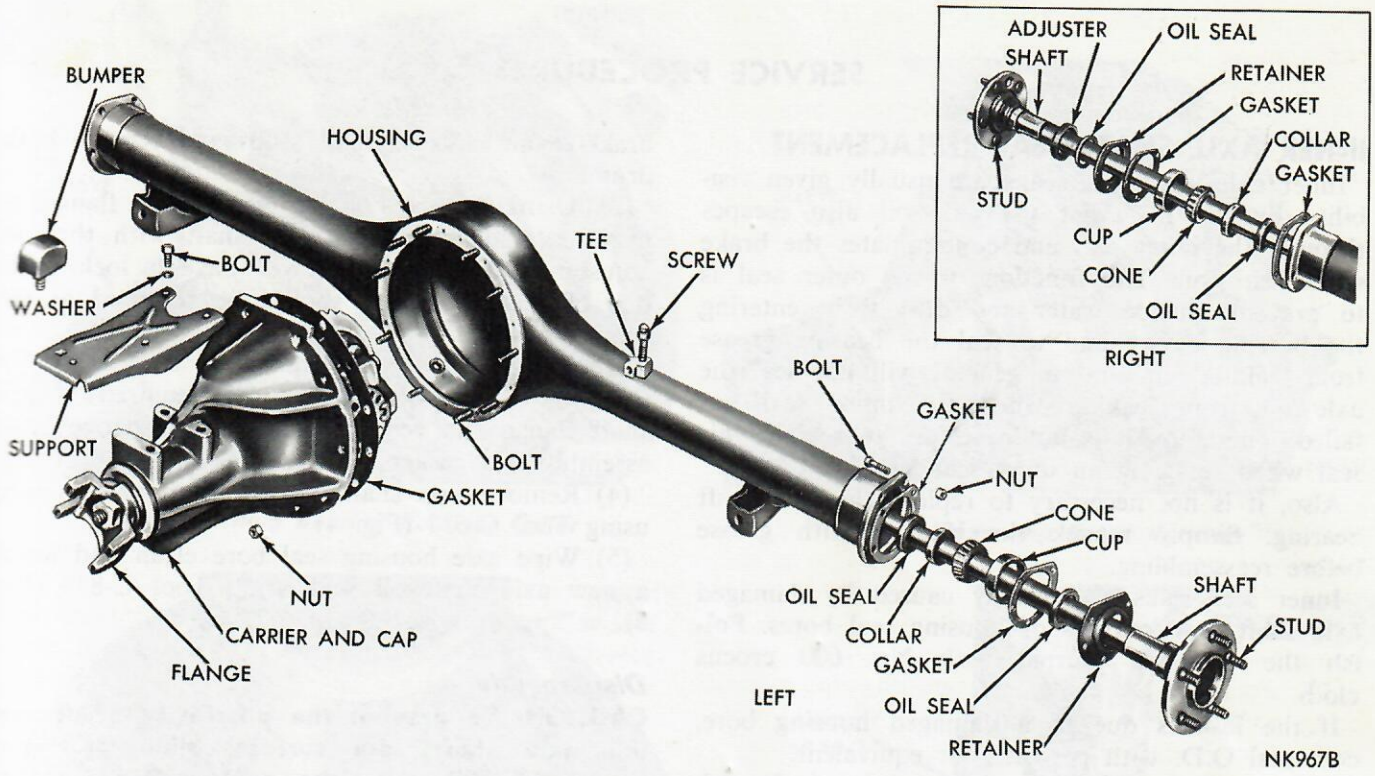

Fig. 1 - 8-3/4 in. Rear Axle Assembly

GENERAL INFORMATION

The 8-3/4 in. Rear Axle Assembly shown in (Fig. 1), is a semi-floating type and may be divided into four subassemblies; flanged axle drive shafts with related parts (Fig. 2) differential with drive gear, drive pinion with carrier, and the axle housing. Servicing of the above mentioned subassemblies, with exception of the axle housing may be performed without removing the complete rear axle assembly from the vehicle.

Gear ratio identification numbers will be stamped on a metal tag and attached by means of the rear axle housing-to-carrier bolt.

Some 8-3/4 in. large stem differential and carrier assemblies have incorporated a collapsible spacer which bears against the inner races of the front and rear bearings. This collapsible spacer is used to establish preload on the pinion bearings.

Adjustment of pinion depth of mesh is obtained by placing a machined shim between the pinion head and the rear pinion bearing cone.

A Sure-Grip Differential is available as optional equipment. The Sure-Grip Differential is of a two piece construction similar to the old type and is completely interchangeable with the previous type and will be serviced as a complete assembly only. Refer to the Sure Grip Differential Section of the Axle Group for the servicing procedure.

SHOULD THE REAR AXLE BECOME SUBMERGED IN WATER, THE LUBRICANT MUST BE CHANGED IMMEDIATELY TO AVOID THE POSSIBILITY OF EARLY AXLE FAILURE RESULTING FROM CONTAMINATION OF THE LUBRICANT BY WATER DRAWN INTO THE VENT.

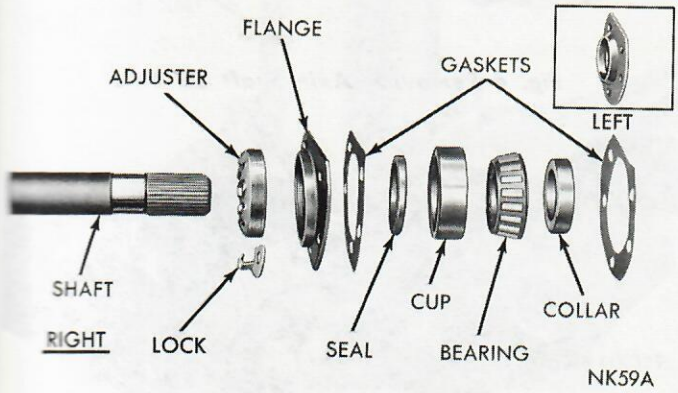

Fig. 2 Axle Shaft Disassembled

(6) Install companion flange remover Tool C-452 and remove flange. Lower rear of vehicle to prevent lubrication leakage.

(7) Using a screwdriver and hammer, remove the pinion oil seal from the carrier and clean the oil seal seat.

(8) Check splines on pinion shaft stem to be sure they are free of burrs or are not worn badly. If burrs are evident remove them using crocus cloth by working in a rotational motion. Wipe the pinion stem clean.

(9) Inspect companion flange for cracks, worn splines, pitted, rough or corroded oil seal contacting surface. Repair or replace companion flange as necessary.

(10) The outside diameter of the seal assembly is precoated with a special sealer so no sealing compound is required for installing. Install the anti-clang washer on pinion stem. Install seal using Tool C-4076 until the seal flange contacts the housing flange face.

(11) Position companion flange on pinion stem being careful to match scribe marks made previously before removal.

(12) Install companion flange with installing Tool C-3718 and holding Tool C-3281.

(13) Remove tool and install Belleville washer (convex side of washer up) and pinion nut.

(14) Hold universal joint flange with holding Tool C-3281 and tighten pinion nut to 170 foot-pounds. Rotate pinion several complete revolutions to assure that bearing rollers are properly seated. Using an inch-pound torque wrench C-685 measure pinion bearing preload. Continue tightening pinion nut and checking preload until preload is at the original established setting you found in Step 4. Under no circumstances should the preload be more than 10 inch-pounds over the established setting found at time of checking in Step 4 of procedure.

Bearing preload should be uniform during a complete revolution. A preload reading that varies during rotation indicates a binding condition which has to be corrected. The assembly is unacceptable if final pinion nut torque is below 170 foot-pounds or pinion bearing preload is not within the correct specifications.

CAUTION: UNDER NO CIRCUMSTANCES SHOULD THE PINION NUT BE BACKED OFF TO LESSEN PINION BEARING PRELOAD. IF THE DESIRED PRELOAD IS EXCEEDED A NEW COLLAPSIBLE SPACER MUST BE INSTALLED AND NUT RETIGHTENED UNTIL PROPER PRELOAD IS OBTAINED. IN ADDITION, THE UNIVERSAL JOINT FLANGE MUST NEVER BE HAMMERED ON OR POWER TOOLS USED.

(15) Install propeller shaft (match scribe marks on propeller shaft universal joint and pinion flange). Tighten clamp screws to 170-200 inch-pounds.

(16) Install the rear brake drums and wheels and tighten nuts 65 foot-pounds.

(17) Raise the vehicle to a level position so axle assembly is at correct running position and check lubricant level. Add the correct type of lubricant required to bring the lubricant to proper level.

LUBRICATION

Refill axle assembly with Multipurpose Gear Lubricant, as defined by MIL-L-2105B (API GL-5) should be used in all rear axles with conventional differentials; Chrysler Hypoid Lubricant part number 2933565 is an oil of this type and is recommended or equivalent.

Anticipated Temperature Range	Viscosity Grade
Above −10 degrees F	SAE 90
As low as −30 degrees F	SAE 80
Below −30 degrees F	SAE 75

"SHOULD THE REAR AXLE BECOME SUBMERGED IN WATER, THE LUBRICANT MUST BE CHANGED IMMEDIATELY TO AVOID THE POSSIBILITY OF EARLY AXLE FAILURE RESULTING FROM CONTAMINATION OF THE LUBRICANT BY WATER DRAWN INTO THE VENT HOLE."

REAR AXLE ASSEMBLY 8-3/4 IN. RING GEAR

INDEX

SERVICE PROCEDURES

INNER AXLE SHAFT SEAL REPLACEMENT

Inner axle shaft seal leaks are usually given visibility by the fact that the axle oil also escapes through the outer seal and contaminates the brake shoes with oil. The function of the outer seal is to prevent outside water and dust from entering the bearing cavity and to seal the bearing grease from leaking out, and in general will not seal the axle oil from leaking when the inner seal has failed. Therefore, it is not necessary to replace this seal when servicing an inner seal leak.

Also, it is not necessary to replace the axle shaft bearing. Simply repack the bearing with grease before reassembling.

Inner seal leaks are usually caused by damaged axle shaft seal journals or housing seal bores. Polish the damaged journal with No. 600 crocus cloth.

If the leak is due to a damaged housing bore, coat seal O.D. with permatex or equivalent.

For servicing procedures, follow steps 1 through 5 for axle shaft bearing removal and steps 1 through 7 for axle shaft installation.

AXLE SHAFTS AND BEARINGS

CAUTION: It is absolutely necessary that anytime an axle assembly is serviced, and the axle shafts are loosened and removed, the axle shaft gaskets and inner axle shaft oil seals must be replaced.

Removal

(1) With wheels removed, remove clips holding brake drum on axle shaft studs and remove brake drum.

(2) Using access hole in axle shaft flange, remove retainer nuts, the right shaft with threaded adjuster in retainer plate will have a lock under one of the studs that should be removed at this time.

(3) Attach axle shaft remover Tool C-3971-A (Fig. 3) (adapter SP-5168 may be required) to axle shaft flange and remove axle shaft. Remove brake assembly and gaskets.

(4) Remove axle shaft oil seal from axle housing using Tool C-637 (Fig. 4).

(5) Wipe axle housing seal bore clean and install a new axle shaft oil seal using Tool C-839 (Fig. 5).

Disassembly

CAUTION: To prevent the possibility of damaging axle shaft seal surface, slide protective sleeve SP-5041 over the seal surface next to

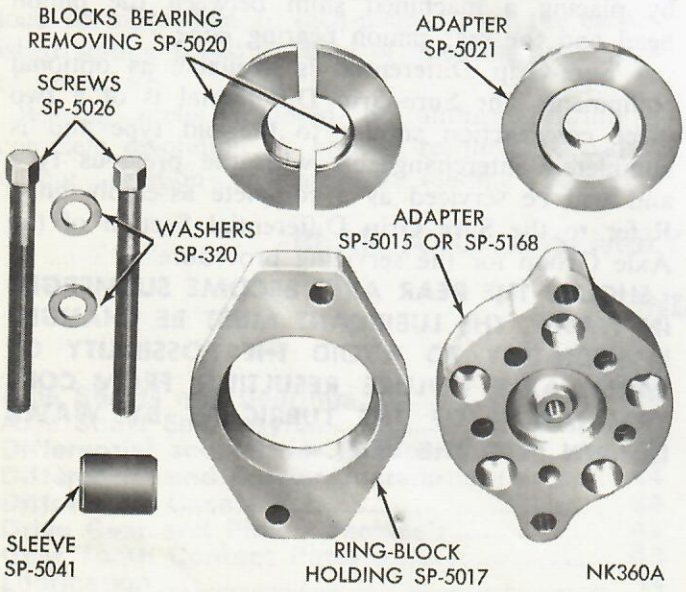

Fig. 3 Tool Set C-3971

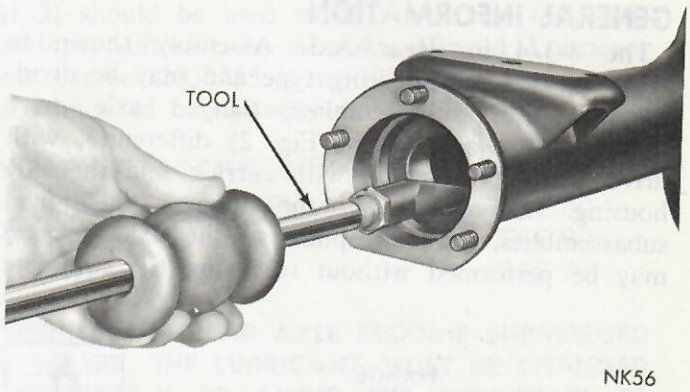

Fig. 4 Removing Axle Shaft Oil Seal

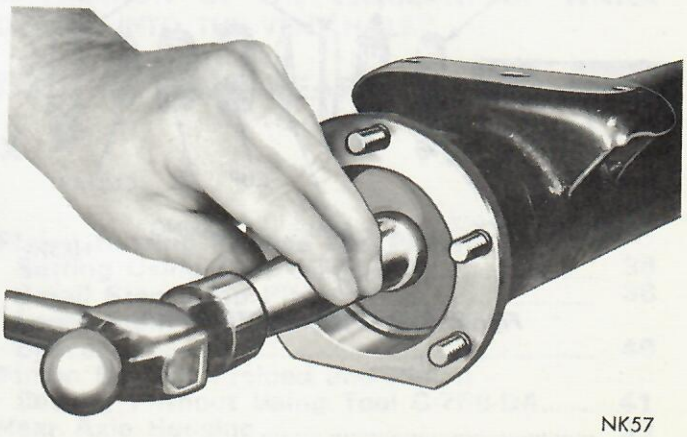

Fig. 5 Installing Axle Shaft Oil Seal

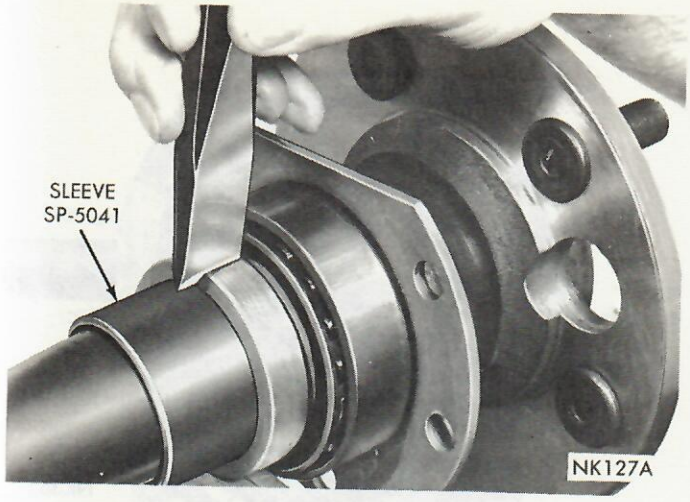

Fig. 6 Notching Bearing Retainer Collar

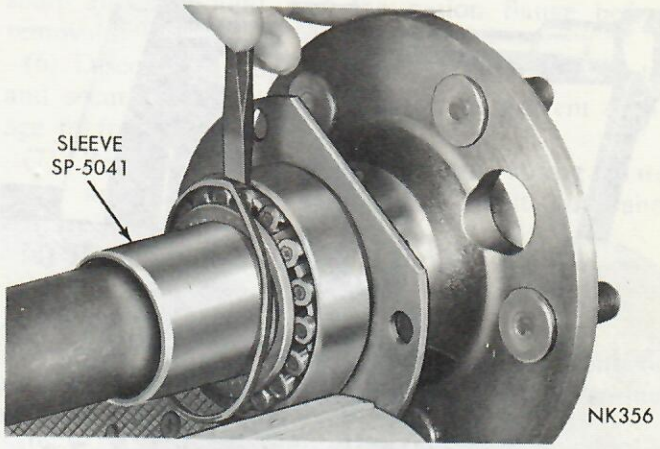

Fig. 7 Removing Roller Retainer

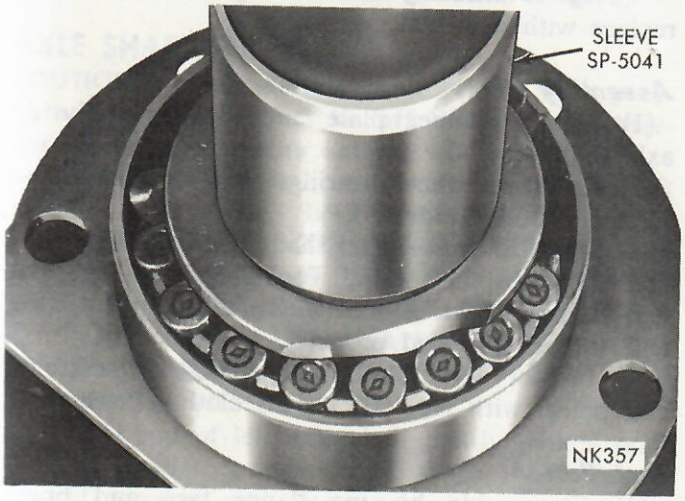

Fig. 8 Flange Ground Off Inner Cone

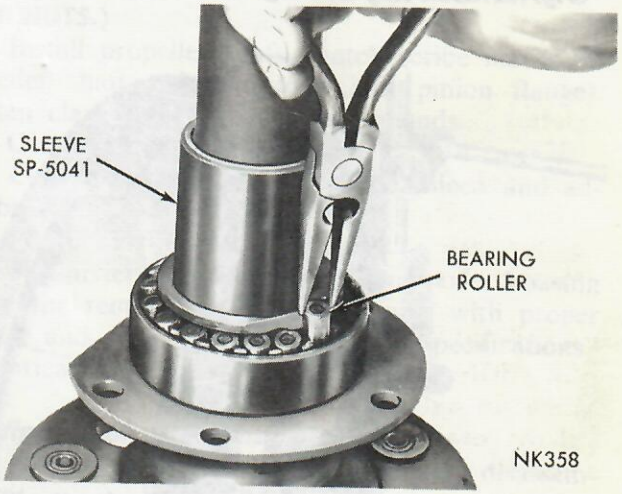

Fig. 9 Removing Bearing Rollers

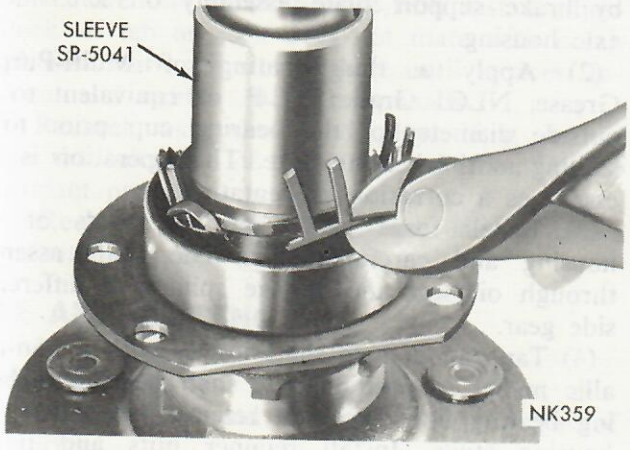

Fig. 10 Cutting Out Roller Bearing Retainer

Fig. 11 Seal Journal Protection

bearing collar.

CAUTION: Under no circumstances should axle shaft collars or bearings be removed using a torch. The use of a torch in the removal of the axle shaft collars or bearings is an unsafe practice, because heat is fed into the axle shaft bearing journal and thereby weakens this area.

(1) Position axle shaft bearing retaining collar on a heavy vise or anvil and using a chisel, cut deep grooves into retaining collar at 90 degrees intervals (Fig. 6). This will enlarge bore of collar and

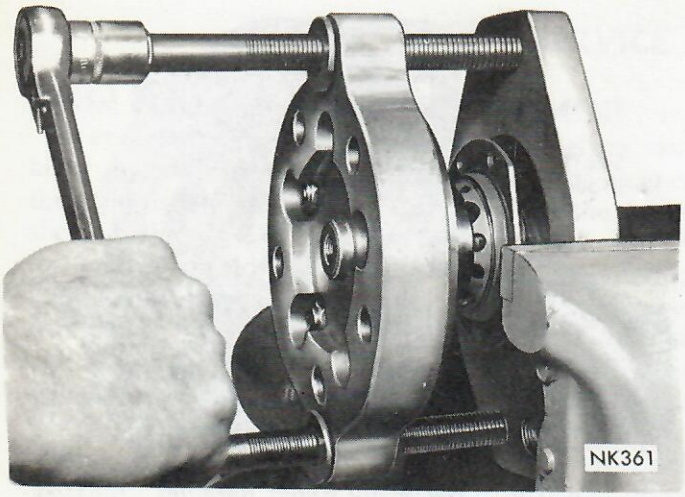

Fig. 12 Removing Bearing Cone with Tool C-3971

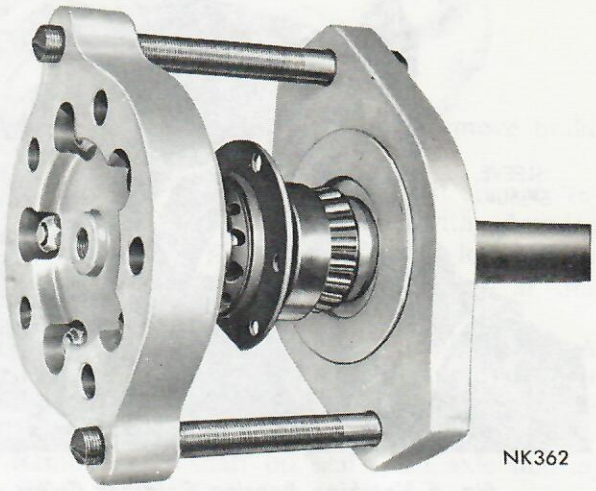

Fig. 13 Installing New Bearing and Collar.

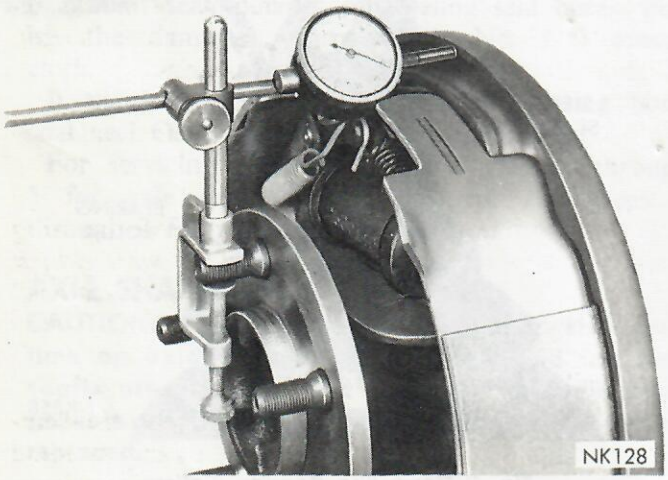

Fig. 14 Measuring Axle Shaft End Play

permit it to be driven off of axle shaft.

(2) Remove bearing roller retainer flange by cutting off lower edge with a chisel (Fig. 7)

(3) Grind a section off flange of inner bearing cone (Fig. 8) and remove bearing rollers (Fig. 9).

(4) Pull bearing roller retainer down as far as possible and cut with a pair of side cutters and remove (Fig. 10).

(5) Remove roller bearing cup and protective sleeve SP-5041 from axle shaft.

CAUTION: Sleeve SP-5041 should not be used as a protector for the seal journal when pressing off the bearing cone, as it was not designed for this purpose.

(6) To avoid scuffing seal journal when bearing cone is being removed, it should be protected by single wrap of .002 thickness shimstock held in place by a rubber band (Fig. 11).

(7) Remove the bearing cone using Tool C-3971-A (Fig. 3). Tighten bolts of tool alternately until cone is removed (Fig. 12).

(8) Remove seal in bearing retainer plate and replace with new seal.

Assembly

(1) Install retainer plate and seal assembly on axle shaft.

(2) Lubricate wheel bearings with Multi-Purpose Grease NLGI Grade 2 EP.

(3) Install a new axle shaft bearing cup, cone and collar on shaft using Tool C-3971-A (Fig. 13) and tighten bolts of tool alternately until bearing and collar are seated properly.

(4) Inspect axle shaft seal journal for scratches and polish with No. 600 crocus cloth if necessary.

Installation

(1) Clean axle housing flange face and brake support plate thoroughly. Install a new rubber coated steel gasket on axle housing studs, followed by brake support plate assembly on left side of axle housing.

(2) Apply a thin coating of Multi-Purpose Grease, NLGI Grade 2 E.P. or equivalent to the outside diameter of the bearing cup prior to installing in the bearing bore. This operation is necessary as a corrosion preventative.

(3) Install foam gasket on the studs of axle housing and carefully slide axle shaft assembly through oil seal and engage splines in differential side gear.

(4) Tap end of axle shaft lightly with a non-metallic mallet to position axle shaft bearing in housing bearing bore. Position retainer plate over axle housing studs. Install retainer nuts and tighten 30-35 foot-pounds. Start by tightening bottom nut.

(5) Repeat step (1) for right side of axle housing.

(6) Back off threaded adjuster of right axle shaft assembly through oil seal and engage splines in differential side gears.

(7) Repeat step (4).

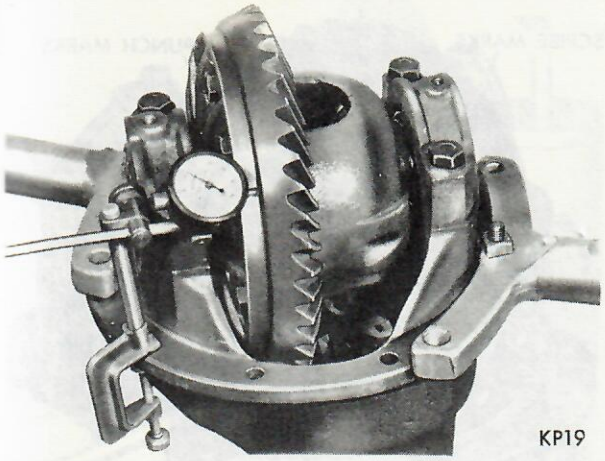

Fig. 15 Checking for Runout and Zero End Play

AXLE SHAFT END PLAY

CAUTION: When setting axle shaft end play, both rear wheels must be off the ground, otherwise a false end play setting will occur.

(1) Using a dial indicator mounted on the left brake support (Fig. 14), **TURN THE ADJUSTER CLOCKWISE UNTIL BOTH WHEEL BEARINGS ARE SEATED AND THERE IS ZERO END PLAY IN THE AXLE SHAFTS. BACK OFF THE ADJUSTER COUNTERCLOCKWISE APPROXIMATELY FOUR NOTCHES TO ESTABLISH AN AXLE SHAFT END PLAY OF .008-.018 INCH.**

(2) Tap end of left axle shaft lightly with a non-metallic mallet to seat right wheel bearing cup against adjuster, and rotate axle shaft several revolutions so that a true end play reading is indicated.

(3) Remove one retainer plate nut, install adjuster lock. If tab on lock does not mate with notch in adjuster, turn adjuster slightly until it does. Install nut and tighten 30-35 foot-pounds.

(4) Recheck axle shaft end play. If it is not within the tolerance of .008-.018 inch, then repeat adjustment procedure.

(5) Remove dial indicator and install brake drum, retaining clips and wheel.

REAR AXLE HOUSING

Removal

(1) Raise vehicle and support body at front of rear springs.

(2) Block brake pedal in the up position using a wooden block.

(3) Remove rear wheels.

(4) Disconnect hydraulic brake hose at connection on left side of underbody.

(5) Disconnect parking brake cable.

To maintain proper drive line balance when reassembling, make scribe marks on the propeller shaft universal joint and the pinion flange before removal.

(6) Disconnect propeller shaft at differential yoke and secure in an upright position to prevent damage to front universal joint.

(7) Remove shock absorber from spring plate studs and loosen rear spring "U" bolt nuts and remove "U" bolts.

(8) Remove the assembly from vehicle.

Installation

(1) With body of vehicle supported at front of rear springs, position the rear axle assembly spring seats over the spring center bolts.

(2) Install spring "U" bolts and tighten nuts to 45 foot-pounds and install shock absorbers on spring plate studs. **(DO NOT OVER TIGHTEN "U" BOLT NUTS.)**

(3) Install propeller shaft (match scribe marks on propeller shaft universal joint and pinion flange). Tighten clamp screws to 15 foot-pounds.

(4) Connect parking brake cable.

(5) Connect hydraulic brake hose, bleed and adjust brakes.

(6) Install rear wheels.

(7) If carrier was removed from axle housing during the removal operation, fill axle with proper amount and type of lubricant; see "Specifications" in Lubrication section Group "O"

Welding Rear Axle Housing

The axle housing should be completely disassembled if it is to be welded with arc welding equipment. It is also possible to weld the assembled housing with gas welding equipment, if precaution is taken to protect gaskets and heat treated parts.

DIFFERENTIAL AND CARRIER

Removal

(1) Remove flanged axle drive shafts.

(2) Disconnect rear universal joint and support propeller up and out of the way to prevent damage to the front universal joint.

(3) Remove the rear axle lubricant.

(4) Loosen and remove the carrier-to-housing attaching nuts and lift the carrier assembly from axle housing.

Disassembly

Side play and runout check taken during disassembly will be very useful in reassembly.

(1) Mount carrier in Stand DD-1014 and attach dial indicator Tool C-3339 to differential carrier flange in a position so pointer of indicator squarely contacts back face of ring gear (Fig. 15). With

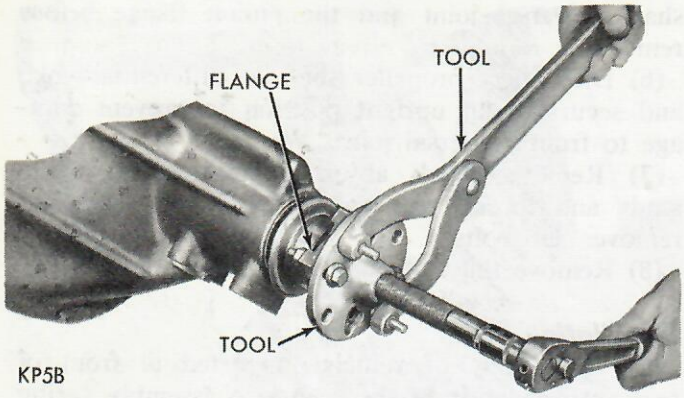

Fig. 16 Removing Companion Flange

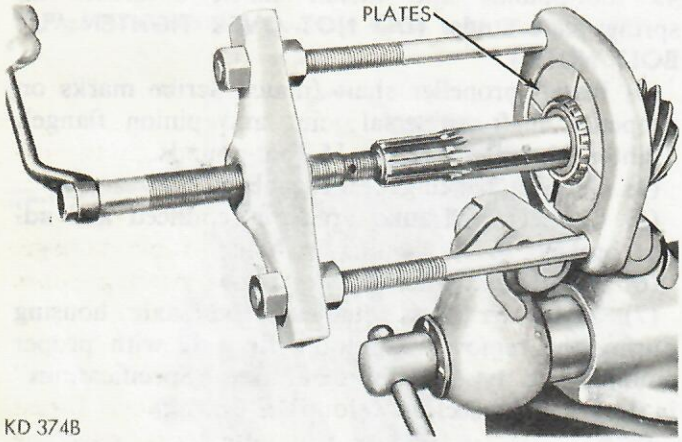

Fig. 18 Removing Drive Pinion Rear Bearing

a screw driver positioned between bearing cap and differential case flange, then using a prying motion determine if side play is present. If side play is evident, remove adjuster lock and loosen adjuster slightly and retighten adjuster sufficiently to eliminate side play.

(2) Rotate drive gear several complete revolutions while noting total indicator reading. Mark drive gear and differential case at point of maximum runout. The marking of differential case will be very useful later in checking differential case runout. Total indicator reading should be no more than .005 inch. If runout exceeds .005 inch the differential case may be damaged, and a second reading will be required after drive gear has been removed. This operation is covered during "Differential Disassembly". Remove dial indicator.

(3) With Tool C-3281 hold companion flange and remove drive pinion nut and Belleville washer.

(4) Install companion flange remover Tool C-452 and remove flange (Fig. 16).

(5) Using a screwdriver and hammer, remove the drive pinion oil seal from the carrier.

(6) While holding one hand over nose end of carrier, invert carrier in stand. The front pinion bearing cone, shim pack and bearing spacer

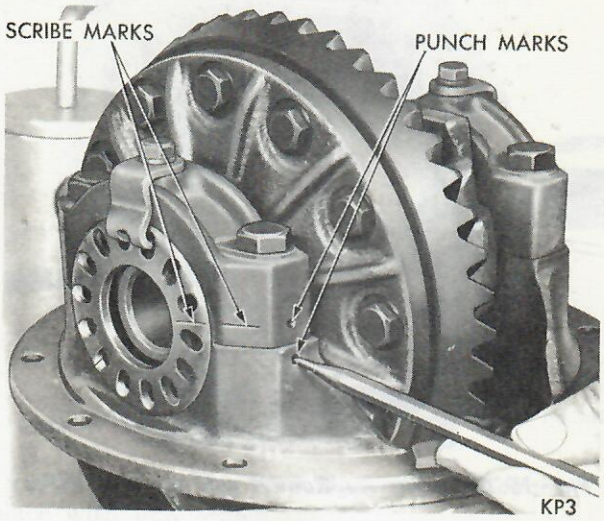

Fig. 17 Marking Bearing Caps and Adjusters

(where used) will drop from carrier.

(7) Apply identifying punch marks on differential bearing pedestals of carrier, differential bearing caps and bearing adjusters for reassembly purposes (Fig. 17).

(8) Remove both differential bearing adjuster lock screws and locks.

(9) With a 3/4 inch socket, loosen bearing cap bolts (one on each side) and back off bearing adjusters slightly using spanner wrench Tool C-406A; to remove differential bearing preload. Remove bearing cap bolts, caps and bearing adjusters.

(10) Remove differential and ring gear assembly with bearing cups. Differential bearing cups must be kept with respective bearing cones.

(11) Remove drive pinion and rear bearing assembly from carrier.

Rear Pinion Bearing Removal

(1) Remove drive pinion rear bearing from small stem pinion with Tool C-293 and four (4) No. 36 plates, or four (4) No. 37 plates on large stem step pinion or large stem pinion using a collapsible spacer (Fig. 18).

(2) Using a flat end brass drift, remove front and rear pinion bearing cups.

DIFFERENTIAL CASE

Disassembly

(1) Mount differential case and ring gear assembly in a vise equipped with soft jaws (brass).

(2) Remove drive gear bolts. **BOLTS ARE LEFT HAND THREAD.** With a non-metallic hammer, tap drive gear loose from differential case pilot and remove.

(3) If drive gear runout exceeded .005 inch in step 2 (under "Carrier Disassembly"), recheck the

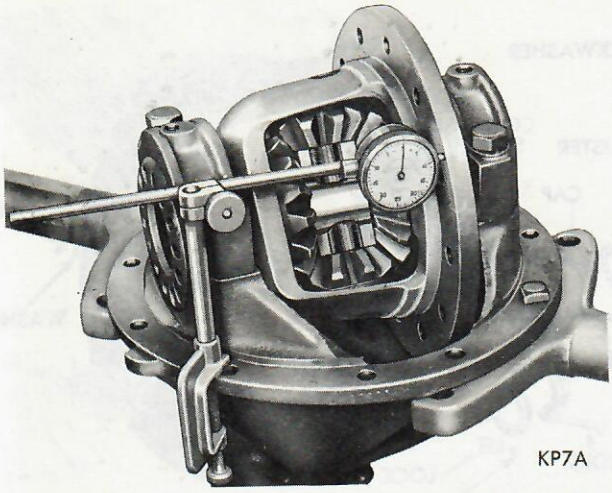

Fig. 19 Checking Drive Gear Mounting Flange Runout

case as follows: Install differential case and respective bearing cups in carrier.

(4) Install bearing caps, cap bolts and bearing adjusters. Tighten bearing cap bolts down lightly and screw in both adjusters with spanner wrench Tool C-406A.

(5) Tighten cap bolts and adjusters sufficiently to prevent any side play in bearings.

(6) Attach a dial indicator Tool C-3339 to carrier flange so pointer of indicator squarely contacts drive gear surface of differential case flange between outer edge flange and drive gear bolt holes (Fig. 19).

(7) Rotate differential case several complete revolutions while noting total indicator reading. This reading must not exceed .003 inch runout. If runout is in excess of .003 inch, differential case must be replaced. **In a case where the runout does not exceed .003 inch it is often possible to reduce the runout by positioning the drive gear 180 degrees from point of maximum runout when reassembling drive gear on differential case.**

(8) With a flat nose drift and hammer, remove differential pinion shaft lock pin from back side of drive gear flange. (The hole is reamed only part way through, making it necessary to remove lock pin from one direction.)

(9) With a brass drift and hammer, remove differential pinion shaft and axle drive shaft thrust block.

(10) Rotate differential side gears until each differential pinion appears at large opening of case. Remove each pinion and thrust washer at that time.

(11) Remove both differential side gears and thrust washers.

Cleaning and Inspection (Figs. 20 and 21)

(1) Clean all parts in a fast evaporating mineral spirits or a dry cleaning solvent and with the exception of bearings, dry with compressed air.

(2) Inspect differential bearing cones, cups and rollers for pitting, spalling or other visible damage. If replacement is necessary, remove bearing cones from differential case with Tool C-293 and adapter plates No. 43 (Fig. 22).

(3) Inspect differential case for elongated or enlarged pinion shaft hole. The machined thrust washer surface areas and counterbores must be smooth and without metal deposits or surface imperfections. If any of the above conditions exist, satisfactory correction must be made or the case replaced. Inspect case for cracks or other visible damage which might render it unfit for further service.

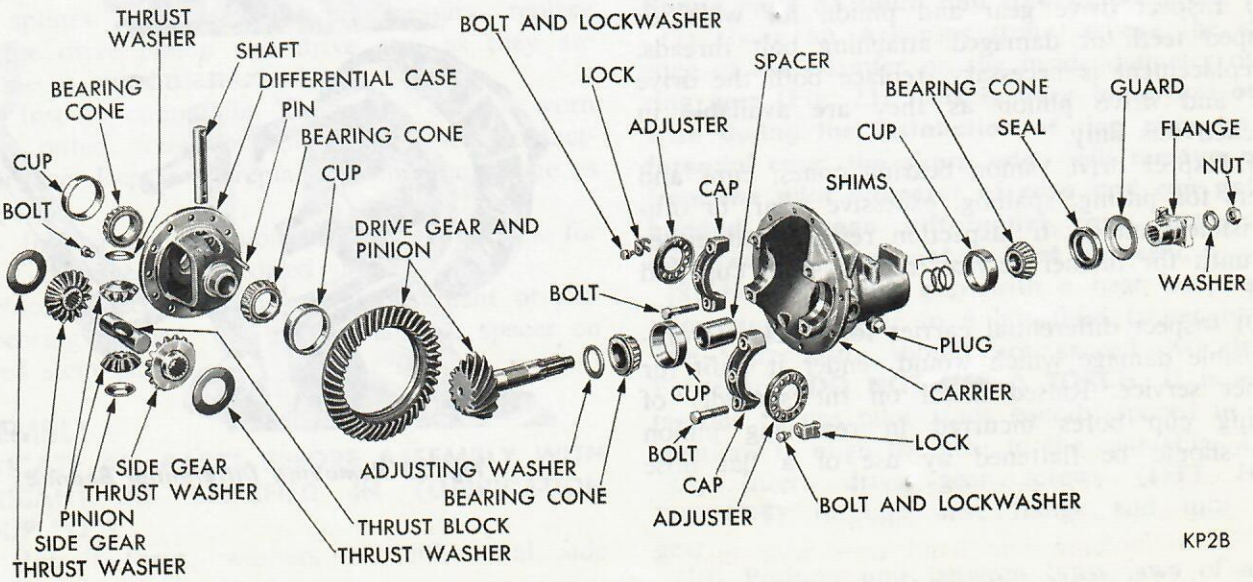

Fig. 20 Differential Carrier Assembly (Small Stem Step Pinion)

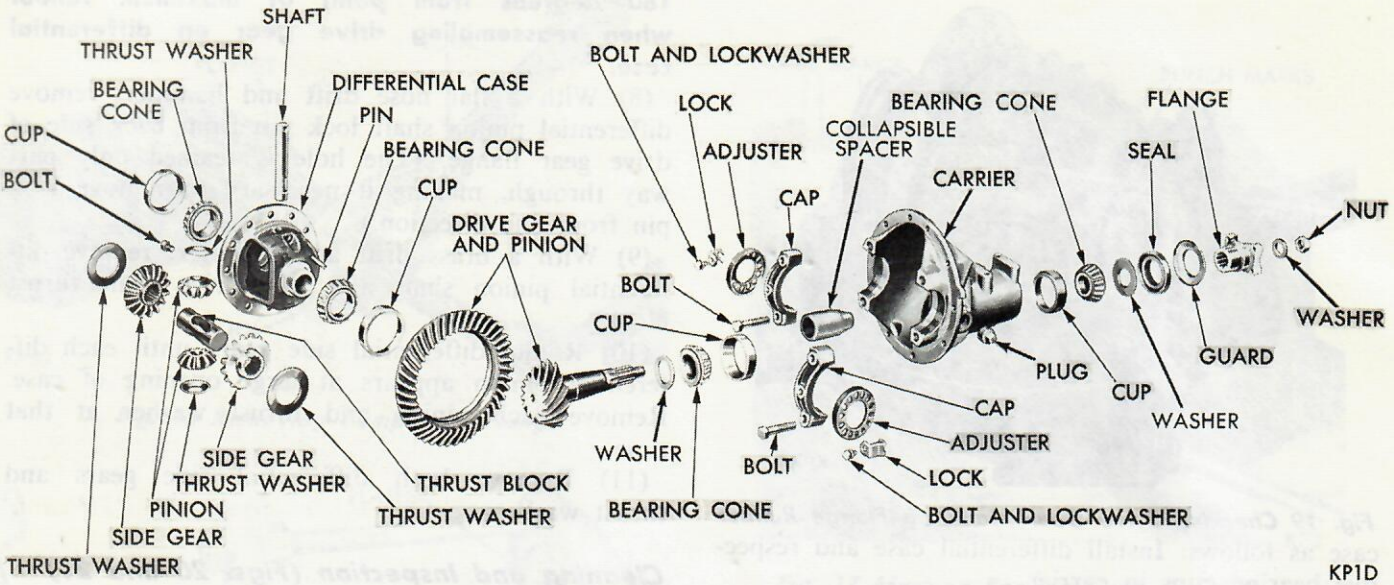

Fig. 21 Differential Carrier Assembly (Large Stem Tapered Pinion)

(4) Inspect differential pinion shaft for excessive wear in contact area of differential pinions. Shaft should be smooth and round with no scoring or metal pickup.

(5) Inspect differential side gears and pinions, they should have smooth teeth with a uniform contact pattern without excessive wear or broken surfaces. The differential side gear and pinion thrust washers should be smooth and free from any scoring or metal pickup.

(6) Inspect axle shaft thrust block for excessive wear or visible damage. The wear surface on the opposite ends of the blocks, must be smooth.

(7) Inspect differential pinion shaft lock pin for damage or looseness in case. Replace pin or case as necessary.

(8) Inspect drive gear and pinion for worn or chipped teeth or damaged attaching bolt threads. If replacement is necessary, replace both the drive gear and drive pinion as they are available in matched sets only.

(9) Inspect drive pinion bearing cones, cups and rollers for pitting, spalling, excessive wear, or other visible damage. If inspection reveals that either are unfit for further service, replace both cup and cone.

(10) Inspect differential carrier for cracks or other visible damage which would render it unfit for further service. Raised metal on the shoulder of bearing cup bores incurred in removing pinion cups should be flattened by use of a flat nose punch.

(11) Inspect drive pinion for damaged bearing journals and mounting shim surface or excessively

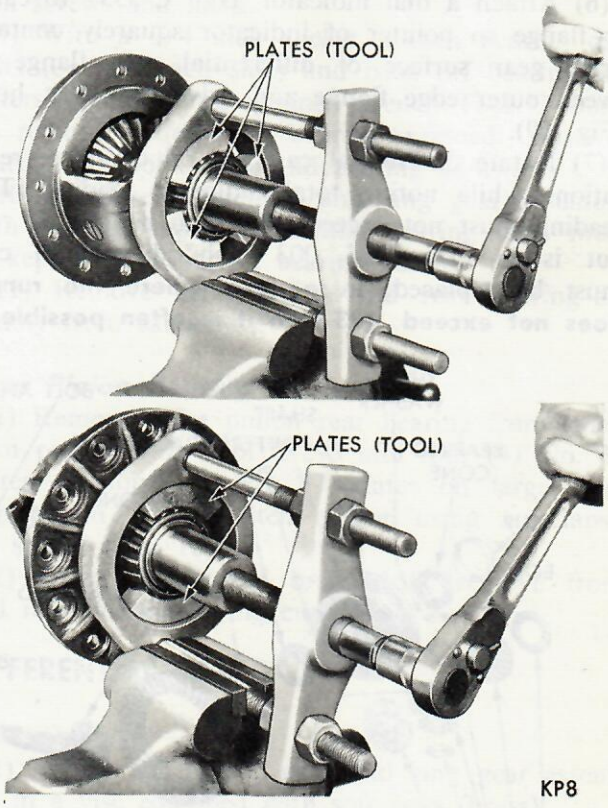

Fig. 22 Removing Differential Bearings

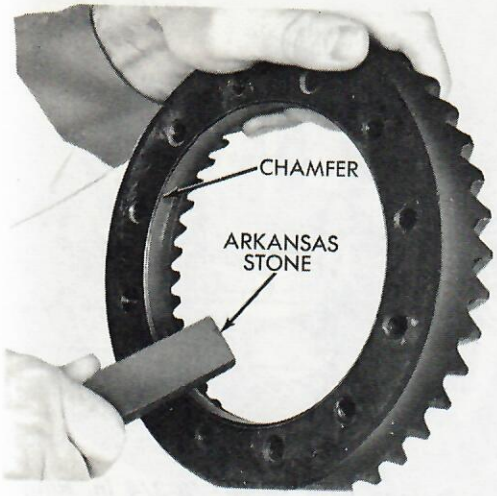

Fig. 23 Stoning Chamfer of Ring Gear

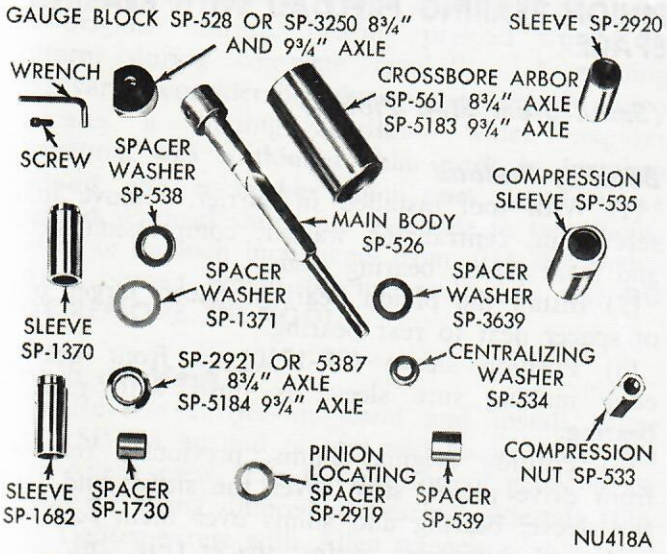

Fig. 24 Rear Axle Setting Gauge Tool C-758-D4

worn splines. If replacement is necessary, replace both the drive pinion and drive gear as they are available in matched sets only.

(12) Inspect companion flange for cracks, worn splines, pitted, rough or corroded oil seal contacting surface. Repair or replace companion flange as necessary.

(13) Inspect drive pinion bearing shim pack for broken, damaged or distorted shims.

Replace if necessary during establishment of pinion bearing preload. Use new collapsible spacer on tapered stem pinion.

ASSEMBLY

LUBRICATE ALL PARTS BEFORE ASSEMBLY WITH LUBRICANT AS SPECIFIED IN (LUBRICATION GROUP "O")

(1) Install thrust washers on differential side gears and position gears in case.

(2) Place thrust washers on both differential pinions and through large window of differential case, mesh the pinion gears with the side gears, having pinions exactly 180 degrees opposite each other.

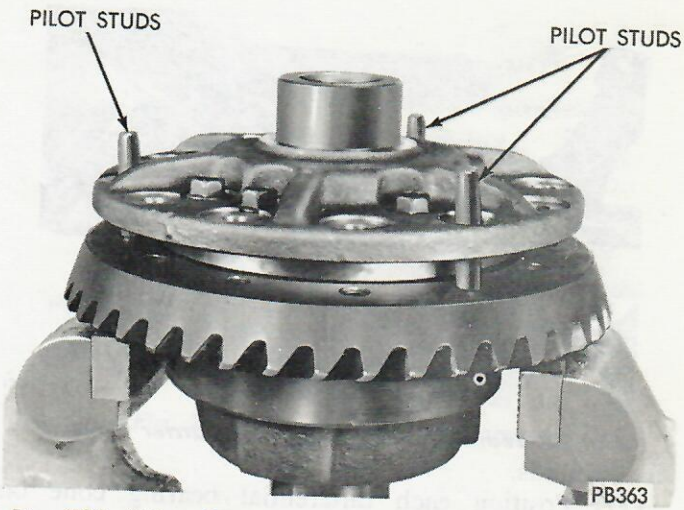

Fig. 23A Using Pilot Studs To Locate Case To Heated Ring Gear

(3) Rotate side gears 90 degrees to align pinions and thrust washers with differential pinion shaft holes in case.

(4) From pinion shaft lock pin hole side of case, insert slotted end of pinion shaft through case, and the conical thrust washer, and just through one of the pinion gears.

(5) Install thrust block through side gear hub, so that slot is centered between the side gears.

(6) While keeping all of these parts in proper alignment, push pinion shaft into case until locking pin hole in pinion shaft is in exact alignment with its respective hole in case. Install pinion shaft lock pin through hole in case from pinion shaft side of drive gear flange. **The contacting surfaces of the drive gear and differential case flange must be clean and free of all burrs.**

(7) Using an Arkansas stone, relieve the sharp edge of the chamfer on the inside diameter of the ring gear (Fig. 23). **This is very important otherwise during the installation of ring gear on differential case, the sharp edge will remove metal from the pilot diameter of case and can get imbedded between differential case flange and gear; causing gear not to seat properly.**

(8) Heat the ring gear with a heat lamp or by immersing the gear in a hot fluid (water or oil). The temperature should not exceed 300 degrees Fahrenheit. **DO NOT USE A TORCH.** It is advantageous to use pilot studs equally spaced in three positions to align the gear to the case (Fig. 23A).

(9) Insert drive gear screws **(LEFT HAND THREADS)** through case flange and into drive gear.

(10) Position unit between brass jaws of a vise and alternately tighten each cap screw to 55

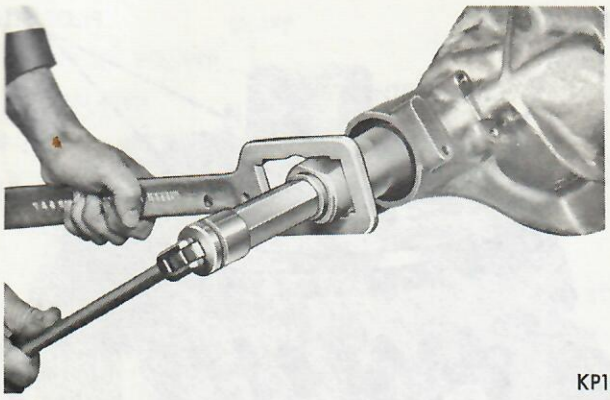

Fig. 25 Seating Bearing Cups in Carrier Housing

foot-pounds.

(11) Position each differential bearing cone on hub of differential case (taper away from drive gear) and with installing Tool C-4086 install bearing cones. An arbor press may be used in conjunction with installing tool.

CAUTION: Never exert pressure against the bearing cage, since this would damage the bearing.

PINION BEARING CUP INSTALLATION

(1) Position pinion bearing cups squarely in bores of carrier. Assemble Tool C-758-D4 (Fig. 24) by placing spacer SP-2919 followed by rear pinion bearing cone over main screw of tool and inserting it into carrier from gear side.

(2) Place front pinion bearing cone over main screw of tool followed by compression sleeve SP-535, centralizing washer SP-534, and main screw nut SP-533. Hold compression sleeve with the companion flange holding Tool C-3281 and tighten nut (Fig. 25) allowing tool to rotate as nut is being tightened in order not to brinnel bearing cone or cups. **Do not remove tool after installing cups.**

PINION BEARING PRELOAD AND DEPTH OF MESH SETTING USING TOOL C-758-D4

The 8-3/4 in. axle incorporates two types of pinions. The method of determining pinion depth of mesh and bearing preload are the same for the small and large stem pinions; however, the sequence of making the two adjustments change. Small stem pinions require the bearing preload adjustment first while large stem pinions require the depth of mesh adjustment first.

The position of the drive pinion with respect to the drive gear (depth of mesh) is determined by the location of the bearing cup shoulders in the carrier and by the portion of the pinion in back of the rear bearing. The thickness of the rear pinion bearing mounting shim suitable for the carrier can be determined by using Tool C-758-D4.

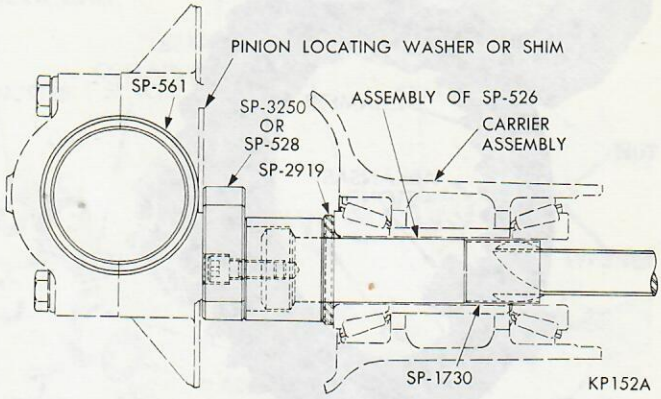

Fig. 26 Pinion Preload with Spacer (8-3/4 in. Ring Gear)

PINION BEARING PRELOAD WITH BEARING SPACER

(Small Stem Step Pinion)

Bearing Preload

(1) With tool installed in carrier, remove main screw nut, centralizing washer, compression sleeve and front pinion bearing cone.

(2) Install the pinion bearing spacer, larger bore of spacer next to rear bearing.

(3) Position sleeve (SP-1730) in front bearing cone making sure sleeve is flush with rear of bearing.

(4) Position original shims, previously removed from drive pinion stem, over the sleeve and slide the sleeve, bearing and shims over main screw of tool until shims rest against spacer (Fig. 26).

(5) Install tool compression sleeve (SP-535) (square end out), centralizing washer (SP-534) and main screw nut (SP-533). Turn carrier in stand to bring nut on top.

(6) Tighten tool nut to 240 foot-pounds with a torque wrench, using holding Tool C-3281 on the compression sleeve to hold the assembly in several positions to make a complete revolution while tightening. Remove holding tool and rotate the pinion several revolutions in both directions to seat the bearing rollers. Recheck torque to 240 foot-pounds (torque may have diminished as bearing rollers were seated by rotating). **Correct bearing preload reading can only be obtained with nose of carrier up.**

(7) Using inch-pound torque wrench C-685, measure pinion bearing preload by rotating pinion with handle of wrench floating, read the torque while wrench is moving through several complete revolutions. Correct preload setting is 20-30 inch-pounds for a new bearing and 0-15 inch-pounds

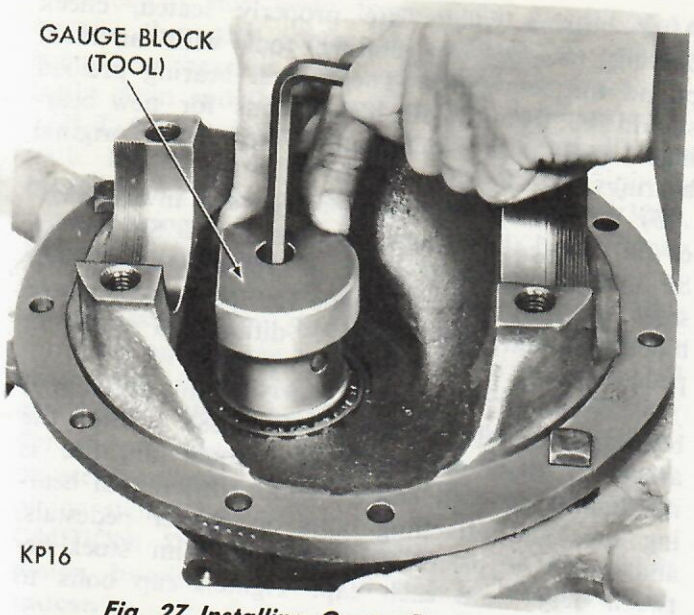

Fig. 27 Installing Gauge Block on Tool

for original bearing. Bearing preload should be uniform during complete revolution. A reading that varies considerably during rotation of pinion indicates a binding condition which requires correction. **Use a thinner shim pack to increase preload and a thicker shim pack to decrease preload.** Preload shims are available in two thousandths of an inch increments from .014-.026 inch.

After correct pinion bearing preload is set, **DO NOT REMOVE THE TOOL.**

Depth of Mesh

(1) Reverse carrier in stand and install gauge block SP-528 on end of tool and secure it to tool with Allen screw. The flat portion of gauge block should be facing differential bearing pedestals (Fig. 27). Tighten screw with Allen wrench.

(2) Position arbor SP-561 (part of Tool C-758-D4) in differential bearing pedestals of carrier (Fig. 28). Center the arbor so that an approximate equal distance is maintained at both ends. Position differential bearing caps and attaching bolts on carrier pedestals, and insert a piece of .002 inch shim stock between arbor and each cap. Tighten cap bolts to 10 foot-pounds.

(3) Select a rear pinion bearing mounting shim which will fit between cross arbor and gauge block. This fit must be snug but not too tight (similar to the pull of a feeler gauge) (Fig. 29). This shim is then used in determining the correct thickness shim for installation.

(4) To select a shim for installation, read the marking on end of pinion head (—0, —1, —2, +1,+2 etc.). When marking is —(minus), add that amount to the thickness of shim selected in step (3). When the marking is +(plus), subtract that amount. Example: With a shim .086 inch thick and a pinion marked —2, install a shim .088 inch

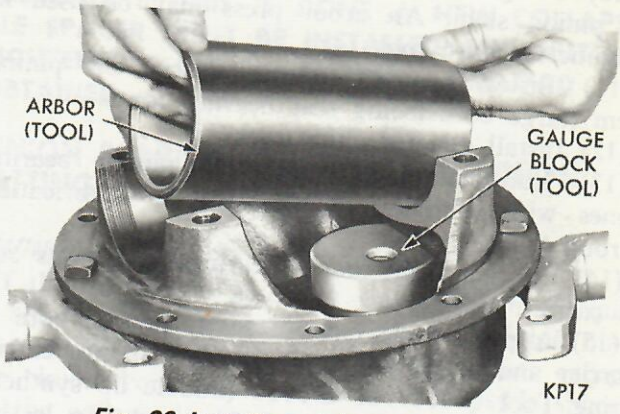

Fig. 28 Installing Arbor in Carrier

Fig. 29 Determining Spacer Thickness

thick. (.086 +.002 = .088). Example: With a shim .086 inch thick and a pinion marked +2, install a washer .084 inch thick, (.086 — .002 = .084) or when a shim .086 inch thick is too loose and .088 inch too tight, use .086 inch shim. Treat other pinion markings in a similar manner. Shims are available in two thousandths of an inch increments. Mounting shims differ in diameter, depending on which pinion they are used on.

(5) Remove tool arbor from carrier.

(6) Remove tool and bearings out of carrier.

(7) Remove shims, spacer, tool sleeve and rear bearing cone from tool main screw.

(8) With stem of pinion facing up, install correct shim on pinion stem. **Shims are chamfered on one side and must be installed on the pinion stem with chamfered side toward pinion head.**

(9) Position rear bearing cone on pinion stem (small side away from pinion head). Make certain that the contacting surfaces of correct shim, pinion head shim contact surface and rear bearing cone are perfectly clean and free of any foreign particles.

(10) Using installing Tool DD-996 press bearing on pinion stem. An arbor press may be used in conjunction with tool.

(11) Install bearing tubular spacer on pinion stem (large bore facing rear bearing cone).

(12) Install selected shim pack.

(13) Lubricate front and rear pinion bearing cones with lubricant as specified in (Lubrication Group "O").

(14) Position front pinion bearing cone in its cup in carrier.

(15) Apply a light coat of sealer in seal bore of carrier and install drive pinion oil seal into carrier using Tool C-4109 or C-3980 (double lip synthetic rubber oil seal) or Tool C-3656 (single lip leather oil seal). The proper tool must be used in order to position the seal the proper depth into the carrier casting.

(16) Insert drive pinion and bearing assembly up through carrier. While supporting pinion in carrier, install companion flange with installing Tool C-496 or DD-999 and holding Tool C-3281.

(17) Remove tools and install Belleville washer (convex side of washer up) and pinion nut.

(18) Hold companion flange with holding Tool C-3281 and tighten pinion nut to 240 foot-pounds. Rotate pinion several revolutions in both directions to seat bearing rollers. Recheck torque to 240 foot-pounds (torque may have diminished as bearing rollers were seated by rotating).

DEPTH OF MESH

(Large Stem Pinion With Collapsible Spacer)

Inspect differential bearing cups and cones, carrier for grit and dirt or other foreign material. Clean all parts in fast evaporating mineral spirits or a dry cleaning solvent and with the exception of bearing cones, dry with compressed air. **Front Pinion Bearing Cone and Cup Must Never Be Reused Under Any Circumstances discard collapsible spacer.**

(1) Assemble spacer SP-5387 to main section of tool followed by spacer SP-1730. Install rear pinion bearing cone over spacer SP-1730 and against spacer SP-5387.

(2) Insert assembly into carrier and install front pinion bearing cone over tool shaft and in its proper position in bearing cup. Install tool spacer, tool thrust washer and tool nut on shaft.

(3) With nose of carrier up, place flange holding Tool C-3281 on compression sleeve. Allow assembly to rotate while tightening nut to not more than 25-50 foot-pounds. **Always make sure bearing cones are lubricated with hypoid gear lubricant.**

(4) Turn tool several complete revolutions in both directions to permit bearing rollers to seat. After bearing rollers are properly seated, check bearing preload by rotating tool with an inch-pound torque wrench. The correct bearing preload should be from 20-30 inch-pounds for new bearings and 0-15 inch-pounds for the original bearings.

(5) With proper bearing preload set, invert carrier in stand and install gauge block SP-528 or SP-3250 to the main screw attaching it with Allen screw securely (Fig. 27). The flat portion of gauge block should be facing differential bearing pedestals.

(6) Position tool arbor SP-561 in differential bearing pedestals of carrier (Fig. 28). Center the arbor so that an approximate equal distance is maintained at both ends. Position differential bearing caps and attaching bolts on carrier pedestals, and insert a piece of .002 inch shim stock between arbor and each cap. Tighten cap bolts to 10 foot-pounds.

(7) Select a rear pinion bearing mounting shim which will fit between cross arbor and gauge block. This fit must be snug but not too tight (similar to the pull of a feeler gauge. (Fig. 29). This shim is then used in determining the correct thickness shim for installation.

(8) To select a shim for installation, read the marking on end of pinion head (—0, —1, —2, +1,+2, etc.). When marking is —, (minus) add that amount to the thickness of shim selected in step (7). When the marking is + (plus), subtract that amount. Example: With a shim .036 inch thick and a pinion marked —2, install a shim .038 inch thick (.036 + .002 = .038). Example. With a shim .036 inch thick, (.036 — .002=.34) or when a shim .036 inch thick is too loose and .038 inch too thick, use .036 inch shim. Treat other pinion markings in a similar manner. Shims are available in one thousandths of an inch increments.

(9) Remove differential bearing caps and remove tool arbor from carrier.

(10) Reverse carrier in stand so nut of tool is in upright position. Loosen compression nut, and support lower portion of tool in carrier with one hand, remove tool nut, centering washer and compression sleeve. Lower tool down and out of carrier.

(11) Remove front pinion bearing cone from carrier housing.

(12) With stem of drive pinion facing up, add rear pinion bearing mounting shim you selected on pinion stem.

PINION BEARING PRELOAD

(Large Stem Pinion With Collapsible Spacer)

(1) Position rear pinion bearing cone on pinion

stem (small side away from pinion head). Make certain that the contacting surfaces of selected shim, rear bearing cone and pinion head are perfectly clean and free of any foreign particles.

(2) Lubricate front and rear pinion bearing cones with hypoid gear lubricant. Install rear pinion bearing cone onto pinion stem, using Tool C-3095, press bearing cone into place. An arbor press may be used in conjunction with tool.

(3) Insert drive pinion bearing and collapsible spacer assembly up through carrier and install the front pinion bearing cone on pinion stem. Install companion flange using Tool C-496 or DD-999 and holding Tool C-3281. This is necessary in order to properly install front pinion bearing cone on stem due to interference fit. Remove tool from pinion stem.

CAUTION: During the installation of the front pinion bearing be careful not to collapse the spacer.

(4) Apply a light coat of sealer in seal bore of carrier casting and install drive pinion oil seal into carrier using Tool C-4109 or C-3980 (double lip synthetic rubber oil seal) or Tool C-3656 (single lip leather oil seal). The proper tool must be used in order to position the seal the proper depth into the carrier casting.

(5) With pinion supported in carrier, install anti-clang washer on pinion stem. Install companion flange with installing Tool C-496 or DD-999 and holding Tool C-3281.

(6) Remove tools and install Belleville washer (convex side of washer up) and pinion nut.

(7) Hold universal joint flange with holding Tool C-3281 and tighten pinion nut to remove end play in pinion, while rotating the pinion to insure proper bearing seating.

(8) Remove holding tool and rotate pinion several complete revolutions in both directions to permit bearing rollers to seat.

(9) Tighten pinion nut to 170 foot-pounds and measure pinion bearing preload by rotating pinion using an inch-pound torque wrench. The correct preload specifications are 20-35 inch-pounds for new bearings or 10 inch-pounds over the original if the old rear pinion bearing is being reused. Correct bearing preload readings can only be obtained with nose of carrier in upright position. Continure tightening of pinion nut in small increments and checking pinion bearing preload until proper preload is obtained. Bearing preload should be uniform during complete revolution. A preload reading that varies during rotation indicates a binding condition which has to be corrected. The assembly is unacceptable if final pinion nut torque is below 170 foot-pounds or pinion bearing preload is not within the correct specifications.

CAUTION: UNDER NO CIRCUMSTANCES SHOULD THE PINION NUT BE BACKED OF\ PRELOAD. IF THIS IS DONE A NE\ BLE SPACER MUST BE INSTALLED A\ TIGHTENED UNTIL PROPER PR\ OBTAINED.

PINION BEARING PRELOAD AND PINION SETTING

(Without Using Tool C-758-D4

If the differential assembly was satisfactorily quiet before being disassembled, the drive pinion may be assembled with the original components except the pinion front bearing and the collapsible spacer on the collapsible spacer type axle. If replacement parts are installed, a complete readjustment is necessary; the proper thickness shim must be selected and installed. The drive gear and pinion are manufactured and lapped in matching sets and are available in matched sets only. The adjustment position in which the best tooth contact is obtained is marked on the end of the pinion head.

To obtain the proper pinion setting in relation to the drive gear, the correct thickness mounting shim must be selected before the drive pinion is installed in the carrier. The pinion bearing mounting shims are available in two thousandths increments from .084 to .100 inch (small stem) or .020-.038, inch in increments of .001 inch (large stem pinion with collapsible spacer). To select the proper thickness shim, proceed as follows: It will be noted that the head of the drive pinion is marked with a plus (+) or minus(—) sign followed by a number ranging from 1 to 4, or zero (0) marking.

Depth of Mesh

If the old and new pinion have the same marking and if the original bearing is being reused, use a mounting shim of the same thickness. But if the old pinion is marked zero (0) and the new pinion is marked +2, try a .002 inch thinner shim. If the new pinion is marked —2, try a .002 inch thicker shim.

Pinion Bearing Preload -- Small Stem Step Pinion

If the bearings are being replaced, place the new bearing cup in position in the carrier and drive the cups in place with a suitable drift. After properly positioning the bearing cups in the carrier, assemble the drive pinion mounting shim (chamfered side down toward gear) on the drive pinion stem. Install the tubular spacer (if so equipped) and the preload shims on the pinion stems. Insert the pinion assembly into the carrier. Install the front pinion bearing cone, universal joint flange, Belleville washer (convex side of

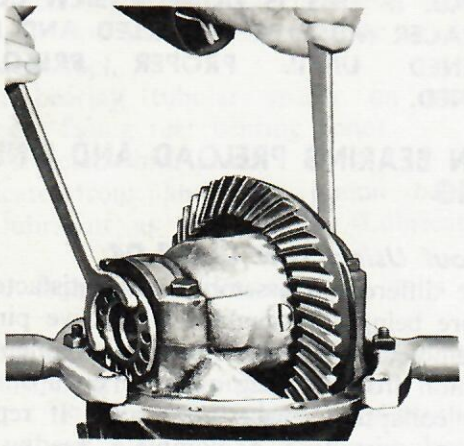
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Fig. 30 Adjusting Differential Bearings

washer up) and nut. **DO NOT INSTALL THE OIL SEAL.** Rotate the drive pinion after tightening the flange nut to 240 foot-pounds, to properly seat the bearing rollers in the bearing cups. The preload torque required to rotate the pinion with the bearings oiled should be 20-30 inch-pounds for new bearings and 0-15 inch-pounds for used bearings. **Use a thinner shim pack to increase preload and a thicker shim pack to decrease preload.** After the correct pinion depth of mesh has been established and correct bearing preload obtained, remove the drive pinion flange. Apply a light coat of sealer to drive pinion oil seal and carrier casting bore and install drive pinion oil seal with Tool C-4109 or C-3980 (synthetic rubber seal) or Tool C-3656 (leather seal). Install the pinion flange, washer and nut and tighten nut to 240 foot-pounds.

Installation of Differential and Ring Gear in Carrier

(1) Holding differential and ring gear assembly with bearing cups on respective bearing cones, carefully install the assembly into carrier.

(2) Install differential bearing caps, on respective sides, making certain that identification marks on caps correspond with those on carrier. Install cap bolts and tighten bolts of each cap by hand.

(3) Install differential bearing adjusters, on respective sides, making certain that identification marks correspond. Screw adjuster in by hand. No attempt should be made to apply any excessive pressure at this time.

(4) Using spanner wrenches Tool C-406A to square bearing cups with bearing cone, turn adjusters "IN" until cups are properly square with bearings and end play is eliminated with some backlash existing between the drive gear and pinion (Fig. 30).

(5) Tighten one differential bearing cap bolt on each side to 85-90 foot-pounds.

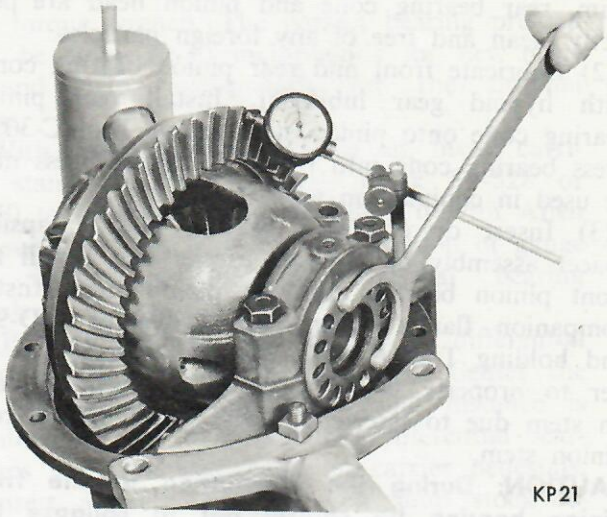
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Fig. 31 Measuring Backlash Between Drive Gear and Pinion

DRIVE GEAR AND PINION BACKLASH

Correct drive gear and pinion backlash when properly set is .006 to .008 inch at point of minimum backlash. Rotate drive gear and ring gear several revolutions in both directions in order to seat the bearing rollers. This is necessary before setting backlash.

(1) Attach a dial indicator Tool C-3339 to carrier flange so pointer of indicator is squarely contacting one drive gear tooth (drive side) (Fig. 31).

(2) Measure backlash between drive gear and pinion at four positions, approximately 90 degrees apart. After point of least backlash has been determined, mark drive gear. **Do not rotate drive gear from point of least backlash until all adjustments have been completed.**

(3) Using Tool C-406A (spanner wrench) turn both bearing adjusters equally (in same direction) until backlash between drive gear and pinion is .0005 to .0015 inch. **This backlash variation is given to permit alignment and installation of the bearing adjuster lock, lockwasher and attaching screw. The adjuster (ring gear side) must only be turned in a clockwise direction and under no circumstances should be backed off.**

(4) Install adjuster lock on bearing cap, backface side of drive gear. Tighten lock screw to 15 to 20 foot-pounds.

Differential Bearing Preload

(1) Turn bearing adjuster (tooth side of drive gear) (Fig. 31) in a notch at a time (notch referred to is the adjuster lock holes) until backlash between drive gear and pinion is a minimum of .006 to .008 inch. This will preload differential bearings and establish correct backlash. Rotate

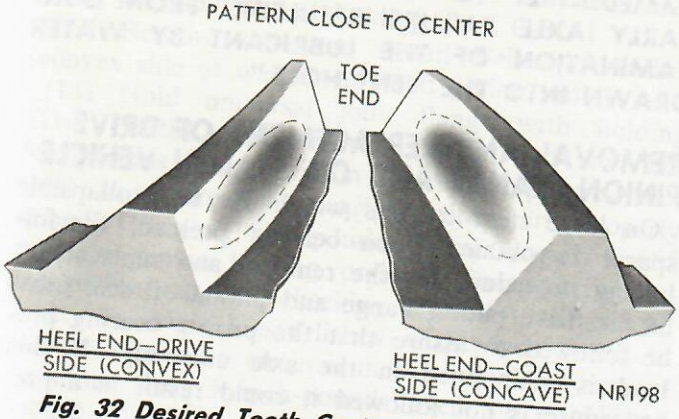

Fig. 32 Desired Tooth Contact Under Light Load

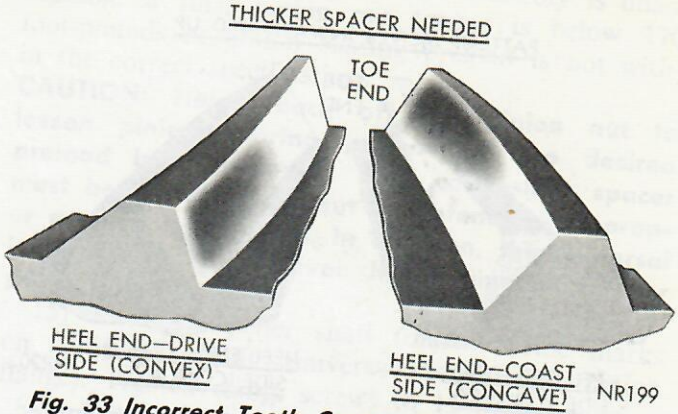

Fig. 33 Incorrect Tooth Contact Pattern (Increase Spacer Thickness)

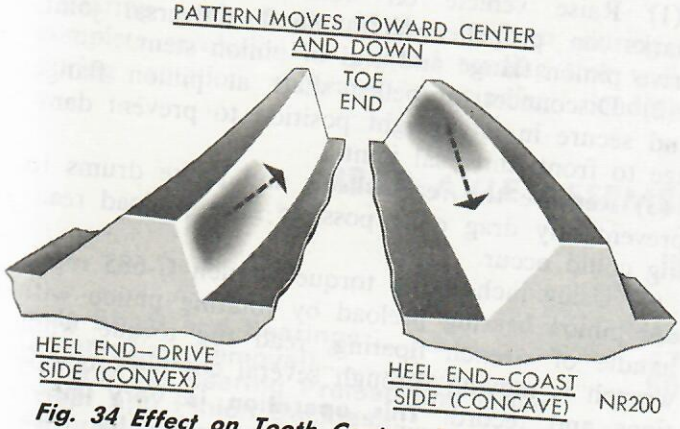

Fig. 34 Effect on Tooth Contact Pattern as Spacer Thickness is Increased

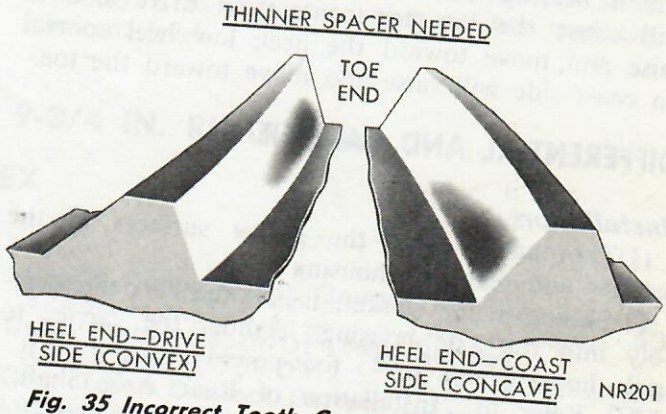

Fig. 35 Incorrect Tooth Contact Pattern (Decrease Spacer Thickness)

gear several times and recheck lash. Readjust with same adjuster as before, if necessary. **NOTE: Final adjustment on either adjuster must be in tightening direction.**

(2) Tighten the remaining two differential bearing cap bolts to 85-90 foot-pounds.

(3) Install remaining adjuster lock, lockwasher and attaching screw. Tighten to 15-20 foot-pounds.

GEAR TOOTH CONTACT PATTERN

The gear tooth contact pattern will disclose whether the correct rear pinion bearing mounting shim has been installed and the drive gear backlash set properly. Backlash between the drive gear and pinion must be maintained within the specified limits until correct tooth contact pattern is obtained.

(1) Apply a thin film of red or white lead on both the drive and coast side of the drive gear teeth. Rotate drive gear one complete revolution in both directions while load is being applied with a round bar or screwdriver between the carrier casting and differential case flange. This action will leave a distinct contact pattern on both the drive and coast side of the drive gear teeth.

(2) Observe the contact pattern on the drive gear teeth and compare with those in figures 32, 33 and 35 to determine if pattern is properly located. With pinion depth of mesh and gear backlash set properly, your contact pattern should resemble that in (Fig. 32). Notice that the correct contact pattern is well centered on both drive and coast sides of the teeth. When tooth contact patterns are obtained by hand, they are apt to be rather small. Under the actual operating load, however, the contact area increases.

(3) If after observing the contact pattern you find it resembles that in (Fig. 33), the drive pinion is too far away from centerline of the ring gear, the contact pattern will appear high on the heel on drive side and high on toe on coast side. To correct this type tooth contact pattern, increase the thickness of the rear pinion bearing mounting spacer (Fig. 34), which will cause the high heel contact on drive side to lower and move toward the toe; the high toe contact on coast side will lower and move toward the heel.

(4) If after observing the contact pattern you find it resembles that in (Fig. 35), the drive pinion is too close to the ring gear, the pattern will appear low on the toe on drive side and low heel contact on coast side. To correct this type tooth contact pattern, decrease the thickness of the rear

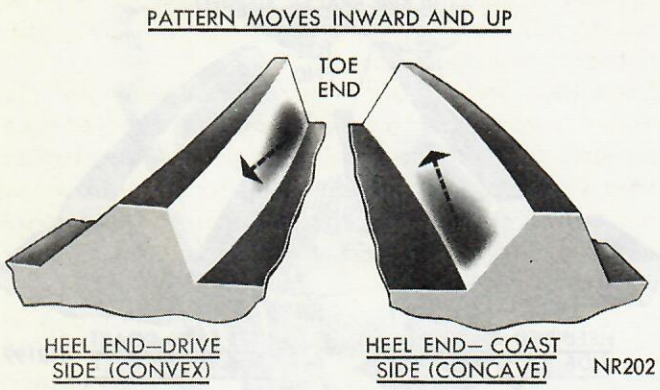

Fig. 36 Effect on Tooth Contact Pattern as Spacer Thickness is Decreased

pinion bearing mounting spacer (Fig. 36), which will cause the low toe contact on drive side to raise and move toward the heel; low heel contact on coast side will raise and move toward the toe.

DIFFERENTIAL AND CARRIER

Installation

(1)Thoroughly clean the gasket surfaces of the carrier and rear axle housing.

(2) Using a new gasket, install the carrier assembly into the axle housing. Tighten the carrier to axle housing nuts to 45 foot-pounds.

(3) Refer to "Installation of Rear Axle Shaft," when installing and setting axle shaft end play.

(4) Install propeller shaft (match scribe marks on propeller shaft universal joint and pinion flange). Tighten clamp screws to 15 foot-pounds.

(5) Remove wooden block from under brake pedal and bleed and adjust brakes.

(6) Install rear wheels and tighten to 65 foot-pounds.

LUBRICATION

Every six months check the fluid level in the axle through the filler plug hole. When checking the level, be sure the vehicle is in a level position on an axle or drive on type hoist. "See Lubrication Section" for proper level of specific axle assembly.

In Sure-Grip Differentials, use only the Chrysler Hypoid Lubricant Part Number 2933565 or equivalent. Do not use any other lubricant than this special lubricant or equivalent.

Anticipated Temperature Range	Viscosity Grade
Above – 10° F.	SAE 90
As low as – 30° F.	SAE 80
Below – 30° F.	SAE 75

"SHOULD THE REAR AXLE BECOME SUBMERGED IN WATER, THE LUBRICANT MUST BE CHANGED IMMEDIATELY TO AVOID THE POSSIBILITY OF EARLY AXLE FAILURE RESULTING FROM CONTAMINATION OF THE LUBRICANT BY WATER DRAWN INTO THE VENT HOLE."

REMOVAL AND REPLACEMENT OF DRIVE PINION FLANGE AND OIL SEAL IN VEHICLE

On large stem carriers which use the collapsible spacer to obtain pinion bearing preload, the following procedure for the removal and replacement of the drive pinion flange and pinion oil seal must be followed to assure that the proper bearing preload is maintained in the axle assembly. If this procedure is not followed it could result in a premature failure of the axle.

(1) Raise vehicle on hoist and make scribe marks on propeller shaft, shaft universal joint, drive pinion flange and end of pinion stem.

(2) Disconnect propeller shaft at pinion flange and secure in an upright position to prevent damage to front universal joint.

(3) Remove the rear wheels and brake drums to prevent any drag or a possible false preload reading could occur.

(4) Using inch-pound torque wrench C-685 measure pinion bearing preload by rotating pinion with handle of wrench floating, read the torque while wrench is moving through several complete revolutions and record. **This operation is very important because preload must be carefully reset when reassembling.**

(5) With Tool C-3281 hold companion flange and remove drive pinion nut and Belleville washer.

(6) Install companion flange remover Tool C-452 and remove flange. Lower rear of vehicle to prevent lubricant leakage.

(7) Using a screwdriver and hammer, remove the pinion oil seal from the carrier and clean the oil seal seat.

(8) Check splines on pinion shaft stem to be sure they are free of burrs or are not worn badly. If burrs are evident remove them using crocus cloth by working in a rotational motion. Wipe the pinion shaft clean.

(9) Inspect companion flange for cracks, worn splines, pitted, rough or corroded oil seal contacting surface. Repair or replace companion flange as necessary.

(10) Apply a light coat of sealer in seal bore of carrier and install drive pinion oil seal into carrier using Tool C-4109 or C-3980 (Double lip synthetic rubber oil seal) or Tool C-3656 (single lip leather oil seal). The proper tool must be used in order to properly position the seal the correct depth into the carrier casting.

(11) Position companion flange on pinion stem being careful to match scribe marks made previously before removal.

(12) Install companion flange with installing Tool C-496 or DD-999 and holding Tool C-3281.

(13) Remove tool and install Belleville washer (convex side of washer up) and pinion nut.

(14) Hold universal joint flange with holding Tool C-3281 and tighten pinion nut to 170 foot-pounds. Rotate pinion several complete revolutions to assure that bearing rollers are properly seated. Using an inch-pound torque wrench C-685 measure pinion bearing preload. Continue tightening pinion nut and checking preload until preload is at the original established setting you found in step 4. Under no circumstances should the preload be more than 5 inch-pounds over the established setting found at time of checking in step 4 of procedure.

Bearing preload should be uniform during a complete revolution. A preload reading that varies during rotation indicates a binding condition which has to be corrected. The assembly is unacceptable if final pinion nut torque is below 170 foot-pounds or pinion bearing preload is not within the correct specifications.

CAUTION: Never back off the pinion nut to lessen pinion bearing preload. If the desired preload is exceeded a new collapsible spacer must be installed and nut retightened until proper preload is obtained. In addition, the universal joint flange must never be hammered on, or power tools used.

(15) Install propeller shaft (match scribe marks on propeller shaft universal joint and pinion flange). Tighten clamp screws to 15 foot-pounds.

(16) Install the rear brake drums and wheels and tighten nuts 65 foot-pounds.

(17) Raise the vehicle to a level position so axle assembly is at correct running position and check lubricant level.

REAR AXLE ASSEMBLY 9-3/4 IN. RING GEAR

INDEX

GENERAL INFORMATION

With the increased torque output of the 440 cubic inch engine with Power Pak or the 426 cubic inch Hemi engine in vehicles equipped with 4-speed manual transmission, the 9-3/4 in. rear axle assembly will appear on those models that are so equipped (Fig. 1).

The standard differential used in both instances will be a SURE-GRIP differential with a plate-type clutch. The new differential in this year's 9-3/4 rear axle assembly has a one-piece case and two pinions. It is not a locking differential. Torque from the ring gear is transmitted through clutch packs between the side gears and differential case. The multiple disc clutches with radial grooves on the plates and concentric grooves on the discs are engaged by a preload from Belleville springs, plus separating forces from the side gears, as torque is applied through the ring gear. In normal driving conditions the controlled internal friction is easily overcome during cornering so that the driving wheels can turn at different speeds. Extreme differences in traction conditions at the driving wheels may permit one wheel to spin.

The standard factory ratio gear set used with both the 440 and 426 engines will be 3.54. A factory option of 4.10 is also offered. Additional matched gear sets with ratios of 4.56 and 4.88 will be available as dealer installed options. For 4.56 and 4.88 ratios, a new differential assembly partial will have to be purchased and installed due to the difference in ring gear mounting dimensions.

The rear axle is of the integral carrier-housing, hypoid gear type in which the centerline of the drive pinion is mounted below the centerline of the ring gear.

The rear axle housing is an iron casting with tubular legs pressed into and welded to the carrier to form a carrier and tube assembly. A removable stamped steel cover is bolted to the rear of the carrier to permit visual inspection of the differential without removing the complete rear axle from the vehicle.