REAR AXLE

THE REAR AXLE ASSEMBLIES used on all models are the same in general design. All are the hypoid, semifloating type with shim adjustments provided for the bearings and for the ring gear and pinion. The assembly used in the President, Commander, Powerhawk, Skyhawk and Goldenhawk, however, is composed of larger and heavier parts than that in the Champion and Flighthawk.

The axle shafts are splined at the inner ends to fit into splines in the differential side gears. The outer ends are tapered and provided with keyways for attaching the rear wheel hubs. Side thrust from the wheels, which are supported on tapered roller bearings pressed on the axle shafts, is transferred from one shaft to the other by a thrust block straddling the differential pin.

The general construction of the Champion and Flighthawk rear axle is illustrated in Figs. 9 and 14. Inasmuch as the rear axle used in the other models is similarly designed, Figs. 9 and 14 also illustrate its general construction.

NOTE.—The rear axle gear ratio is stamped on a plate attached to the assembly by one of the cover cap screws and also on the ring and pinion gears.

SPECIFICATIONS

	CHAMPION FLIGHTHAWK	COMMANDER POWERHAWK, SKYHAWK PRESIDENT W, F, D	GOLDENHAWK PRESIDENT Y
Make	Salisbury	Salisbury	Salisbury
Model	23-1	44-3	44-3
Type	Semifloating	Semifloating	Semifloating
Type of drive	Hypoid	Hypoid	Hypoid
Road clearance	7⅞" (200 mm.) C, W, and F 8³⁄₁₆" (208 mm.) D	7²³⁄₃₂" (198 mm.)	8¹⁄₃₂" (204 mm.)
Lubricant capacity	2.50 U.S. Pts. 2.08 Imp. Pts. 1,175 Liters	3.00 U. S. Pts. 2.50 Imp. Pts. 1,43 Liters	3.00 U.S. Pts. 2.50 Imp. Pts. 1,43 Liters
Lubricant			
Type gear	Hypoid	Hypoid	Hypoid
Backlash-pinion and gear	.003"-.006" (0,076-0,15 mm.)	.003"-.006" (0,076-0,15 mm.)	.003"-.006" (0,076-0,15 mm.)
Standard Gear Ratio			56H 56J
—with Overdrive Transmission	4.56 to 1	3.92 to 1	4.09 to 1 3.92 to 1
—with Automatic Drive	3.54 to 1	3.31 to 1	3.31 to 1 3.07 to 1
—with Standard Transmission	4.10 to 1	3.54 to 1	3.54 to 1
Optional Gear Ratio			
—with Overdrive Transmission	4.10 to 1 4.88 to 1		
—with Automatic Drive	4.10 to 1		
—with Standard Transmission	4.56 to 1		

REAR AXLE SHAFT

Removal—All Models

Remove the rear wheel hub cover, cotter pin, axle shaft nut, and washer. Loosen the rear wheel retaining nuts. Then raise the car to provide sufficient clearance for the removal of the rear wheel. The hub and drum assembly can then be removed by removing the wheel nuts and using Puller J-1644-B. All accumulated grease and dirt should be removed from the backing plate assembly.

Remove the brake backing plate retaining bolts and remove the outer washer and retainer and backing plate reinforcing plate. Pick out and discard the felt washer.

Remove the hand brake cable from the equalizer and frame guides. Disconnect the brake pipes at the wheel cylinders. Pull the backing plate and parking brake cable assembly outward and up over the end of the shaft and support the assembly in an out-of-the-

way position. Remove the end play adjusting shims and set aside for reassembly.

Remove the axle shaft with bearing and bearing cup, using Puller HM-931. If necessary to remove the bearing from the shaft, an arbor press must be used.

Remove the inner oil seal from the housing, using Oil Retainer Remover J-943, and discard the seal.

Wipe the inside of the end of the housing and clean all parts thoroughly, especially the end play shims. Be careful not to splash cleaner or oil on the brake linings. Clean the bearing separately from other rear axle parts, using kerosene or parts cleaner. After rinsing the bearing in clean fluid, hold the races to prevent rotation and blow the bearing dry with compressed air. Do not spin the bearings while drying. Inspect the bearing cup and rollers for roughness, flat spots, or galling. Replace the bearing and cup if either shows any sign of damage.

Oil the bearing with rear axle lubricant and wrap in a clean cloth until ready to use.

Installation and Adjustment—All Models

Install a new inner oil seal in the housing, using Bearing Cup Replacer Set Handle J-872-5 (1, Fig. 1) with Disc J-270-6 (3) to prevent seal distortion.

Press the bearing onto the shaft in an arbor press until it is tight. Pack bearing with wheel bearing lubricant and install the axle shaft, bearing, and bearing cup in the axle housing. Install the end play shims which were removed during disassembly. Then install the brake backing plate, backing plate reinforcing plate, and outer seal retainer with new felt washer. Center the outer seal carefully around the axle shaft, then tighten the seal assembly retaining bolts to 35 to 40 ft-lbs (4,841 to 5,532 kg-m) torque. Connect the brake lines to the wheel cylinders.

Bump the axle shaft with a heavy mallet to be sure that all clearances are eliminated; then check end play, using a dial indicator mounted on the shaft as shown in Fig. 2. This is total end play and should be from .001" to .006" (0,025 mm. to 0,153 mm.). The end play is controlled by shims (3, Fig. 3) which are located between the backing plates and the flange at the right end of the housing. To increase end play, add shims between the right-hand backing plate and the axle housing flange. To decrease end play, remove shims at this point.

The hub, the hub contact surface and keyway of the axle shaft, and the key must be washed and wiped dry before reassembly. Then install the hub and drum. Install the rear axle shaft washer and nut and install the rear wheel. Bleed the hydraulic brake system and test for leaks. Remove the axle stands, tighten the rear axle nut to 170 to 240 ft-lbs (23,51 to 33,1 kg-m) torque, and install the cotter pins.

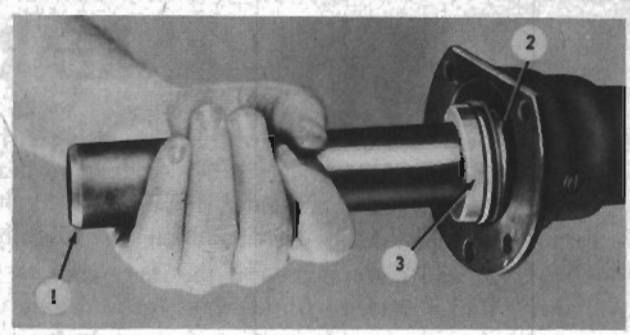


FIG. 1

1. Bearing Cup Replacer Set Handle J-872-5
2. Seal
3. Disc J-270-6

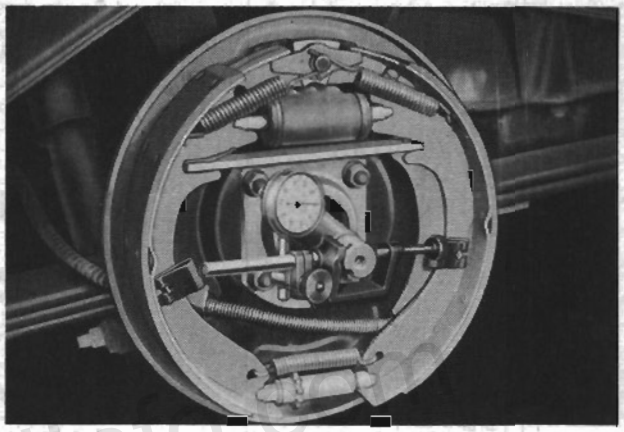


FIG. 2

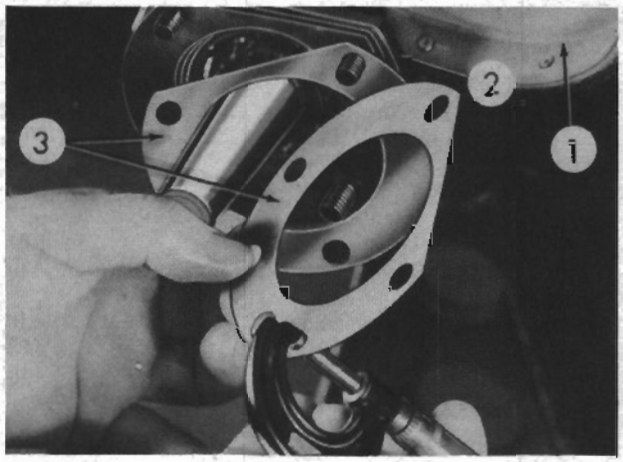


FIG. 3

1. Backing plate
2. Housing flange
3. Shim

PINION BEARING OIL SEAL

Removal and Installation—All Models

Raise the rear of the car and support it on stationary stands so that the wheels are clear of the floor. Disconnect the propeller shaft at the rear universal joint and suspend it in an out-of-the-way position. Remove the companion flange nut and flat washer, using Companion Flange Holding Tool J-2035. Center

punch the companion flange and pinion shaft spline so that the original alignment can be preserved on reassembly. Remove the companion flange, using Universal Joint Flange Puller J-2046 (see Fig. 4). If necessary, the J-2035 Holding Tool may be installed under the puller to keep the pinion shaft from turning. Take off the dust cover and remove the oil seal and gasket.

Clean the pinion bore and remove all burrs. Coat the lip of the new oil seal with light oil. Install the oil slinger and new gasket and, using Driver J-2037, drive the oil seal into position. Align the companion flange and pinion shaft according to the marks made during disassembly, and press the flange into position on the splines, using Pusher Set J-2204-B. Install the flat washer and companion flange nut. Tighten the nut to 150 ft-lbs (20,745 kg-m) torque. Install the universal joint. Check the level of lubricant in the rear axle and, if required, fill with recommended lubricant.

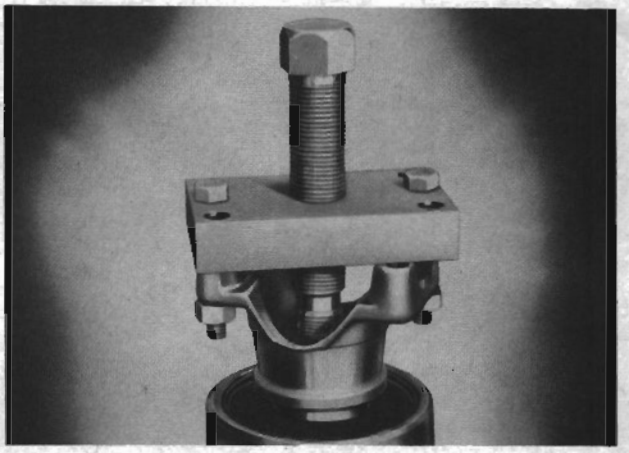


FIG. 4

REAR AXLE ASSEMBLY

Removal—All Models

Remove the rear hub covers and the rear axle nut cotter pins. Then remove the axle nuts and loosen the rear wheel retaining nuts. Raise the car and rest it on two stands placed under the frame directly in front of both rear springs. Remove both rear wheels and, using Hub Puller J-1644-B, remove both hub and drum assemblies.

Disconnect the brake pipes at the wheel cylinders and remove the backing plate bolts from both backing plates. Remove the brake pipe clamps and the cap screw which holds the brake pipe tee to the housing, and remove the brake pipe from the housing. Remove the backing plates and adjusting shims and suspend them from the frame. It is not necessary to disconnect the parking brake cables from the backing plates.

To complete the removal of the rear axle assembly, remove the rear universal joint U bolts and nuts, disconnecting the rear propeller shaft, and move the shaft to one side. Remove the rear spring U bolts from the axle housing, and disconnect the shock absorbers from the spring plate and, on President 56H models, also disconnect the stabilizer shaft from the spring plates.

Remove the rear axle assembly from the car and place it in a suitable stand for cleaning or for further disassembly and repair.

Disassembly—All Models

Drain the lubricant. Remove the axle shafts, bearings, and bearing cups, using Puller HM-931. If the axle shaft inner oil seals are to be replaced, use Axle Shaft Oil Retainer Remover J-943 to remove them. Remove the rear cover plate and gasket. Clean all differential parts with solvent and allow to drain.

Before proceeding any further with the rear axle disassembly, check the ring gear back face to runout with a dial test indicator (see Fig. 5). The runout reading must not be more than .003″ (0,076 mm.). Runout in excess of this amount may be caused by runout in the gear, a sprung differential case, carrier bores not parallel, or loose differential bearings. A sprung differential case must be replaced.

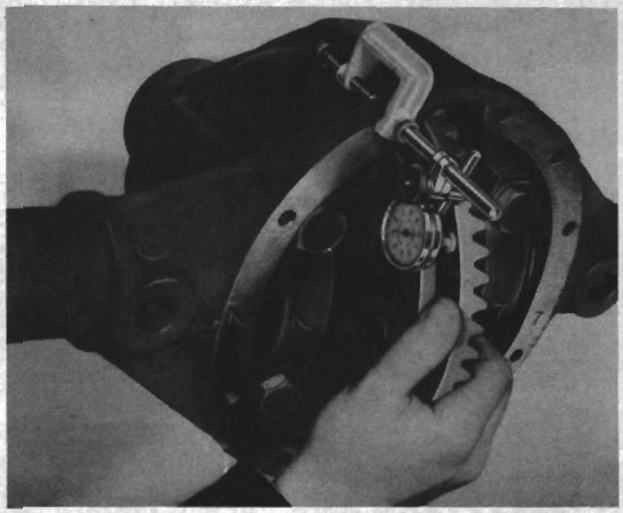


FIG. 5

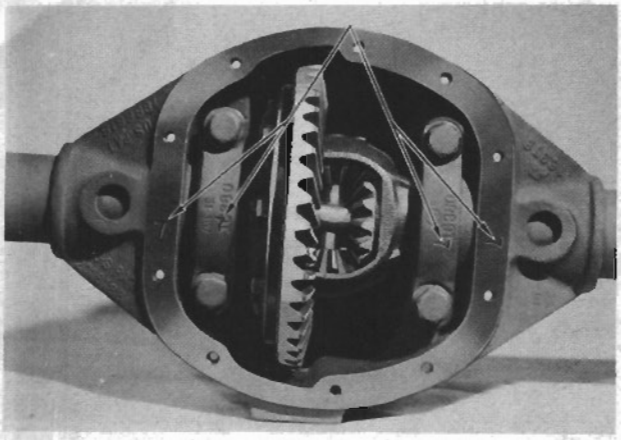


FIG. 6

DIFFERENTIAL CASE—Remove the differential caps, noting that each is marked (see Fig. 6) and that there is a corresponding mark on the rear cover gasket surface of the housing. When reinstalling these caps, make sure that the positions of these numerals correspond. Pry the differential case assembly out of the housing. (Do not pry on the ring gear.)

To remove the ring gear from the differential case, remove the attaching cap screws. To disassemble the differential, drive out the differential lock pin and remove the shaft, thrust block, differential pinions and gears, and thrust washers. Using Bearing Puller J-986-S, remove the differential side bearings. See Fig. 7.

PINION SHAFT—Remove the companion flange nut and flat washer, using Companion Flange Holding Tool J-2035. Then remove the companion flange, using Universal Joint Flange Puller J-2046 (see Fig 4). The J-2035 Holding Tool may be used under the bar of the J-2046 Puller to keep the pinion shaft from turning.

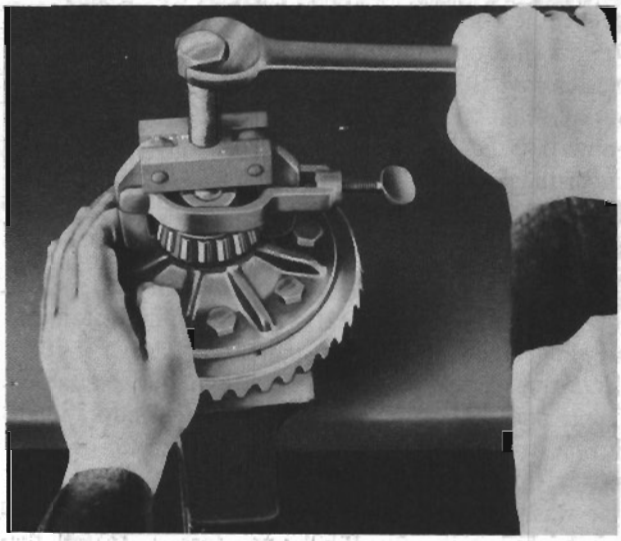


FIG. 7

Drive the pinion shaft assembly out of the forward bearing, using a brass drift placed on the forward end of the pinion shaft. When the pinion shaft assembly has been freed of the forward bearing, it can be pulled out of the axle housing. Remove the bearing adjusting shims, keeping all shims intact.

Drive the front bearing cup and oil retainer out of the front of the housing, using a brass drift. If the rear bearing cup is to be replaced or the pinion setting changed, it should be driven out of the rear of the housing. Retain the pinion adjusting shim pack intact for reassembly. To remove the rear bearing cone from the pinion shaft, use an arbor press and Puller Plate J-1298-B with Adapter Rings J-1298-4, as illustrated in Fig. 9.

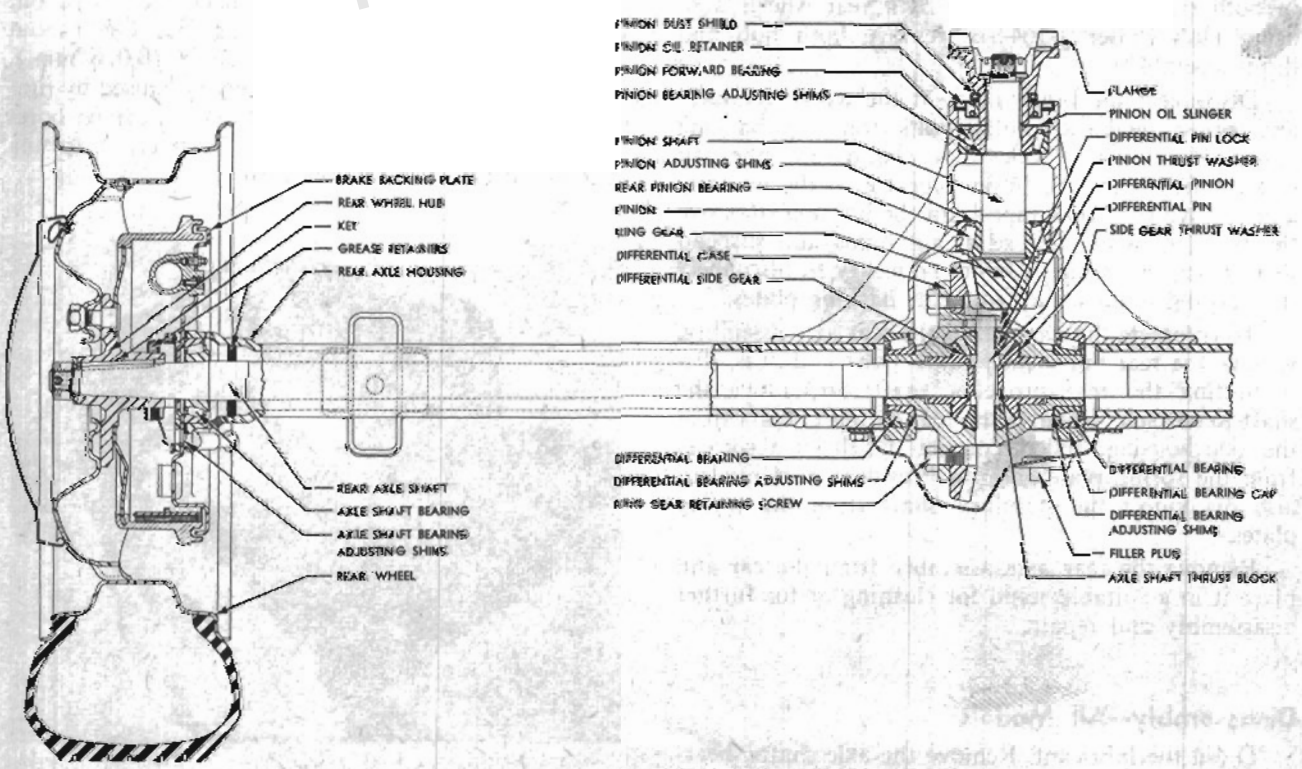


FIG. 8

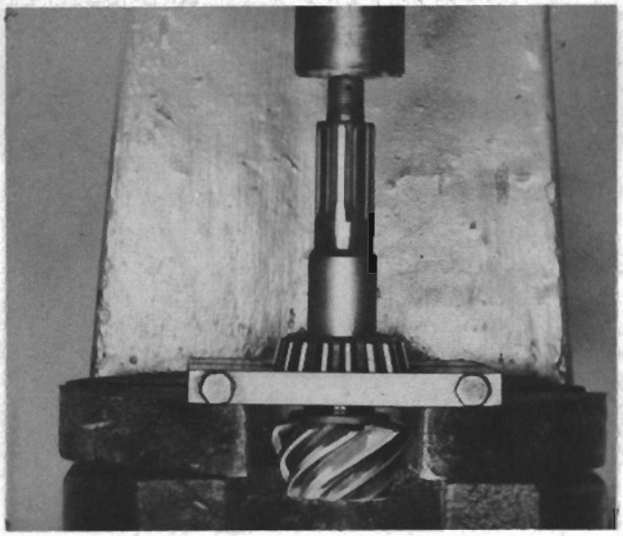


FIG. 9

Reassembly—All Models

PINION SHAFT—Using Bearing Cup Replacer Head J-270-6 with Driver Handle J-872-5, install the pinion bearing front cup. Then install the original pack of pinion adjusting shims which was removed from this point during the disassembly and, with the Handle J-270-1 (2, Fig. 10) and Driver Head J-270-14 (3), install the pinion bearing rear cup (1) on top of the shims. Using an arbor press and a suitable pipe, press the rear bearing cone on the pinion. The pipe must contact only the inner bearing race, not the bearing roller cage.

Before proceeding further with the assembly of the rear axle, the pinion must be properly adjusted.

PINION SETTING — To determine the proper setting of the pinion, using Pinion Setting Gage Set J-589-D, first make sure that the pinion bearing, cone, and shaft, the fixture, and the side bearing seats in the axle housing are perfectly clean. Fasten the bar of the gage set to the axle housing with two rear cover screws (see Fig. 11), and adjust the hold-down bolt so that it holds the Step Plate J-589-10-2 (3) tightly against the ground surface of the pinion (4). Make sure that the step plate is flat on top of the pinion. Place the

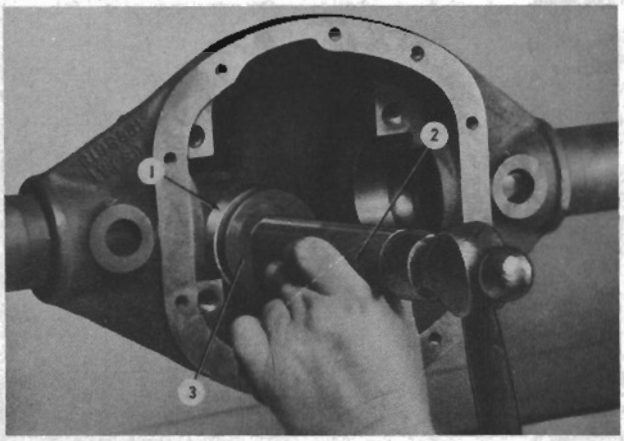


FIG. 10

1. Rear cup 2. Handle J-270-1 3. Driver Head J-270-14

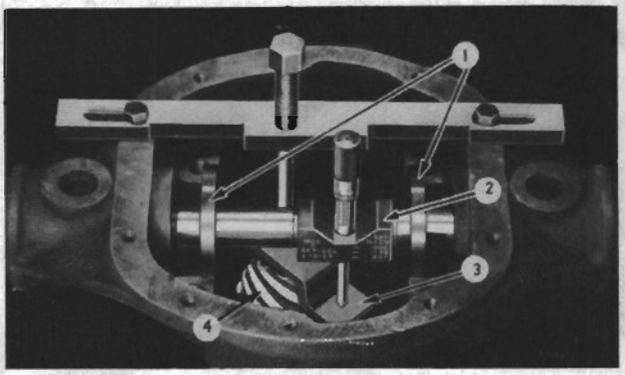


FIG. 11

1. Large discs
2. Bar
3. Step Plate J-589-10-2
4. Pinion

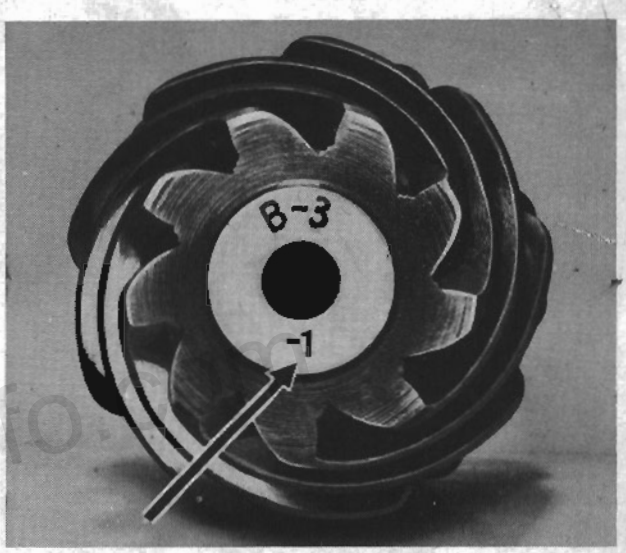
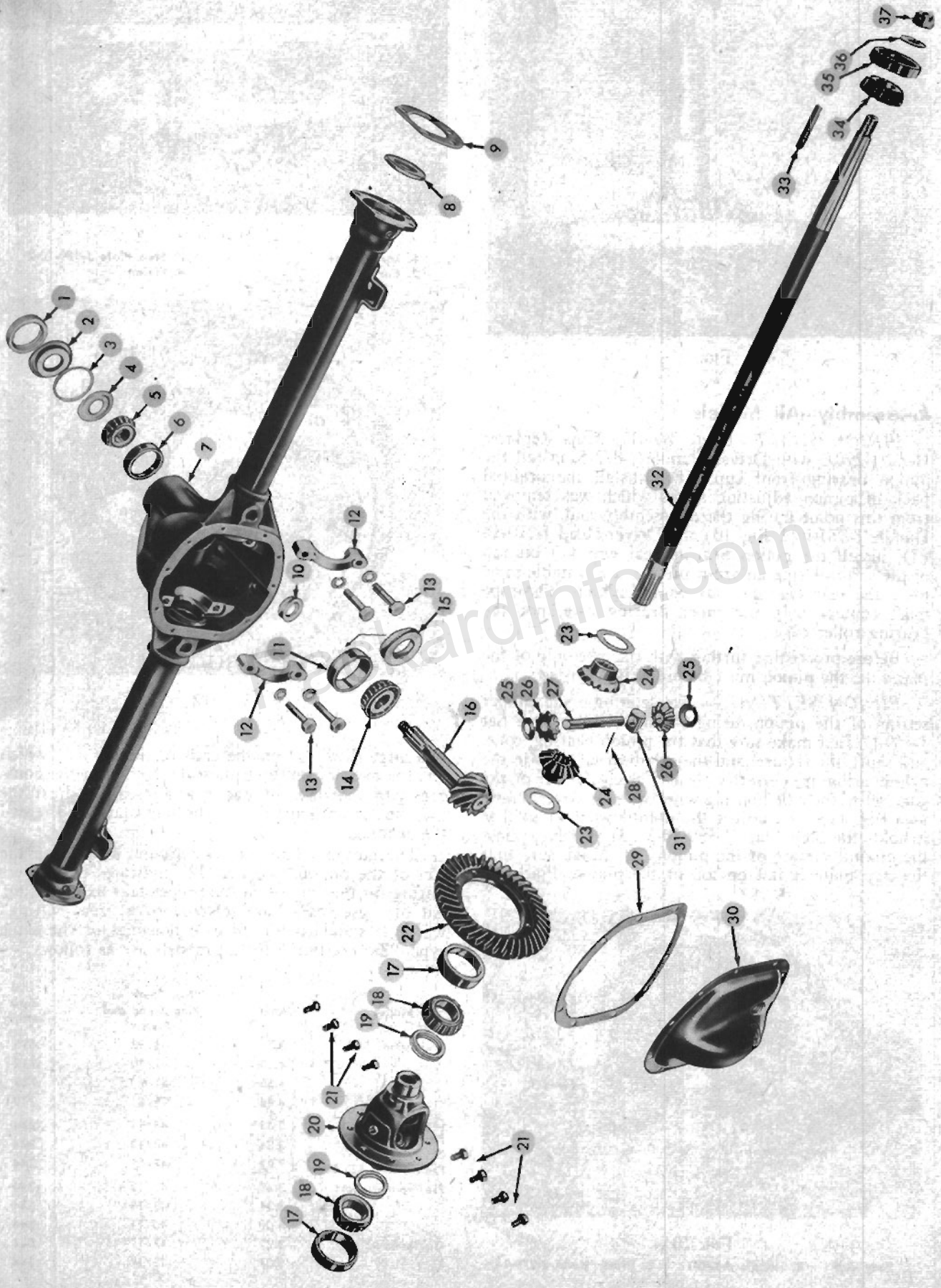


FIG. 12

two large discs (1) on the ends of the bar (2) which has the micrometer, and place the fixture in the housing with the discs on the bearing seats. Adjust the micrometer until it contacts the step plate, and record the reading.

The etched number on the ground surface on the end of the pinion (see Fig. 12) indicates the correct setting for that pinion in the proper rear axle housing. All of these marks are referred to a "zero setting" which is standard for all axle housings of the same type. "Zero settings" for all models are as follows:

Model	Ratio	No. Teeth on Ring Gear and Pinion	Zero Setting
Champion 56G	3.54	46/13	.625
	4.10	41/10	.719
	4.56	41/9	.719
	4.88	39/8	.719
Commander 56B, Powerhawk 56B, Skyhawk 56H, President W,F,D 56H	3.54	46/13	.344
	3.31	43/13	.344
	3.92	47/12	.344
President Y, 56H	3.54	46/13	.344
	3.31	43/13	.344
	4.09	45/11	.344
Goldenhawk 56J	3.92	47/12	.344
	3.07	43/14	.344



For example, if the pinion setting is being checked in a Champion axle having a 4.56 to 1 ratio, and if the pinion is marked "O," the correct micrometer reading, using the J-589-D Pinion Setting Gage, would be .719" (18,26 mm.). If the pinion was marked +2, the correct setting would give a micrometer reading of .747" (18,21 mm.), and if the pinion was marked —4, the correct setting would give a micrometer reading of .723" (18,36 mm.).

In a President Y rear axle with a 3.54 to 1 ratio, the zero setting would be .344" (8,737 mm.), so a pinion marked +3 should be set to give a reading of .341" (8,661 mm.).

If the reading on the micrometer is not exactly the one indicated by the marks on the pinion, add or remove shims between the rear bearing cup and the housing as required to obtain as close a setting as possible. Shims are available in thickness of .003" (0,076 mm.) and larger.

After the correct pinion setting has been obtained and the pinion installed in the housing, install the pinion bearing adjusting shims which were removed during disassembly. Install the front bearing and companion flange, using Companion Flange and Pinion Bearing Pusher J-2204-B (see Fig. 14) and Holding Tool J-2035. Install the flat washer, lock washer, and nut, tighten to 150 ft-lbs (20,745 kg-m) torque, and test the pinion bearing adjustment. The pinion should have no end play and there should be a slight drag or resistance to turning. Add or remove shims in front of the front bearing cone to obtain the proper pinion bearing adjustment.

DIFFERENTIAL CASE—Install the thrust washers (23 and 25, Fig. 13), side gears (24), and pinions (26) in the differential case. Position the thrust block (31) between the pinions and insert the pinion shaft through the case, gears, and thrust block. Install the differential shaft lock pin (28). Then, using a punch, peen a portion of the edge of the differential case over the end of the lock pin with a punch to keep the pin from working loose during operation.

Clean the contacting surfaces of the ring gear and differential case, making sure that all burrs or nicks

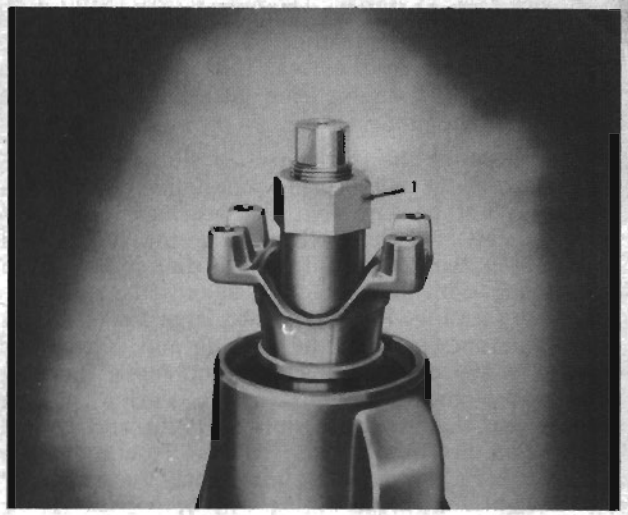


FIG. 14

are removed. Align the cap screw holes in the ring gear with those of the differential case, and tap the gear into place with a rawhide hammer or a block of wood. Install the ring gear attaching cap screws and tighten the screws uniformly to 45 to 55 ft-lbs (6,2 to 6,9 kg-m) torque.

DIFFERENTIAL END PLAY—Make sure that the contacting surfaces of the differential side bearings and the differential case are perfectly clean and free from burrs or nicks. Using an arbor press and Tool J-270-22, press the bearings into position on the case. Do not install any shims between the side bearings and the differential case at this time. Making sure that the bearings, cups, and rear axle housing are clean, place the differential case assembly, with the side bearing cups on the bearings, in the axle housing. Install a dial indicator on the housing, with the button against the back face of the ring gear. Insert two heavy screw drivers between a bearing race and the axle housing, and move the differential case assembly to one side of the housing (see Fig. 15). Set the indicator to zero,

FIG. 15

KEY TO PARTS IN FIG. 13

1. Flange dust cover
2. Pinion bearing oil seal
3. Seal retainer gasket
4. Oil slinger
5. Bearing and rollers
6. Bearing cup, front
7. Axle housing
8. Shaft inner oil seal
9. Bearing adjusting shim
10. Pinion bearing shims
11. Bearing cup, rear
12. Bearing caps
13. Bearing cap screws
14. Bearing
15. Pinion adjusting shims
16. Pinion
17. Differential bearing cup
18. Side bearing
19. Adjusting shims
20. Differential case
21. Ring gear-to-case screws
22. Ring gear
23. Thrust washer
24. Side bevel gear
25. Thrust washer
26. Differential pinion
27. Shaft
28. Lock pin
29. Cover gasket
30. Cover
31. Thrust block
32. Axle shaft
33. Key
34. Bearing
35. Bearing cup
36. Washer
37. Nut

move the assembly to the other side of the case, and record the indicator reading. This reading will be used in determining the total thickness of shims to be used in adjusting the ring gear later during the assembly of the unit.

To determine the thicknesses of shims needed between each of the side bearing cones and the differential case, first be sure that the bearings, cups, and housing seats are clean, then place the differential assembly in the housing. Install a dial indicator on the housing, with the contact tip against the ring gear back face (see Fig. 15). Insert two large screw drivers or suitable bars between the housing and cup on the opposite side from the ring gear and move the ring gear away from the pinion until the bearing cone on the ring gear side is seated firmly in its cup and against the housing. Set the indicator to zero. Now move the assembly back toward the pinion until the ring gear meshes lightly with the pinion with zero backlash or clearance. Record the dial indicator reading. This reading less .003" (0,076 mm.) (approximate backlash) is the thickness of shims needed between the differential case and the side bearing on the ring gear side of the differential (2, Fig. 16). To find the thickness of shims needed under the other side bearing, subtract the thickness of the shims just used from the total side movement obtained earlier in the reassembly. To the figure thus obtained, add .008" (0,20 mm.) for preload.

The following example will help to clarify the differential ring gear adjustment procedure. Assume that the total side movement measured earlier in the reassembly was .072" (1,829 mm.) and that the movement just measured was .038" (0,965 mm.). Subtract .003" (0,076 mm.) (approximate backlash) from .038" (0,965 mm.), giving .035" (0,889 mm.), the thickness of shims to be placed under the bearing on the ring gear side (2, Fig. 16). Subtract this thickness, .035" (0,889 mm.), from the total obtained earlier, .072" (1,829 mm.), which gives .037" (0,94 mm.). This difference plus .008" (0,20 mm.) (preload) is .045" (1,143 mm.), the thickness of the shim pack to be put under the bearing away from the ring gear (1, Fig. 16).

To facilitate the installation of the differential assembly in the housing, cock the bearing cups and tap them lightly with a lead hammer. When reinstalling the bearing caps, be sure the positions of the numerals marked on the housing and the caps correspond. Tighten the differential bearing cap screws to 70 to 80 ft-lbs (9,7 to 11,0 kg-m) torque.

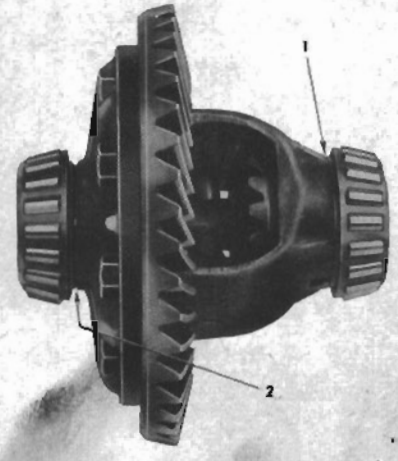


FIG. 16

1 Shim—Opposite ring gear side 2. Shim—Ring gear side

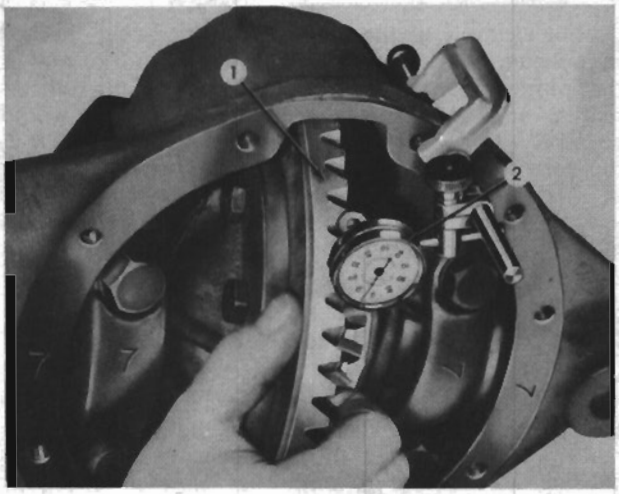


FIG. 17

1. Ring gear teeth 2. Dial indicator

RING GEAR - PINION BACKLASH—Mount a dial indicator (2, Fig. 17) on the rear axle housing with the button of the indicator against one of the ring gear teeth (1). Move the ring gear by hand to check the backlash which should be between .003" and .006" (0,076 mm. and 0,1524 mm.). If the backlash is not in the specified range, transfer the necessary number of shims from one side of the carrier to the other to obtain the desired setting. To decrease the backlash, remove shims located at (1) in Fig. 16 and install on the opposite side at (2). To increase the backlash, remove shims located at (2) and transfer to opposite side (1). Backlash will be changed approximately 2/3 of the thickness of the shims transferred.

TOOTH CONTACT—After setting the backlash to comply with the specifications, check the tooth contact of the ring gear and pinion. Improper tooth mesh will cause excessive wear and noise. Ordinarily, if the pinion adjustment is made correctly during the reassembly and the proper backlash is secured, the resultant tooth contact will be correct. Nevertheless, the tooth contact test should be made as a further check for correct assembly and proper tooth mesh. With a small brush, paint eight or ten of the ring gear teeth with a mixture of ground red lead and engine oil. Move the painted ring gear teeth over the pinion until a good impression of the tooth contact is obtained. The resulting impressions should be similar to the first example illustrated in Fig. 18.

To correct a high narrow tooth contact condition, move the pinion toward the ring gear. This adjustment of the pinion will decrease the backlash; therefore, if the backlash is out of limits, move the ring gear away from the pinion to make the backlash correction.

A low narrow tooth contact condition is corrected by moving the pinion away from the ring gear. Then, if necessary to correct the backlash, move the ring gear toward the pinion.

To correct a short toe contact, move the ring gear away from the pinion. This will increase the lengthwise contact and move the contact area toward the heel of the tooth. If backlash is out of limits, correct by moving the pinion toward the gear.

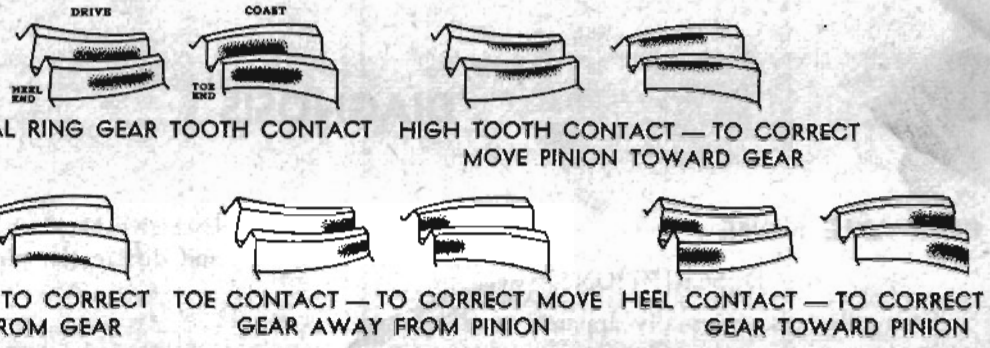


FIG. 18

A short heel contact can be corrected by moving the ring gear toward the pinion. Then, to make the necessary backlash adjustment, move the pinion away from the gear.

Adjust either the ring gear or the pinion as required to obtain proper tooth contact.

When changing the position of the ring gear to obtain proper tooth contact, the shims which have been removed at one side must always be installed on the opposite side to maintain the correct preload.

To change the position of the pinion to obtain proper tooth contact, insert or remove the shims from between the pinion rear bearing cup and the housing. Always recheck the pinion bearing preload after making any change in the position of the pinion.

After removing the companion flange, install the oil slinger, and with Bearing Oil Seal Driver J-2037 (2, Fig. 19) and Handle J-872-5 (1), install a new pinion oil seal. Install the companion flange, flat washer, and nut. Tighten to 150 ft-lbs (20,745 kg-m) torque. Install new axle shaft inner oil seals, using Handle J-872-5 and Driver Head J-270-6 to avoid distortion. Install axle shafts, bearings, and cups. Install housing rear cover plate, with new gasket. Fill to proper level with recommended lubricant.

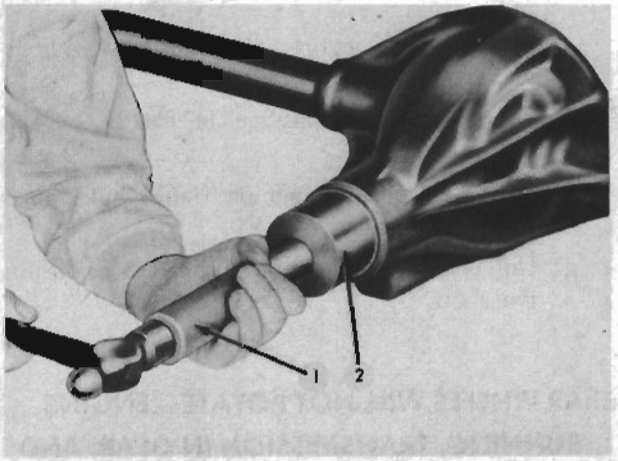


FIG. 19

1. Handle—J-872-5.
2. Bearing oil seal driver J-2037

Installation—All Models

Position the axle housing on the springs, making sure that the spring center bolts are properly seated in the holes provided in the spring seats. Install the spring U bolts, spring plates, lock washers, and nuts. Tighten nuts evenly to 47 to 50 ft-lbs (6,50 to 6,91 kg-m) torque on the Champion, and to 63 to 68 ft-lbs (8,7 to 9,4 kg-m) torque on all other models. Then connect the shock absorbers to the spring plates. On President 56H models, connect the stabilizer shaft to the spring plates. Assemble the universal joint and connect the propeller shaft to the rear axle companion flange.

Install axle end play shims, brake backing plates, reinforcing plates, outer oil seals with new felt washers, and retaining bolts and nuts. Tighten bolts to 35 to 40 ft-lbs (4,841 to 5,532 kg-m) torque, and check axle end play as described in the Rear Axle Shaft section. Correct if necessary.

Fasten the brake pipe to the axle housing and connect the hydraulic lines to the wheel cylinders. Install the hub and drum assemblies and the rear wheels, and bleed the hydraulic brake system. Check for leaks in the brake system.

Lower the car to the floor, tighten both rear axle nuts to 170 to 240 ft-lbs (23,51 to 33,1 kg-m) torque, and install new cotter pins. Then tighten the rear wheel nuts and install the hub covers.

DIAGNOSIS

REAR AXLE NOISE

DESCRIPTION

Rear axle noise is usually apparent as a hum in moderate cases or as a growl in severe cases. Very often a rear axle which is noisy when the engine is driving the car, will be quiet when the car is coasting or vice-versa.

Difficulties with rear wheel bearings, universal joints, propeller shaft support bearing, muffler, or tire noise are often improperly diagnosed as rear axle noise. The possibility of an incorrect diagnosis of these difficulties is great and must not be disregarded.

CAUSES

1. Insufficient lubricant in housing.
2. Use of poor quality or incorrect grade of lubricant.
3. Rear wheel bearing races or rollers brinelled or rough (bump noise).
4. Ring gear and pinion not adjusted to provide correct tooth contact.
5. Ring gear and pinion not matched.
6. Ring gear or pinion teeth badly worn, scuffed or chipped.
7. Excessive or insufficient ring gear backlash.
8. Loose pinion bearings.
9. Loose differential side bearings.
10. Pitted or broken pinion or differential bearings.
11. Ring gear does not run true (intermittent noise).
    a) Loose or broken differential bearings.
    b) Ring gear bolts drawn up unevenly.
    c) Foreign substances between ring gear and differential case.
    d) Warped ring gear.
12. Differential assembly noisy on turns only.
    a) Differential pinion gears tight on cross or pinion shaft.
    b) Differential side gears tight in differential case.
    c) Differential pinion or side gears chipped, scuffed, or otherwise damaged.
    d) Differential side gears or case thrust washers rough, scored, or otherwise damaged.
    e) Excessive backlash between differential gears and differential pinions.

RAPID REAR AXLE LUBRICANT LOSS

CAUSES

1. Loss at axle shafts.
    a) Lubricant level too high.
    b) Incorrect grade of lubricant.
    c) Rear axle shaft grease retaining felts improperly installed or badly worn.
    d) Rear wheel bearing retainer loose on end of housing.
    e) Rear wheel bearing gasket damaged or improperly installed.
    f) Cracked rear axle housing.
2. Loss at rear axle pinion shaft.
    a) Lubricant level too high.
    b) Incorrect grade or poor quality of lubricant used.
    c) Pinion oil seal improperly installed or badly worn.
    d) Pinion oil seal retainer distorted, loose in housing, or improperly installed.
    e) Lubricant return passage in carrier housing restricted.
    f) Universal joint companion flange hub rough, scored, or nicked.
    g) Universal joint companion flange loose on pinion shaft.

REAR WHEELS WILL NOT ROTATE— ENGINE RUNNING, TRANSMISSION IN GEAR, AND PROPELLER SHAFT ROTATING

1. Rear axle shaft broken or axle key sheared.
2. Ring gear or pinion teeth stripped.
3. Differential side gear or differential pinion teeth stripped.
4. Differential pin broken.
5. Propeller shaft rear yoke welds broken loose and yoke turning inside propeller shaft tubing.

SERVICE BULLETIN REFERENCE

NUMBER	PAGE	SUBJECT

ADDITIONAL NOTES