer assembly. Note and record number and thickness of shims removed. Remove pinion flange and press pinion gear out of bearing retainer.
- 4) Press rear pinion bearing from gear. Drive front and rear pinion bearing cups and pinion oil seal from bearing retainer. Drive pinion straddle bearing from axle housing.
- 5) Mark differential case halves for reassembly reference. Remove ring gear bolts and ring gear. Split case halves. Remove side gears, differential spider, differential pinion gears, and thrust washers.

REASSEMBLY & ADJUSTMENT

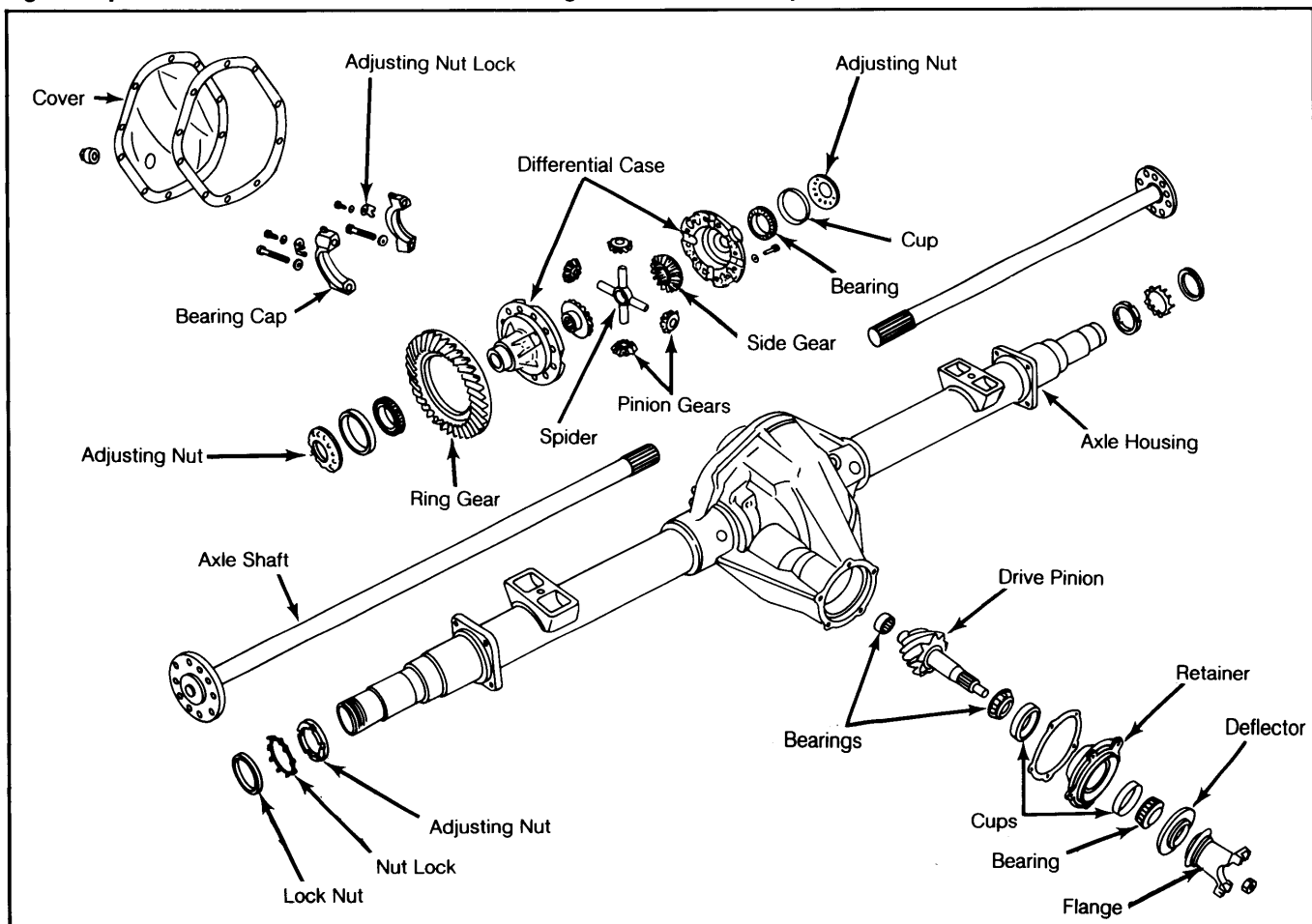
Case Assembly

- 1) Lubricate differential pinion gears, side gears and thrust washers with hypoid gear oil. Place pinion gears and thrust washers on differential spider. Install side gears and spider assembly into left half of differential case.
- 2) Assemble both halves of case, making sure alignment marks on both halves are together. Install 2 guide pins in ring gear, directly opposite each other.
- 3) Start guide pins through holes in case flange, and tap ring gear lightly with soft face hammer until ring gear attaching bolts can be started. Tighten bolts evenly until ring gear is flush with case flange. Remove guide pins, and tighten all ring gear bolts alternately and evenly.

Pinion Depth & Bearing Preload

- 1) With pinion bearing retainer mounted in vise, install pinion gear and bearing assembly into retainer. Place pinion flange on gear stem. Install new pinion nut, and tighten nut in small increments until specified pinion bearing preload is obtained.
- 2) If original ring and pinion gears are to be reinstalled, use new pinion shims of same number and thickness as those removed.
- 3) If new gears are to be installed, compare pinion depth code number of new pinion gear with that of

Fig. 2: Exploded View of Chevrolet & GMC 10½" Ring Gear Axle Assembly



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original pinion gear. From these 2 codes, determine correction factor by referring to Pinion Depth Code chart.

4) Combine correction factor with thickness of new shim pack. Place new shim pack onto carrier housing, and install pinion bearing retainer assembly. Tighten retainer bolts in a crosswise sequence.

PINION DEPTH CODES

| Original Code | Service Code | Correction In. (mm) |
|---------------|--------------|---------------------|
| +2 | +2 | 0 (0) |
| +2 | +1 | -.001 (-.025) |
| +2 | 0 | -.002 (-.005) |
| +2 | -1 | -.003 (-.008) |
| +2 | -2 | -.004 (-.10) |
| +1 | +2 | +.001 (+.025) |
| +1 | +1 | 0 (0) |
| +1 | 0 | -.001 (-.025) |
| +1 | -1 | -.002 (-.005) |
| +1 | -2 | -.003 (-.008) |
| 0 | +2 | +.002 (+.005) |
| 0 | +1 | +.001 (+.025) |
| 0 | 0 | 0 (0) |
| 0 | -1 | -.001 (-.025) |
| 0 | -2 | -.002 (-.005) |
| -1 | +2 | +.003 (+.008) |
| -1 | +1 | +.002 (+.005) |
| -1 | 0 | +.001 (+.025) |
| -1 | -1 | 0 (0) |
| -1 | -2 | -.001 (-.025) |
| -2 | +2 | +.004 (+.10) |
| -2 | +1 | +.003 (+.008) |
| -2 | 0 | +.002 (+.005) |
| -2 | -1 | +.001 (+.025) |
| -2 | -2 | 0 (0) |

AXLE ASSEMBLY SPECIFICATIONS

| Application | Measurement In. (mm) |
|------------------------|----------------------|
| Ring Gear Backlash | |
| Preferred | .005-.008 (.13-.20) |
| Acceptable | .003-.012 (.008-.30) |
| Pinion Bearing Preload | INCH Lbs. (N.m) |
| New Bearings | 23-35 (2.6-4.0) |
| Used Bearings | 5-15 (.6-1.7) |

TIGHTENING SPECIFICATIONS

| Application | Torque Ft. Lbs. (N.m) |
|-------------------------------------|-----------------------|
| Ring Gear | 120 (163) |
| Side Bearing Cap | 135 (184) |
| Drive Pinion Nut | ¹ |
| Differential Bearing Adjusting Lock | 20 (27) |
| Pinion Bearing Retainer | 65 (84) |

¹ - Torque as necessary to obtain correct preload. Tighten to approximately 350 Ft. Lbs. (476 N.m).

Backlash & Final Assembly

1) Place lubricated bearing cups onto differential side bearings and place differential assembly into carrier. Install bearing caps in their original positions, and tighten cap bolts until just snug.

2) Loosen right side bearing adjusting nut, and tighten left side adjusting nut until zero backlash is obtained. Back off left adjusting nut 2 slots to a locking position.

3) Tighten right adjusting nut until case is in firm contact with left adjusting nut. Loosen right adjusting nut until it is free of bearing. Retighten nut until it just contacts bearing. Tighten right adjusting nut additional 2 slots (used bearings) or 3 slots (new bearings) to properly preload differential side bearings.

4) Using a dial indicator, measure ring gear backlash in at least 4 locations around ring gear. Adjust to specifications by moving adjusting nuts in or out as necessary. If 1 adjusting nut is loosened, the other nut must be tightened an equal amount to maintain side bearing preload.

5) With backlash adjustment complete, install adjusting nut lock fingers into slots in nuts, and attach fingers to bearing caps. Tighten bearing cap bolts, and perform gear tooth contact pattern check. Install axle housing cover.