SECTION 6-B

REAR AXLE SERVICE PROCEDURES

CONTENTS OF SECTION 6-B

6-4 REMOVAL AND INSTALLATION OF REAR AXLE ASSEMBLY

It is not necessary to remove the rear axle assembly for any normal repairs. The axle shafts and the carrier assembly can easily be removed from the car, leaving the rear axle assembly in place. However, if the housing is damaged, the rear axle assembly can be removed and installed using the following procedure.

a. Removal of Rear Axle Assembly

1. Raise rear of car and support securely using car stands under both frame side rails.

2. Mark rear universal joint and pinion flange for proper reassembly. These parts are carefully balanced in production and assembled with heavy sides opposite. Thus they should be reassembled the same way. Then disconnect rear universal joint by removing two U-bolts. Push rear propeller shaft forward as far as possible, then wire it to the upper control arm frame bracket to support it up out of the way.

3. Disconnect brake hose at support bracket. Cover hose and brake pipe openings to prevent entrance of dirt.

4. Disconnect parking brake cables by removing adjusting nut and sheave. Unclip each cable at two places, disengage from guides, pull each cable free and lay-out forward from rear wheels.

5. Place a jack under center of rear axle housing and raise until shock absorbers are compressed slightly. Disconnect shock absorbers at lower ends.

6. Disconnect track bar at axle ends.

7. Disconnect upper control arm at axle end.

8. Lower jack slightly and disconnect lower control arms at axle end.

9. Lower jack from under axle housing and remove.

10. Roll rear axle assembly out from under car.

b. Installation of Rear Axle Assembly

1. With car resting securely on stands under frame, roll rear axle assembly into place.

2. Place a jack under center of axle housing and raise until aligned with lower control arms. Install lower control arm bolts and nuts. Torque nuts to 75 ft. lbs.

3. Raise jack slightly and connect upper control arm to axle housing. Torque nuts to 75 ft. lbs.

4. Connect track bar to axle housing. Torque nut to 120 ft. lbs.

5. Connect shock absorber lower ends. Torque nuts to 40 ft. lbs.

6. Install parking brake cables through clips and guides. Install sheave and adjusting nut.

7. Adjust parking brake according to procedure in paragraph 9-9.

8. Connect brake hose at support bracket and lock in place with yoke.

9. Bleed both rear wheel cylinders as described in paragraph 9-7.

10. Connect rear universal joint to pinion flange according to alignment marks. Compress bearings using a C-clamp so that bearing snap rings will engage pinion flange without gouging. See Figure 6-70.

11. Torque U-bolt nuts to 13 ft. lbs. using an extension such as J-9113 (this corresponds to 15 ft. lbs. without an extension). See Figure 6-71.

12. With car approximately level, fill rear axle housing to filler plug hole using specified gear lubricant. If axle housing or any rear suspension parts were replaced due to damage, rear universal joint angle must be checked and adjusted as required. See paragraph 6-19.

6-5 REMOVAL AND INSTALLATION OF AXLE SHAFT, WHEEL BEARING, OR OIL SEAL

a. Remove Axle Shaft Assembly

1. Place car stands solidly under rear axle housing so that wheels are clear of floor.

2. Remove rear wheel and brake drum. Notice that left side wheel bolts have left hand threads.

3. Remove nuts holding wheel bearing retainer plate to brake backing plate, leaving bolts in place to support backing plate.

4. Pull out axle shaft assembly using Puller J-6176 with a slide hammer. See Figure 6-5. CAUTION: While pulling axle shaft out through seal, support shaft carefully in center of seal to avoid cutting seal lip.

5. Replace two opposite retainer nuts finger tight to hold brake plate in position.

b. Remove and Install Rear Wheel Bearing

The rear wheel bearing and the bearing retaining ring both have a heavy press fit on the axle shaft. Because of this fit, they should be removed or installed separately.

1. Notch wheel bearing retaining ring in 3 or 4 places with a chisel. See Figure 6-6. Retaining ring will expand so that it can be slipped off. CAUTION: Axle shaft may be nicked if ring is cut completely through.

2. Press wheel bearing off, using Remover J-6525 either in a press or in a set-up using Ram and Yoke Assembly J-6180 and Adapter J-6258 as shown in Figure 6-7.

3. Install bearing retainer plate. Press new wheel bearing and retaining ring against shoulder on axle shaft using Installer J-9739 either in a press or in a set-up using Ram and Yoke Assembly J-6180 and Holder J-6407 shown in Figure 6-8. CAUTION: Bearing retainer plate must be on axle shaft before bearing is installed; retainer gasket can be installed after bearing.

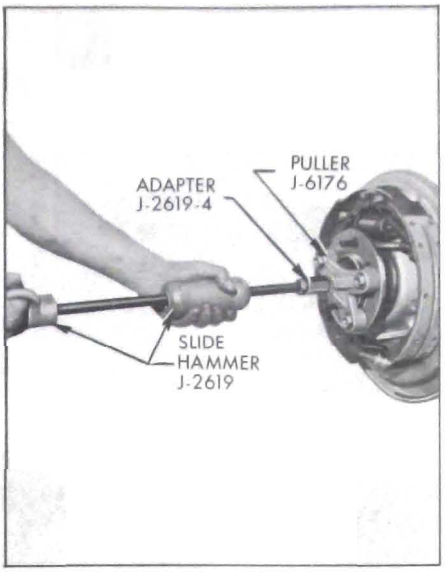

Figure 6-5—Removing Rear Axle Shaft

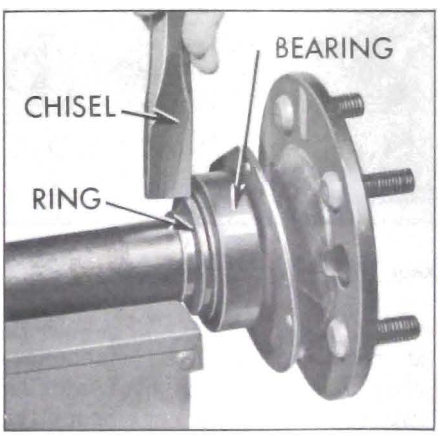

Figure 6-6—Removing Rear Wheel Bearing Retaining Ring

c. Remove and Install Axle Shaft Oil Seal

The oil seal is located inboard of the wheel bearing with its O.D. tight in the rear axle housing and its sealing lip contacting a ground surface of the axle shaft. See Figure 6-2. Before removing, install 2 nuts finger tight to retain backing plate to axle housing. This protects the brake lines.

1. To remove oil seal, insert Puller J-6199 just through seal and expand. Pull seal with a slide hammer. See Figure 6-9.

2. Before installing apply sealer to O.D. of new seal.

3. Position seal over Installer J-9740 and drive seal straight into housing until installer bottoms against wheel bearing shoulder.

d. Remove and Install Rear Wheel Bolt

1. To remove and install a rear wheel bolt, axle shaft assembly must be out of car. Remove rear wheel bolt by pressing from axle flange.

2. Install new rear wheel bolt by pressing through axle flange. Check new bolt for looseness; if bolt can be moved at all with fingers, axle shaft must be replaced.

e. Install Axle Shaft Assembly

Rear axle shafts are not interchangeable between sides; the right shaft is longer than the left. Also, wheel bolts in the right shaft have right hand threads; left shaft bolts have left hand threads.

1. Apply a coat of wheel bearing grease in wheel bearing recess of housing. Install new outer retainer plate gasket over retainer bolts.

2. Apply gear lubricant to the bearing surface and splines at the inner end of the axle shaft. Apply a coat of wheel bearing grease on the seal surface of the shaft to approximately 6 inches inboard of the shaft. Install axle shaft

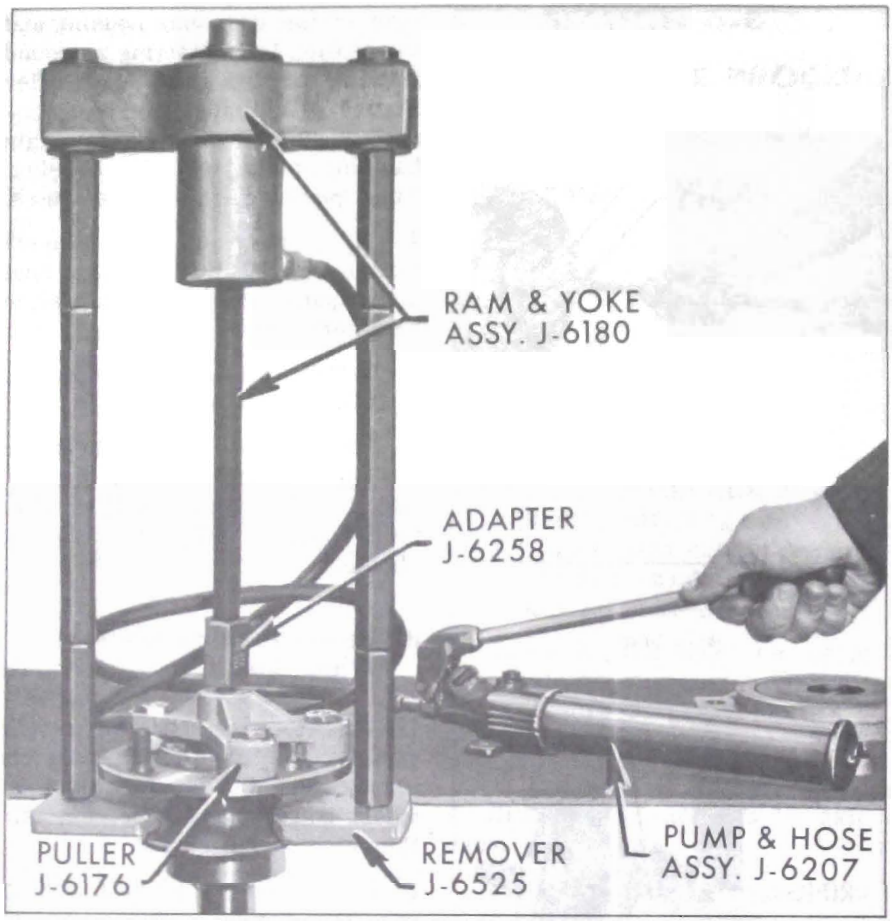

Figure 6-7—Removing Rear Wheel Bearing

through seal carefully to avoid cutting seal lip. Drive shaft into position. NOTE: If the axle to be installed is a positive traction axle, ONLY POSITIVE TRACTION LUBRICANT SHOULD BE USED.

3. Install retainer nuts and torque to 70 ft. lbs.

4. Install drum and wheel. Torque lug nuts to 70 ft. lbs.

6-6 REMOVAL AND INSTALLATION OF CARRIER ASSEMBLY

a. Remove Carrier Assembly

1. Raise rear of car and support securely under rear axle housing.

2. Mark rear universal joint and pinion flange for proper alignment at reassembly. Then disconnect rear universal joint by removing two U-bolts. Push rear propeller shaft forward as far as possible, then wire it to the upper control arm frame bracket to support it up out of the way.

3. Remove rear wheels and brake drums. Remove axle shaft assemblies as described in paragraph 6-5.

4. Remove carrier to axle housing nuts except two opposite nuts; back these two nuts out until they engage only a few threads.

5. Locate a drain pan under carrier flange, then move carrier forward to drain gear lubricant.

6. Remove carrier assembly using a transmission jack, if available.

b. Install Carrier Assembly

1. Clean gasket surface of rear axle housing. Apply gasket cement and install new gasket. Make sure mounting surface of carrier is clean and free of any burrs or nicks.

2. Raise carrier assembly with a transmission jack, if available. Install carrier on axle housing. Torque nuts to 50 ft. lbs.

3. Install axle shaft assemblies as described in paragraph 6-5. Install rear drums and wheels. Torque lug nuts to 70 ft. lbs.

4. Connect rear universal joint to pinion flange according to alignment marks. Compress bearings using a C-clamp so that bearing snap rings will engage pinion flange without gouging. See Figure 6-70.

5. Torque U-bolt nuts to 13 ft. lbs. using an extension such as J-9113. See Figure 6-71.

6. With car approximately level, fill rear axle housing to filler plug hole using specified lubricant.

6-7 DISASSEMBLY OF CARRIER ASSEMBLY

a. Removal and Disassembly of Ring Gear and Case Assembly

1. Place carrier assembly in suitable mounting fixture such as Fixture J-6177.

2. It is advisable to check the existing gear lash with a dial indicator as described in paragraph 6-8, f. This will indicate gear or bearing wear or an error in backlash or preload setting which will help in determining cause of axle noise. It will also enable used gears to be reinstalled at original lash setting to avoid changing gear tooth contact.

3. Remove differential bearing pedestal clamp bolts and open

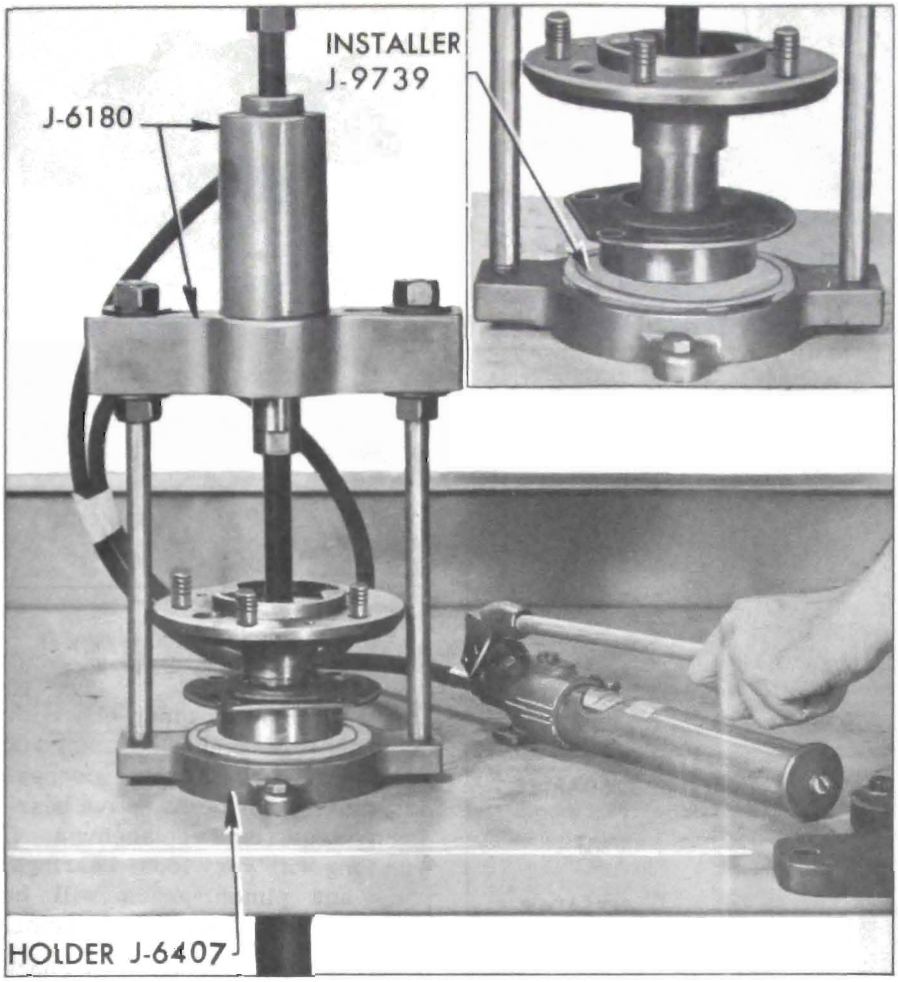

Figure 6-8—Installing Rear Wheel Bearing or Retaining Ring

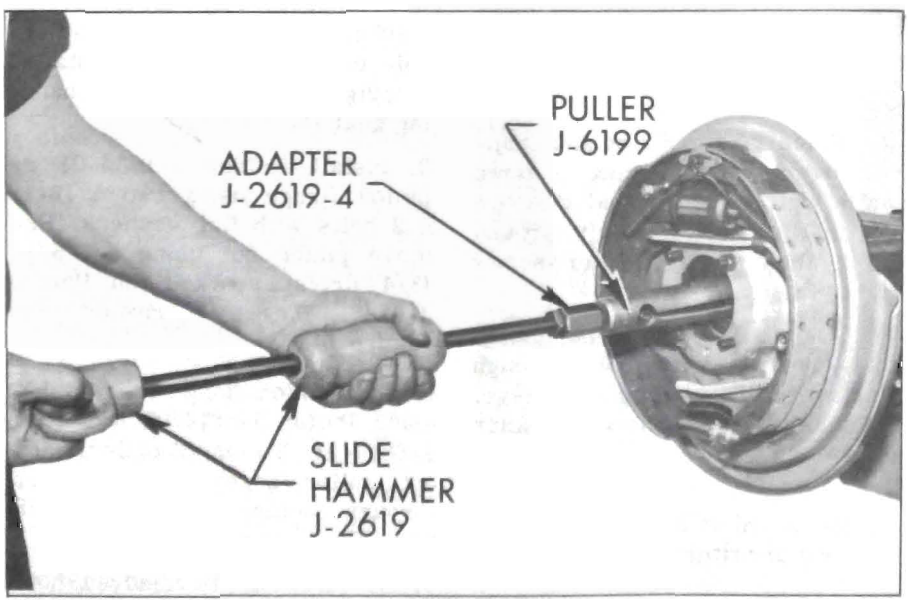

Figure 6-9—Removing Axle Shaft Oil Seal

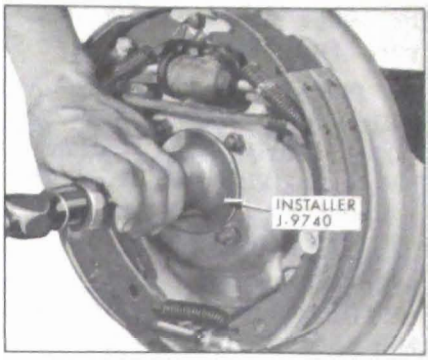

Figure 6-10—Installing Axle Shaft Oil Seal

pedestals by tapping a wedge in each pedestal slot.

CAUTION: Do not use excessive force on wedges as pedestal bores may be permanently distorted.

4. Pull differential bearing supports with Puller J-9744-1 using the following procedure:

(a) Using a screwdriver, turn expanding screw in puller body, J-9744-5 in a counterclockwise direction to retract pins, then insert puller body into differential bearing support until reference line on tool is flush with end of support and punch mark is in general direction of hole in support. See Figure 6-11.

(b) Expand pins a slight amount by turning expanding screw with screwdriver in a clockwise direction until a light drag on pins is felt, then move tool as required

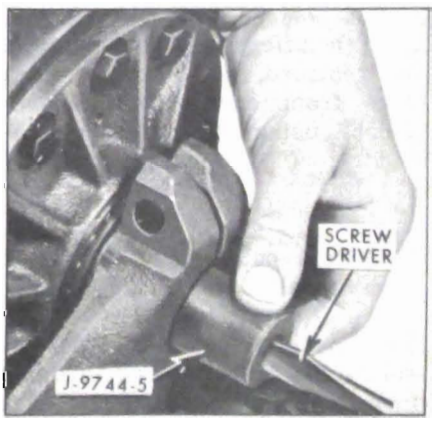

Figure 6-11—Installing Support Puller

to engage pins with holes in support. Fully expand pins.

(c) Place bridge J-9744-2 over puller complete with draw bolt, thrust bearing, and washer as shown in Figure 6-12. With a suitable wrench tighten bolt to withdraw bearing support.

5. Install Spreader J-6185 shown in Figure 6-34. Tighten spreader bolt just enough to free case assembly.

CAUTION: Do not spread pedestals any farther than necessary or they may be permanently sprung.

Lift case straight out until side bearings are half-way clear of pedestals. Then take hold at bearings with both hands to prevent bearings from dropping and lift case assembly out. Keep right and left bearings, shims, and supports in sets so that they may be reinstalled in the same positions. Remove spreader tool.

6. Mark ring gear and case, so they may be reassembled in same relative position. Remove ring gear from case. If ring gear is tight, tap it off using a soft hammer; do not pry between ring gear and case.

7. Drive differential pinion axle spring pin and pinion axle from case. Mark side gears, pinions, and washers so they may be reinstalled in same sides. Remove side gears, pinions, and washers.

8. If a differential bearing is to be replaced, pull bearing outer race from case with Remover J-6552 using the following procedure: (See Figures 6-13 and 6-14).

(a) Insert puller jaws with lips down under edge of outer race.

(b) Carefully thread spreader screw into jaws, making sure that threads are not crossed. Leave spreader screw one full turn away from jaws.

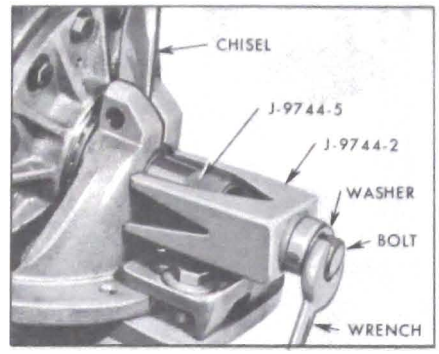

Figure 6-12—Removing Differential Bearing Support

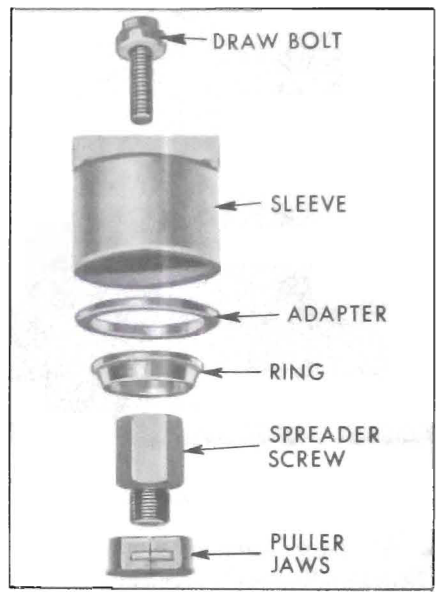

Figure 6-13—Proper Position of J-6552 Parts

(c) Place retainer ring and adapter over jaws, tapping it down while pulling up spreader screw so that ring fits snugly around jaws, then turn spreader screw tightly against jaws.

(d) Place sleeve over assembled tool. Insert draw bolt through washer, thrust bearing and sleeve. Then thread it into spreader screw and pull bearing outer race.

b. Removal of Pinion and Bearings

1. Check pinion preload as described in paragraph 6-8. If there

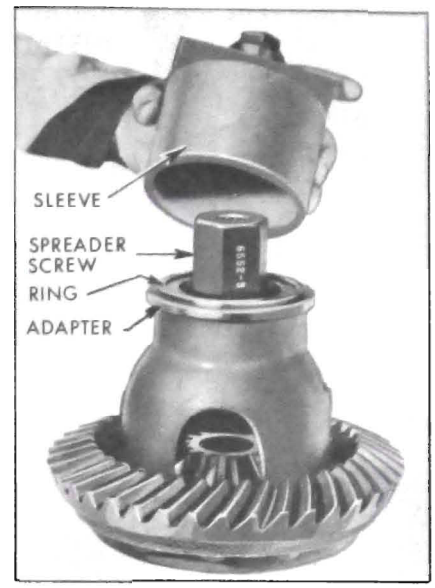

Figure 6-14—Installing Sleeve to Remove Bearing Outer Race

is no preload reading, check for looseness of pinion assembly by shaking. Any noticeable looseness indicates worn or defective bearings, requiring replacement. If run long with very loose bearings, ring and pinion gears will be damaged and also need replacing.

2. It is also advisable to check the pinion depth setting as described in paragraph 6-8. This will indicate any error in the existing setting and will also enable used parts to be reinstalled at original setting to avoid changing gear tooth contact.

3. Install Holder J-8614-01 on pinion flange using two 5/16-18 x 2 bolts with flat washers. Remove pinion nut using a 1-5/16 (3/4 drive) socket on Handle J-6246. Remove washer. See Figure 6-15.

4. Pull pinion flange from pinion using Puller J-8614-02 in Holder J-8614-01. To install puller, back out puller screw, insert puller through holder and rotate 1/8 turn. See Figure 6-16.

5. As pinion nut is removed, hold hand under pinion to catch it, as it may fall through. Remove "O"

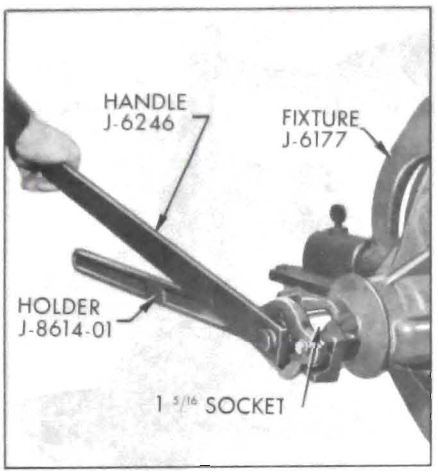

Figure 6-15—Removing Pinion Nut

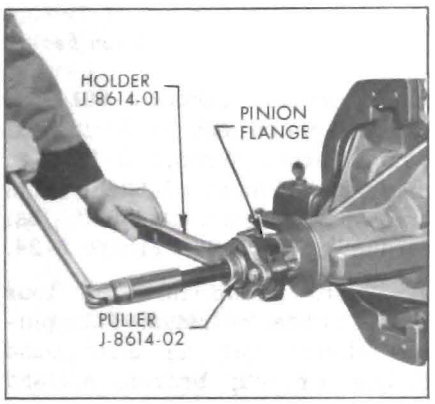

Figure 6-16—Removing Pinion Flange

ring seal from pinion. If necessary, tap pinion out with a soft hammer, being careful to guide pinion with hand to avoid damage to bearing outer races.

6. If rear pinion bearing is to be replaced or pinion depth setting is to be changed, remove rear bearing from pinion shaft using Remover J-9746 and Holder J-6407 in a press or in a set-up using Ram and Yoke Assembly J-6180 as shown in Figure 6-18.

7. Pry pinion oil seal from carrier, being careful not to damage front pinion bearing. If front pinion bearing is to be replaced, drive outer race from carrier using a drift in slots provided for this purpose.

Figure 6-17—Installing Pinion Bearing Remover

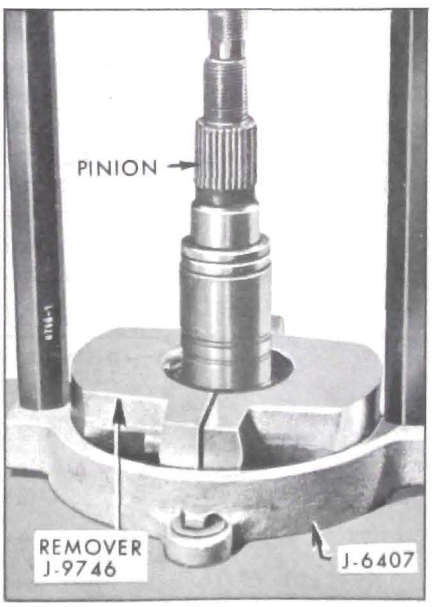

Figure 6-18—Removing Rear Pinion Bearing

8. If rear pinion bearing is to be replaced, drive outer race from carrier using a drift in slots provided for this purpose.

6-8 ASSEMBLY OF CARRIER ASSEMBLY

Before installation of any parts, examine the wearing surfaces of all parts for scoring or unusual wear. Make certain that the interior of the carrier housing is absolutely clean and dry. Also make certain that the parts to be assembled are absolutely clean and that there are no burred edges. Lubricate all parts with the specified rear axle lubricant just before assembly.

NOTE: If the Buick is equipped with a Positive Traction Differential only Positive Traction Lube should be used.

CAUTION: If the ring gear and pinion are changed only factory hypoid lubricant should be used for filling because of its special anti-scoring properties. For this reason the proper lubricant is included in the carton with the replacement gears as received from the Buick warehouses. See paragraph 1-9.

a. Installation of Pinion Bearings

1. Drive front pinion bearing outer race against shoulder in carrier using Replacer J-8611 with driver handle. See Figure 6-19.

2. Drive rear pinion bearing outer race against shoulder in carrier using Replacer J-9745 with driver handle. See Figure 6-20.

3. Place original shim against head of pinion and install rear pinion bearing using Replacer J-6377 and Holder J-6407 with Ring J-6407-2 in a press or as shown in Figure 6-21.

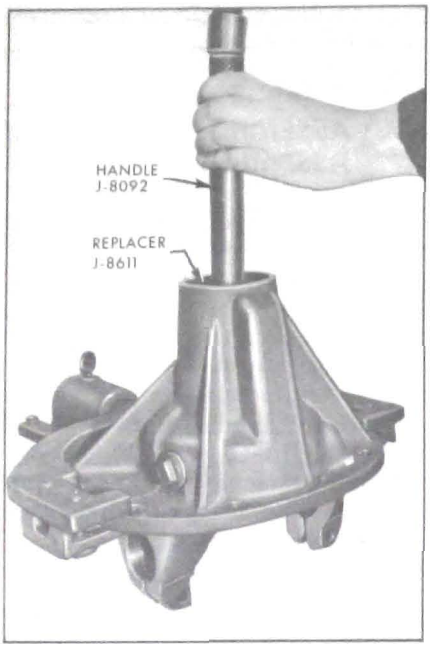

Figure 6-19—Installing Front Pinion Bearing Outer Race

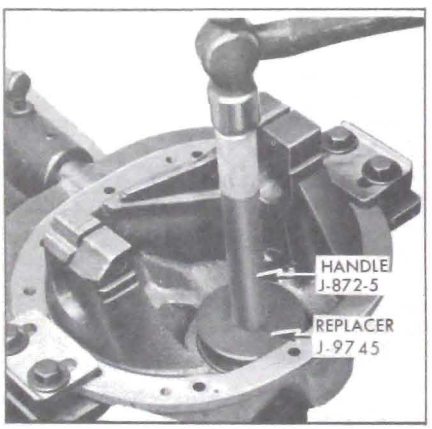

Figure 6-20—Installing Rear Pinion Bearing Outer Race

NOTE: Original shim is used only as a starting adjustment; pinion depth must be checked and readjusted if necessary, as described in subparagraphs c and d below.

4. For a starting pinion bearing preload adjustment, use original pinion preload spacers. Place these spacers on pinion and hold pinion assembly in position in carrier. Oil front pinion bearing

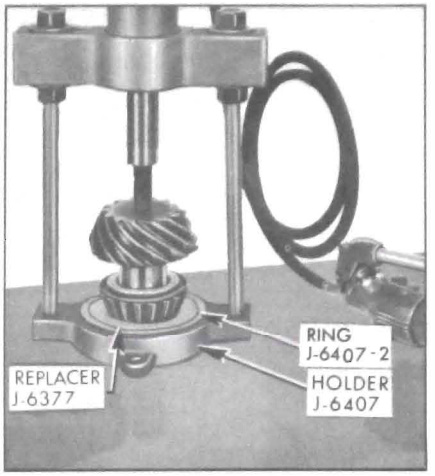

Figure 6-21—Installing Rear Pinion Bearing

and place in position on pinion. Hold pinion in place and drive front pinion bearing over pinion until fully seated using Installer J-21005. See Figure 6-22.

5. Install new "O" ring seal on pinion. Coat O.D. of new pinion seal with sealing compound and install seal using Installer J-21005. See Figure 6-23.

6. Fill space between lips of oil seal with wheel bearing grease and apply a thin coat of the same grease on seal surface of pinion flange. Install pinion flange on pinion by tapping with a soft hammer until a few pinion threads project through the flange. Install pinion washer and nut. Hold pin-

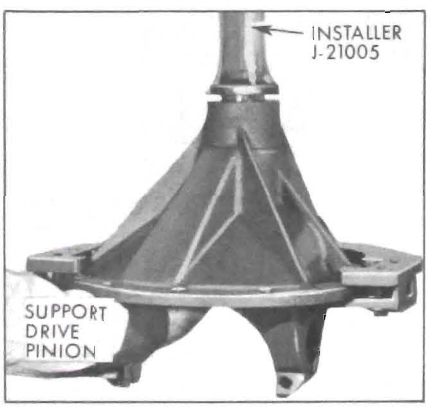

Figure 6-22—Installing Front Pinion Bearing

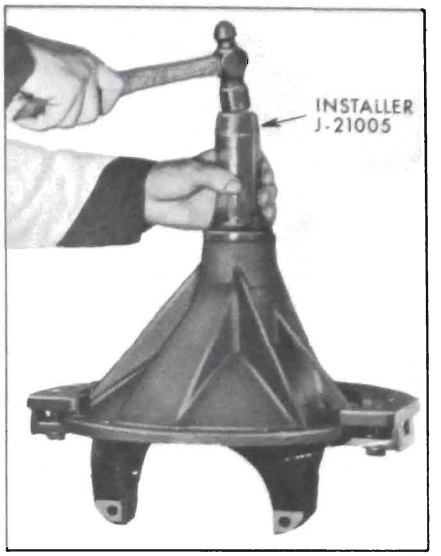

Figure 6-23—Installing Pinion Seal

ion flange with Holder J-8614-01. Torque pinion nut to 80 ft. lbs. using Torque Wrench J-1313 on outer end of Handle J-6246. (This amounts to an actual 250 ft. lbs. torque at nut.) See Figure 6-24.

7. Rotate pinion three or four times to seat bearings. Turn pinion slowly with an inch pound torque wrench; bearing preload including drag of new seal should be 15 to 35 inch pounds. See Figure 6-25.

If preload torque is low, reduce total pinion spacer thickness .001" for each added 10 in. lbs. preload

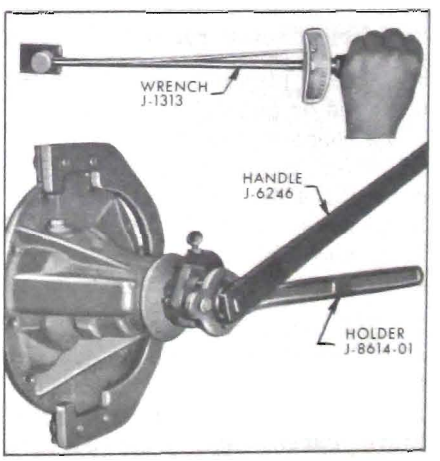

Figure 6-24—Tightening Pinion Nut

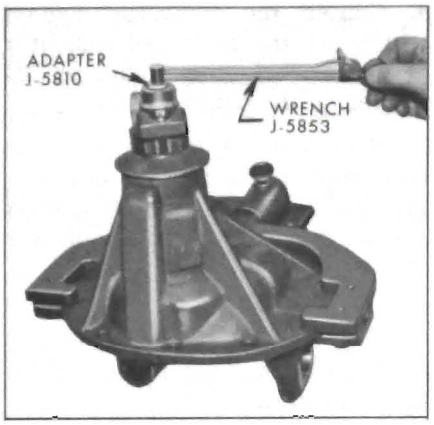

Figure 6-25—Checking Pinion Bearing Pre-Load

is high, increase total pinion spacer thickness .001" for each 10 in. lbs. preload to be subtracted. These spacers are furnished to be used in pairs so that possible thicknesses range from .400" to .470" by thousandths. Service spacers are marked with their thickness in thousandths.

b. Pinion Setting Marks and Setting Gauges

All Buick ring and pinion gear sets are selectively matched for best operating position and proper tooth contact. After matching, a serial number is etched on one tooth of pinion and on rear face of gear to aid in keeping matched parts together. See Figure 6-26. Parts having different serial numbers must never be used together.

Ring and pinion gear sets are matched in a special test machine which permits adjustment of pinion depth in ring gear until a point is reached where best operation and proper tooth contact under load is obtained. At this point, the setting of the pinion with reference to the centerline of the ring gear is indicated by the machine. This setting may vary slightly from the design or "nominal" setting due to allowable variation in machining the parts.

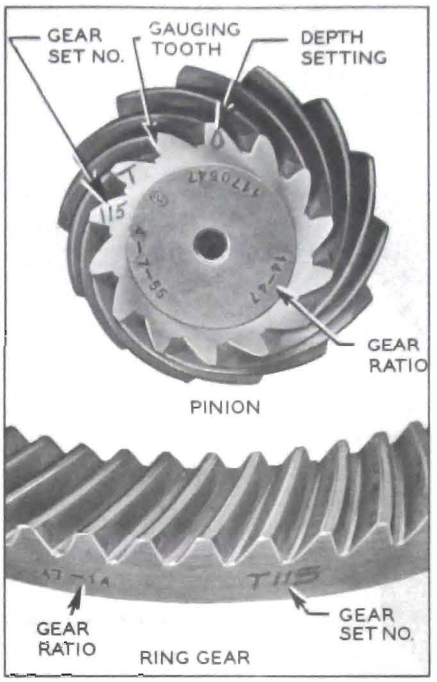

Figure 6-26—Ring and Pinion Gear Set Markings

This variation in thousandths of an inch over or under the "nominal" setting is etched on the small end of a pinion tooth. See Figure 6-26. When a pinion is marked "+" (plus) it means that the rear face of the pinion when pressed in the carrier must be at the "nominal" distance from the centerline of the side bearing pedestals plus the amount indicated on the pinion tooth. When a pinion is marked "-" (minus) it means that it must be located at the "nominal" distance minus the amount indicated on the pinion tooth. See Figure 6-27.

The dial indicator type Pinion Setting Gauge J-5647 is used with adapters to provide a fast and accurate method of checking pinion location; it gives a direct reading on a dial indicator that does not require computation or reference tables. See Figure 6-28.

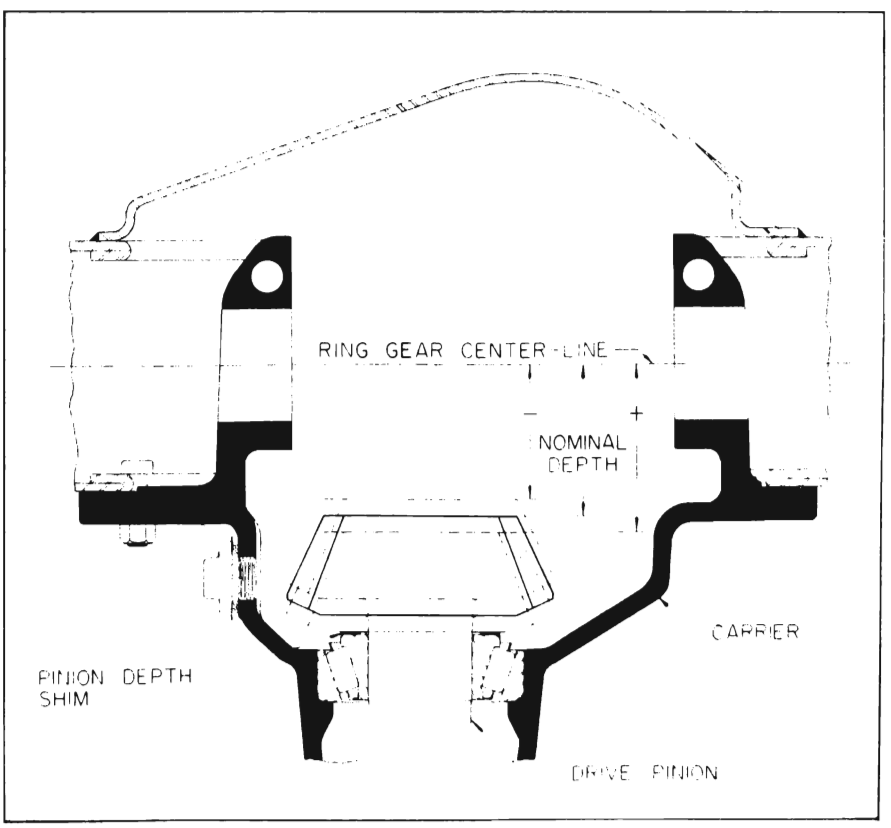

Figure 6-27—Nominal Pinion Depth Setting

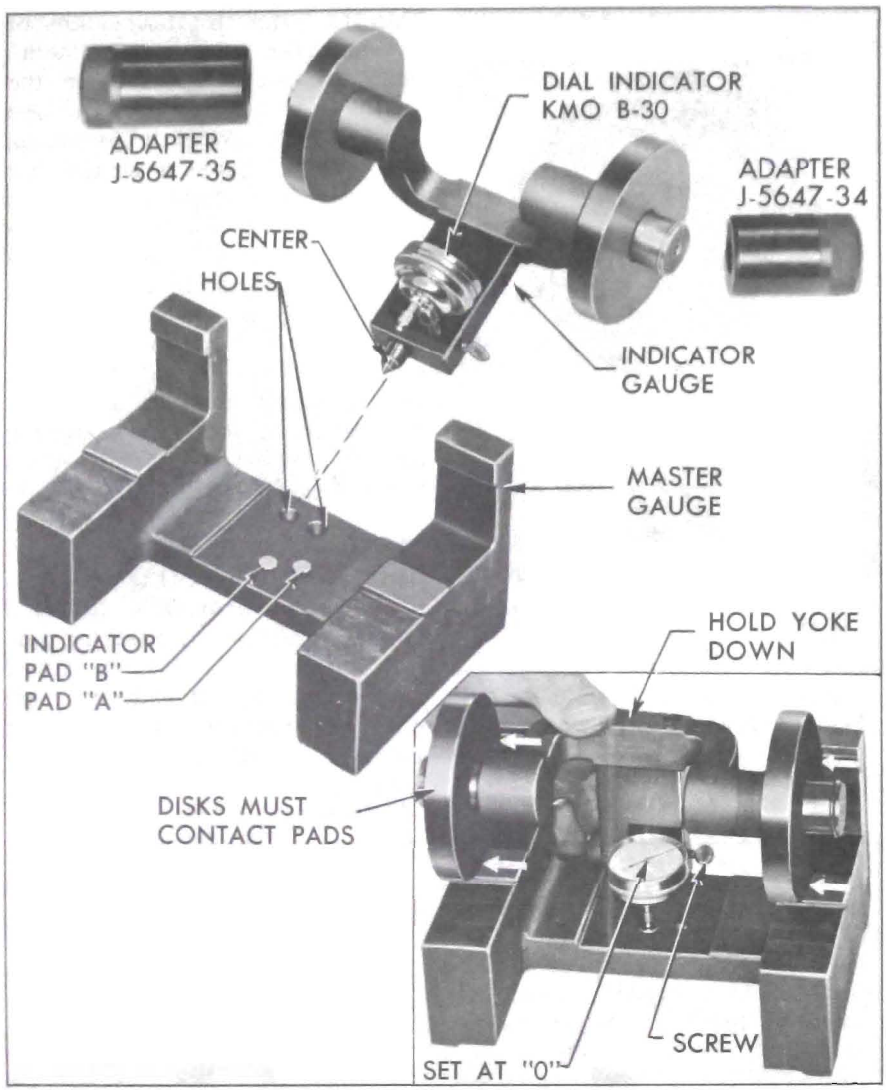

Figure 6-28—Pinion Setting Gauge J-5647 and Adapters

Before checking the pinion setting, pinion bearing preload must be right because incorrect preload will cause a false pinion depth reading.

c. Checking Pinion Depth

Pinion Setting Gauge J-5647 consists of a master gauge and an indicator gauge upon which a dial indicator is mounted. Adapter Set J-5647-17 is not used when zeroing the gauge, but is used in place of the discs when checking the pinion setting. See Figure 6-28.

1. Make certain that the gauge parts are clean, particularly the center and discs of indicator gauge, the centering holes, indicator pads, disc pads on the master gauge, and the adapter holes and outer surfaces.

2. Install the discs on the "indicator gauge" and install the small contact button on the stem of the dial indicator. Mount the dial indicator on the indicator gauge. See Figure 6-28.

3. Place indicator gauge on the master gauge so that the spring loaded center is engaged in the centering hole corresponding to the indicator pad "B".

4. Center the indicator contact button on the specified indicator pad and lock the indicator by tightening the thumb screw.

5. Hold yoke down firmly, with both discs contacting the horizontal and vertical pads on master gauge, and set the dial indicator at zero ("0").

6. Make sure that differential bearing support bores are free of burrs and that the center of the pinion is clean.

7. Rotate the pinion until the black tooth between the matching number and the pinion setting mark is slightly counterclockwise of top center (at about 11 o'clock). This tooth is called the gauging tooth (Figure 6-26) because it is used for locating and gauging during production and should therefore be used for gauging in service.

8. Drive a wedge into each pedestal split and spread them just enough so that Adapters J-5647-34 and -35 will slip in. Then place the indicator gauge in the carrier as follows: (see Figure 6-29).

(a) Remove discs from indicator gauge and hole it in position in the carrier with pins centered in the pedestal bores.

(b) Slide long adapter through pedestal bore farthest from pinion and over gauge pin. Then slide short adapter in place on other side.

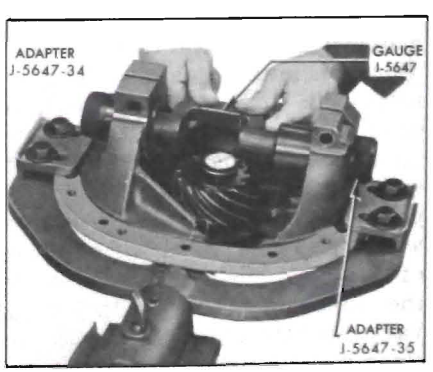

Figure 6-29—Checking Pinion Setting

(c) Be sure that gauge center is engaged in pinion center and that adapters are against shoulders of gauge. Then remove pedestal wedges.

(d) Turn pinion if necessary so that indicator contact button has a good contact with gauging tooth of pinion.

9. Press gauge yoke firmly downward toward pinion and read dial indicator noting whether it is plus (+) or minus (-) as indicated by arrows on surface of yoke.

CAUTION: This reading does not indicate the thickness of the shim to be used, but only indicates the variation from the "nominal" setting of the gauging face of this pinion.

10. Recheck indicator "zero setting" on master gauge with discs to make sure it was not changed in handling.

11. If the old ring and pinion gear set is being reinstalled and it has been in use long enough to establish a wear pattern on teeth, the original pinion setting found before removal should be maintained to avoid changing tooth contact.

12. If the ring and pinion set is new, or has not been in use long enough to establish a wear pattern on teeth, the dial indicator reading should be within .0015" of the pinion setting marked on pinion.

13. If pinion setting is not as specified, adjust as follows:

d. Adjusting Pinion Depth

The pinion setting is adjusted by changing the thickness of the shim which is located between the rear pinion bearing inner race and the head of the pinion. These shims are furnished in thicknesses ranging from .040" to .070" by thousandths.

1. Remove pinion assembly and press off rear pinion bearing using Remover J-9746 and Holder J-6407. (Par. 6-7, b.)

2. Remove shim from pinion, wipe dry and measure its thickness with a micrometer. Service shims are marked with their thickness in thousandths. Measure shim anyway, however, as any slight error here will necessitate pulling pinion and bearing again.

3. Increase or decrease thickness of shim as required to obtain proper pinion setting. See Figure 6-27.

If pinion is marked "+8", but gauge reads "+6", decrease thickness of shim by .002". If gauge reads "+10", increase thickness of shim by .002".

If pinion is marked "-8", but gauge reads "-6", increase the thickness of shim by .002". If gauge reads "-10", decrease thickness of shim by .002".

CAUTION: When a new pinion is to be installed, its depth setting must be gauged. Even though the new pinion has the same depth marking, it may require a different thickness shim because the dimension from the gauging face to the bearing shoulder varies in different pinions.

4. Change preload spacers by same amount that shim thickness was changed. If thickness of shim was decreased .002", use spacers with .002" less thickness. If thickness of shim was increased .002", use spacers measuring .002" thicker.

5. Reinstall rear pinion bearing on pinion with new thickness shim. (Par. 6-8,a.)

6. Reinstall pinion, bearings, and pinion flange carefully in carrier with new thickness preload spacers. Install pinion nut and washer. While holding pinion flange with Holder J-8614-01, tighten pinion nut to 80 ft. lbs. using Torque Wrench J-1313 in outer end of Handle J-6246 as shown in Figure 6-24.

7. Recheck pinion bearing preload to make sure it is still between 15 and 35 in. lbs. Recheck pinion setting with gauge. Setting for new pinion must be within .0015" of setting marked on pinion. Setting for used pinion should be within .0015" of original setting (as checked before disassembly).

e. Assembly of Differential Case, Gears and Bearings

1. Drive differential bearing outer races into case, using Replacer J.9742. See Figure 6-30.

2. Install side gears, pinions, and washers in case. If same parts are used, replace in original sides. Install pinion axle. Drive spring pin through hole in pinion axle until flush with case.

3. Check matching numbers on ring gear and pinion to make sure the two parts have not been mixed with another gear set. See Figure 6-26.

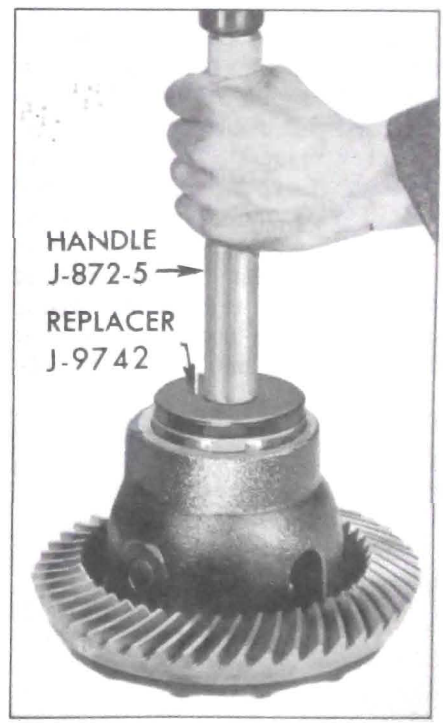

Figure 6-30—Installing Differential Bearing Outer Race

4. After making sure that mating surfaces of case and ring gear are clean and free of burrs, bolt ring gear to case using three Studs J-6251 to align parts. See Figure 6-31. If same ring gear and case are used, line up marks so they are assembled in same relative positions.

Do not use lock washers or any substitute bolts.

5. First tighten bolts alternately on opposite sides of the case to 35 ft. lbs. torque, then tighten in the same manner to 70 ft. lbs.

f. Installation and Adjustment of Ring Gear and Case Assembly

1. Before installation of ring gear and case assembly make sure that differential bearing and bearing support surfaces in carrier pedestals are clean and free of burrs. Remove any burrs which might prevent bearings or bearing supports from seating properly.

2. Place case assembly and differential bearings in position in carrier. If same bearings are used, install in original positions. Insert Support Tools J-9743 through the pedestal bores into the bearing inner races. Press tools toward each other to seat them, using hand pressure. If support tools are loose, install pedestal clamp bolts and nuts and tighten lightly until support tools can just be moved by twisting them. If support tools are too tight, loosen them as necessary by slightly wedging pedestals open with chisels. See Figure 6-32.

3. Rotate the differential assembly three or four times to seat bearing rollers, then manually adjust the whole assembly sideways to get .008" gear backlash. The assembly tools may be tapped lightly with a hammer to seat them. Check backlash as follows:

(a) Mount dial indicator as shown in Figure 6-33. Use a small button on indicator stem so that contact can be made near heel end of tooth. Set dial indicator so that indicator stem is as nearly as possible in line with gear rotation and perpendicular to the tooth surface. If stem bears against edge of tooth, or stem is at considerable angle to the line of gear rotation, or at a considerable angle to face of the tooth, a false indication of backlash will be obtained.

(b) Check gear lash at three or four points around ring gear. Lash must not vary more than .003" around ring gear. If lash varies over .003" check for burrs, uneven bolting conditions, or distorted case flange, and make necessary corrections.

CAUTION: Any gear lash check must be made with pinion locked to carrier to be sure it cannot turn.

(c) Adjust gear lash at the point of minimum lash to .008" for all new gears. If original gear set is being reinstalled, the original lash should be maintained.

4. Measure with a shim between each bearing and its pedestal. Do not remove support tools for measuring. Select shim that measures .002" thicker than largest shim that can be inserted for each side; this should preload each differential bearing .002". These shims are furnished to be used singly in thicknesses ranging from .040" to .082" by two thousandths. Service shims are marked with their thickness in thousandths.

5. Remove support tool farthest from ring gear, insert shim for that side, and replace support tool.

Figure 6-31—Installing Ring Gear on Differential Case

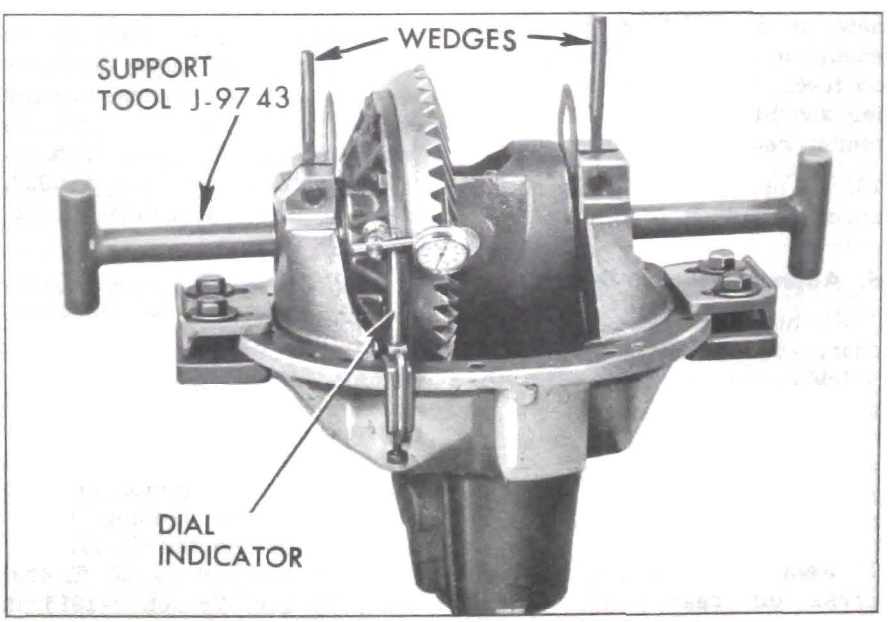

Figure 6-32—Positioning Differential for Correct Backlash

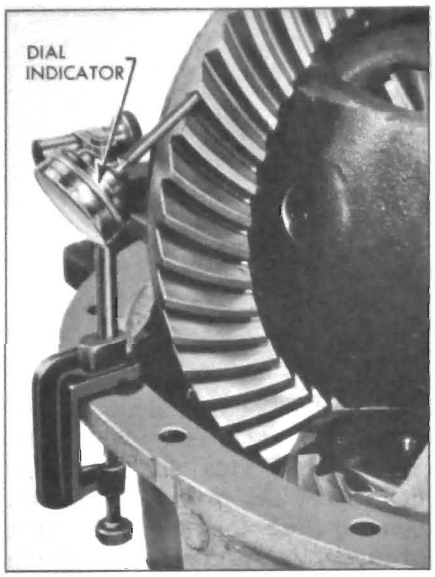

Figure 6-33—Checking Backlash with Dial Indicator

6. Place other shim in position for insertion. While keeping a heavy hand pressure on shim, spread carrier pedestals just enough to start shim, using Spreader J-6185.

CAUTION: Do not spread pedestals any farther apart than is absolutely necessary to push differential shim into position. If pedestals are sprung too far, they may take a permanent set. See Figure 6-34. Leave support tool in position until after shim is started to keep case assembly from dropping out of line.

7. Remove left assembly tool and push shim into final position. Center it first with fingers through pedestal bore, then with a support tool. Remove spreader tool and pedestal wedges.

8. Lubricate support bushings with hypoid gear lubricant. Drive each differential bearing support into its pedestal until seated solidly in the bearing, using Support Tool J-9743. See Figure 6-35. Tighten pedestal clamp bolts and nuts to 50 ft. lbs.

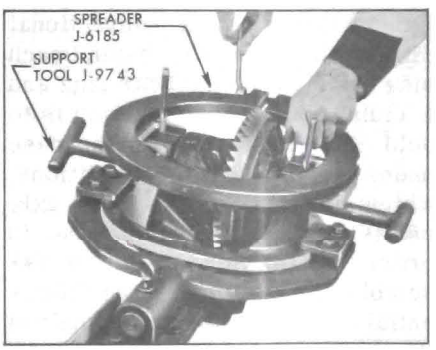

Figure 6-34—Installing Differential Bearing Shims

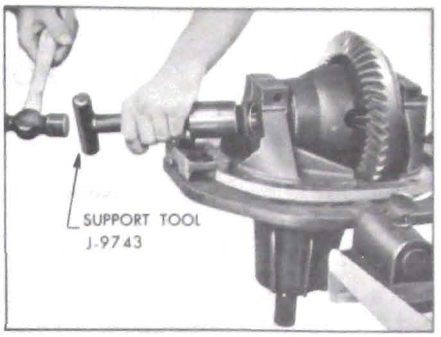

Figure 6-35—Installing Differential Bearing Supports

9. Recheck backlash as in Step 3. Final backlash must be .007"-.009" at point of minimum lash, with not more than .003" variation around gear.

10. Add lubricant and fill to level of filler plug opening to 1/4" below.

CAUTION: If the ring gear and pinion are changed only factory hypoid lubricant should be used for filling because of its special anti-scoring properties. For this reason the proper lubricant is included in the carton with the replacement gears as received from the Buick warehouses. See paragraph 1-9.