KUBOTA TRACTOR CORPORATION
SERVICE TRAINING SERIES
(BOOK 2)

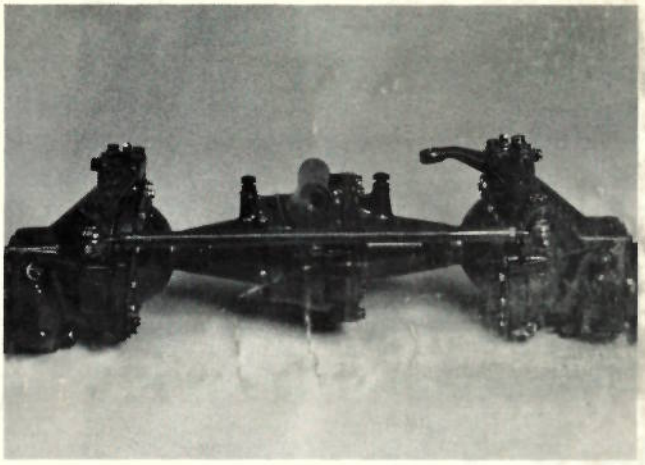
Front Drive Axle Disassembly and Assembly Procedure (B-Series, L-Series, M-Series Tractors)

Kubota B-Series Front Drive Axle
Disassembly and Assembly Procedure

Kubota L-Series Front Drive Axle
Disassembly and Assembly Procedure

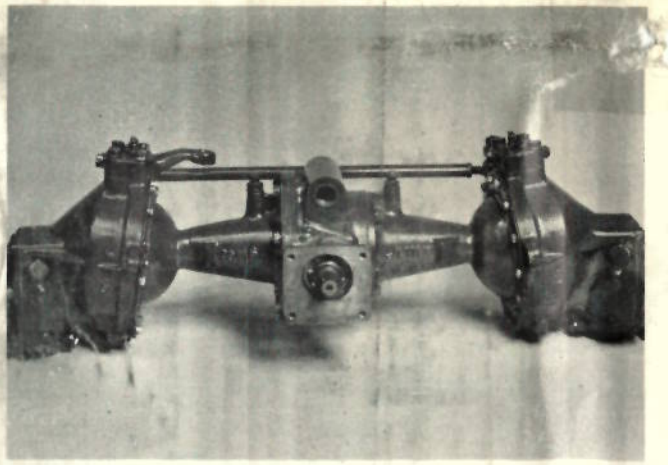
Kubota M-Series Front Drive Axle
Disassembly and Assembly Procedure

KUBOTA

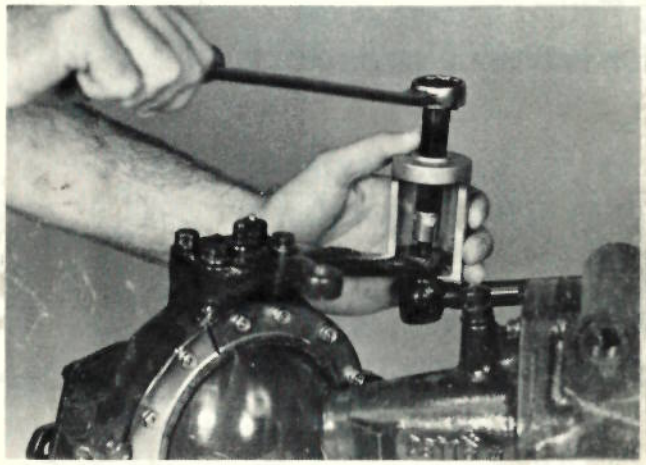


B-Series Front Drive Axle Disassembly and Assembly Procedure

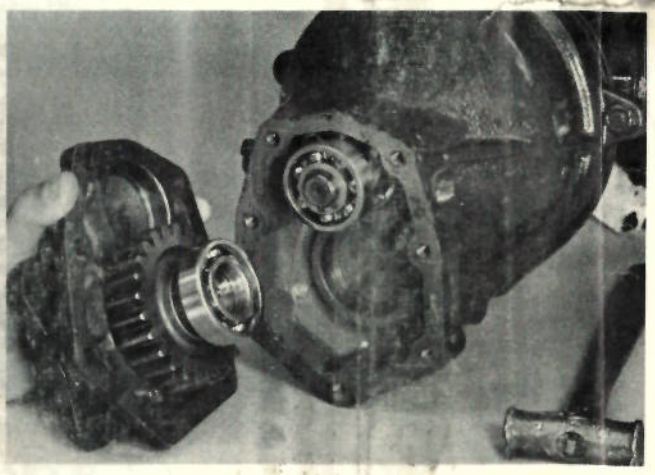
This is a front drive axle from a B5100-DT tractor as seen from the front. Basically this axle is similar to the B6000, B6100 and B7100 units.



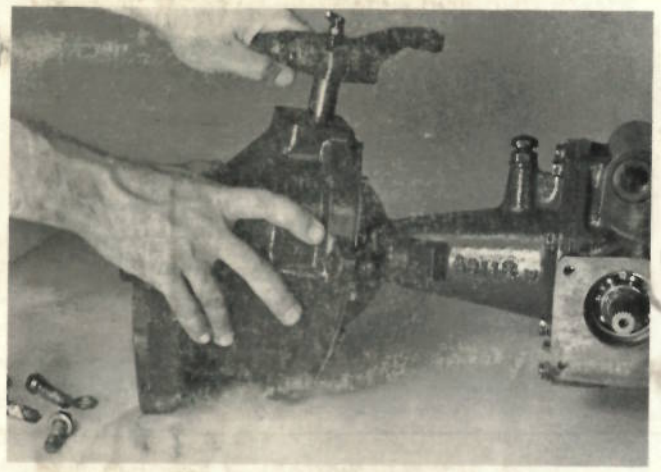
The major difference between this axle and the other B-Series axles is the method of retaining the pinion gear in the differential. This B5100 unit uses a large snap ring whereas the other units use a triangular retaining plate held in with three bolts.



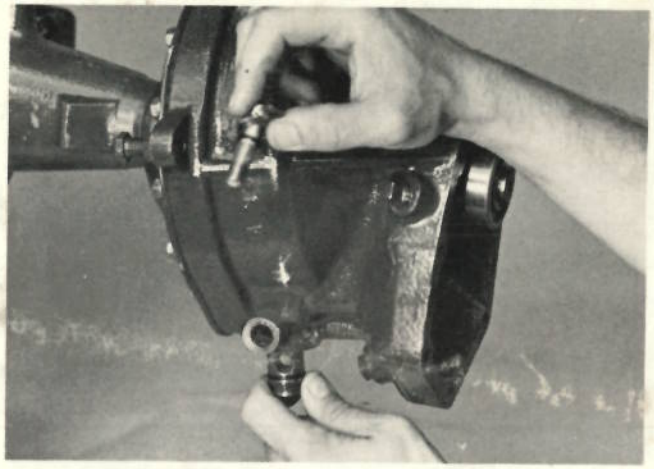
Remove the tie rod ends using Kubota Tool #07916-06021.



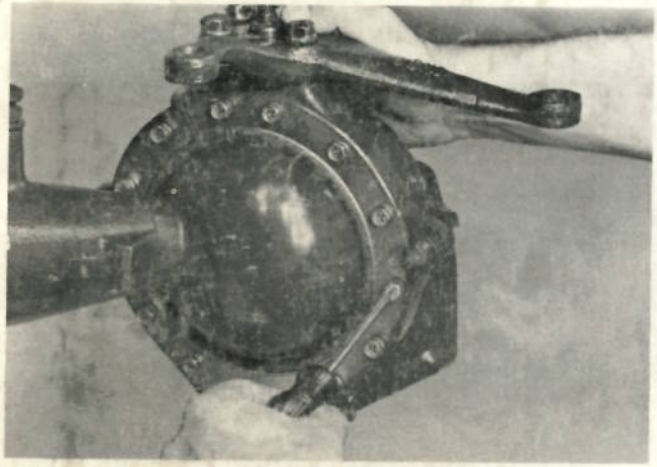
Remove the front wheel gear case retaining bolts and tap off the gear case covers. If the large driven gear hangs up on the upper outboard bearing, carefully drive the lower inboard bearing approximately half the way off the axle shaft as shown in this photograph. This will allow the driven gear to clear the upper outboard bearing.



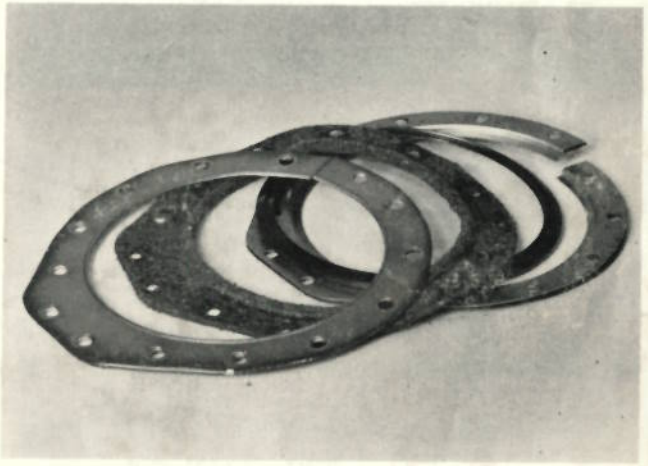
Remove the four knuckle arm retaining bolts and remove the knuckle arm and upper king pin together.



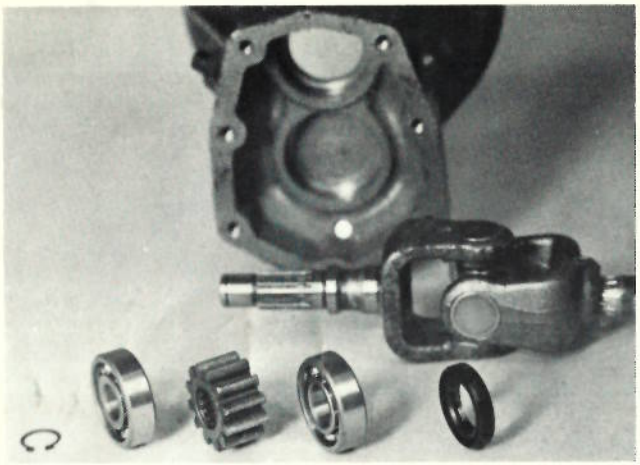
Remove the lower king pin retaining bolt and PULL the lower king pin from the front gear case. Do not try to drive the king pin into the gear case — it must be PULLED FROM the gear case.



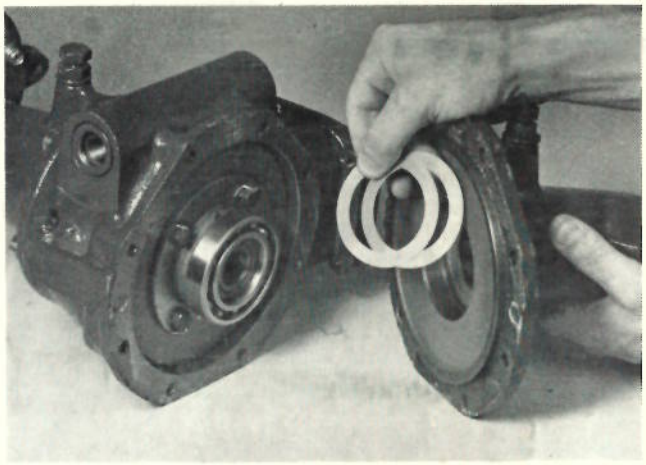
Remove the 14 screws retaining the front hub dust seal assembly.



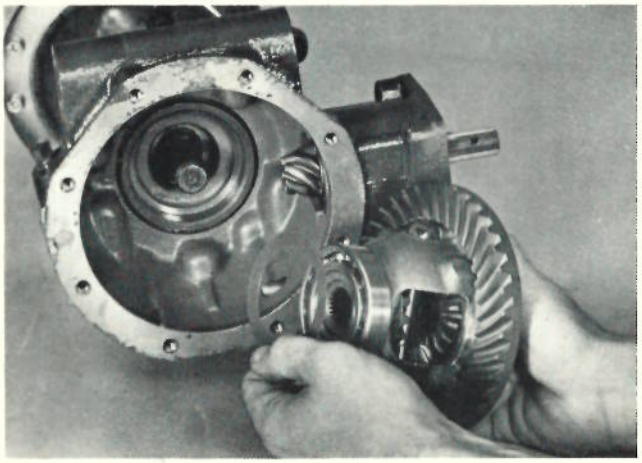
Inspect the rubber ring and felt washer for excess wear. These two rings are only a dust seal. If there is oil leaking past these rings, the problem lies elsewhere. Check the seals in the outboard gear case or the seal in the inboard end of the axle housing.



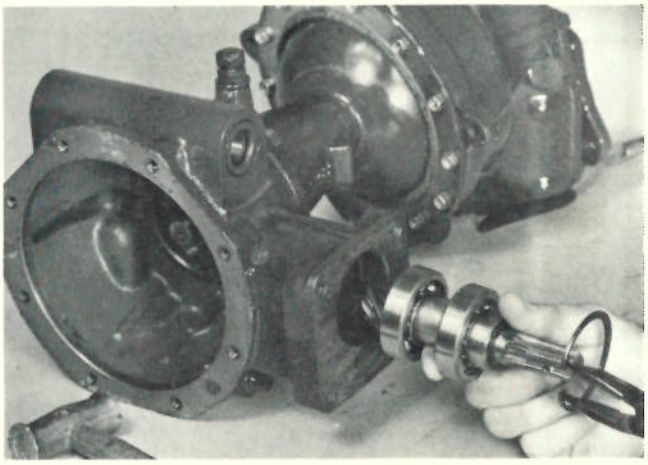
Disassemble the axle shaft assembly from the front gear case by removing the snap ring and pulling the gear and bearings from the shaft. Note the direction that the oil seal is installed.



Remove the left axle housing by removing the eight retaining bolts and lightly tapping the case free. Note the number of shims between the axle housing and the ring gear carrier bearing.



Remove the ring gear carrier and note the number of shims on the right side of the carrier.

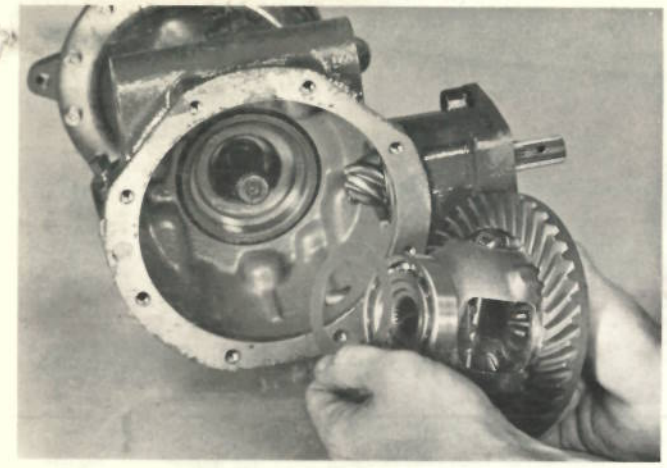


B5100-DT — To remove the pinion gear, first remove the pinion seal and the snap ring under the pinion seal and then tap out the pinion assembly with a brass hammer or mallet.

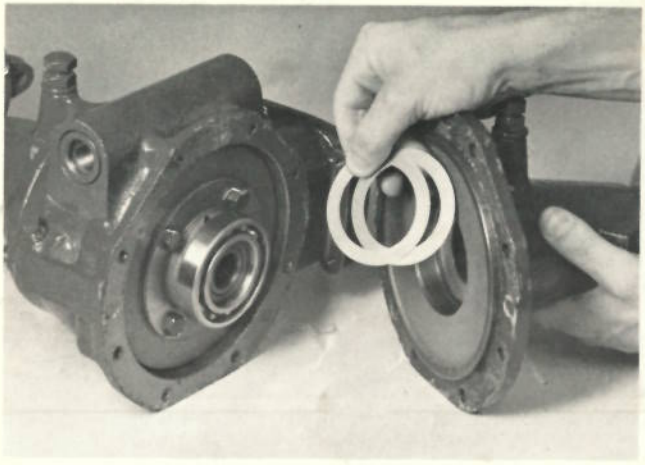
B7100 & B6100 — Removing the pinion gear is accomplished by removing the three pinion cover bolts and gently tapping out the pinion assembly.

Axle Reassembly

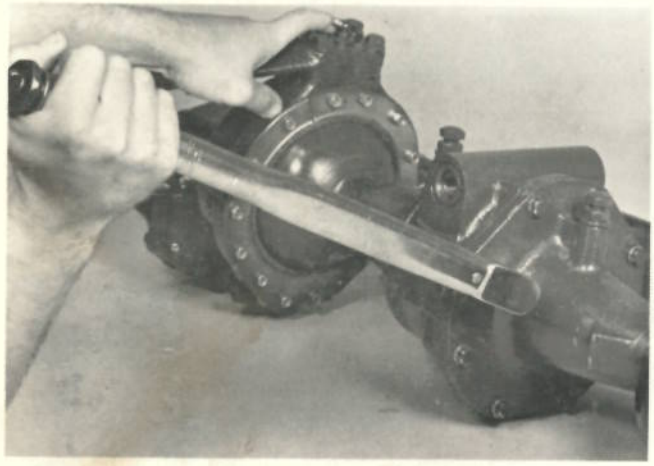
Before reassembly, clean all parts in clean solvent and carefully inspect all gear teeth for chips, cracks or excess wear. Replace any pieces that you suspect as being damaged.



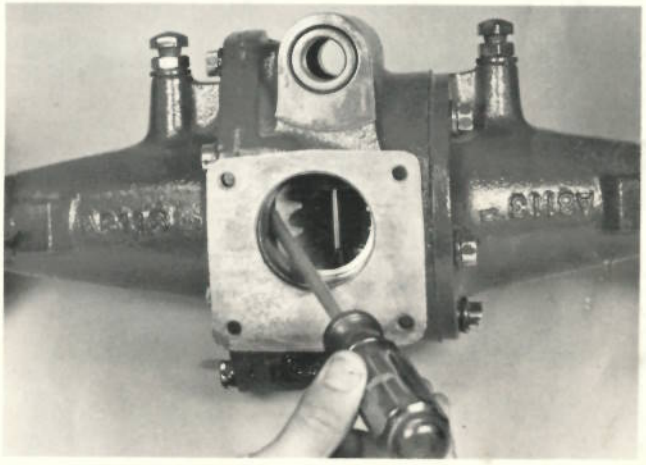
Install the right side axle housing, if removed, and carefully place a number of shims into the bearing bore. At this point, the number of shims is not too critical, although a good starting point is to use the same number of shims removed during disassembly.



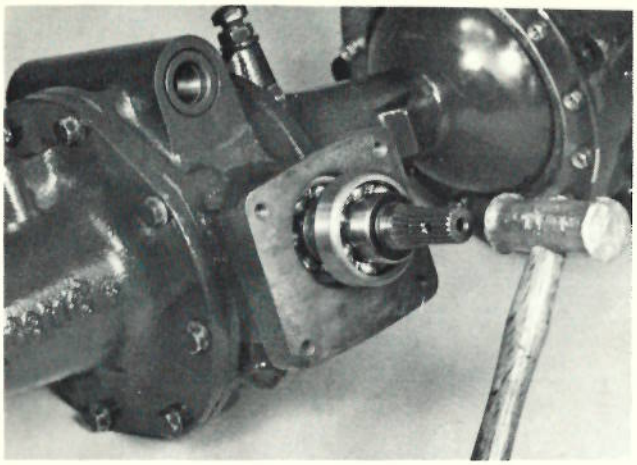
Install the ring gear carrier assembly into the differential housing. Install a number of shims into the left axle housing carrier bearing bore. (Again the number of shims at this point is not critical, but a good starting point is to replace the same number of shims removed.)



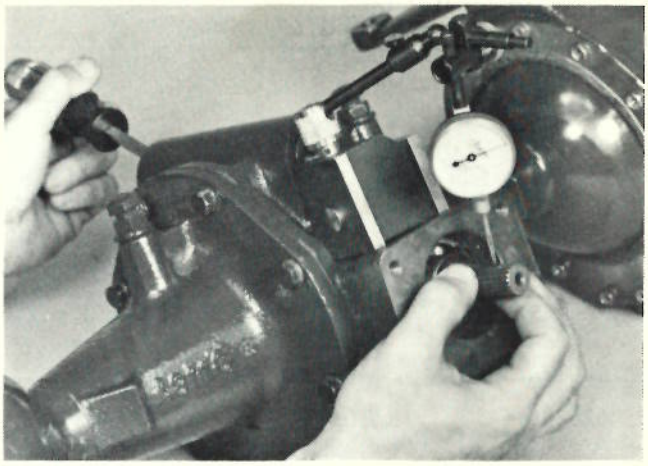
Now install the left side axle housing and torque both axle housing bolts. Bolt torque: **Left** side 20 ft. lbs. **Right** side 35 ft. lbs.



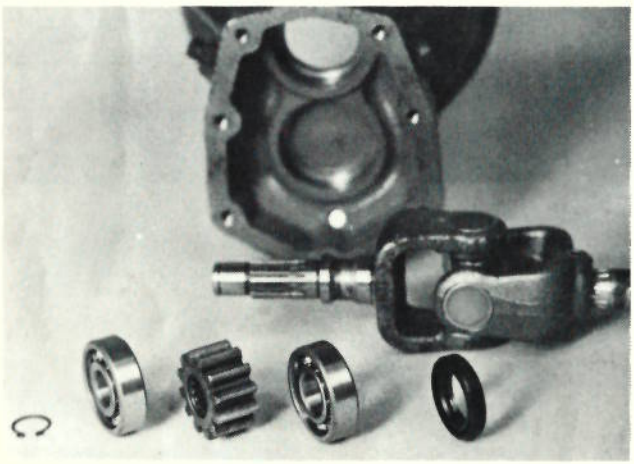
By reaching through the pinion hole see that the carrier turns freely, but has no side play. If the carrier does not spin freely and is binding, you must remove some shims. If there is any side play, you must add some shims.



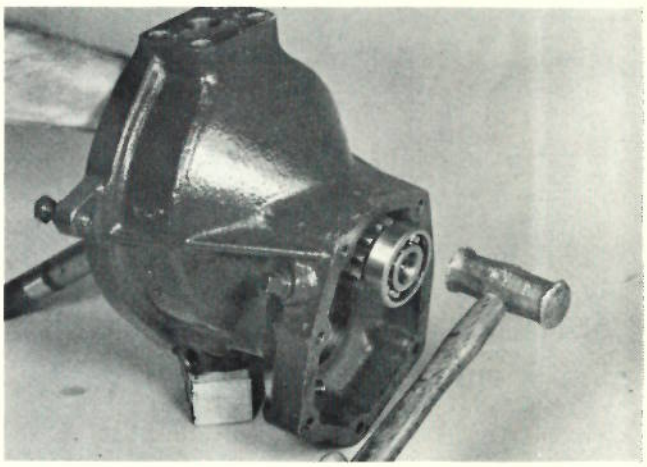
To install the pinion assembly on B5100 tractors, gently tap the pinion assembly into place and insert the snap ring into the groove. Make sure the sharp edge of the snap ring is installed away from the pinion gear. On B6000, B6100 and B7100 tractors, tap the pinion into position and install the pinion cover and cover bolts.



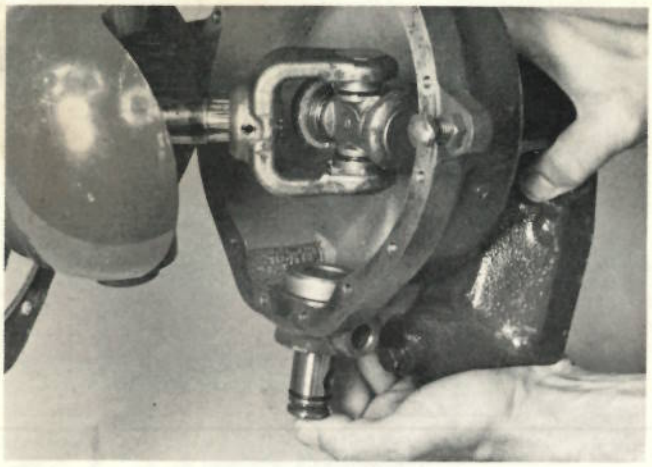
Check the ring and pinion backlash by setting a magnetic base on the center housing and a lever type dial indicator in the pin hole of the pinion shaft. Backlash should be .004" to .008". Adjust the backlash by exchanging shims on each side of the carrier bearings.



Install a new-seal into the gear case and carefully slide the axle shaft in place.

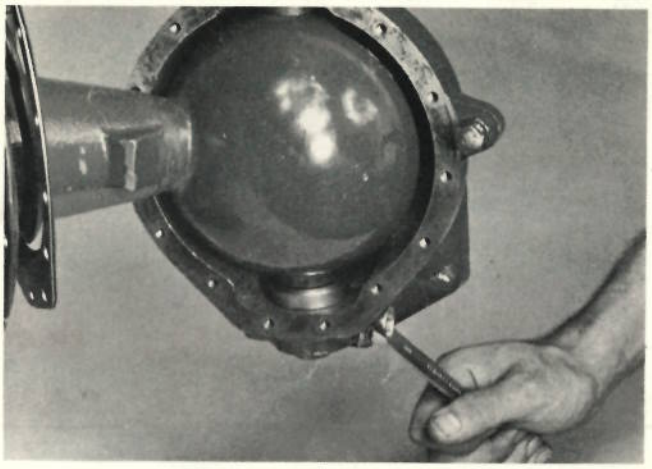


Gently tap in the inner axle bearing making sure that the axle seal remains in place. Slide on the drive gear and install the outer axle bearing. Recheck the oil seal to ensure it is still in place. Install the snap ring.



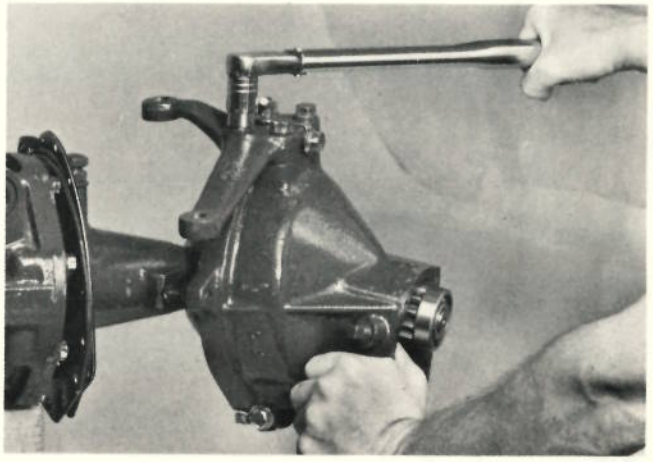
Slide the lower king pin through the gear case, thrust bearing and axle case.

Slip the dust seals over the front axle housing and slide the axle shafts and gear cases into place.

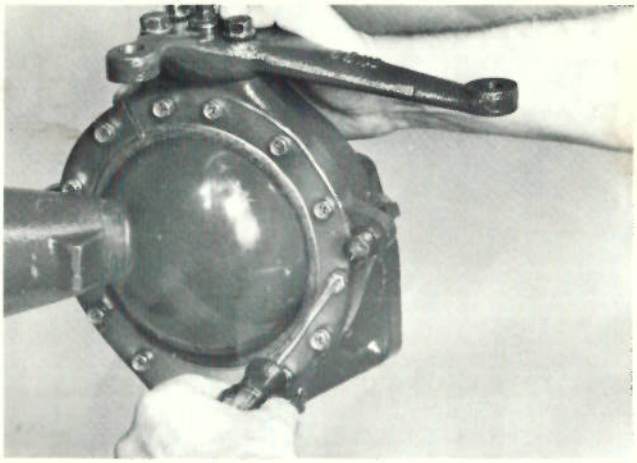


Insert the lower king pin lock bolt and bend over the lock tab.

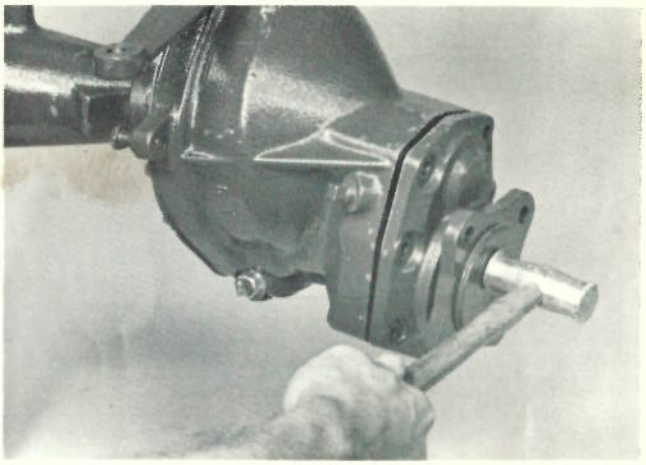
Insert the upper king pin and knuckle arm assembly.



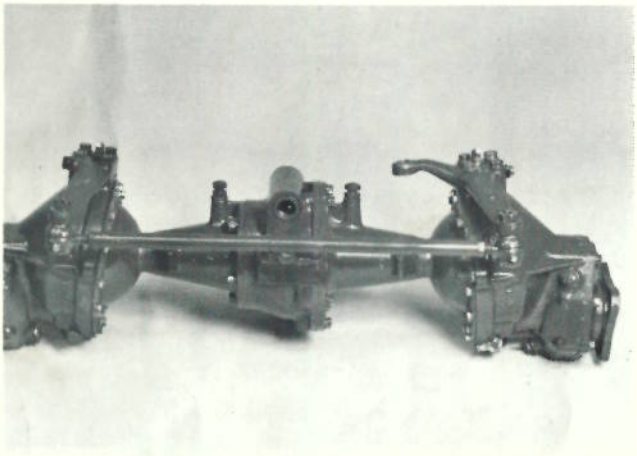
Torque the knuckle arm mounting bolts to 30 ft. lbs.



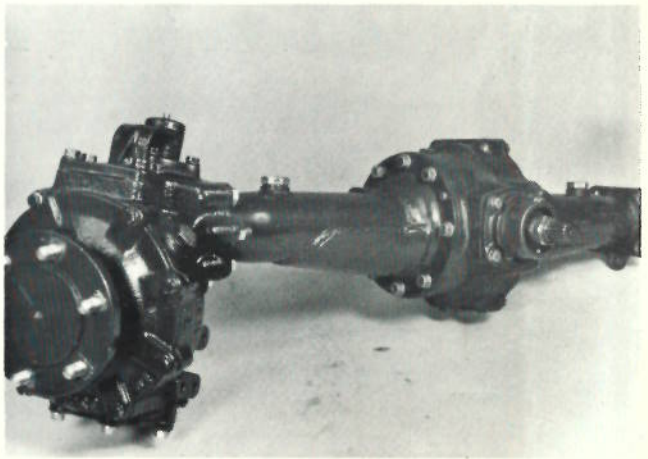
Install the rubber seal ring with the writing on the ring away from the axle. Install the felt washer and retaining ring.



Lightly tap the gear case cover into place. (Do not press the inner spindle bearing all the way on, as it will not clear the axle shaft gear. With the cover in place tap on the spindle to drive the bearing up against the shoulder.) Install the seven cover bolts.

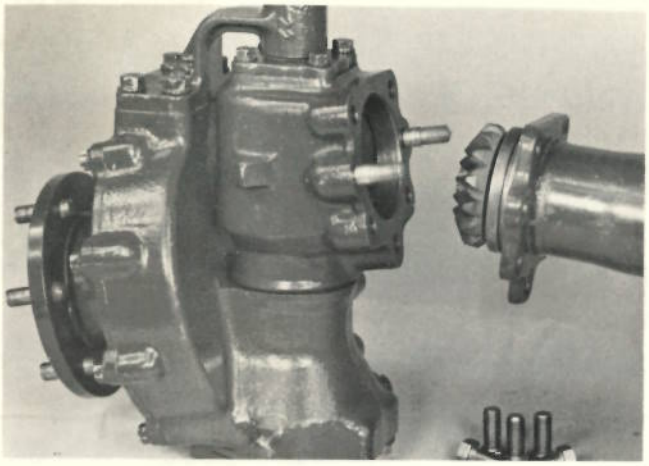


The reassembled axle.

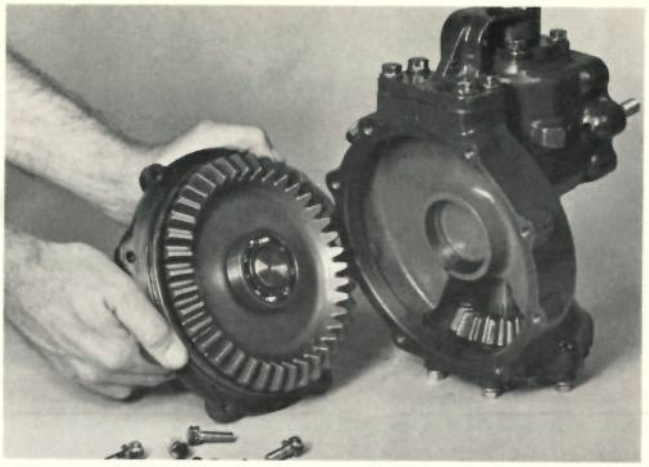


L-Series Front Drive Axle Disassembly and Assembly Procedure

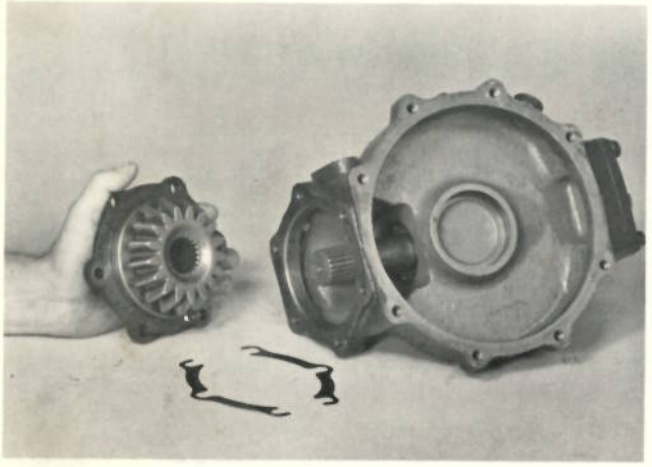
This is a front axle assembly used on L-series "DT" tractors.



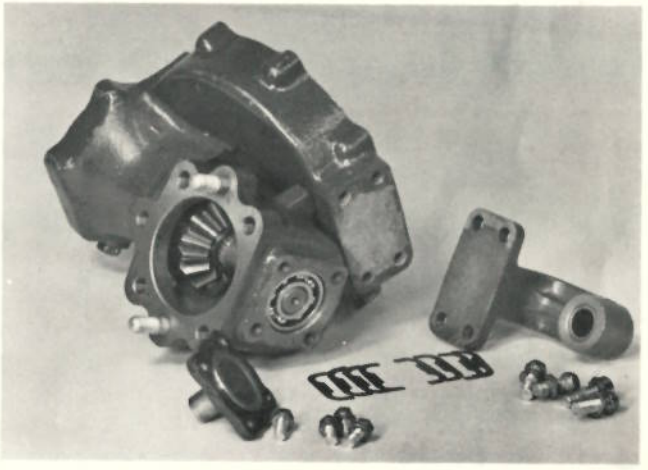
To disassemble the axle first detach the bevel gear case from the front axle housing. Note the number of shims between the axle housing and the bevel gear case.



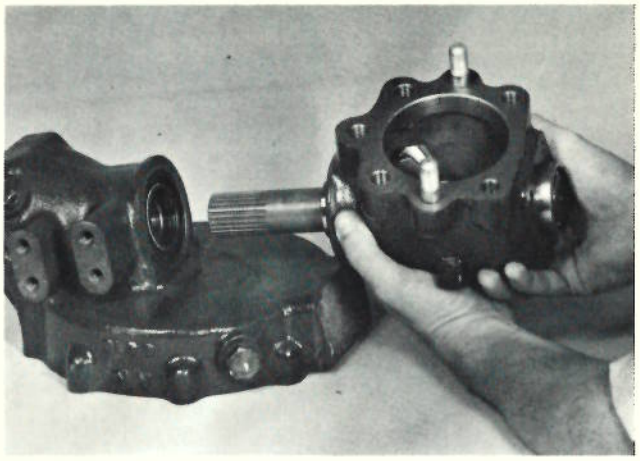
Next, remove the bolts securing the axle flange and remove the axle flange from the ring gear housing.



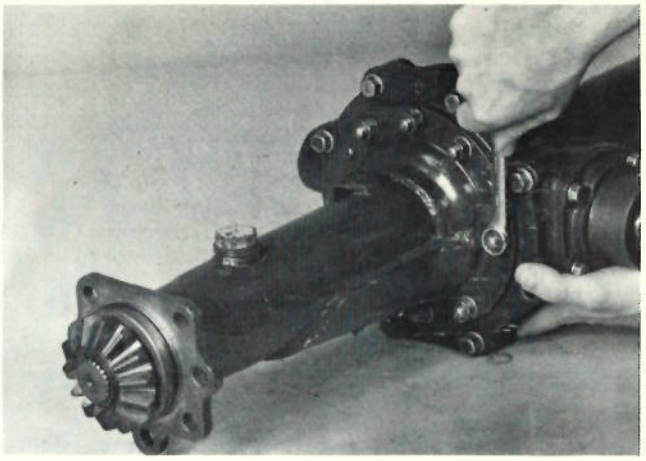
Now remove the lower king pin bearing case from the ring gear housing. Note the number of shims between the bearing case and the ring gear housing.



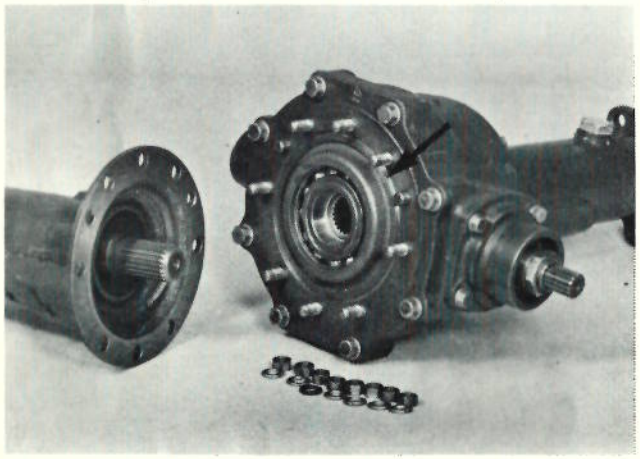
Remove the ring gear case support and king pin cover. Note the number of shims between the ring gear case and the case support.



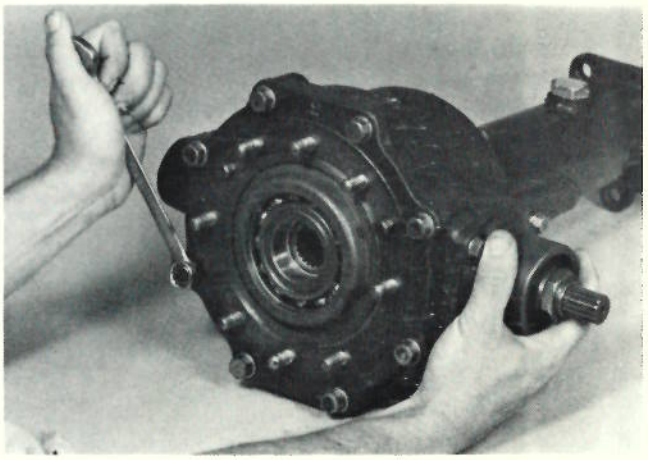
Tap the bevel gear shaft (or king pin) on the bottom to separate the bevel gear case from the ring gear case.



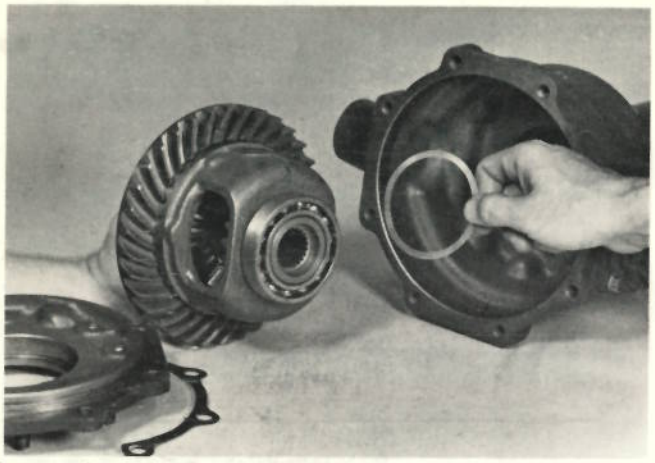
Remove the left front axle housing bolts.



And remove the axle housing.



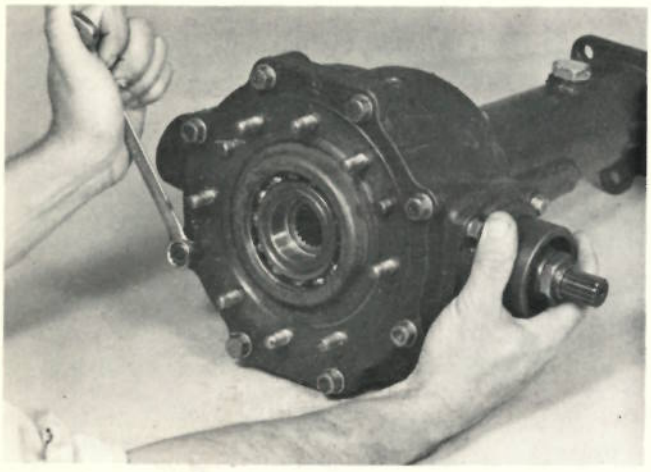
Remove the 8 bolts securing the differential bearing case.



Remove the differential bearing case and differential ring gear carrier assembly. Note the number of shims between the bearing case and differential housing and between the ring gear carrier assembly and the differential housing.

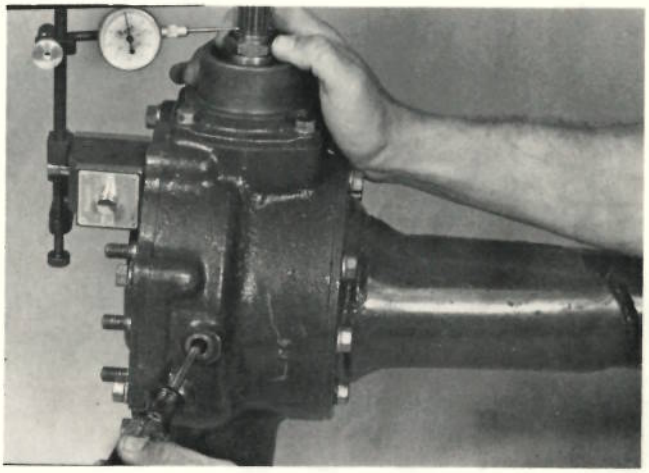
Remove the bolts securing the pinion bearing case and tap out the pinion assembly. Note the number of shims between the pinion bearing case and the differential housing.

With the axle assembly completely disassembled, or that part of the axle in need of service, clean all parts in clean solvent and blow dry. Inspect all bearings for smooth operation. Any bearings that feel rough or have pitted races or balls must be replaced. Check all gears for proper wear patterns and indications of tooth chipping or cracks. Replace any parts as necessary.

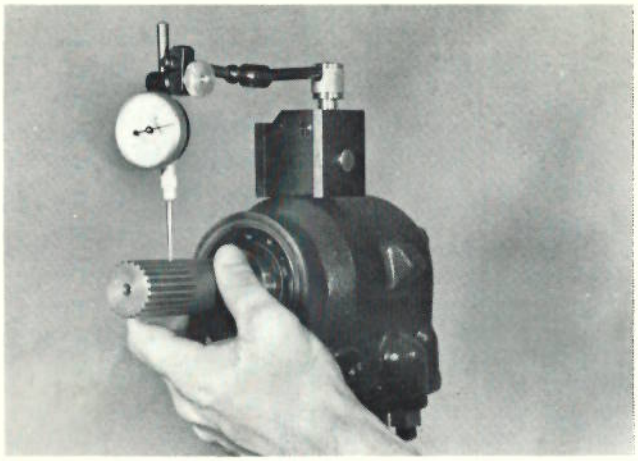


Axle Reassembly

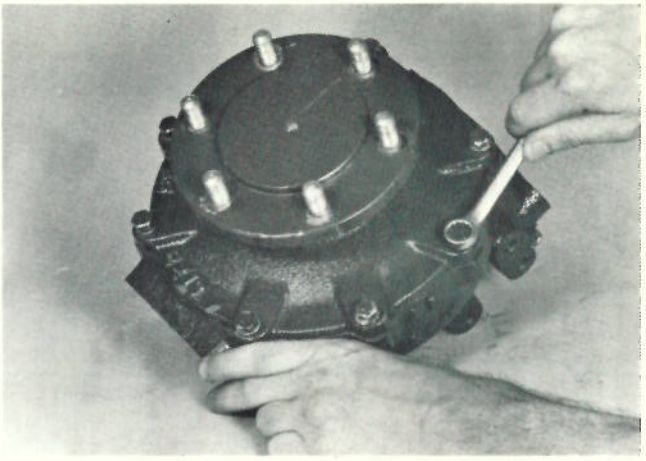
Reinstall the pinion shims, pinion assembly, carrier shims, bearing case shims and bearing case. Using an inch-pound torque wrench, measure the rolling torque at the pinion of the ring and pinion assembly. The specification is 8 to 10 inch pounds. Adjust by increasing or reducing the number of shims in the differential bearing case and differential housing. Shim thickness is approximately .004" and .008".



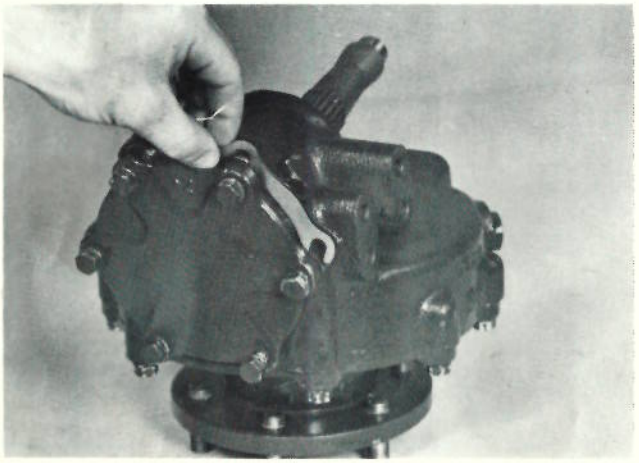
To set the backlash, lock the ring gear with a screwdriver. To gain access to the ring gear, put the screwdriver through the drain plug hole on the differential gear case. Set a lever-type indicator on the pinion and measure the backlash while turning the pinion by hand. To adjust for greater backlash, add a shim in the differential gear case. Also ADD a shim of the same thickness to the differential bearing case. To adjust for less backlash, remove a shim from the differential bearing case and remove a shim of the same thickness from the differential gear case.



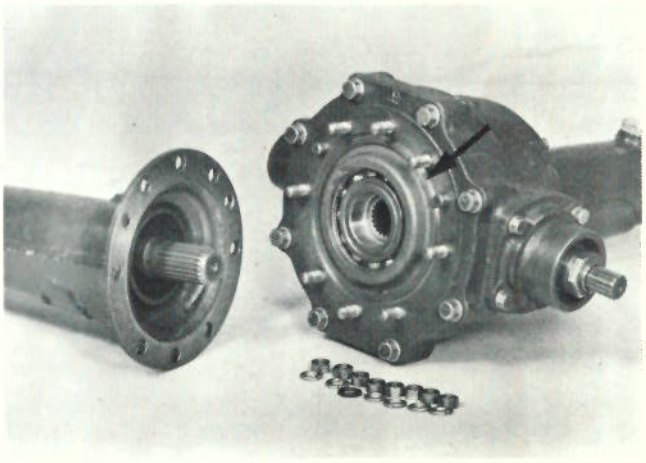
To set the bevel gear backlash, hold the axle shaft in a vise. Set a lever-type indicator on the bevel gear shaft and measure the backlash by turning the bevel gear shaft by hand. Adjust by altering the shims between the bevel gear case and the axle housing. Tooth contact should be more than 35% of the tooth face. Once the bevel gear backlash has been adjusted, remove the bevel gear case from the axle housing so that the axle case backlash can be properly adjusted. Backlash: .006" - .012"



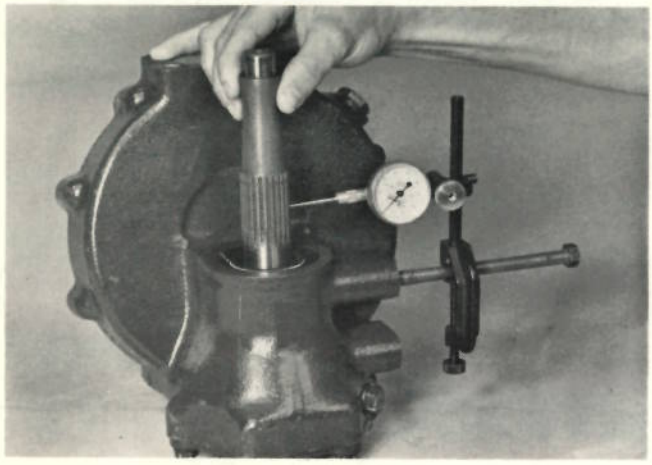
Install the axle flange to the ring gear housing.



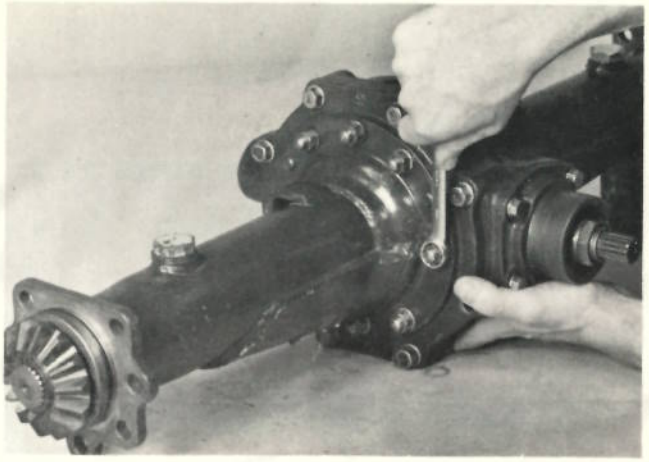
Reinstall the bevel gear shaft lower bevel gear, and bevel gear bearing case in the ring gear housing.



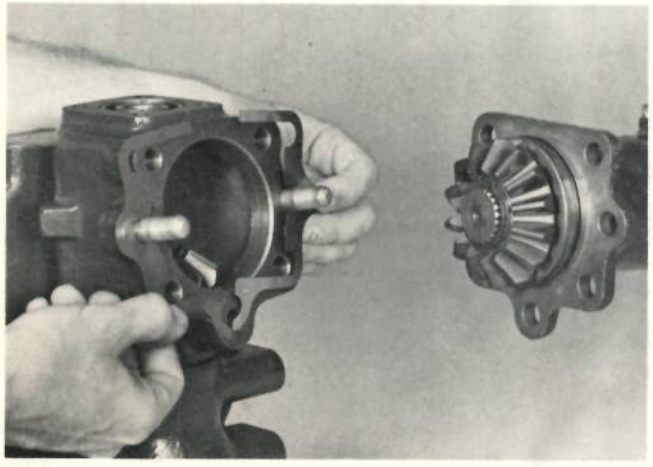
Inspect the "O" ring in the bearing case before installing the axle housing.



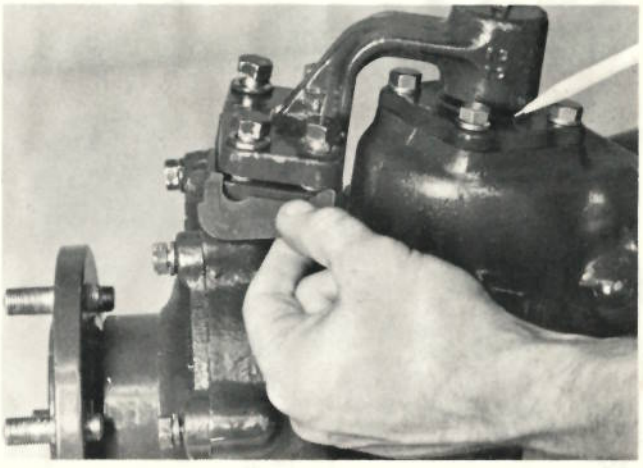
To set the bevel gear backlash in the ring gear housing, set a lever-type indicator on the bevel gear shaft and measure the backlash by turning the bevel gear shaft by hand. Adjust by altering the shims between the bearing case and the ring gear housing. When installing the ring gear case to the bevel gear case, install the oil seals so that the two steel seal pre-load springs are facing each other. Note the position of the seal pre-load spring in this photograph.



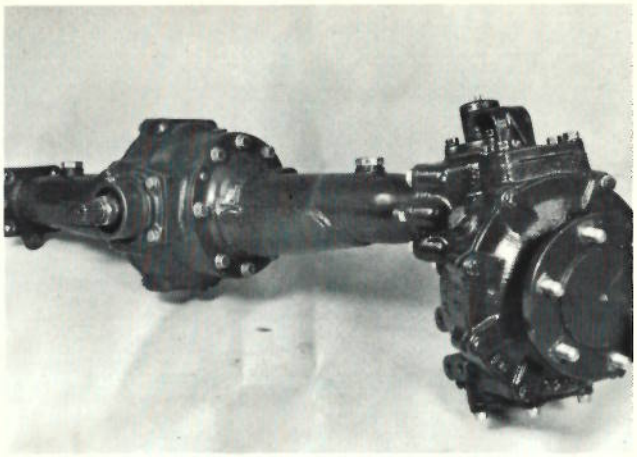
Reinstall the axle housing to the differential assembly making sure that the oil filler hole is pointing upward.



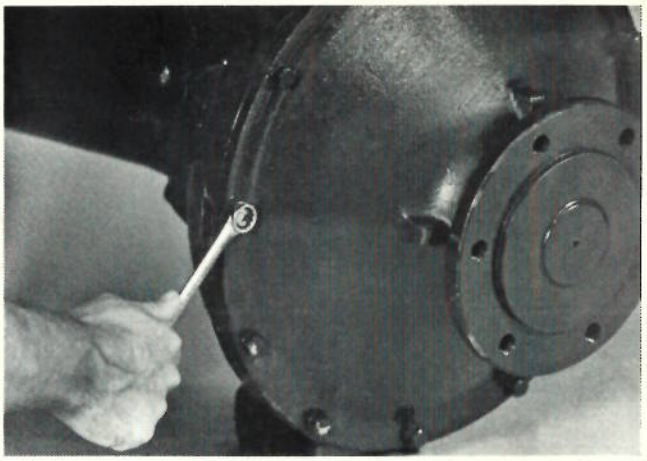
Reassemble the axle drive assembly using the proper number of shims.



Reinstall the bevel gear/king pin cover support. Add a sufficient number of shims between the support and the case to allow from .002" to .008" clearance between the support and the king pin cover.

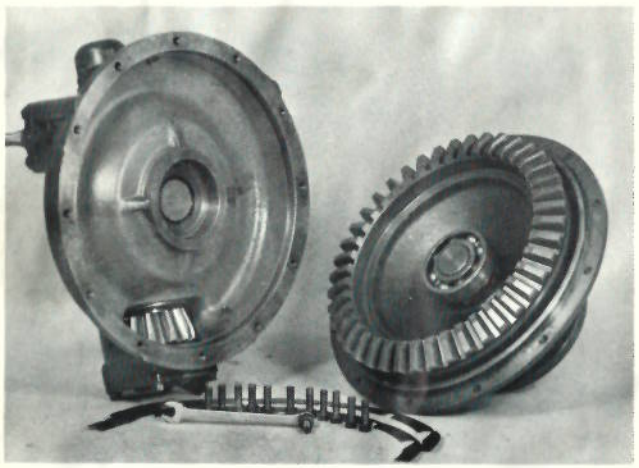


Your axle should be fully assembled.

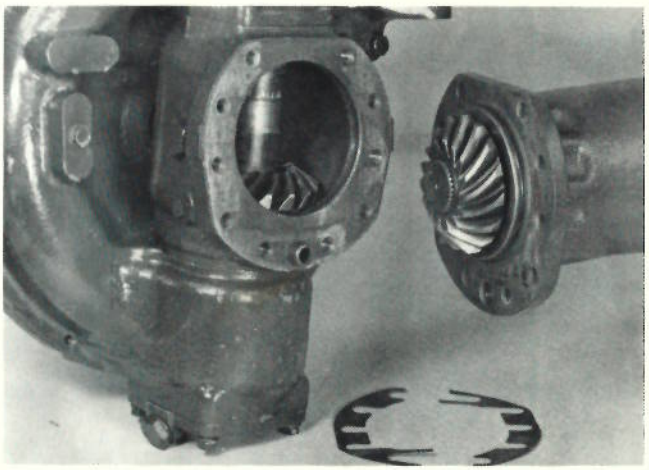


M-Series Front Drive Axle Disassembly and Assembly Procedure

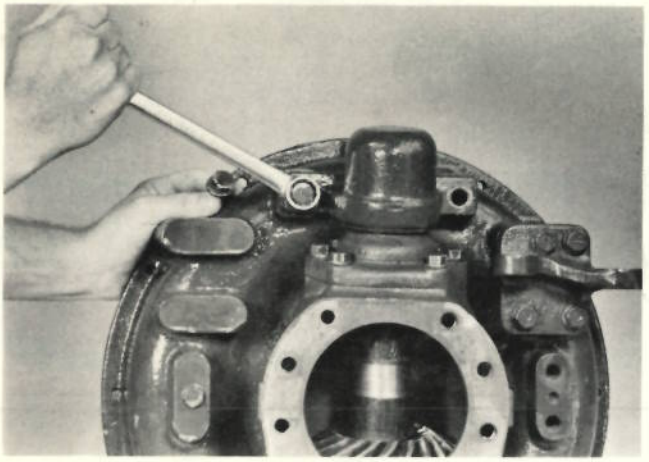
Remove the 12 bolts securing the front wheel case cover.



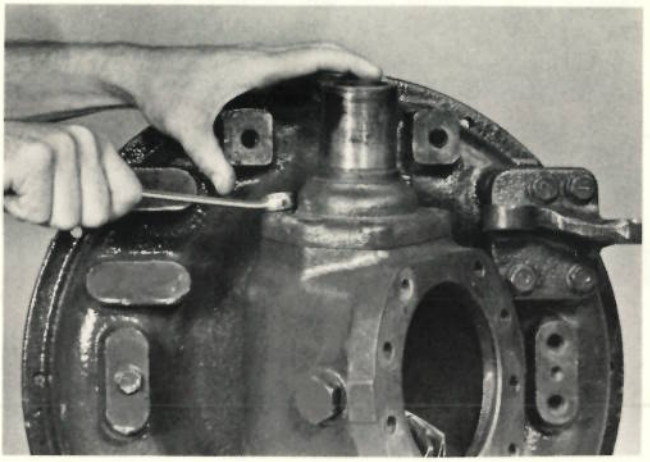
Remove the wheel case cover and 42 tooth ring gear. Note the number of shims between the wheel case cover and the front wheel case.



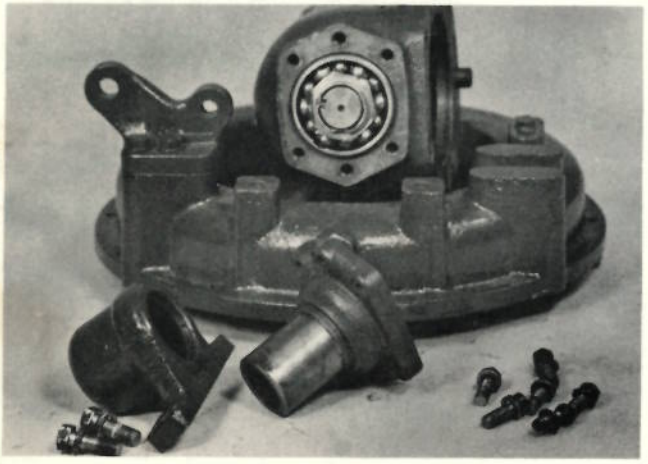
Remove the bevel gear case from the axle housing and note the number of shims.



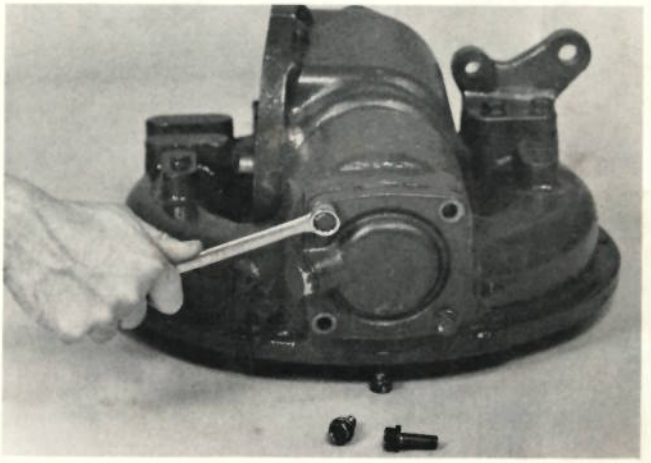
Remove the front wheel support.



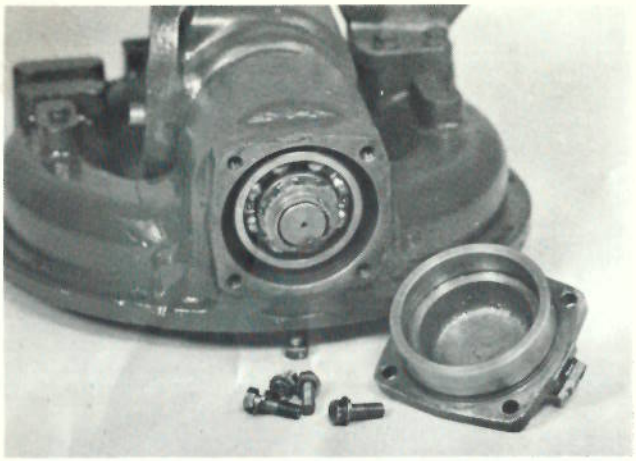
Remove the king pin upper bearing retainer.



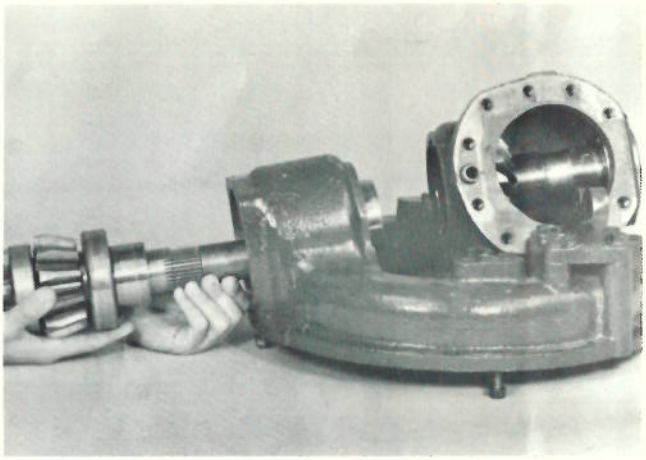
Remove the top king pin's lock nut.



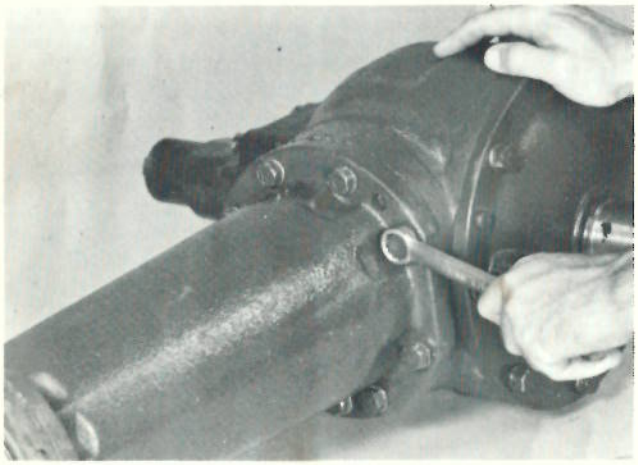
Remove the lower king pin bearing case retaining bolts.



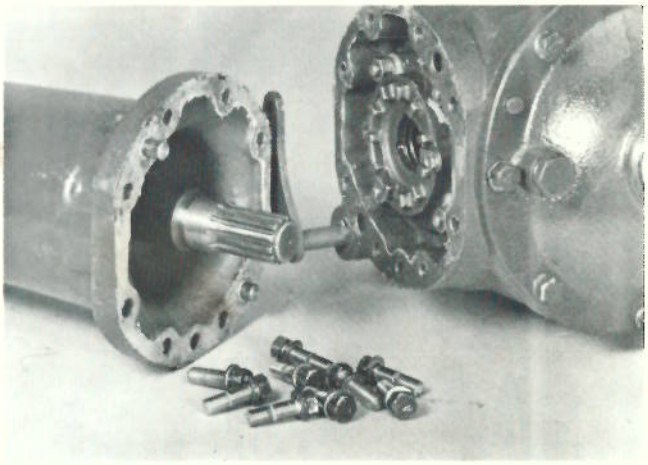
Remove the lower king pin bearing case.



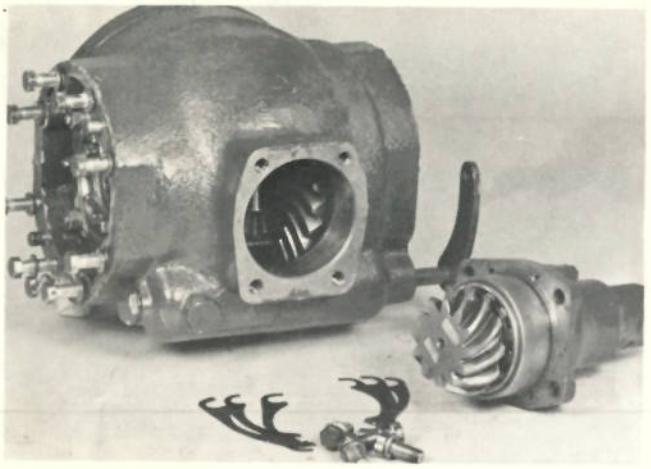
Tap on the top of the king pin and drive the king pin from the wheel case.



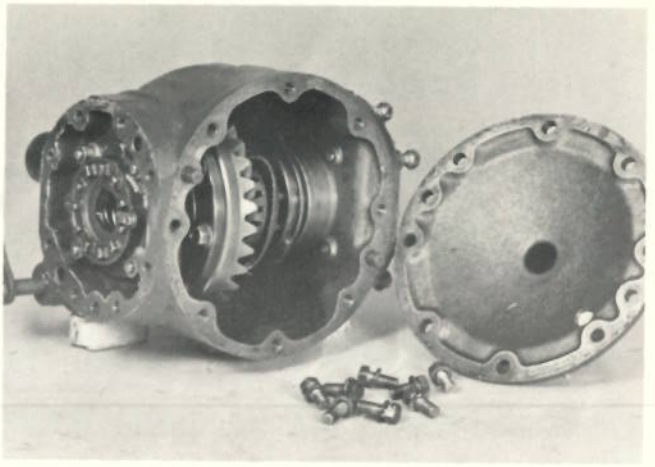
Unbolt the axle housings from the differential assembly.



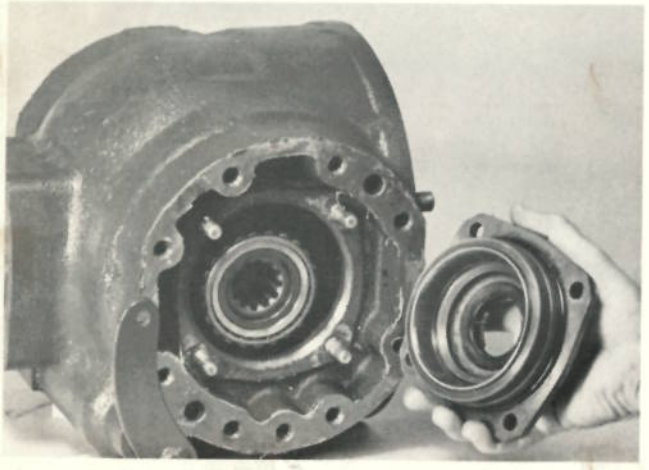
Separate the axle housings from the differential assembly.



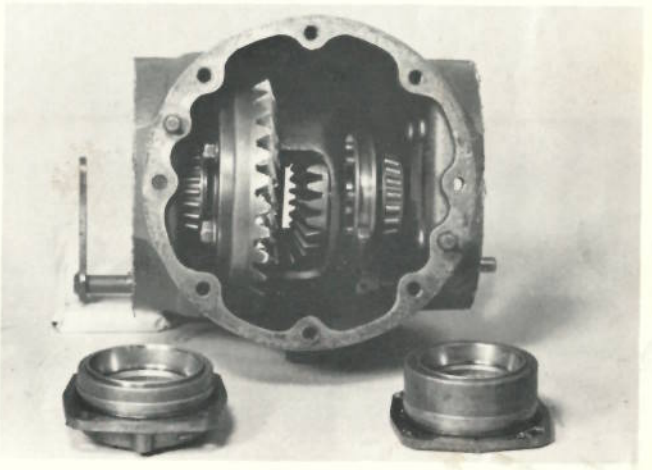
Remove the pinion bearing case retaining bolts and remove the pinion bearing case and pinion shaft as an assembly. Note the number of shims between the bearing case and differential housing.



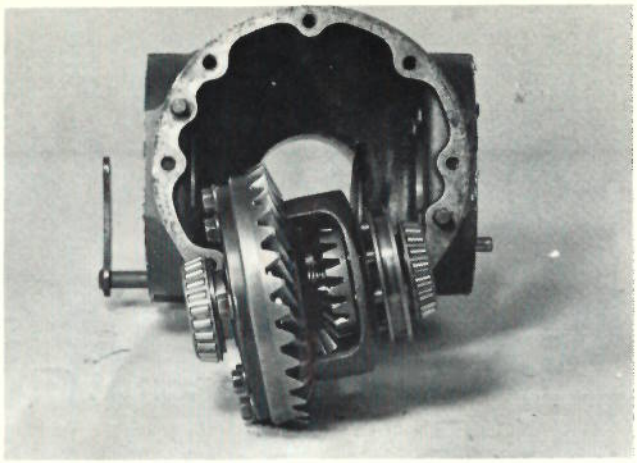
Remove the differential housing front cover.



Remove the differential carrier assembly bearing cases.

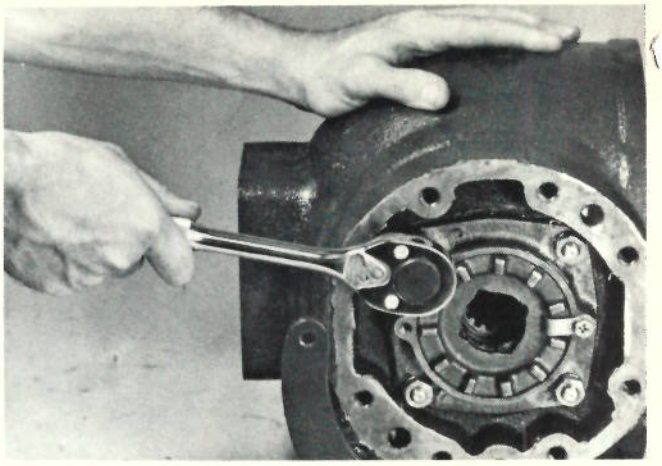


Due to differences between the right and left carrier bearing cases, these parts are not interchangeable.



The differential carrier can now be removed.

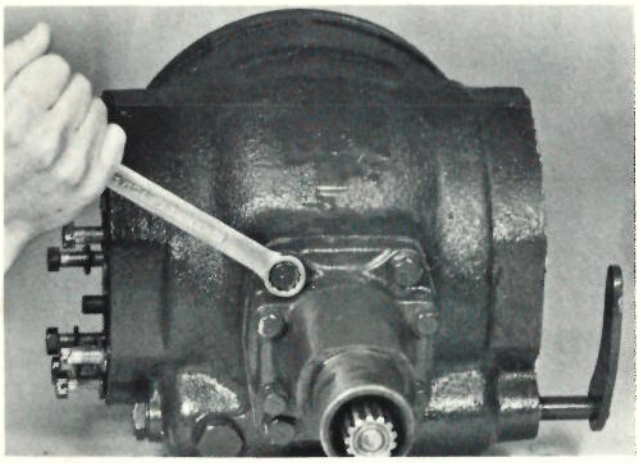
Clean all parts in clean solvent and inspect the gears for excess damage and for correct wear patterns. Inspect all bearings for damage or rough operation.



Axle Reassembly

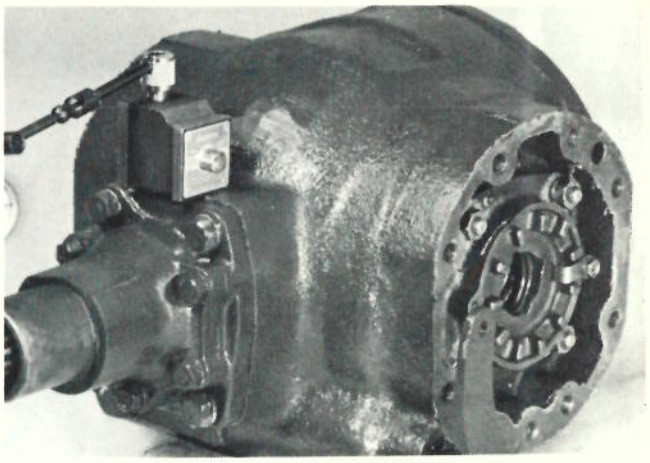
Refit the ring gear carrier assembly into the differential housing and install the carrier bearing caps.

Tighten the carrier bearing caps into position. If the carrier and carrier bearings were not changed the pre-load on the carrier bearings should be OK. If the carrier or either of the bearings were replaced the roller bearing pre-load will have to be adjusted by removing the locking tab and rotating the threaded ring in the center of each bearing cap.

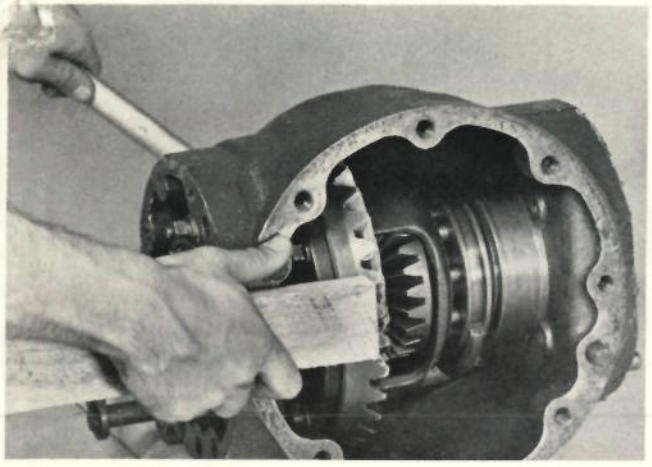


Install the pinion bearing case assembly and shims to obtain proper pinion height. If the pinion bearing case assembly was disassembled torque the pinion shaft nut to 150 to 180 ft. lbs.

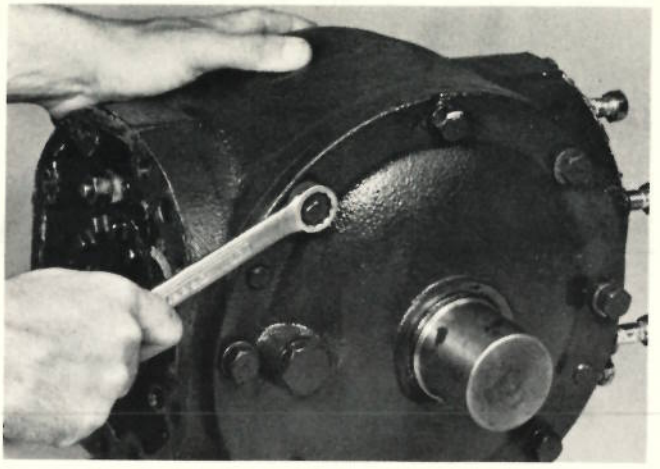
The rolling torque of both the ring and pinion assemblies should be approximately 3 ft. lbs maximum.



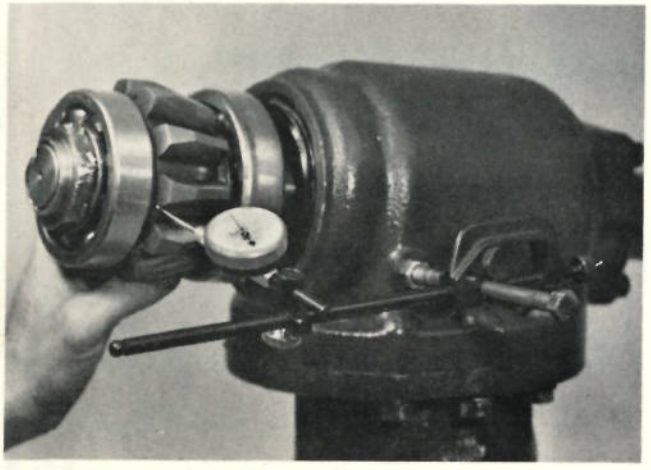
To measure the backlash between the ring and pinion, lock the ring gear and measure the backlash at the pinion shaft. Ring and pinion backlash should be between .008" to .012". If the backlash is too great, loosen the adjustment screw in the left carrier bearing support and tighten the adjustment screw on the right side an equal amount to maintain the pre-load on the carrier bearings. If the backlash is too small, loosen the right adjustment screw and tighten the left by the same amount.



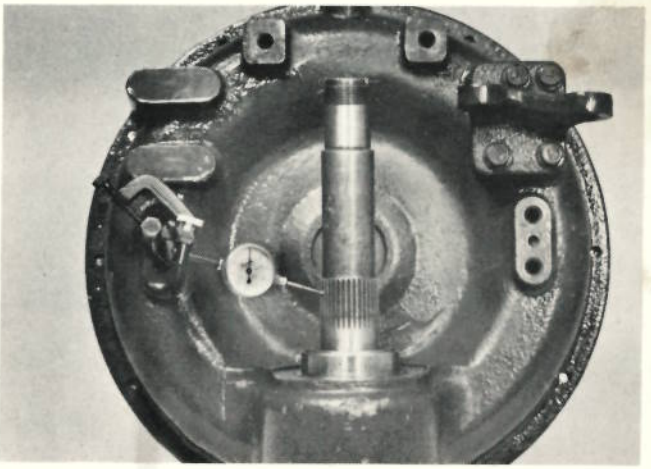
To check the ring and pinion tooth contact, visually divide the bevel gear teeth into three equal parts. Apply a small amount of white grease to a few teeth of each part. Turn the pinion shaft while lightly braking the circumference of the ring gear with a wooden block. Check to see that there is 35% or more tooth contact. Adjust the tooth contat by means of the pinion setting adjustment shims. Shim thickness: 0.1 mm (0.0039 in.) and 0.3 mm (0.0118 in.)



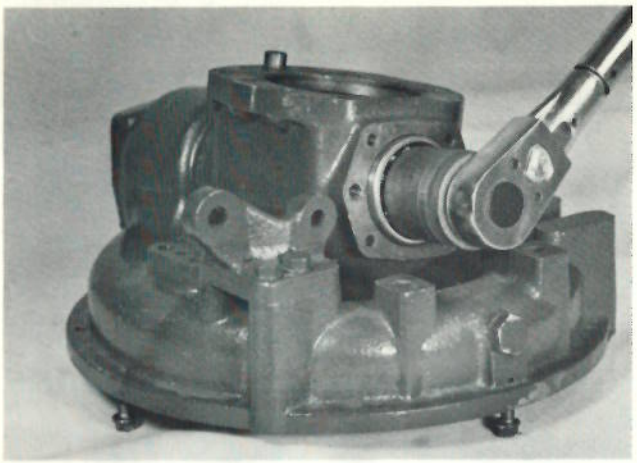
Reinstall differential housing cover.



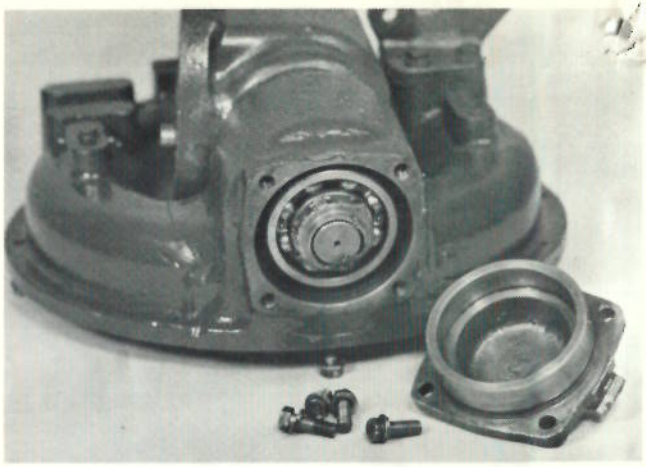
Install the king pin shaft into the bevel gear case and toque the upper king pin nut to 200 ft. lbs. Install the upper king pin bearing retainer. Now measure the backlash between the two bevel gears. Backlash should be between .008" and .010". Backlash is adjusted by adding or removing shims between the bevel gear case and the axle housing.



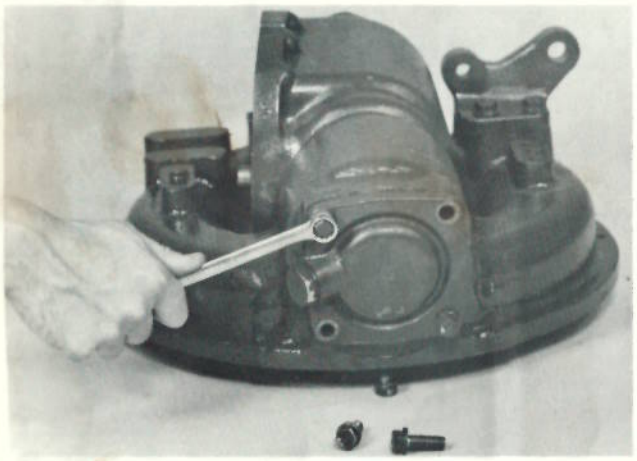
Install the king pin shaft into the ring gear housing and install the lower king pin bearing case. Install the axle flange and ring gear assembly along with a number of shims. Using a dial indicator check the backlash between the ring gear and the king pin bevel gear. This should be .012" to .020". Adjust by changing the number of shims between the axle flange and ring gear housing.



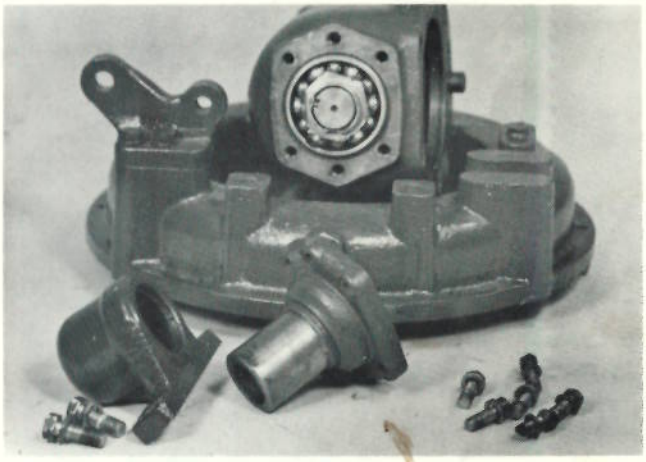
Reinstall the bevel gear case, bevel gear, spacer and bearing on the king pin. Torque the locking nut to 250 ft. lbs.



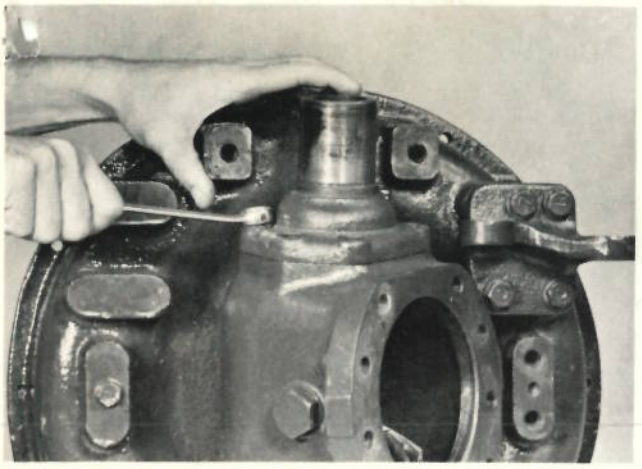
If the lower king pin nut was removed, torque to 250 ft. lbs.



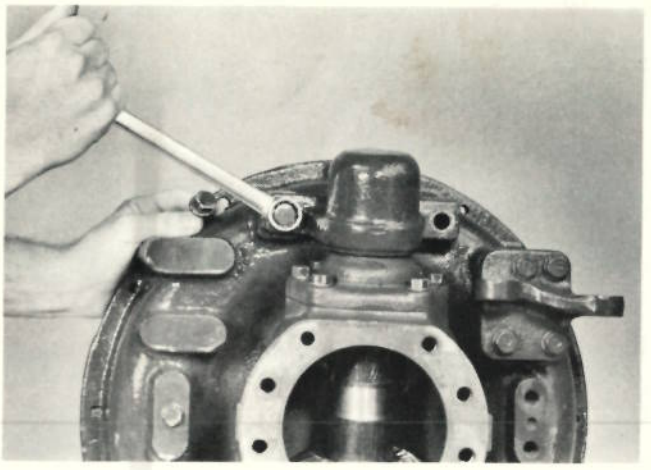
Install the lower king pin bearing case.



The upper king pin bearing retainer and front wheel case support ready for installation.

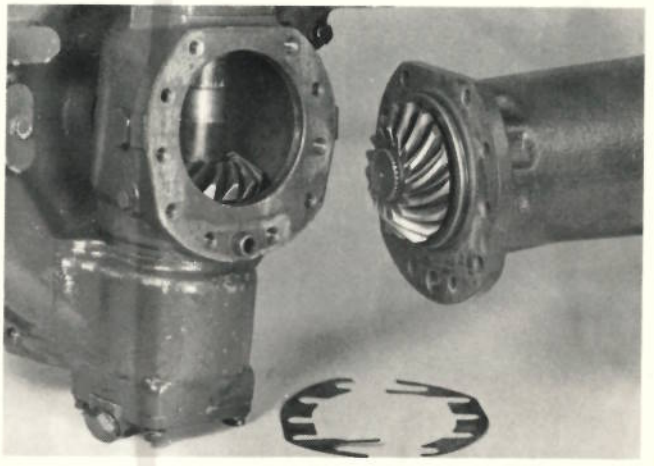


Install the upper king pin bearing retainer.

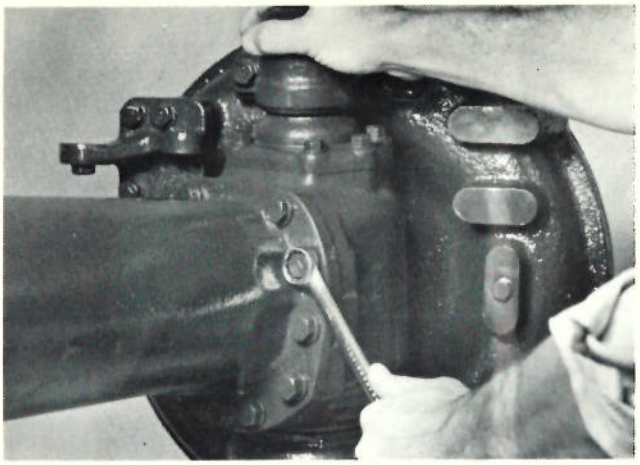


Install the front wheel case support.

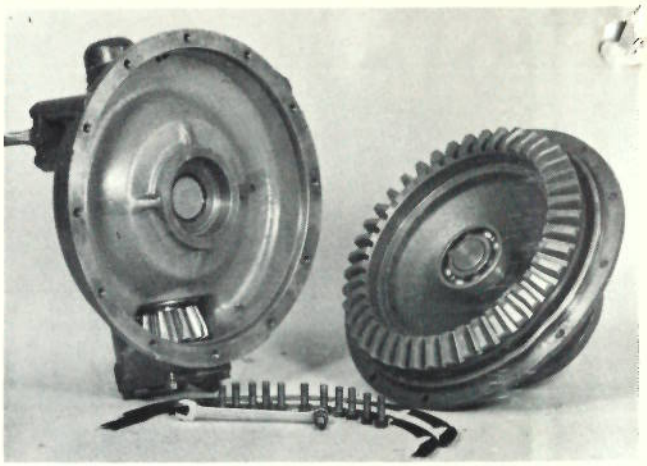
Install the axle housing to the differential assembly.



Note the helical bevel gears. The gears on the right side of the tractor are not interchangeable with those on the left as the helix is cut in opposite directions. The gears are marked "R" and "L" on the back of the gear.



Install the bevel gear case and front wheel case to the axle housing, not forgetting the shims necessary for proper gear backlash.



Install the axle flange assembly and shims to complete the axle reassembly.