IHC FULL FLOATING AXLES

MS-1210
1310 MHC
1510 MHC

NOTE – *Some models use other units, see Dana/Spicer Semi-Floating or Dana/Spicer Full Floating Axles in this Section.*

CHANGES, CAUTIONS, CORRECTIONS

► *1975 PINION SEAL CHANGE* – Some models have a simplified pinion seal arrangement that requires fewer parts between front pinion bearing and pinion flange. New type seal is replaced as follows: Scribe mark relationship of "U" joint, pinion flange, and pinion shaft for reassembly reference. Disconnect drive shaft at rear axle and support out of way. Holding pinion flange with suitable tool, remove pinion nut and washer. Using suitable puller, remove pinion flange. Being careful not to damage pinion seal bore, pry seal out of assembly. Wet lip of new seal with clean oil and install, making sure seal flange is tight against differential housing. Install flange, washer, and nut, then tighten to specifications.

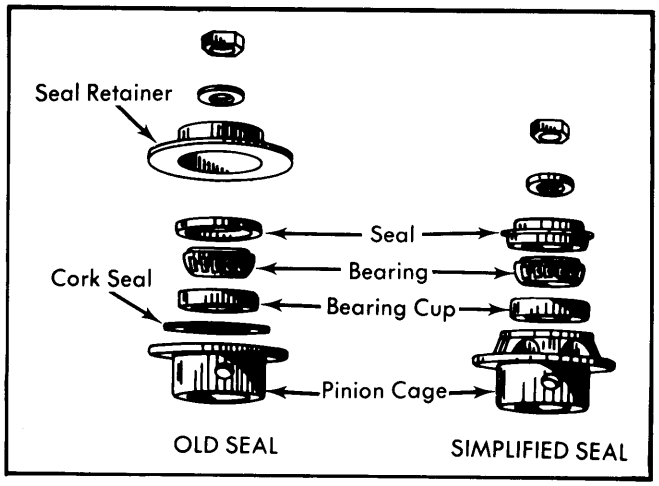

Fig. 1 View Showing Difference Between Old & Simplified Seal

DESCRIPTION

The axle has a banjo-type housing with a removeable carrier. The drive pinion is straddle mounted, and its depth is adjusted by shims. The ring gear and differential case are mounted on the removeable carrier. The preload on the side bearings is set by adjusting nuts on which the bearing cups rest. This unit is distinguished from the Dana/Spicer units by its removeable carrier and lack of rear cover plate. It is used with full floating axles in all applications.

AXLE RATIO & IDENTIFICATION

Axle ratio is stamped on small metal tag attached to carrier bolt circle. Axle can be identified by code number on Part Code Sheet found in glove compartment and mounted on driver's sun visor, or by corresponding model number stamped on metal tag with axle ratio. This axle assembly is only one used by IHC that has a removeable carrier; all others have an integral carrier.

Axle Identification

Code Number	Model Number	Axle Type
14015	RA-15	Full Floating

REMOVAL & INSTALLATION

AXLES

Removal (Axles W/Tapered Dowels) – 1) Axles can be removed without removing wheels. Remove nuts from studs on axle flange. Strike center of flange sharply with a hammer. This will loosen tapered dowels on studs.

2) Remove tapered dowels. Push flange back into position and again strike center of flange sharply with a hammer. Axle will spring back out from wheel hub. This will allow axle to be removed without prying against edge of flange.

Installation – To install axle, reverse removal procedure. Make sure there is a slight clearance between lock washers and axle shaft flange after dowels are installed. If there is no clearance, there will be excessive wear on studs, dowels or holes.

Removal (Axle W/O Tapered Dowels) – Axle can be removed without removing wheel. Remove nuts from studs on axle flange. Install puller screws in two threaded holes in axle flange. As screws are turned in, axle will be pulled away from hub. When sufficient clearance is obtained, remove axle.

Installation – To install axle shaft, reverse removal procedure.

HUBS (BRAKE DRUMS)

Removal – Remove axle shaft as previously outlined. Pry lock tang away from bearing adjusting nut. Remove outer nut, lock washer and inner adjusting nut. Pull hub and drum assembly off axle housing.

Installation – Place drum and hub with bearings on axle shaft. Install outer bearing cone. Install inner adjusting nut. Rotate wheel while tightening nut to make sure bearings are correctly seated. Adjust wheel bearings. *See Rear Wheel Bearing Adjustment in WHEEL ALIGNMENT Section*

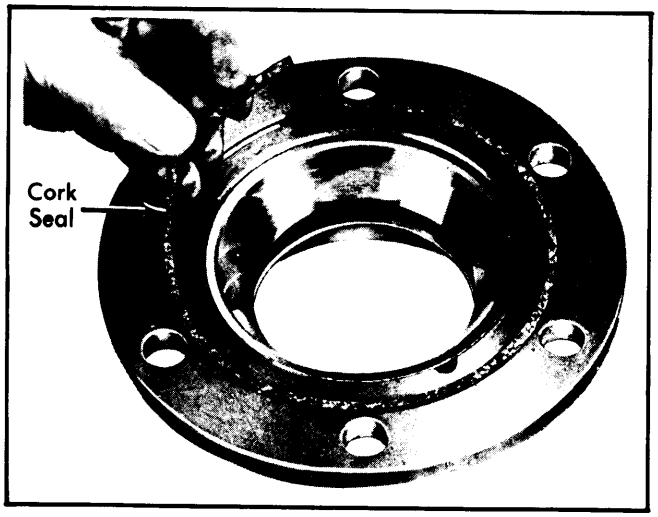

Fig. 2 Removing Cork Cage Seal

IHC FULL FLOATING AXLES (Cont.)

PINION FLANGE & SEAL

Disconnect drive shaft. Holding pinion flange or yoke, remove pinion shaft nut and washer. Using a suitable puller, remove pinion flange. Remove pinion case bolts and slide off oil seal retainer without removing pinion cage. Remove and replace cork seal (see illustration). Remove and replace seals in seal retainer. To install, reverse removal procedure.

DIFFERENTIAL CARRIER

Remove propeller shaft and both axle shafts. Place a pan under axle to catch lubricant. Remove carrier attaching bolts and remove carrier. If carrier has threaded puller screw holes, puller screws can be used to initially loosen carrier from axle assembly. If carrier does not have threaded holes, a soft hammer can be used to jar carrier loose. To install, reverse removal procedure and tighten carrier attaching bolts.

OVERHAUL

DISASSEMBLY

1) Remove cotter pins from bearing adjuster locks and remove locks from bearing caps (see illustration). Mark bearing caps so that they can be installed in their original positions. Remove nuts and remove bearing caps and adjusting nuts. Tip differential away from pinion and lift out of axle housing.

2) Remove side bearings from differential case with a suitable puller. Mark differential case halves with a punch for correct alignment during reassembly. Cut lock wire, remove bolts, and separate case halves. Remove spider, pinions, side gears, and thrust washers.

3) If it is necessary to remove ring gear from case, DO NOT cut rivet heads off with a chisel. Carefully center punch rivet head, then drill out head only with $^{13}/_{32}$" bit. Punch rivet out with drift pin (see illustration).

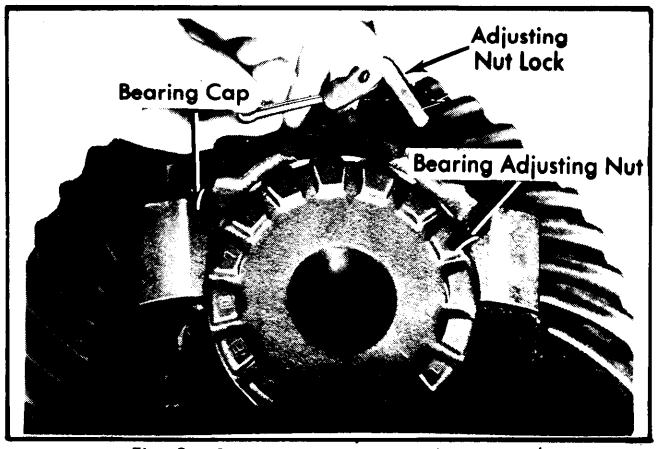

Fig. 3 Removing Bearing Adjuster Lock

4) There are two methods for removing pinion and cage assembly. If there are no puller screw holes in pinion cage flange, remove pinion cage bolts and with a brass drift, tap machined end of pinion gear to drive pinion cage assembly out of rear of carrier. **CAUTION** – *Do not let cage assembly fall.*

5) If there are puller screw holes in pinion cage flange, hold pinion flange or yoke and remove pinion shaft nut and washer. Remove flange with suitable puller. Remove pinion cage bolts,

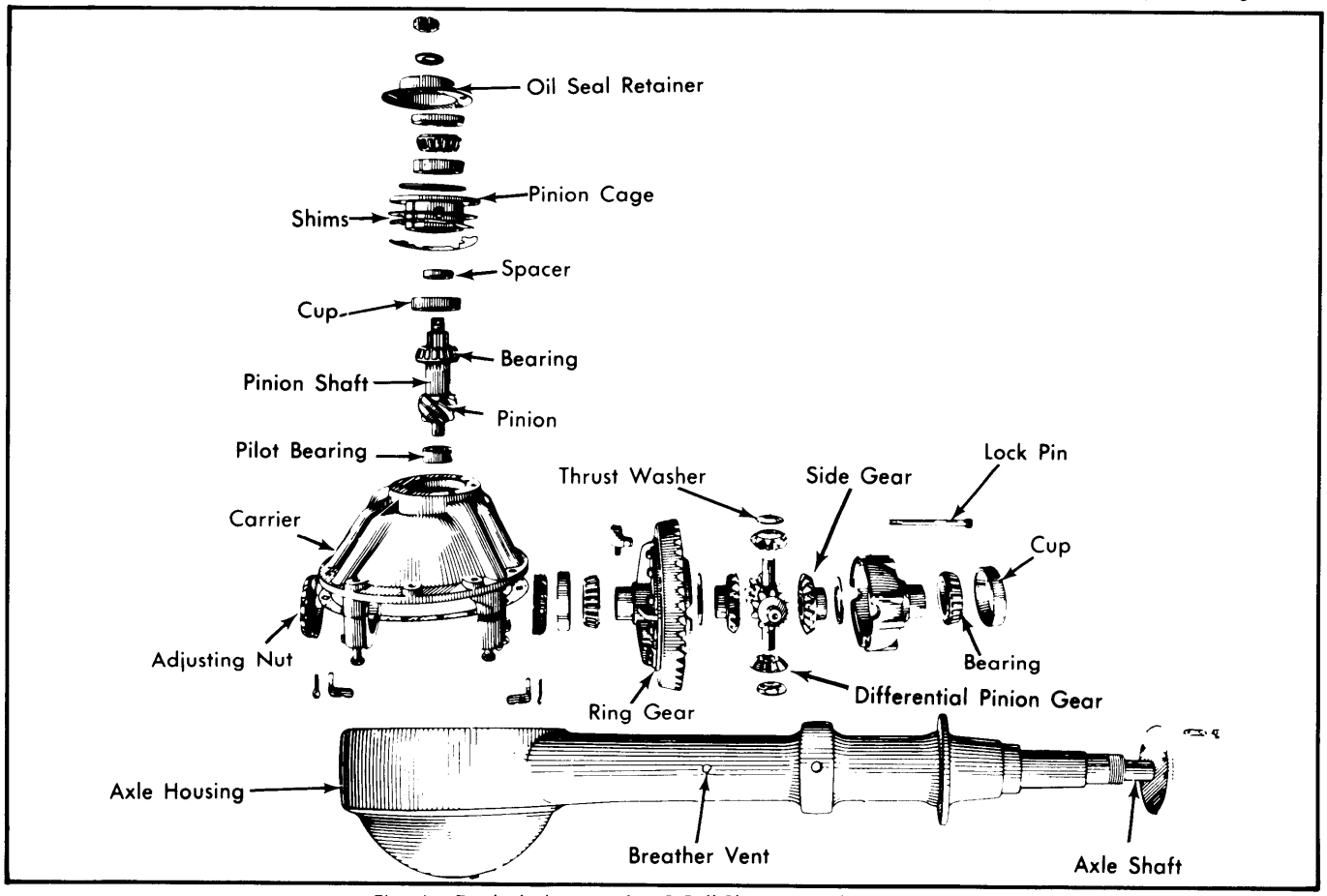

Fig. 4 Exploded View of IHC Full Floating Axle Assembly

IHC FULL FLOATING AXLES (Cont.)

bearing cover and oil seal assembly. Insert puller screws in cage flange and remove pinion and cage assembly. **CAUTION** – *If puller screw holes are provided, never use brass drift technique, for damage to bearing lock ring groove could result.*

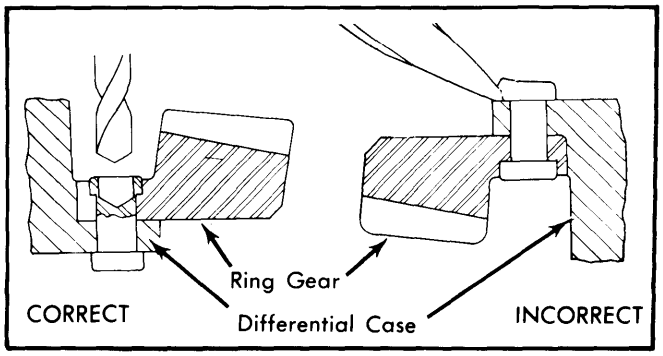

Fig. 5 View Showing Correct & Incorrect Methods of Removing Ring Gear Rivets

6) If pinion flange or yoke has not been removed, mount pinion and cage assembly in vise and remove pinion shaft nut. Using a suitable puller, remove pinion flange. Using a brass drift, tap pinion shaft from yoke end to drive assembly out of cage. Disassemble pinion shaft assembly.

REASSEMBLY & ADJUSTMENT

Case Assembly – 1) To assemble, reverse disassembly procedure noting the following: Examine side gear and differential pinion thrust washers for wear. If any wear is evident, replace. Make sure that case halves are assembled in their original position by noting marks made during disassembly.

2) Ring gear is installed by using suitable riveting jig (SE-1575) and specified riveting pressure. Ring gear and pinion must be installed as a set.

Pinion Depth & Bearing Preload – 1) Before pinion and ring gear can be adjusted for correct tooth contact, pinion bearing preload must be set. This is accomplished by selecting the correct size spacer, located between pinion thrust bearings, and tightening pinion shaft nut.

2) Temporarily bolt together pinion, cage, and pinion flange assembly, less oil seal and retainer. Clamp assembly in vise by the pinion flange, and tighten pinion shaft nut. Cage should be rotated while tightening shaft nut in order to properly seat bearings. Bearing rollers must be seated against face of bearing cone, and there must be no clearance at large end of bearing rollers (see illustration).

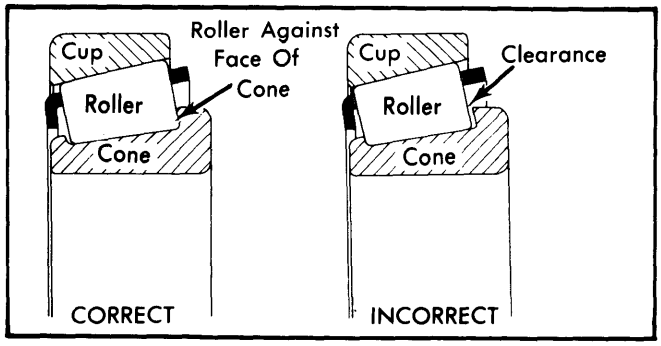

Fig. 6 View Showing Correct & Incorrect Bearing Roller Position

3) To measure preload, wrap a cord or soft wire around pinion cage and attach free end to spring scale (see illustration). Pull on scale and note tension after cage begins to move; ignore initial starting tension. If tension is not to specifications, adjust by replacing spacer with thicker or thinner spacer as required. A spacer that is close to dimension but too large, can be worked on emery cloth to necessary size. Be sure to wipe all filings from spacer before installing on shaft.

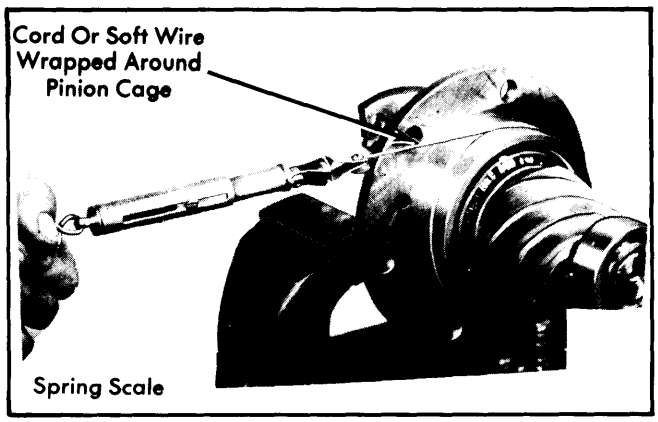

Fig. 7 Using Spring Scale to Measure Pinion Bearing Preload

4) If pilot bearing was removed from pinion shaft, it is replaced by pressing it onto end of shaft and staking it into position. Staking should be done with a blunt punch at six equidistant points 1/8" in from shaft outside diameter (see illustration).

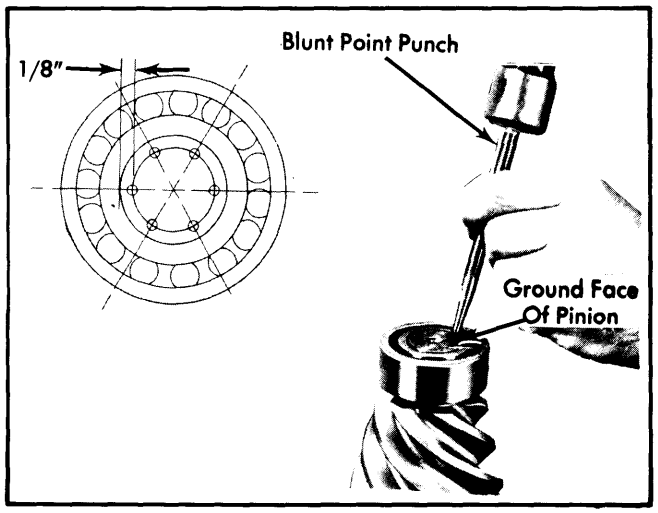

Fig. 8 Correct Procedure to Stake Pinion Pilot Bearing

5) Install pinion, cage, and bearing assembly in differential carrier. Add or subtract, as indicated, correction figure etched on end of pinion gear to specified pinion gear depth. Using a suitable gauge or fixture, establish pinion gear depth, measuring from machined surface of pinion to center of ring gear. Increase or decrease shim thickness, as required, to obtain corrected pinion depth.

IHC FULL FLOATING AXLES (Cont.)

Backlash & Side Bearing Preload – 1) Install differential case assembly in carrier. Using a dial gauge, measure ring gear backlash. If backlash figure is not etched on ring gear, see specifications for proper tolerance. To adjust backlash, turn side bearing adjusting nuts to move ring gear either in or out.

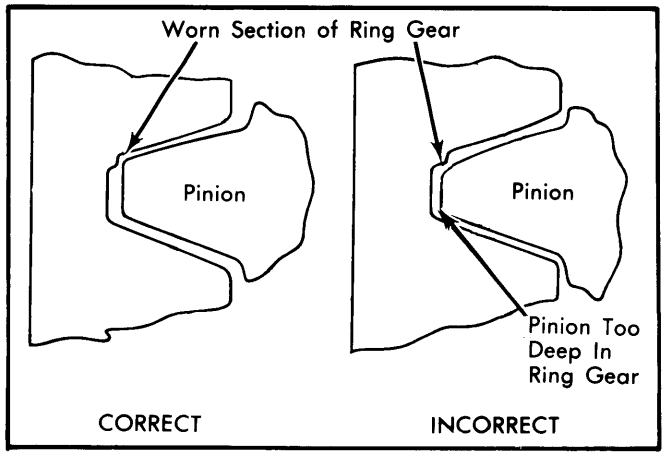

Fig. 9 View Showing Correct & Incorrect Methods of Installing Worn Gears

2) When original gear and pinion sets are being reinstalled, wear pattern of gear teeth must be considered. Gears that have been in service for long periods form running contacts which should not be greatly changed. If, in checking backlash, amount measured is in excess of amount specified, backlash may be reduced only by amount that will avoid overlap of worn tooth section. Any overlap of worn section will cause gear operation to be rough and noisy.

3) Mount dial indicator at side of ring gear. Loosen bearing caps only enough to allow slight bearing movement. Loosen adjusting nuts until slight bearing end play is indicated on dial indicator. Tighten adjusting nuts to reduce end play to zero, but no tighter. Rotate ring gear to check for runout. If runout exceeds .008", remove case and check for cause. Tighten bearing adjusting nuts specified number of notches to preload bearings, then tighten bearing cap bolts. Recheck backlash to insure that it has not changed during preload adjustment. Install adjusting nut locks.

4) Check gear tooth contact using paint impression method described in this section.

Final Assembly – *See Differential Carrier.*

AXLE ASSEMBLY SPECIFICATIONS

Ring Gear Backlash	.004-.006"
Side Bearing Preload	1 Notch
Pinion Bearing Preload	3-8 Lbs.
Pinion Gear Depth	2.9830"

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Pinion Shaft Nut	200-230
Pinion Cage To Carrier	30-40
Carrier-To-Housing	80-90
Differential Case	40-50
Bearing Cap-To-Carrier	80-90
Axle Flange-To-Rear Hub	80-90

RIVET PRESSURE

Application	Pressure (Tons)
Ring Gear	18-20