STEIGER

Service Manual
Series I thru IV
P/N 37-182

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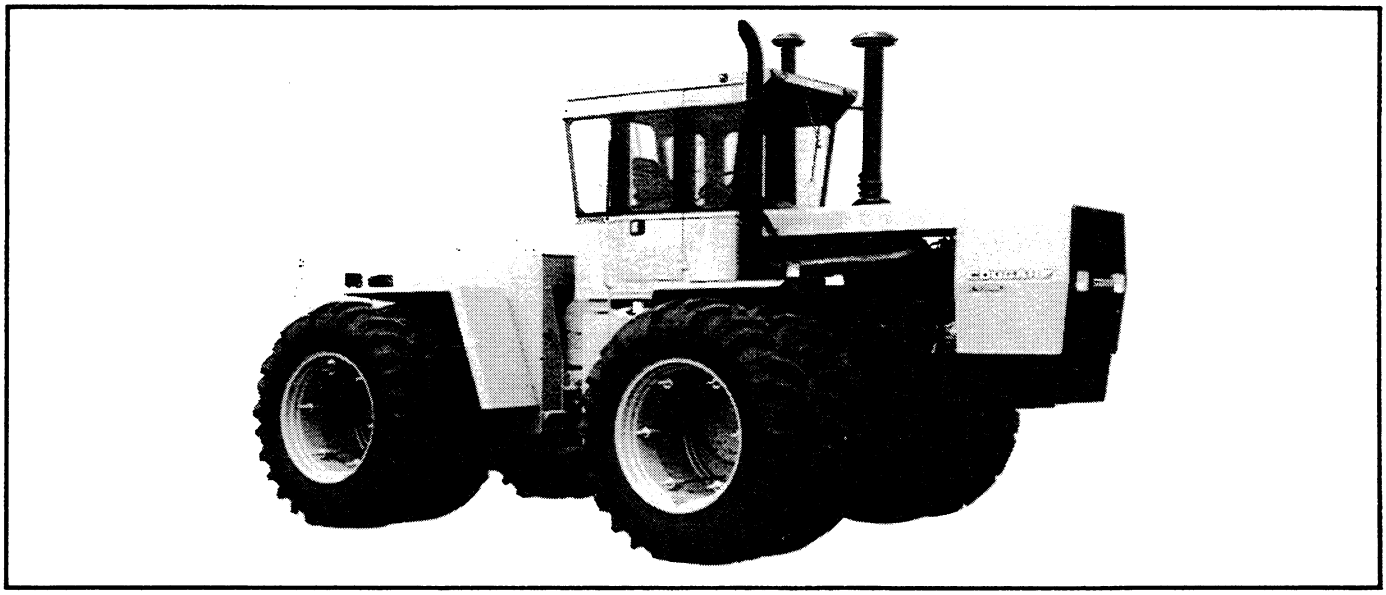
Reprinted

STEIGER®

GENERAL SPECIFICATIONS, SERIES IV
CM, KM, SM, CS & KS SERIES TRACTORS

SERVICE MANUAL



IMMEDIATE ACTION LETTER REFERENCE:

No/Date

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SERVICE BULLETIN REFERENCE:

No/Date

1_____ 4_____ 7_____

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SERVICE NEWS REFERENCE:

No/Date

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37-138 (9-84)

OVERHAUL OF AXLE ASSEMBLY

The instructions contained herein cover the disassembly and reassembly of the axle assembly in a sequence that would normally be followed after the unit has been removed from the machine and is to be completely overhauled. Mount axle on steel horses or on V-blocks. If axle is mounted on horses, invert it from its normally installed position and allow axle housing mounting pads to rest on crossbars of horses to provide necessary rigidity.

CAUTION: Cleanliness is of extreme importance in the repair and overhaul of this unit. Before attempting any repairs, the exterior of the unit must be thoroughly cleaned to prevent the possibility of dirt and foreign matter entering the mechanism.

DISASSEMBLY OF AXLE

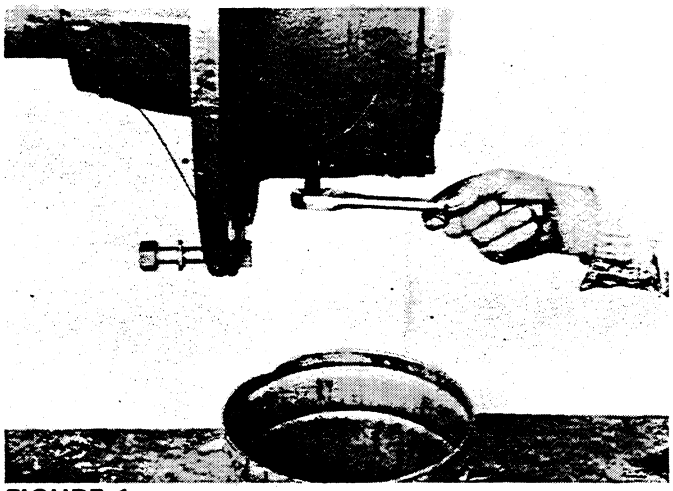


FIGURE 1:
Remove drain plugs from planetary hub and from axle housing to drain axle.

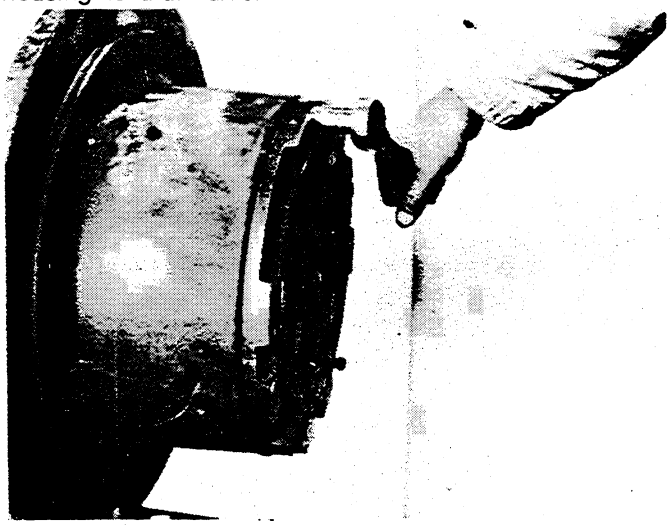


FIGURE 2:
Remove bolts, washers, and stud nuts from planet spider assembly.

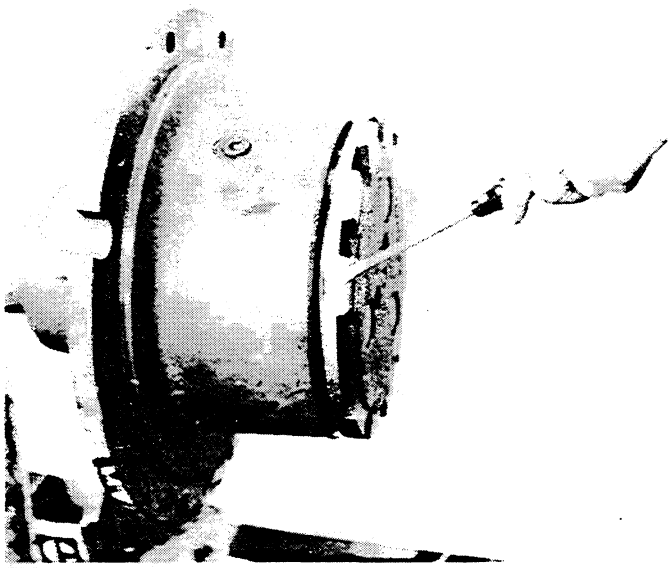


FIGURE 3:
Remove planet spider assembly. Take care not to lose tapered dowels used to align spider to studs.

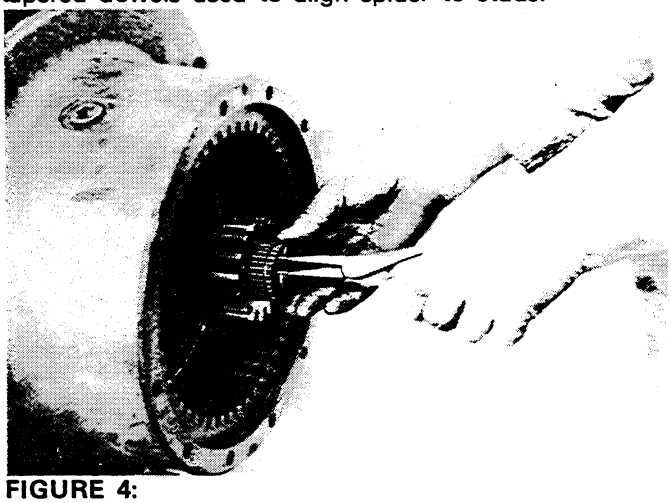


FIGURE 4:
Remove sun gear retaining ring and remove sun gear.

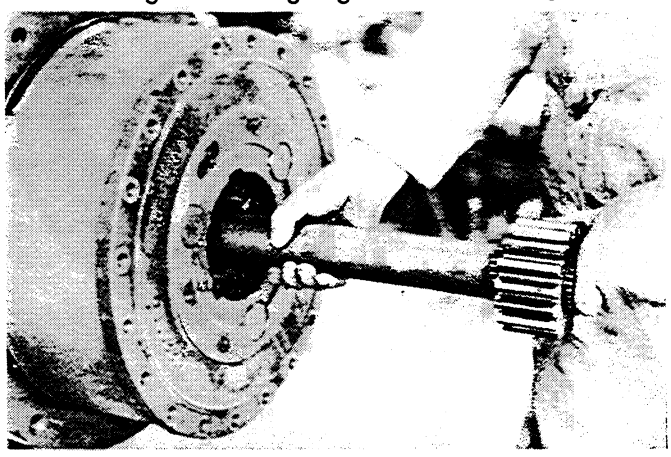


FIGURE 5:
Pull straight out to remove axle shaft assembly.

DISASSEMBLY

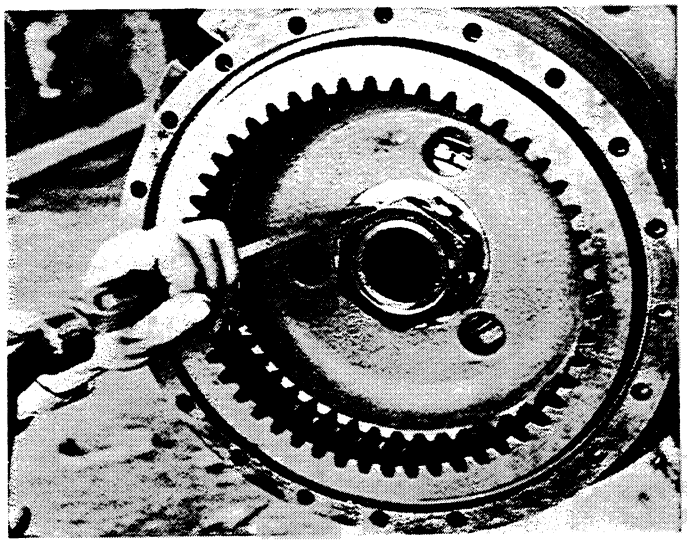


FIGURE 6:
Straighten tangs on locknut.

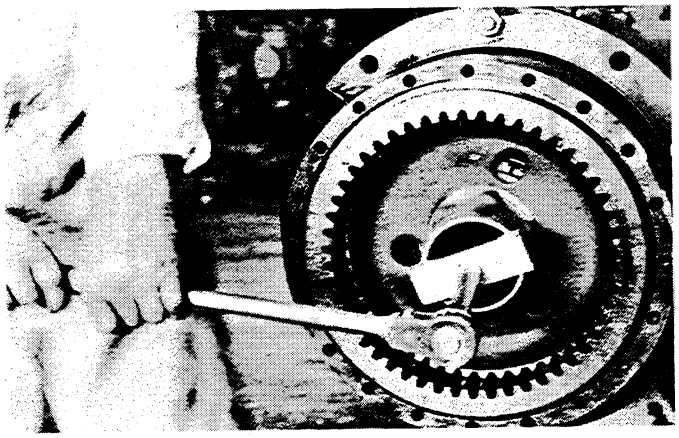


FIGURE 7:
Remove outer spindle nut.

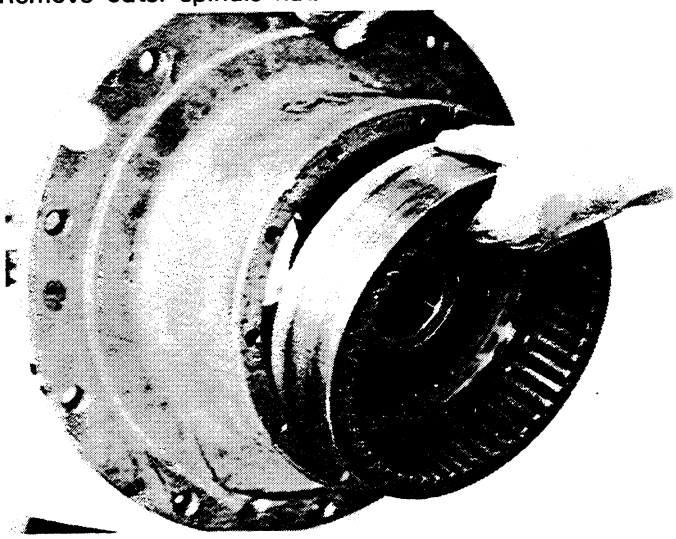


FIGURE 8:
Support weight of hub assembly with hoist. Remove internal gear and hub from spindle. In some cases, it will be necessary to use pry bars.

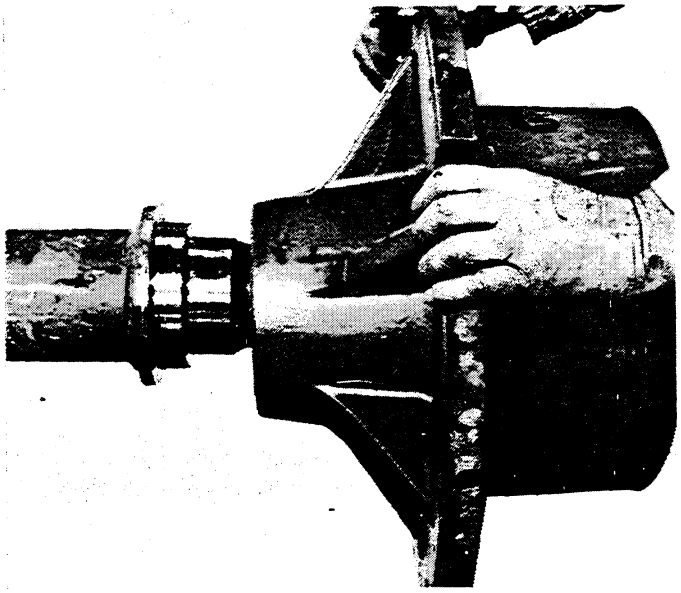


FIGURE 9:
Pull straight out on hub assembly to remove it from axle.

DISASSEMBLY OF PLANET SPIDER ASSEMBLY

FIGURE 10:
Remove pinion shaft cap to gain access to snap ring.

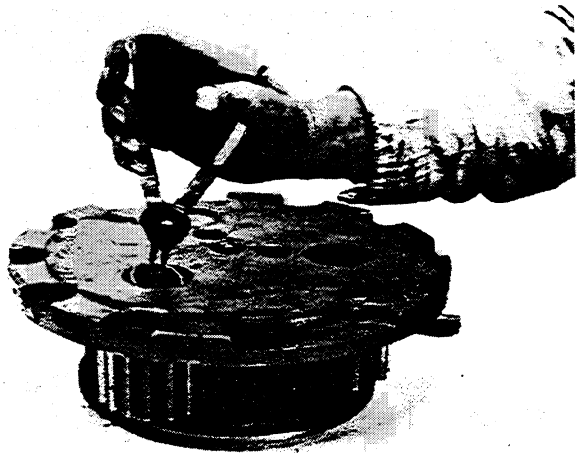


FIGURE 11:
Remove Snap Ring.

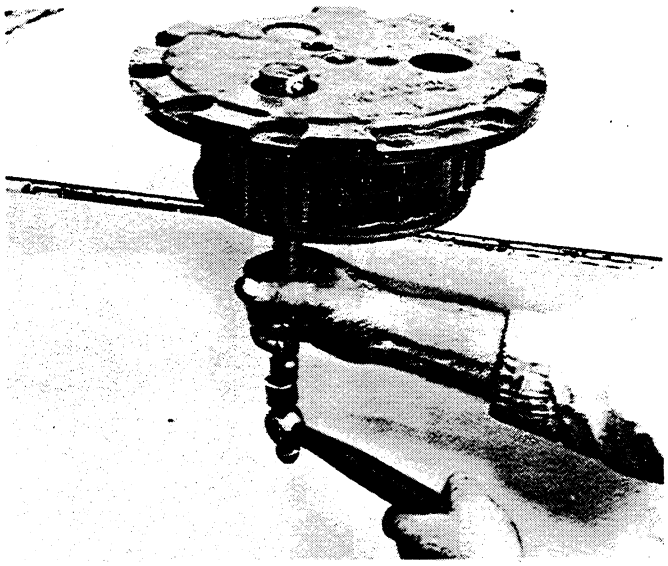


FIGURE 12:
Remove pinion shaft securing pinion to spider. Take care to catch pinion shaft ball released by shaft movement.

NOTE: Refer to Cougar-Tiger Drive Train, Section C, Page 4 through 14, for disassembly and assembly of internal gear and hub, and differential and carrier assembly.

Parts are not interchangeable but the same procedure can be followed for Dissassembly & Assembly.

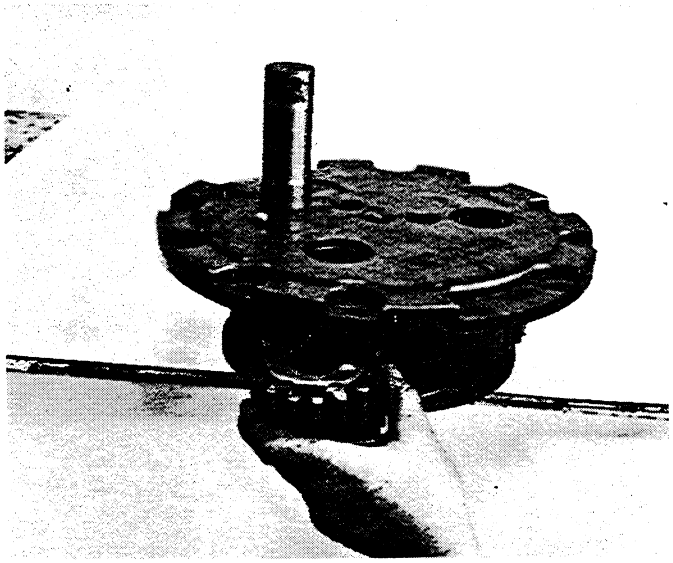


FIGURE 13:
Carefully remove pinion shaft, planet pinion, pinion thrust washers, pinion rollers, and pinion roller spacer.

DISASSEMBLY

The instructions contained herein cover the disassembly and reassembly of the axle assembly in a sequence that would normally be followed after the unit has been removed from the machine and is to be completely overhauled. However, most axle repairs can be made with the assembly in the tractor. When axles are repaired off of the tractor, mount the axles on steel horses or on V-blocks. If axle is mounted on horses, invert it from its normally installed position and allow axle housing mounting pads to rest on crossbars of horses to provide necessary rigidity.

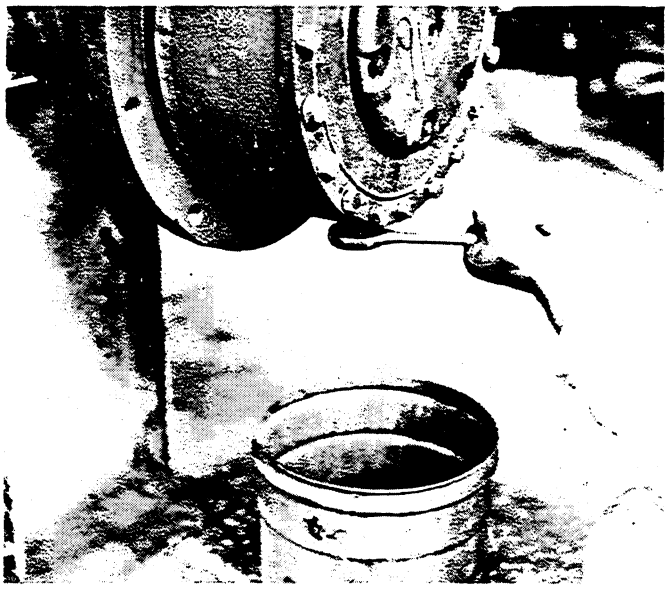


FIGURE 1:

Remove drain plugs from planetary hub and from axle housing to drain axle.

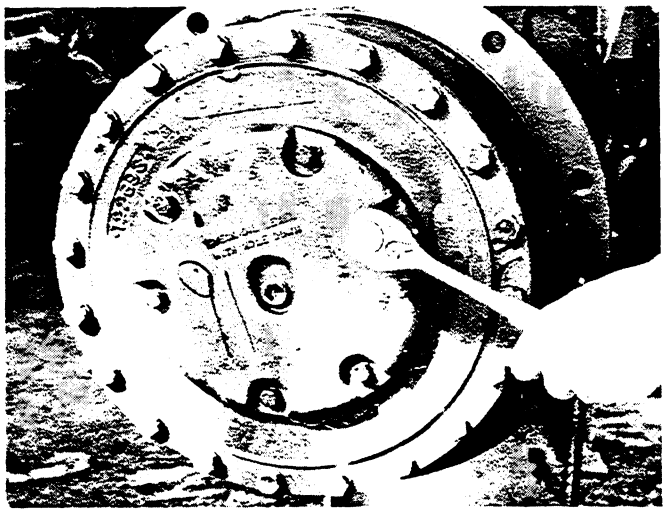


FIGURE 2:

Remove bolts and washers securing sun gear thrust cap.

CAUTION: Cleanliness is of extreme importance in the repair and overhaul of this unit. Before attempting any repairs, the exterior of the unit must be thoroughly cleaned to prevent the possibility of dirt and foreign matter entering the mechanism.

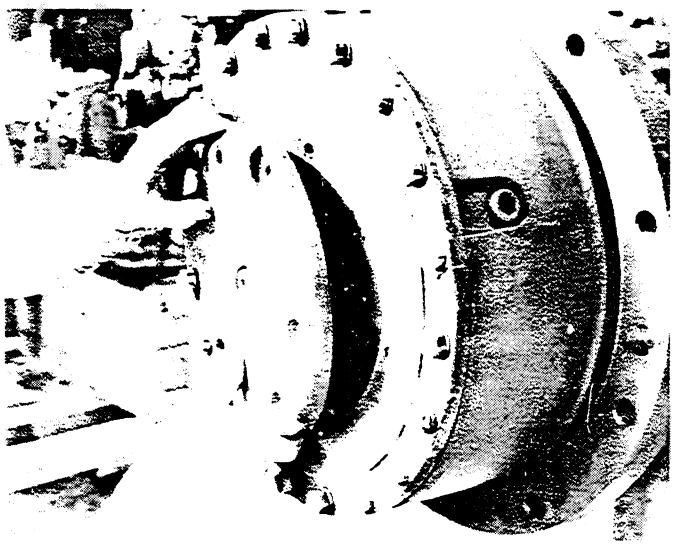


FIGURE 3:

Remove thrust cap. If damaged, remove sun gear thrust cap washer from thrust cap.

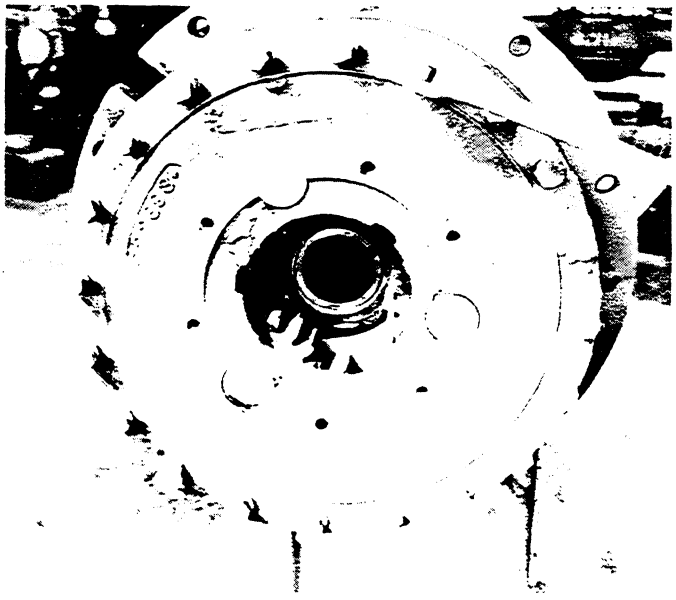


FIGURE 4:

Remove bolts, and washers from planet spider assembly.

DISASSEMBLY

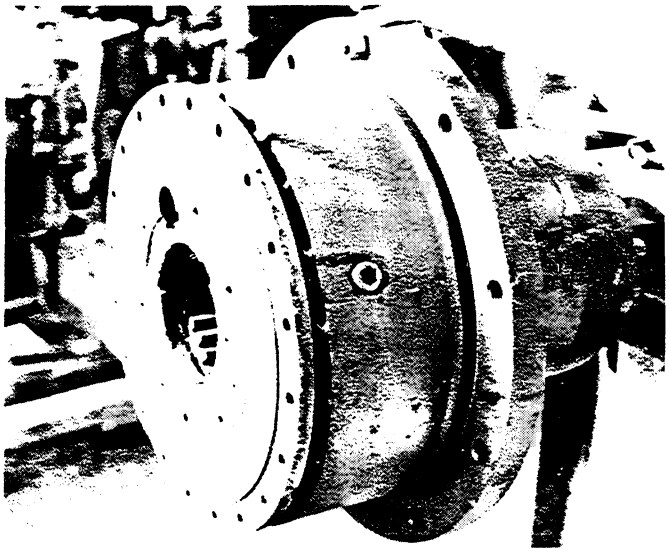


FIGURE 5:
Remove planet spider assembly. Take care not to lose tapered dowels used to align spider to studs.

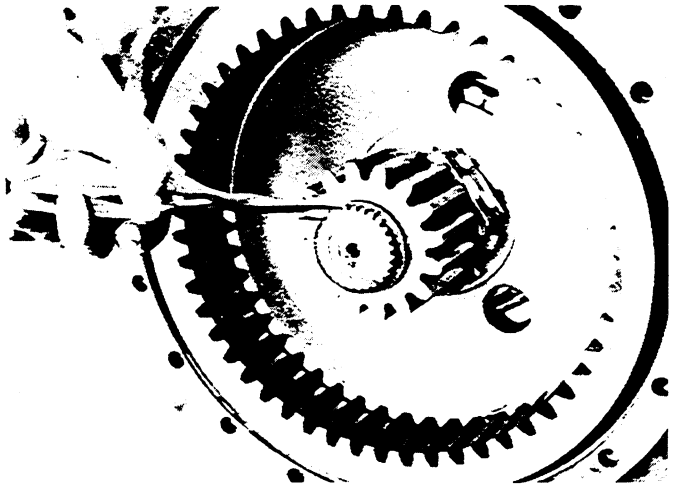


FIGURE 6:
Remove sun gear retaining ring and remove sun gear.

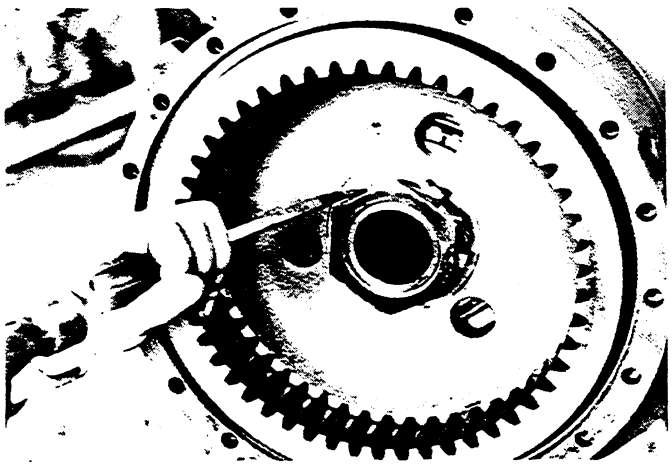


FIGURE 7:
Straighten tangs on nut lock as shown.

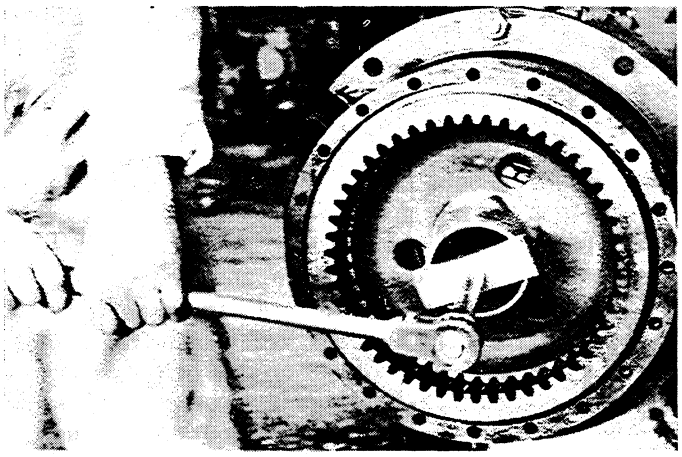


FIGURE 8:
Remove outer spindle nut, spindle nut lock, and inner spindle nut.

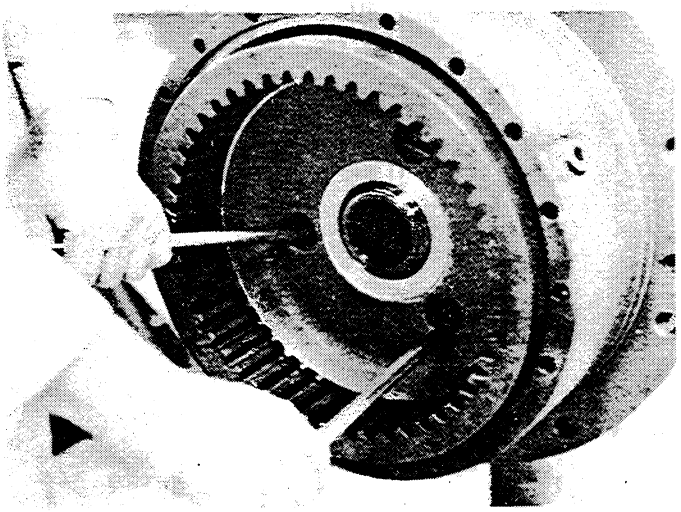


FIGURE 9:
Support weight of hub assembly with hoist. Remove internal gear and hub from spindle. In some cases, it will be necessary to use pry bars as shown.

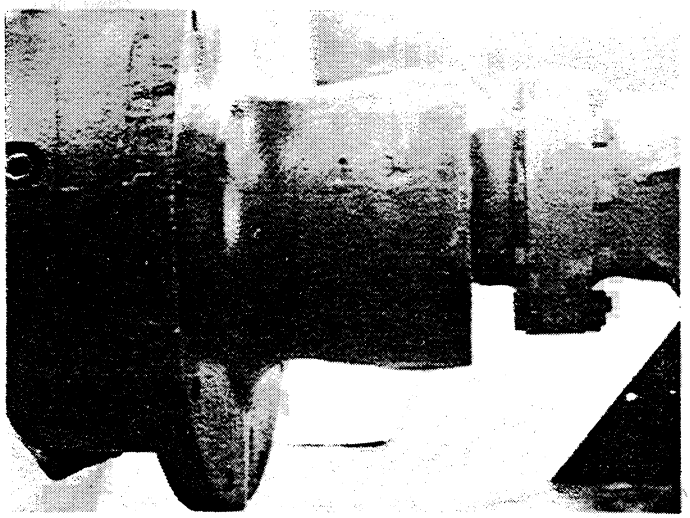


FIGURE 10:
Pull straight out on hub assembly to remove it from axle.

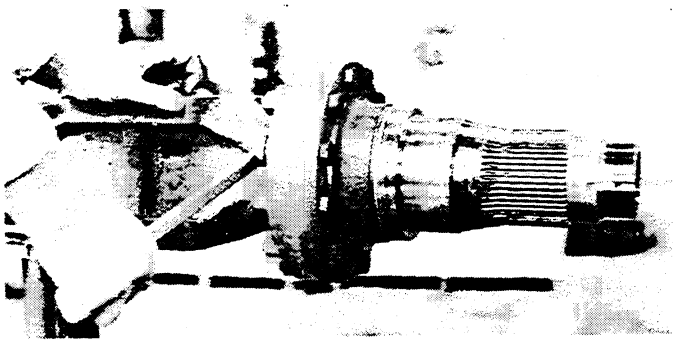


FIGURE 11:

Remove spindle from axle housing.

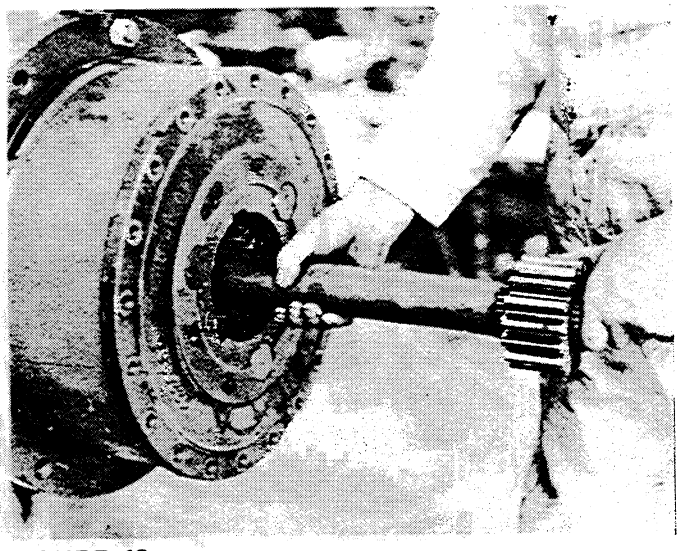


FIGURE 12:

Pull straight out to remove axle shaft assembly.

Disassemble opposite side of axle following instructions given under Fig. 1 thru 12.

NOTE: To remove differential, it is not necessary to fully disassemble axle ends. Axle shafts can be removed by removing sun gear thrust cap and pulling assembled sun gear and axle shaft from axle. Removal of axle shaft will allow differential to be removed.

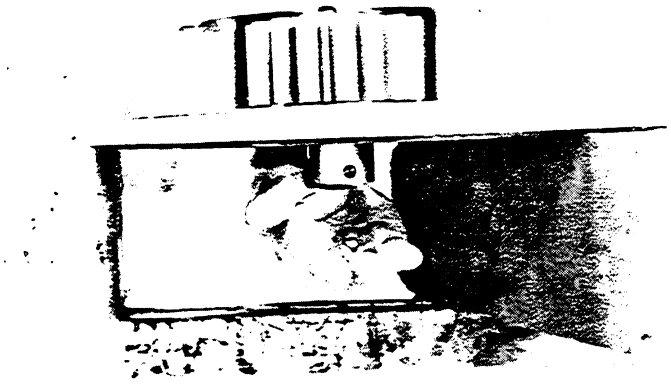


FIGURE 13:

Place planet spider assembly in press as shown in Figure 13 and press out pinion shaft securing pinion to spider. Take care to catch pinion shaft ball released by shaft movement.

FIGURE 14:

Carefully remove pinion shaft, planet pinion, pinion thrust washers, pinion rollers, and pinion roller spacer. Rollers will drop from pinions. Take care to prevent losing them.

FIGURE 15:

Pry out oil seal.

DISASSEMBLY

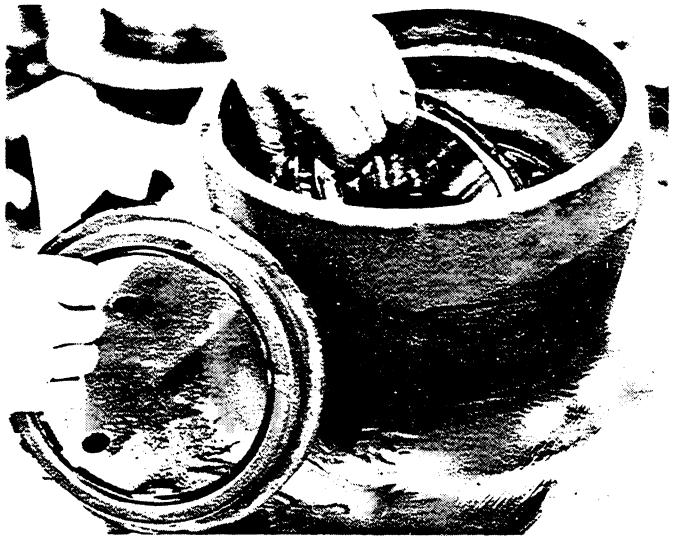


FIGURE 16:
Lift out bearing cone.

FIGURE 17:
If replacement of the bearing cups is required, drive out cups with a soft drift. Exercise care to prevent damage to the bearing bores when driving out cups.

DISASSEMBLY OF INTERNAL GEAR AND HUB

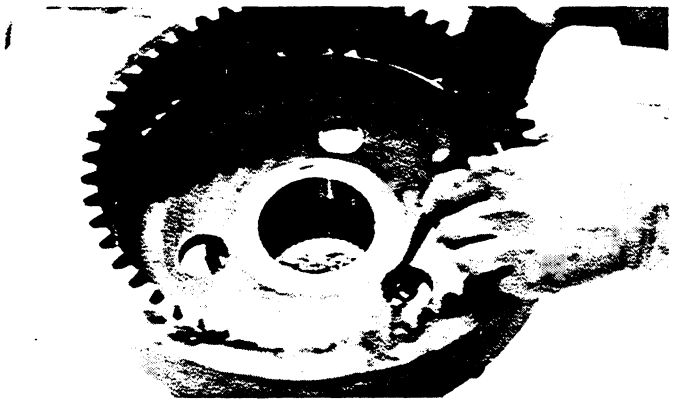


FIGURE 18:
Drive bearing cone from hub.

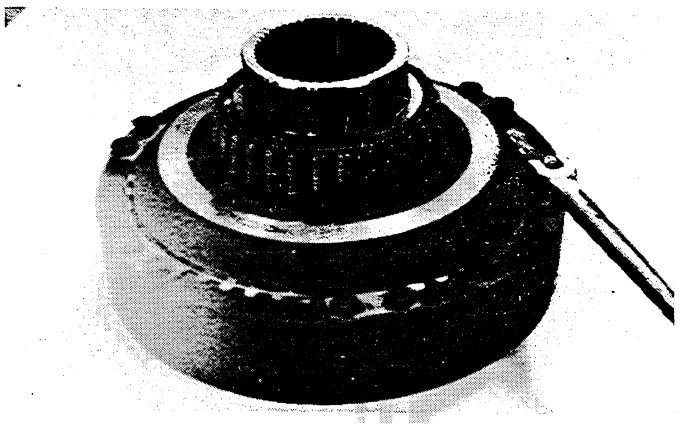


FIGURE 19:
If replacement of internal gear is necessary, cut lock-wires and remove bolts securing internal gear to hub. Separate internal gear from hub.

DISASSEMBLY OF DIFFERENTIAL AND CARRIER

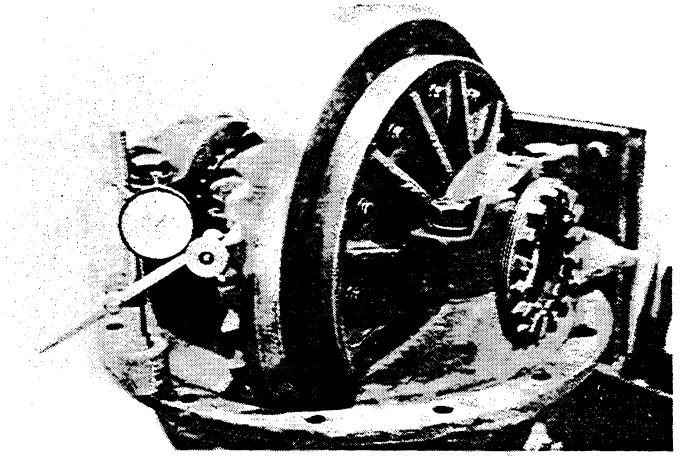
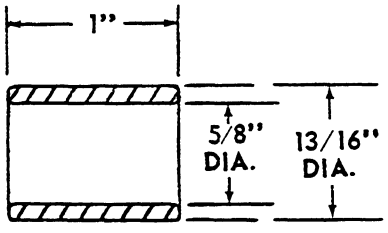


FIGURE 20:
Mount differential on differential overhaul stand. Check and record ring gear backlash with dial indicator. This information is necessary for reassembly unless a new gear set is installed.

If axle is not equipped with parking brake, companion flange nut should be loosened now to facilitate flange removal later. Position socket on flange nut and then install flange retainer tool with two spacers between tool and flange. Spacer dimensions are given below. Loosen flange nut.



1/32" DIA RADIUS ALL CORNERS

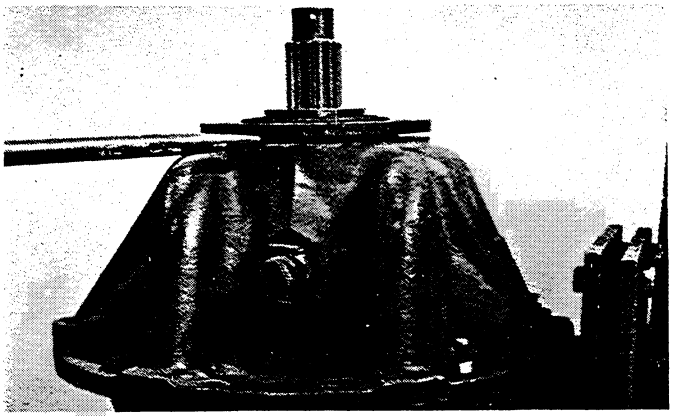


FIGURE 26:

Remove pinion shaft assembly from carrier. Remove bearing cage shims. Retain bearing cage shim pack intact for possible reuse in reassembly.

DISASSEMBLY OF STANDARD DIFFERENTIAL

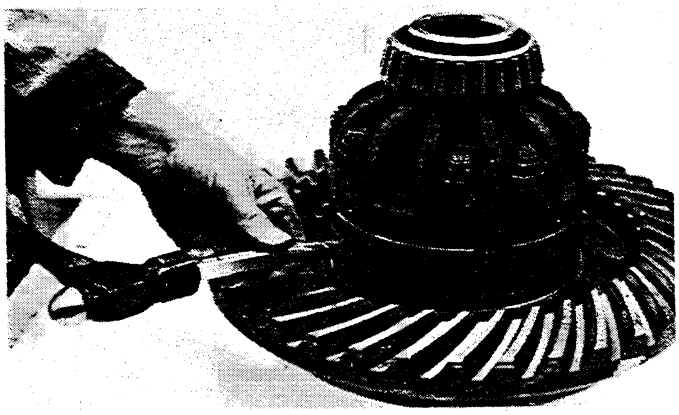


FIGURE 27:

Match-mark case halves to insure correct reassembly. Cut lockwires that secure differential case bolts.

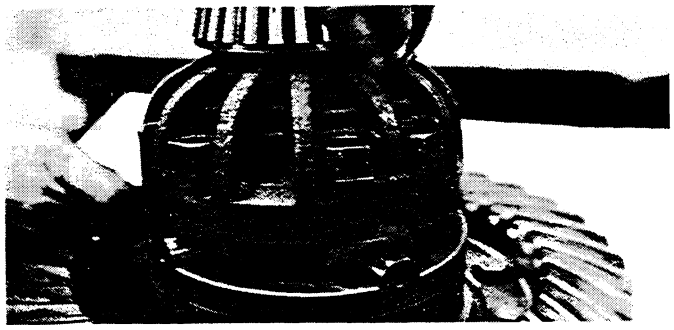


FIGURE 28:

Remove differential bolts securing case halves. Lift off plain case half. Use soft mallet if necessary to aid removal.

NOTE: Some differential case halves are secured with bolts and self-locking nuts instead of bolts and lockwires.

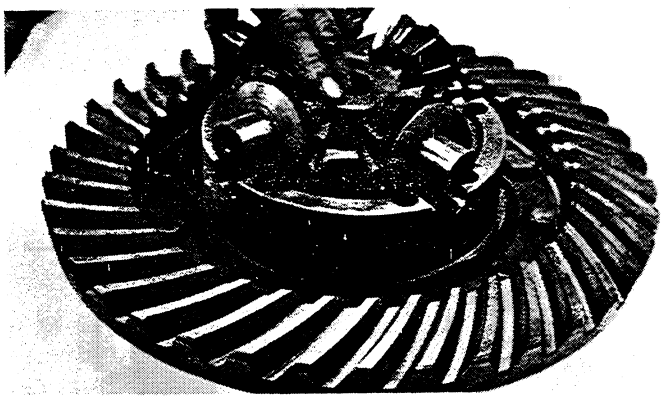


FIGURE 29:

Remove spider, pinions, and thrust washers.

DISASSEMBLY OF DIFFERENTIAL CASE PARTS

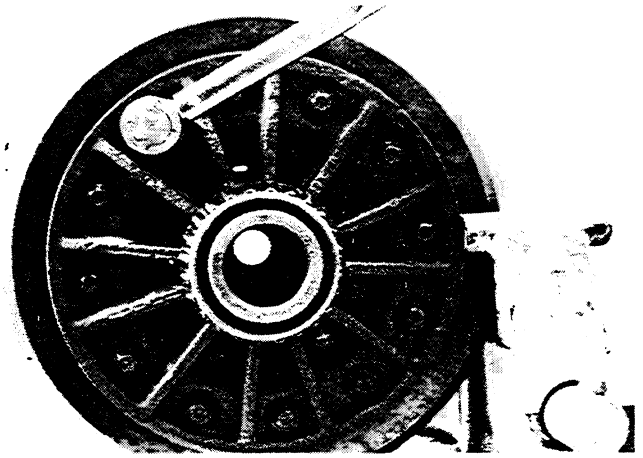


FIGURE 30:

Remove nuts that secure ring gear to case half. Place case half and ring gear in press and apply light pressure to hold parts while removing nuts.

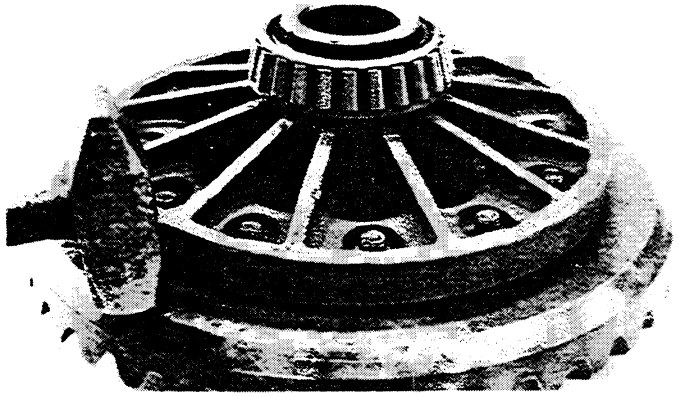
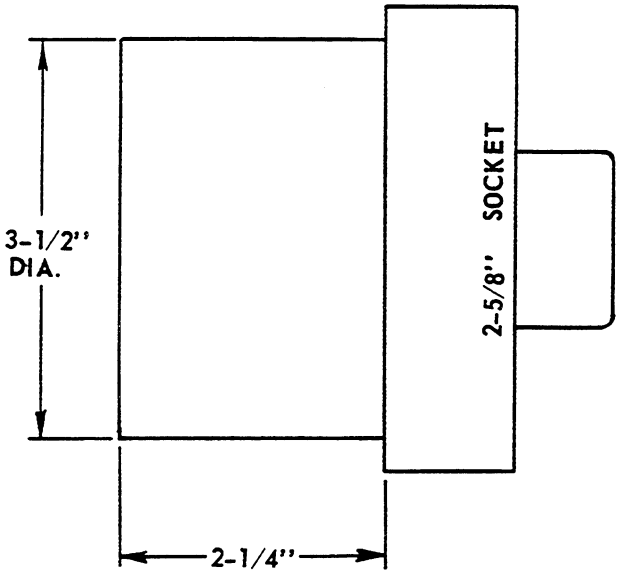


FIGURE 31:

Use soft hammer to drive ring gear from case half.

NOTE: Standard 2-5/8 inch socket will not fit flange nut because socket walls are too thick to enter flange. Machine socket as shown below to provide proper clearance.



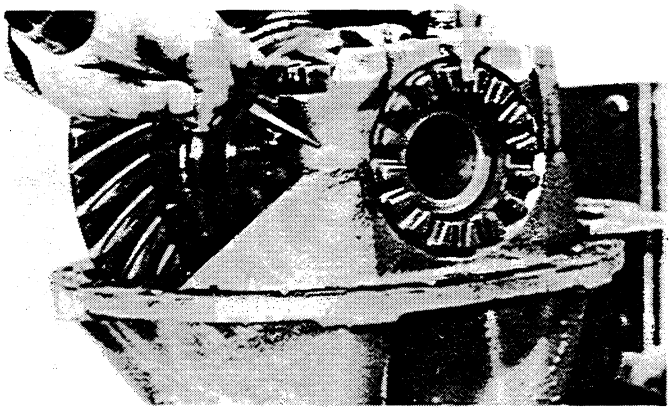


FIGURE 21:
Remove lockwire and adjusting nut lock. Before removing bearing cap bolts, use center punch to matchmark bearing caps to carrier assembly. This is to insure correct match in reassembly.

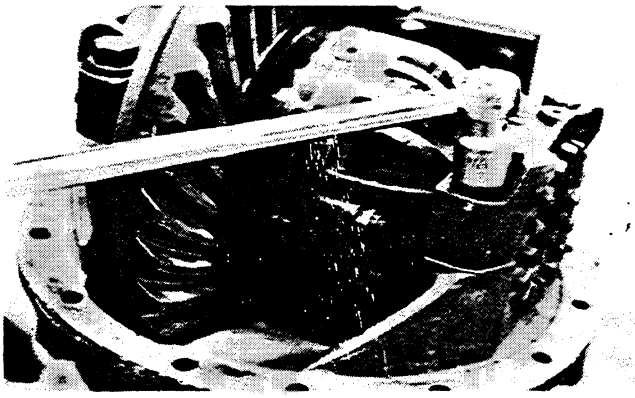


FIGURE 22:
Remove bearing cap bolts and bearing caps.

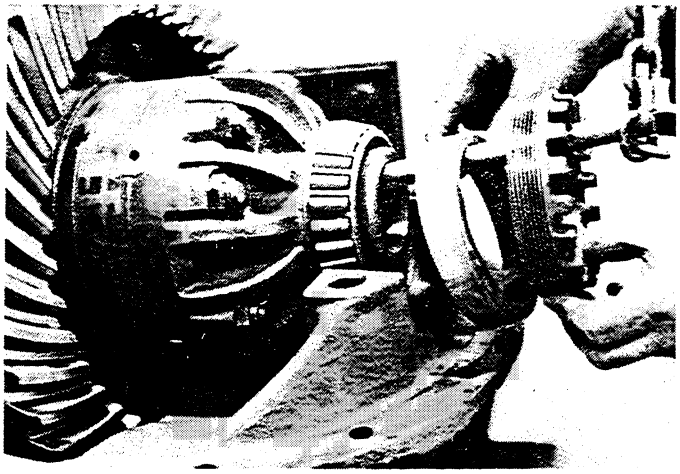


FIGURE 23:
Insert metal bar through differential to facilitate hoisting. Raise ends individually and remove adjusting nuts and bearing cups.

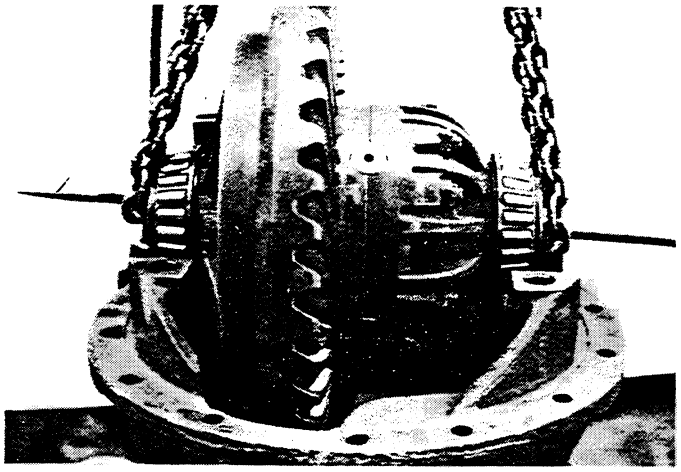


FIGURE 24:
Hoist differential with assembled bearing cones from carrier assembly. Tilt differential to allow ring gear to pass web in differential carrier.

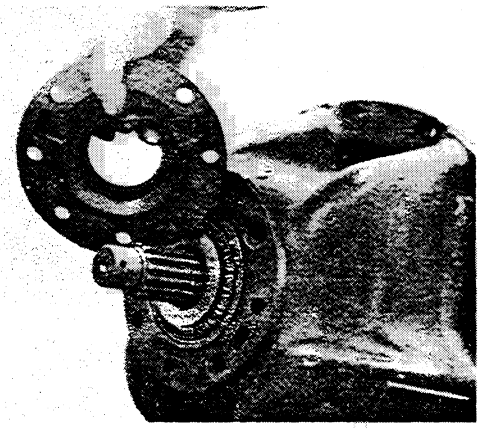


FIGURE 25:
Remove bolts securing seal retainer to carrier and remove retainer. If necessary, tap with soft mallet to break seal between parts.

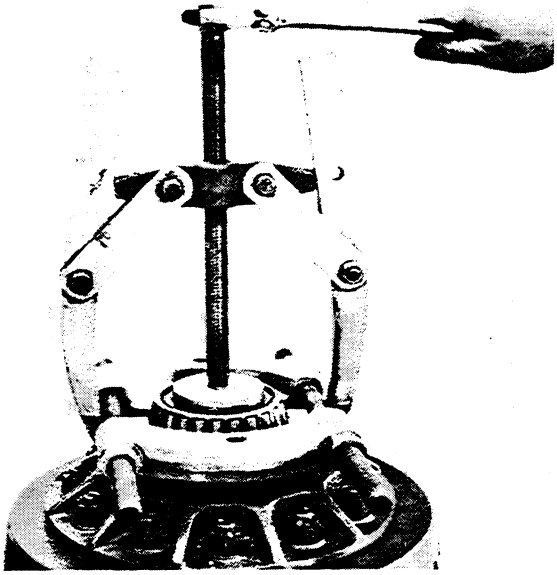


FIGURE 32:
If replacement is required, remove differential bearing cones with a suitable puller.

DISASSEMBLY OF PINION SHAFT ASSEMBLY

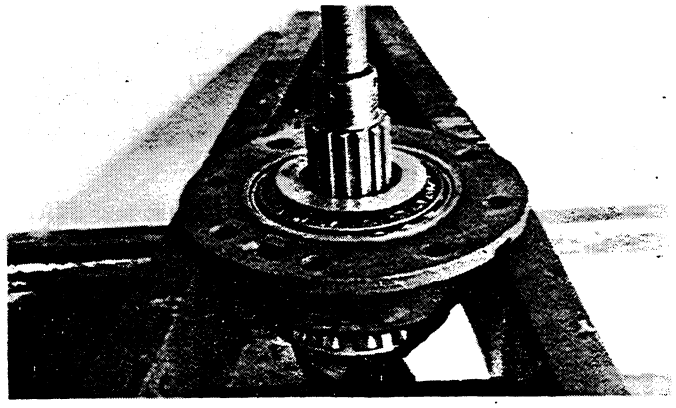


FIGURE 33:
Press pinion shaft from pinion bearing cage assembly. This will release outer pinion bearing cone.

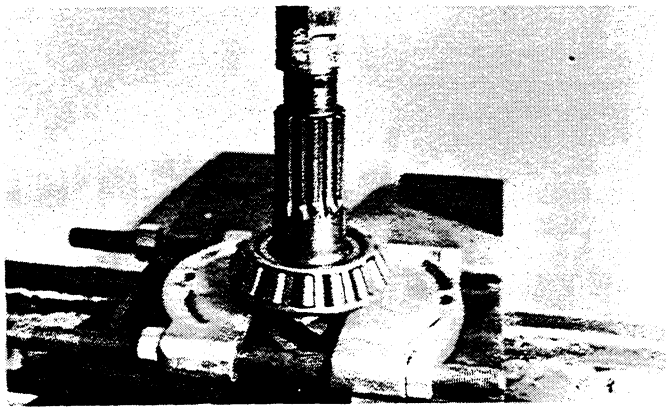


FIGURE 34:

Press center pinion bearing cone from pinion assembly.

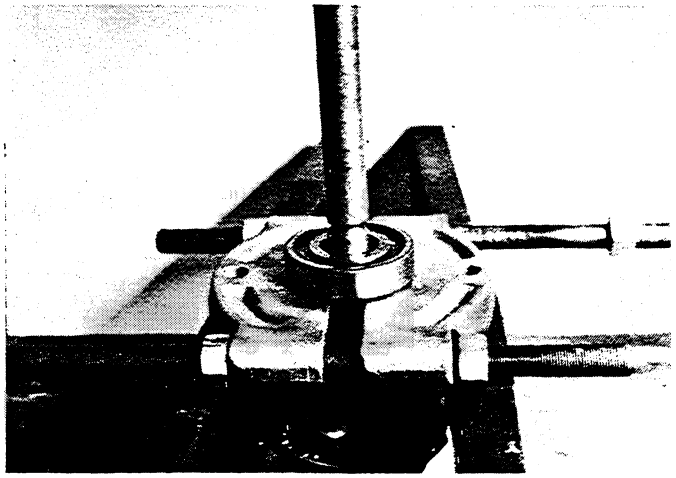


FIGURE 35:
Press inner bearing from pinion assembly.

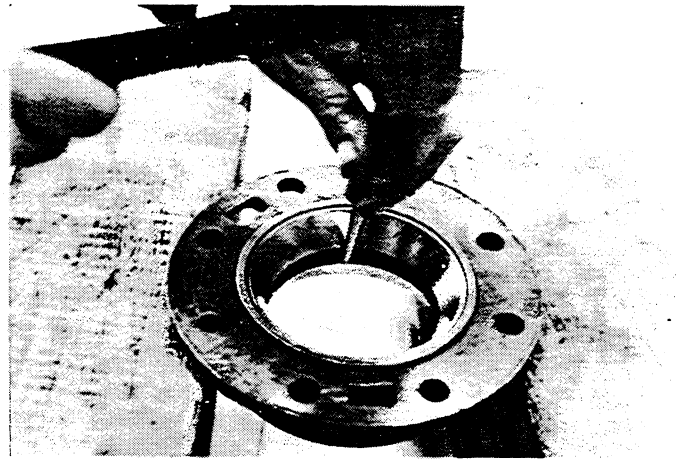


FIGURE 36:
If worn or damaged drive bearing cups from pinion bearing cage.

CLEANING

Clean all parts thoroughly using solvent type cleaning fluid. It is recommended that parts be immersed in cleaning fluid and slushed up and down slowly until all old lubricant and foreign material is dissolved and parts are thoroughly cleaned.

CAUTION: Care should be exercised to avoid skin rashes, fire hazards and inhalation of vapors when using solvent type cleaners.

CLEANING & INSPECTION

BEARINGS

Remove bearings from cleaning fluid and strike larger side of cone flat against a block of wood to dislodge solidified particles of lubricant. Immerse again in cleaning fluid to flush out particles. Repeat above operation until bearings are thoroughly clean. Dry bearings using moisture-free compressed air. Be careful to direct air stream across bearing to avoid spinning. Do not spin bearings when drying. Bearings may be rotated slowly by hand to facilitate drying process.

HOUSINGS

Clean interior and exterior of housings, bearing caps, etc., thoroughly. Cast parts may be cleaned in hot solution tanks with milk alkali solutions providing these parts do not have ground or polished surfaces. Parts should remain in solution long enough to be thoroughly cleaned and heated. This will aid the evaporation of the cleaning solution and rinse water. Parts cleaned in solution tanks must be thoroughly rinsed with clean water to remove all traces of alkali. Cast parts may also be cleaned with steam cleaner.

CAUTION: Care should be exercised to avoid skin rashes and inhalation of vapors when using alkali cleaners.

Thoroughly dry all parts cleaned immediately by using moisture-free compressed air or soft, lintless absorbent wiping rags free of abrasive materials such as metal fillings, contaminated oil or laping compound.

INSPECTION

The importance of careful and thorough inspection of all parts cannot be overstressed. Replacement of all parts showing indication of wear or stress will eliminate costly and avoidable failures at a later date.

BEARINGS

Carefully inspect all rollers, cages and cups for wear, chipping or nicks to determine fitness of bearings for further use. Do not replace a bearing cone or cup individually without replacing the mating cup or cone at the same time. After inspection, dip bearings in clean light oil and wrap in clean lintless cloth or paper to protect them until installed.

OIL SEALS, GASKETS AND RETAINING RINGS

Replacement of spring loaded oil seals, gaskets and snap rings is more economical when unit is disassembled than to risk premature overhaul to replace these parts at a future time. Loss of lubricant through a worn seal may result in failure of other more expensive parts of the assembly. Sealing members should be handled carefully, particularly when being installed. Cutting, scratching, or curling under of lip of seal seriously impairs its efficiency. At reassembly, lubricate lips of oil seals with lubriplate.

GEARS AND SHAFTS

If magna-flux process is available, use process to check parts. Examine teeth and ground and polished surfaces on all gears and shafts carefully for wear, pitting, chipping, nicks, cracks or scores. If gear teeth are cracked or show spots where case hardening is worn through, replace with new gear. Small nicks may be removed with suitable hone. Inspect shafts to make certain they are not sprung, bent, or splines twisted, and that shafts are true. Differential pinions and side gears must be replaced as sets. Differential ring gear and bevel pinion must also be replaced as a set if either is damaged.

HOUSING AND COVERS

Inspect housing, covers and planet spider, and differential case to be certain they are thoroughly cleaned and that mating surfaces, bearing bores, etc., are free from nicks or burrs. Check all parts carefully for evidence of cracks or conditions which would cause subsequent oil leaks or failures.

REASSEMBLY OF AXLE

The following instructions describe the procedure to be followed when reassembling and installing components of axle. Instructions cover reassembly of only one side of axle. Reassembly of opposite group is identical unless otherwise noted.

IMPORTANT: Both Grade 5 and Grade 8 fastening hardware have been used in the production of the axle assemblies covered by this manual. A table of proper torque values for both Grade 5 and Grade 8 hardware is provided on page E-7, Section E BC Drivetrain. Grade of hardware may be determined by the "hash" marks contained on the head of each bolt, Grade 5 having three hash marks and Grade 8 having six hash marks as indicated below, in all cases except where specified in text, use torque value specified in table for applicable bolts.

GRADE 5 GRADE 8

REASSEMBLY OF PINION SHAFT

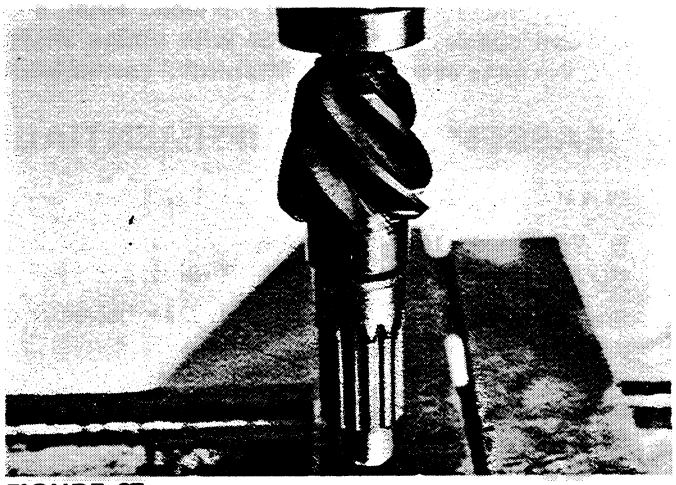
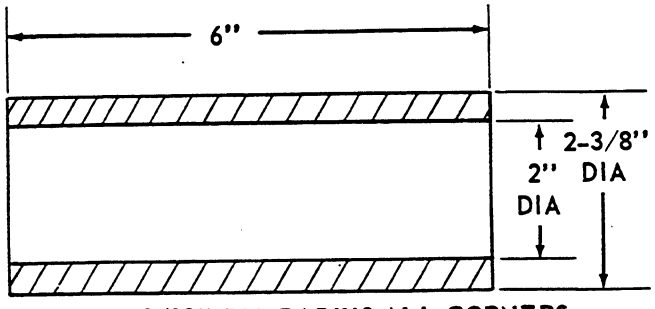


FIGURE 37:

Press inner pinion bearing on pinion using steel tubing for driver. Driver dimensions are given below.



1/32" DIA RADIUS ALL CORNERS

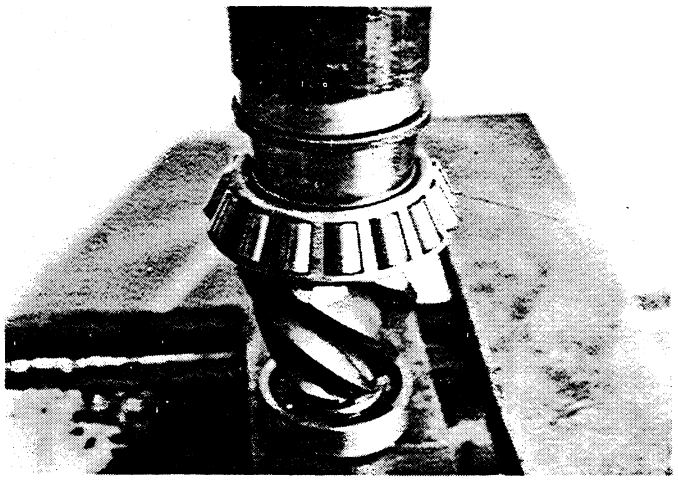
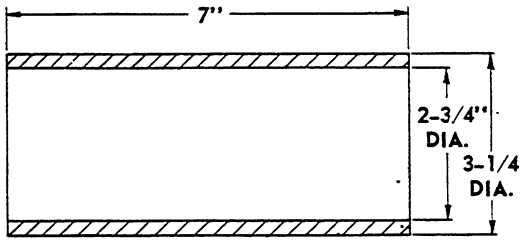


FIGURE 38:

Press center pinion bearing cone onto pinion shaft. Bearing driver dimensions are given below.



1/32" DIA RADIUS ALL CORNERS

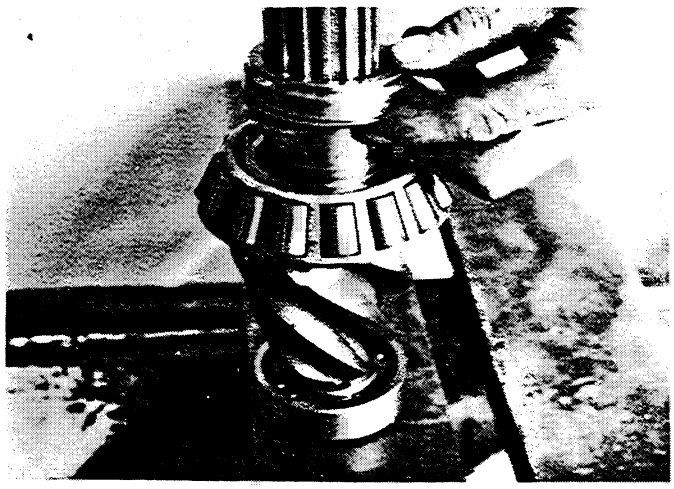


FIGURE 39:

A pinion bearing spacer and shim kit is provided for service repair of differential and carrier assemblies. This kit, consisting of a spacer and quantity of shims, is used to obtain proper pinion bearing preload as described below. Position bearing spacer and one .010" shim on pinion shaft.

Suggest:

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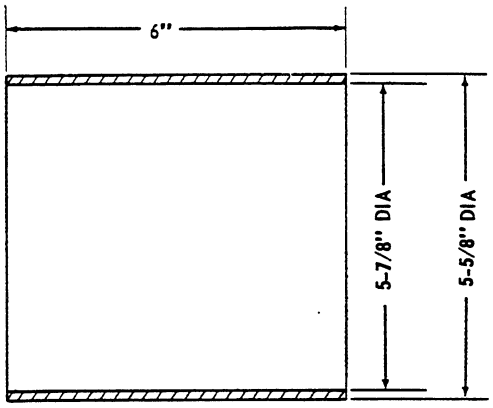
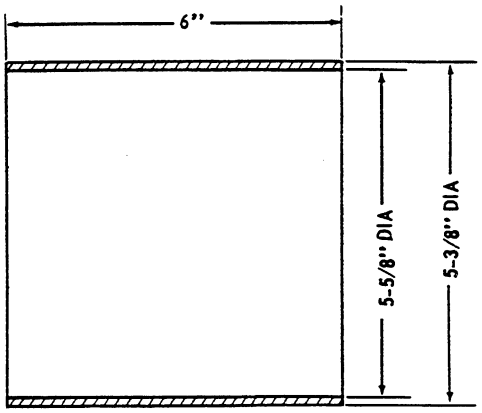
to download the complete manual.

Thank you so much for reading

Press bearing cups into pinion bearing cage using a bearing driver. Bearing driver dimensions are shown below.



1/32" DIA RADIUS ALL CORNERS



1/32" DIA RADIUS ALL CORNERS

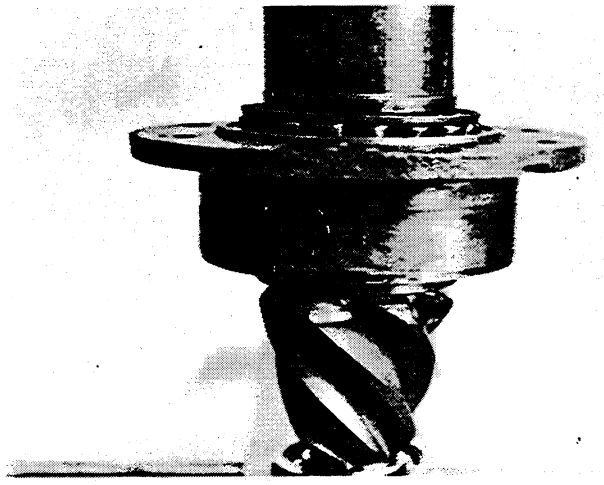


FIGURE 40:

Position pinion bearing cage assembly on pinion shaft. Position outer pinion bearing cone on pinion shaft and press into place using steel tubing for driver. Driver dimensions were shown previously.

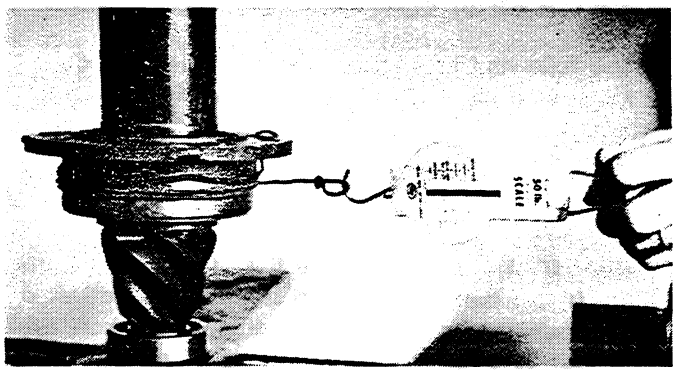


FIGURE 41:

Keep pinion and cage assembly in press with approximately 500 pounds of press pressure exerted on driver. Wrap several turns of soft wire or cord around pinion cage and pull in horizontal line with spring scale. While pulling in straight line, (90 degrees from centerline of shaft), read spring scale and measure rotating torque. Multiply reading on spring scale by one-half diameter of bearing cage to obtain preload torque. Correct preload torque is 13 to 23 in. lbs. If preload is not within these limits, remove shims to increase preload or add shims to decrease preload.

NOTE: This is a preliminary check. Final bearing preload check must be made with pinion shaft and bearing cage assembly in differential carrier housing.

REASSEMBLY OF DIFFERENTIAL RING GEAR AND BEARINGS

NOTE: Lubricate all differential bearings, gears, and thrust washers with SAE 90 EP lubricant, SCL type.

Press differential bearing cones on case halves. Bearing driver dimensions are given below.

Check ring gear mounting surface of flanged half of differential case for burrs. Remove burrs with file.

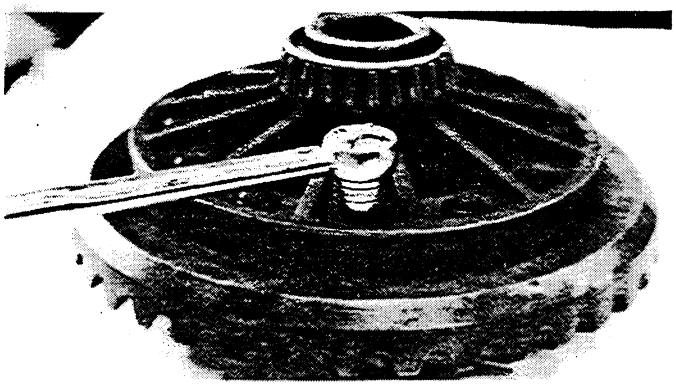


FIGURE 42:

Install ring gear. Install bolts so internal diameter of ring gear prevents turning of hex head. Install ring gear bolt nuts and torque to 120 to 135 ft. lbs.