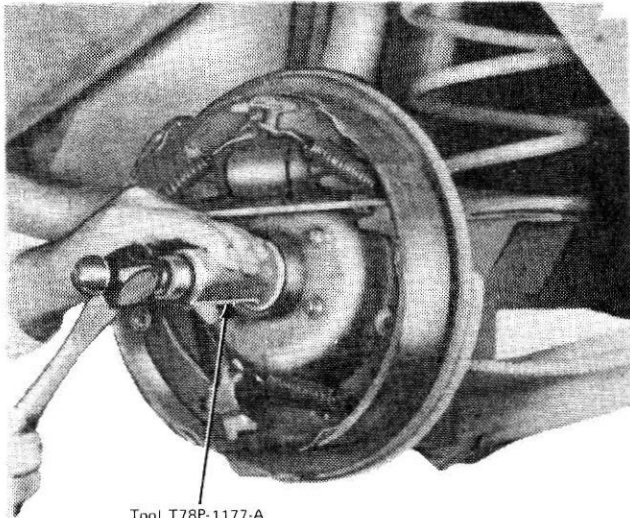


Replacement of the pinion oil seal involves removal and installation of only the pinion shaft nut and the universal joint flange. However, this operation disturbs the pinion bearing preload, and this preload must be carefully reset when assembling.

Removal

1. Raise the vehicle and install safety stands. Remove the rear wheels and brake drums.
2. Make scribe marks on the drive shaft end yoke and the axle U-joint flange to insure proper position of the drive shaft at assembly (Fig. 8). Disconnect the drive shaft from the axle U-joint flange. **Be careful to avoid dropping the loose universal joint bearing cups.** Hold the cups on the spider with tape. Mark the cups so that they will be in their original position in relation to the flange when they are assembled. Remove the drive shaft from the

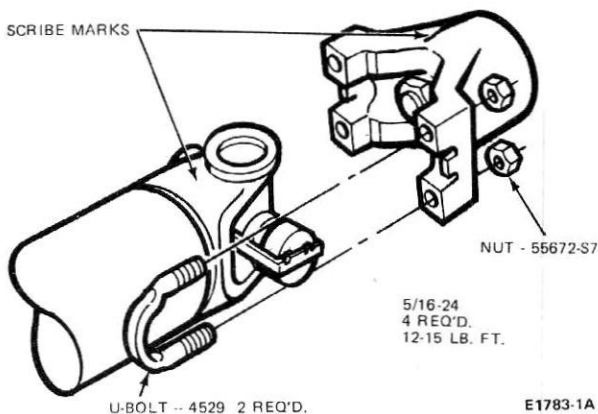


Tool T78P-1177-A

E1571-1C

FIG. 7 Rear Axle Shaft Bearing Seal

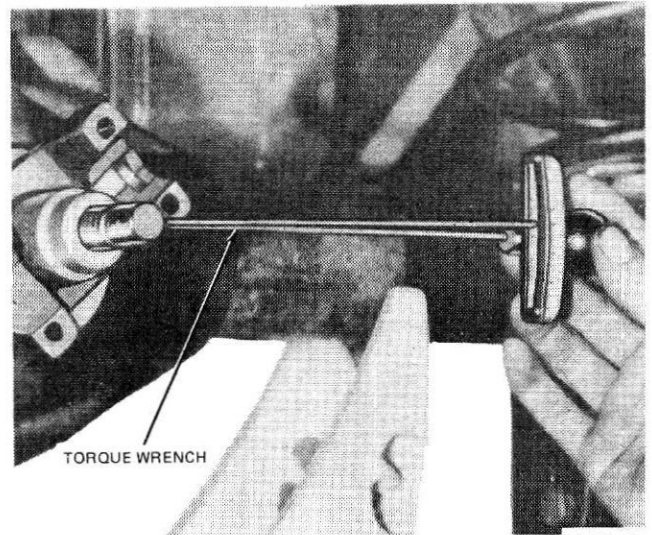
transmission extension housing. Install an oil seal replacer tool in the transmission extension housing to prevent transmission leakage. Refer to the transmission group for the appropriate tool.



E1783-1A

FIG. 8 Drive Shaft-to-Axle U-Joint Connection

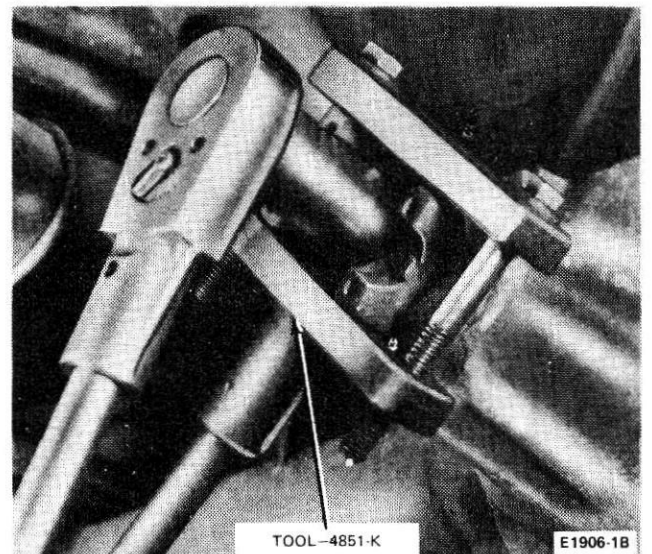
3. Install an in-lb. torque wrench on the pinion nut (Fig. 9). Record the torque required to maintain rotation of the pinion shaft through several revolutions.



E1582-1A

FIG. 9 Checking Pinion Bearing Preload

4. While holding the flange with the tool shown in Fig. 10, remove the integral pinion nut and washer.



TOOL-4851-K

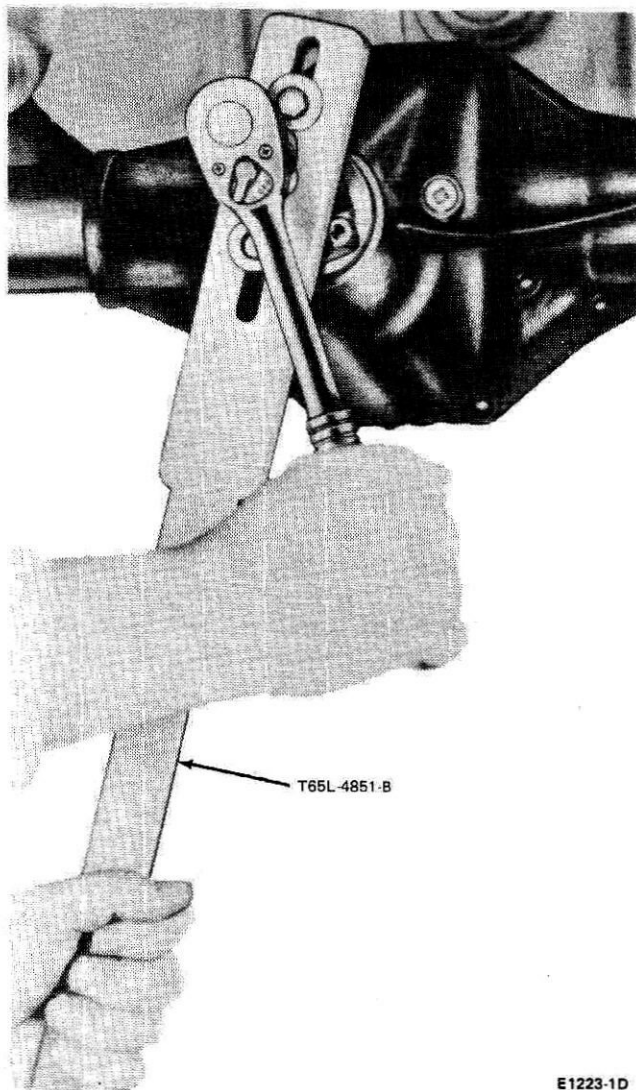
E1906-1B

FIG. 10 Removing or Installing Drive Pinion Nut

5. Clean the pinion bearing retainer around the oil seal. Place a drain pan under the seal, or raise the front of the vehicle higher than the rear. Using a center punch or scribe, mark the U-joint flange in relation to the pinion stem.
6. Using the tool shown in Fig. 11, remove the pinion U-joint flange.
7. Using the tool shown in Fig. 12, remove the drive pinion oil seal.
8. Clean the oil seal seat.

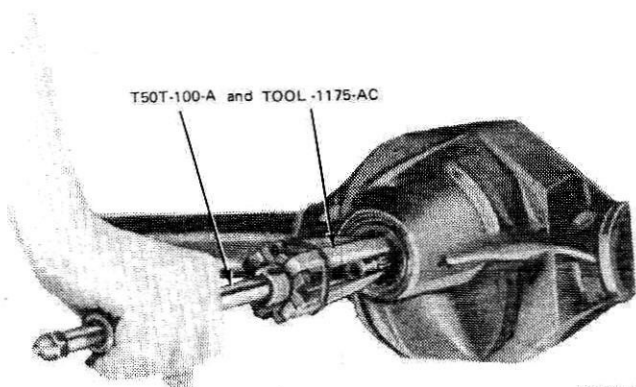
Installation

1. Pinion oil seals have pre-applied oil resistant sealer. Install the seal in the retainer using the tool shown in Fig. 13.



E1223-1D

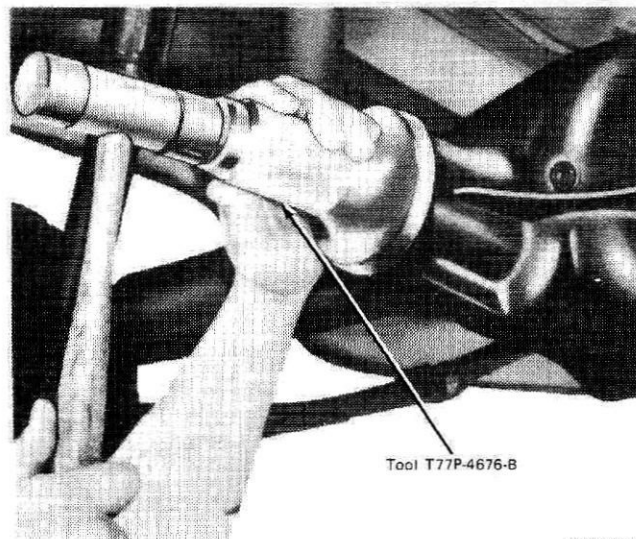
FIG. 11 Typical Drive Pinion Flange Removal



E1681-1B

FIG. 12 Removing Pinion Seal

2. Check splines on the pinion shaft to be sure they are free of burrs. If burrs are evident, remove them by using a fine crocus cloth, working in a rotational motion. Wipe the pinion shaft clean.
3. Apply a small amount of lubricant to the U-joint flange splines.



E2182-1C

FIG. 13 Typical Drive Pinion Flange Seal Installation

4. Align the punch or scribe mark on the U-joint flange with the mark on the end of the pinion shaft, and install the flange.
5. Install a new integral nut and washer on the pinion shaft. (Apply a small amount of lubricant on the washer side of the nut.)
6. Hold the flange with the tool shown in Fig. 10, while tightening the nut.
7. Tighten the pinion shaft nut, rotating the pinion occasionally to insure proper bearing seating, and take frequent preload readings (Fig. 9) until the preload is at the original recorded reading established in Step 3 under Removal.
8. If the recorded preload is less than specification, tighten to specification as outlined at the end of this Part. If the preload is higher than specification, tighten to original reading recorded in Step 3 of Removal. **The preload should not exceed the amount indicated above, or bearing damage may result.** Under no circumstances should the pinion nut be backed-off to lessen preload. If this is done, a new pinion bearing spacer must be installed. In addition, the U-joint flange must never be hammered on, or power tools used.
9. Remove the oil seal replacer tool from the transmission extension housing. Install the front end of the drive shaft on the transmission output shaft.
10. Connect the rear end of the drive shaft to the axle U-joint flange, aligning the punch or scribe marks made on the drive shaft end yoke and the axle U-joint flange (Fig. 8).
11. Check the lubricant level. Make sure the axle is in running position. Add whatever amount of specified lubricant is required to reach the lower edge of the filler plug hole, located in the carrier casting.

REMOVAL AND INSTALLATION OF THE ORIGINAL U-JOINT FLANGE

Use procedure as outlined under Drive Pinion Oil Seal Replacement, omitting replacement of the seal.

INSTALLATION OF A NEW UNIVERSAL JOINT FLANGE

Use procedure as outlined under Drive Pinion Oil Seal Replacement, omitting replacement of the seal.

AXLE HOUSING

REMOVAL

Coil or Leaf Spring Suspension

1. Raise the vehicle on a hoist.
2. Remove the wheels and tires from the brake drums.
3. Position a drain pan and loosen the rear axle cover to housing attaching bolts. *Drain the housing.*
4. Remove the drums after removing the shakeproof fasteners.
5. Remove the axle housing cover bolts, cover and gasket. Discard the gasket. Remove the drain pan.
6. *Mark drive shaft and flange for identification.* Disconnect the drive shaft at the drive pinion companion flange. Remove the drive shaft from the transmission extension housing. Install an oil seal replacer tool in the transmission housing to prevent leakage. Refer to the transmission group for the appropriate tool.
7. Loosen the pinion shaft lock bolt and remove the pinion shaft (Fig. 2), then remove the differential pinion gears and thrust washers.
8. Push the axle shaft(s) inward toward the center of the axle housing. Remove the C-locks from the inner ends of the axles (Fig. 3). Remove the axle shafts from the housing. **Extreme care must be used to avoid contacting the axle shaft seal lip with any portion of the axle shaft other than the seal journal.**
9. Disconnect the vent hose from the rear vent tube and remove all brake lines from the axle housing retaining clips.
10. Remove the brake backing plate attaching nuts and the plates from the axle housing. Suspend the plates above the axle housing with mechanic's wire. **The hydraulic brake lines and the parking brake cables will remain attached to the brake backing plates.**
11. Position safety stands under the rear frame members. Lower the vehicle with the hoist and allow the axle to lower far enough to relieve rear spring tension.
12. Disconnect the lower end of the shock absorbers at the mounting brackets.

Leaf Spring Suspension

1. Remove the U-bolts (spring clips) attaching the axle housing to the springs and remove the axle housing and spring insulators from the vehicle.

Coil Spring Suspension

1. Disconnect the track bar from the axle housing stud. If the axle housing is to be replaced, transfer the stud to the new housing.
2. Remove the nuts, washers and pivot bolts that connect the suspension lower arms to the axle housing. Disconnect both arms from the axle housing.

3. Disconnect the upper suspension arm from the axle housing by removing the pivot bolt, nut, lock washer, and two eccentric washers.
4. Lower the rear axle to the floor with the jack and remove the axle from under the vehicle, along with the right and left rear springs and insulators.

Coil or Leaf Spring Suspension

1. Remove the wheel bearings and oil seals with the tool shown in Fig. 4.
2. If the axle housing is being replaced, transfer all the differential and pinion parts to the new housing and install as outlined in this Part.

INSTALLATION

1. Lightly coat the wheel bearing rollers with axle lubricant. Install wheel bearings in the axle housing with the tool shown in Fig. 6. The bearings should seat firmly against the shoulder.
2. Wipe all lubricant from the oil seal bore before installing the seal. **If axle housing is being replaced, new seals must be installed. New seals are prepacked with lubricant and do not require an oil soak.**
3. Install the seal with the tool shown in Fig. 7. **Installation without the use of the proper tool will distort the seal and cause leakage. New seals are color coded and marked right and left side.**
4. Raise the rear axle into position under the vehicle with a hoist or floor jack.

Leaf Spring Suspension

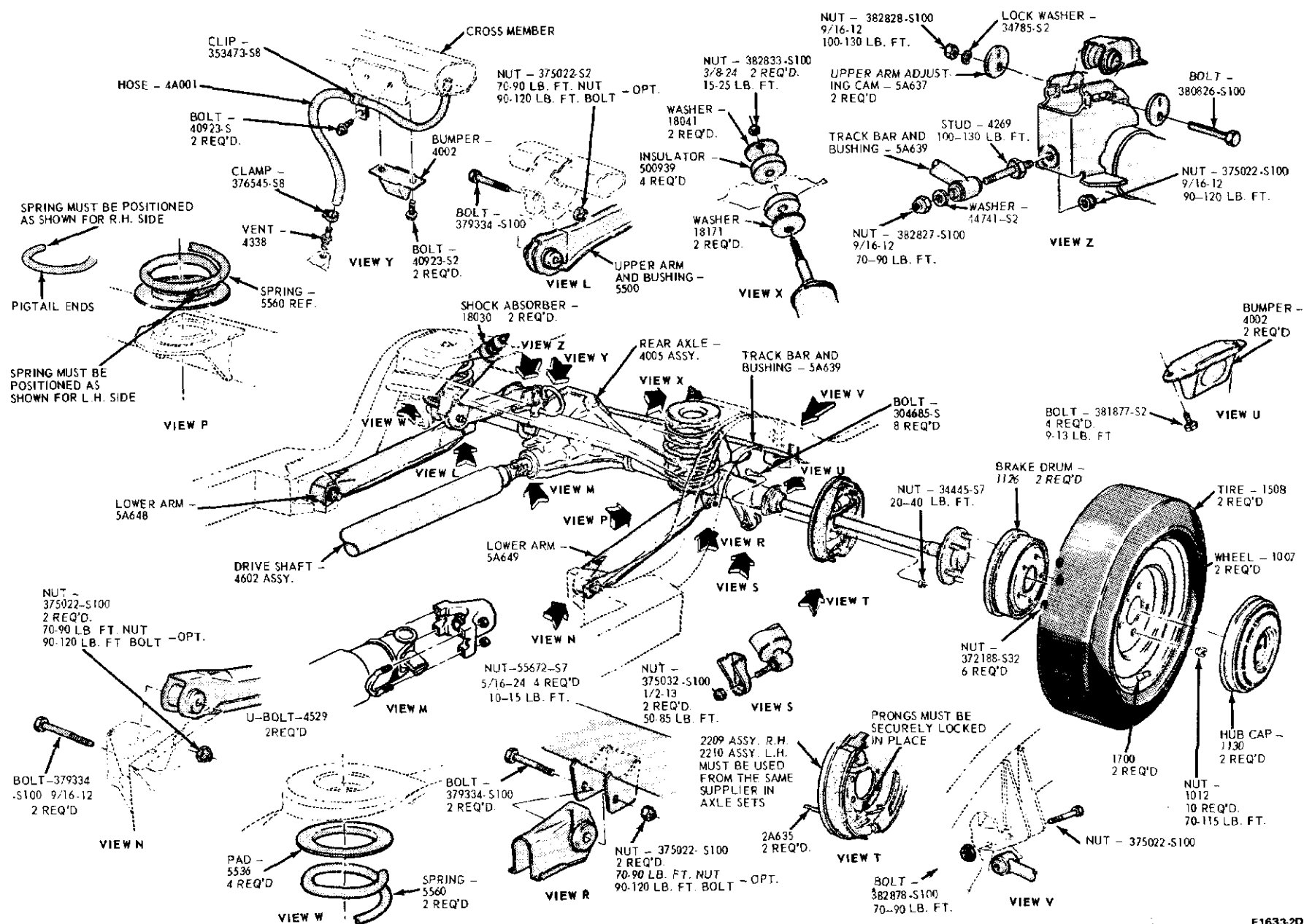
1. Position the axle housing on the springs and install the spring insulators and U-bolts. Torque the U-bolt nuts to specifications. Connect the rear shock absorbers and torque the attaching nuts to specifications.

Coil Spring Suspension

1. Connect the suspension lower arms to their mounting brackets on the axle housing with pivot bolts and nuts. Do not tighten the mounting bolts at this point.
2. Place the rear coil springs and insulators into position in the pockets provided. Raise the rear axle until the coils are under tension.
3. Position the suspension upper arm in its mounting bracket on the axle housing and install the adjusting bolt, eccentric washers, lockwasher and nut. Do not tighten the mounting bolt at this point.

Coil or Leaf Spring Suspension

1. Place the brake backing plates on the axle housing flanges. Install four attaching bolts and nuts and torque them to specifications.
2. Position the brake lines to the axle housing and secure them with the retaining clips. If the axle housing is new, install a new vent. When installing the new axle vent, apply a small amount of Loctite (C5AZ-19554-B) or equivalent to prevent oil leakage between vent and axle housing. Connect the vent tube to the vent.
3. Install the pinion gears and thrust washer. Install axle shaft O-ring on shaft.



F1633-2D

FIG. 14 Typical Rear Axle Installation—WER Axle

4. Slide the axle shafts into place in the axle housing. Exercise care that splines or any portion of the axle shafts do not damage the oil seals and that they engage with the splines of the differential side gears.
5. Install the axle shaft C-lock on the inner end of each shaft, and push the shafts outward so that the shaft lock seats in the counterbore of the differential side gear.
6. Position the pinion differential gears and thrust washers 180 degrees apart to the differential side gears. Turn the gear assembly until the holes in the differential case are aligned with the pinion gears.
7. Position the differential pinion shaft through the case and pinions, aligning the hole in the shaft with the lock bolt hole. Tighten the lock bolt to specification.
8. Clean the gasket mounting surface of the rear axle housing and the cover. Install a new cover gasket, cover, and attaching bolts. Torque the bolts to specification.

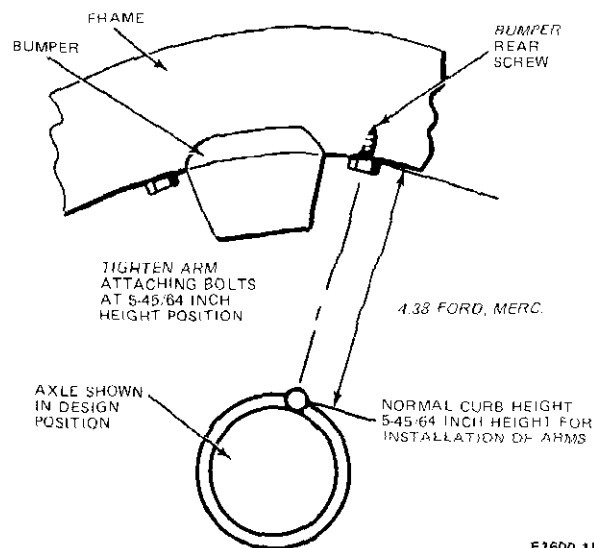


FIG. 15 Axle Normal Curb Height and Controlled Height for Arm Installation

Coil Spring Suspension

1. Raise the rear axle on a hoist and remove the safety stands.
2. Connect the track bar to the mounting stud (Fig. 14). Install the washer and nut. Torque the nut to specification.
3. Connect the two rear shock absorbers to the mounting brackets on the axle housing and torque the attaching nuts to specification.
4. Make sure that both the front and rear pivot bolts of the upper and the two lower arms are loose, then raise the axle assembly to the controlled height (Fig. 15). Hold the axle at the controlled height by placing blocks or pieces of steel pipe between the axle housing and the bumper rear screw on the side rail.
5. With the axle at controlled height, torque the suspension upper and lower arm front pivot bolts and nuts to specification. Torque the lower arm to

the axle housing pivot bolts and nuts to specification.

6. Adjust the pinion angle to specification.

Coil or Leaf Spring Suspension

1. Remove the oil seal replacer from the transmission extension housing. Install the drive shaft in the extension housing. Align the scribe marks on the cups, flange and drive shaft, and connect the drive shaft at the drive pinion flange. Torque the attaching bolts to specification.
2. Install the brake drum and attaching shakeproof retainers.
3. Install the wheel and tire on the brake drum. Install the wheel covers.
4. Add the amount of specified lubricant required to reach to the bottom of the filler plug hole. **Make sure the rear axle is in running position. Install the filler plug and torque it to specification.**
5. Lower the vehicle.

DISASSEMBLY AND ASSEMBLY

DISASSEMBLY OF AXLE

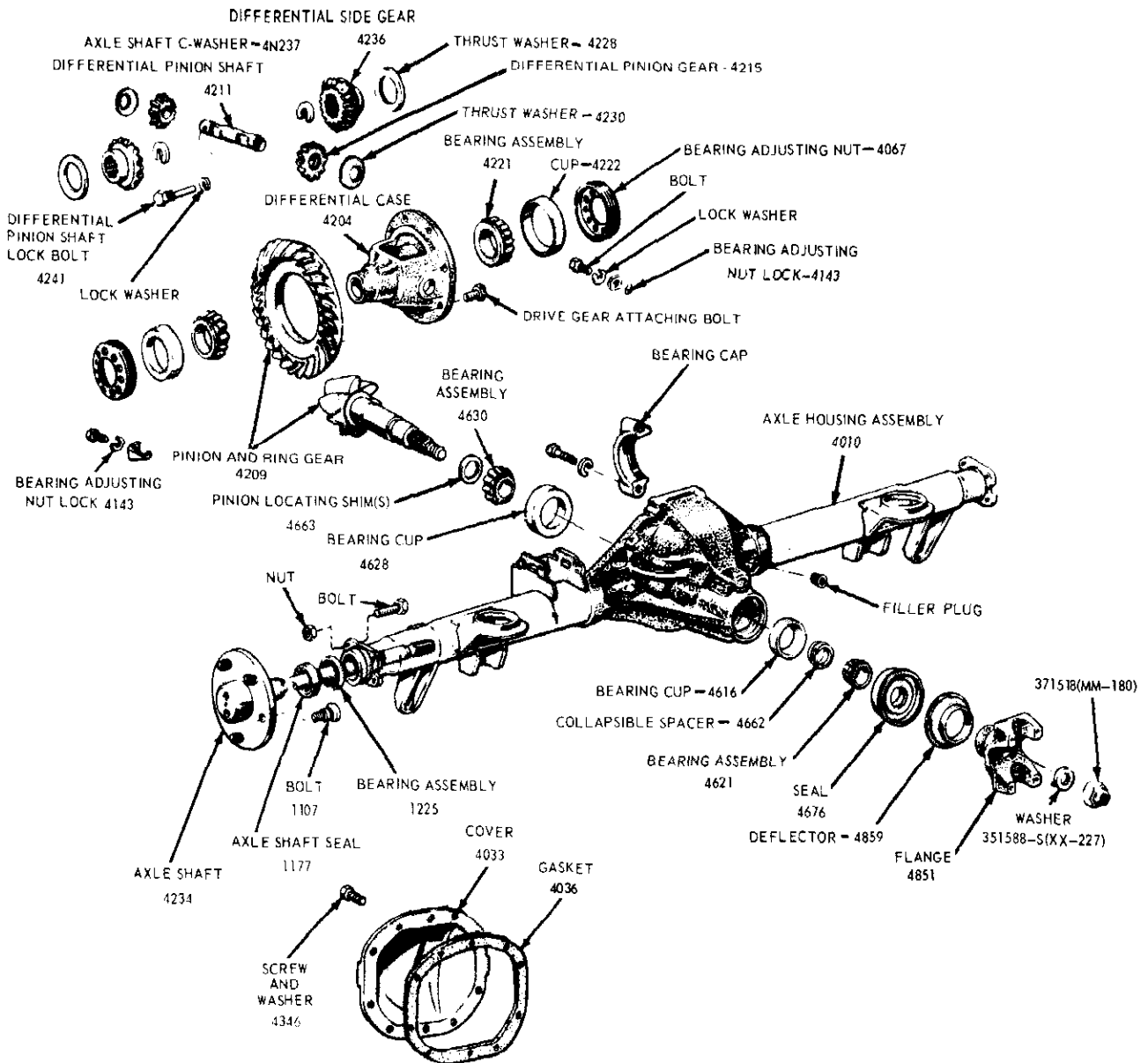
The rear axle components are shown in Figs. 16 and 17.

All service operations on the differential case assembly can be performed with the axle housing in the vehicle.

1. Raise the vehicle on a hoist.
2. Position the drain pan under the axle housing. Loosen the housing cover attaching bolts. Drain the lubricant from the housing.
3. Make scribe marks on the drive shaft end yoke and the rear axle shaft companion flange to insure proper position of the drive shaft at assembly. Disconnect the drive shaft from the rear axle companion flange. **Be careful to avoid dropping the loose universal joint bearing cups.** Hold the

cups on the spider with tape. Mark the cups so that they will be in their original position in relation to the flange when they are reassembled. Remove the drive shaft from the transmission extension housing. Install an oil seal replacer tool in the transmission extension housing to prevent transmission leakage. Refer to the transmission group for the appropriate tool.

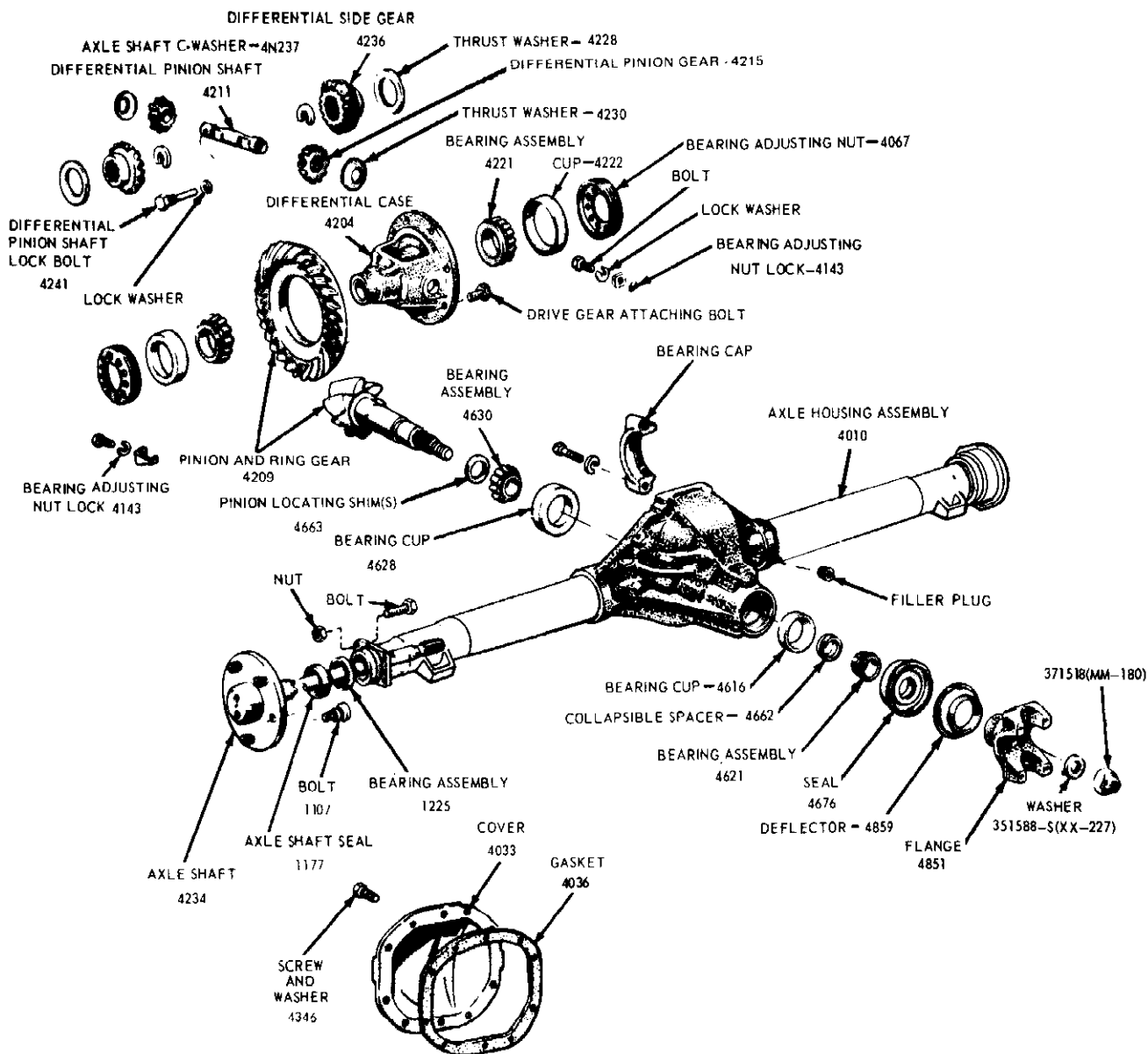
4. Raise the vehicle and place jack-type stands under the rear frame crossmember. Lower the vehicle on a hoist and allow the axle to lower as far as possible.
5. Remove the axle housing cover and gasket. Discard the gasket.
6. Perform the Inspection before Disassembly of Carrier as outlined in Part 15-01. Remove rear wheels.



E1572-2E

FIG. 16 Disassembled WER Rear Axles—Coil Spring Suspension—Ford and Mercury

7. Remove the attaching shakeproof retainers that secure the rear brake drums to the axle shaft flanges, and then remove the drums.
8. Working through the differential pinion shaft lock opening, loosen the differential pinion shaft lock bolt and remove the differential pinion shaft (Fig. 2).
9. Push the axle shafts inward toward the center of the axle housing. Remove the C-locks (Fig. 3) from the inner ends of the rear axles. Remove the axle shafts from the housing. **Extreme care must be used to avoid contacting the axle shaft seal lip with any portion of the axle shaft except the seal journal.**
10. Remove the oil seal and bearings from the axle housing as shown in Fig. 4.
11. Remove both side bearing adjusting nut locks (bolts).
12. Install a dial indicator (Fig. 18), and check and record the backlash and ring gear runout.
13. Mark one differential bearing cap and the case to help in positioning the parts properly during assembly.
14. Remove the bearing cap retaining bolts. Remove the bearing caps, cups, adjusting nuts and case assembly.
15. Hold the drive pinion flange and remove the pinion nut (Fig. 19). Discard the nut.
16. Remove the pinion flange (Fig. 20).
17. Drive the pinion out of the front bearing cone and remove it from the carrier housing. Remove and discard the bearing spacer.
18. With a hammer and drift, remove the pinion shaft oil seal out through the front of the carrier housing.
19. Remove the pinion rear bearing from the drive pinion shaft (Fig. 21).
20. Measure the shim which is found under the bearing cone with a micrometer. Record the thickness of the shim.



E2610-2A

FIG. 17 Disassembled WER Rear Axle—Leaf Spring Suspension—Granada and Monarch