

MAZDA

GLC
626
B2000
RX7

DESCRIPTION

Axle housing is banjo type with removable differential carrier and semi-floating axle shafts. Ring and pinion are hypoid type, in which centerline of pinion is set below centerline of ring gear. Differential case may be either two pinion or four pinion design. The axle shafts are retained in housing by ball bearings and bearing retainers at axle housing outer ends.

AXLE RATIO & IDENTIFICATION

All Mazda models use one basic type of rear axle assembly. Any differences in Removal & Installation or Overhaul procedures will be noted where they occur. To determine axle ratio, divide number of ring gear teeth by number of pinion teeth.

REMOVAL & INSTALLATION

AXLE SHAFTS & BEARINGS

Removal (All Exc. Pickup) — Remove wheel and tire assembly and brake drum or disc. Remove brake shoes and return springs (drum brake models). Remove center cap adapter (if equipped). Remove brake backing plate and bearing retainer to axle housing. Use slide hammer and adapter to remove axle shaft assembly from housing.

Bearing Replacement (All Exc. Pickup) — 1) Remove axle bearing and collar using a press and a suitable bearing adapter.

NOTE — If pressure necessary to remove bearing exceeds 10 tons (7 tons on GLC & RX7), or if bearing adapter is not available, grind bearing retaining collar down and cut with a chisel to remove.

2) To reassemble, apply a light coat of oil to axle shaft and place bearing retainer and spacer on shaft. Position bearing on shaft with sealed side toward axle shaft flange, then press bearing on shaft until spacer contacts shaft shoulder. Next, press bearing retaining collar on shaft until it seats firmly against bearing.

NOTE — Do not press bearing and collar on shaft at the same time. In addition, if collar is installed with less than 2.5 tons (2.7 tons on GLC & RX7) pressure, replace with a new part.

Installation (All Exc. Pickup) — 1) Apply a light coat of grease to oil seal in axle housing. Check axle shaft end clearance as follows: Install backing plate and gasket temporarily and measure depth of bearing seat in axle housing. Then, measure width of axle bearing outer race. The difference between the two measurements indicates the required thickness of shim.

2) Shims are available in .028" (.7 mm) thickness for RX7 and .004" (.1 mm) and .016" (.4 mm) thicknesses for all other models. After selecting correct shim pack, apply sealant to shims and position brake backing plate and shims on axle housing. Install axle shaft assembly in housing using a new gasket, then install and tighten retainer bolts. At this time, recheck end play; maximum end play allowable is .004" (.1 mm). Install brake shoes, return springs, brake drum, and wheel and tire assembly.

Removal (Pickup) — Remove wheel and tire assembly, then remove brake drum and brake shoes. Remove parking brake cable retainer and disconnect brake lines at wheel cylinders. Remove nuts attaching backing plate and bearing housing to axle housing, then pull axle shaft, backing plate, bearing housing assembly, and shims off axle housing.

Bearing Replacement (Pickup) — Straighten tabs of lock washer, and using suitable spanner wrench (49 0603 622A), remove lock nut and lock washer. Using a puller, withdraw bearing and housing assembly from axle shaft, then remove backing plate. Remove bearing and oil seal from housing. To reassemble, reverse disassembly procedure.

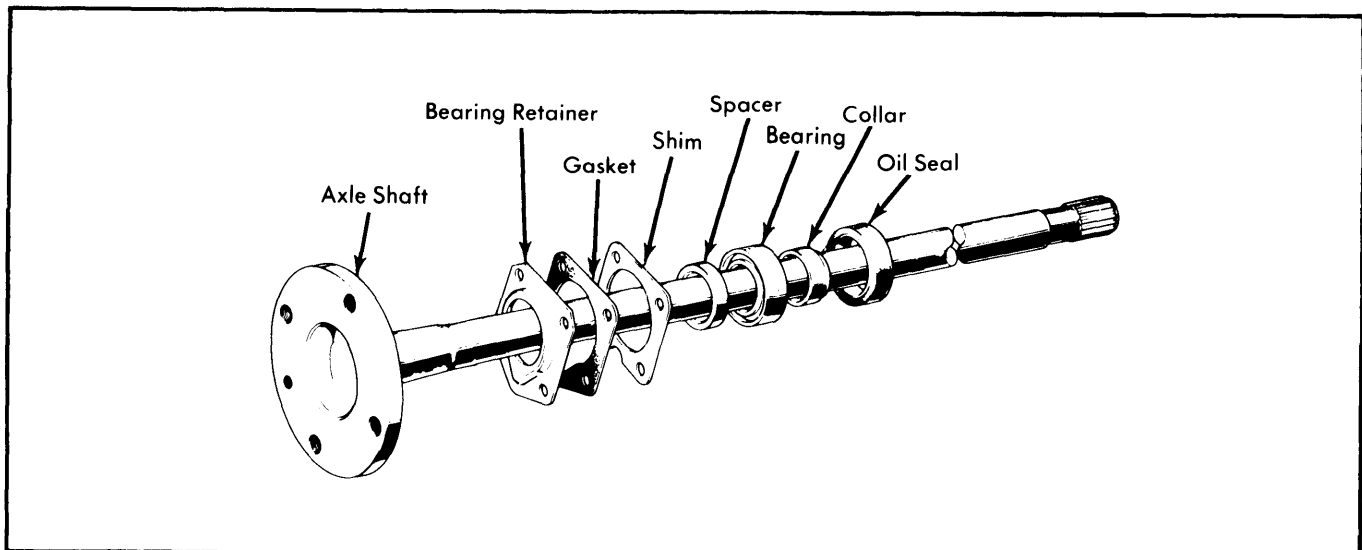


Fig. 1 Axle Shaft Assembly (Except Pickup)

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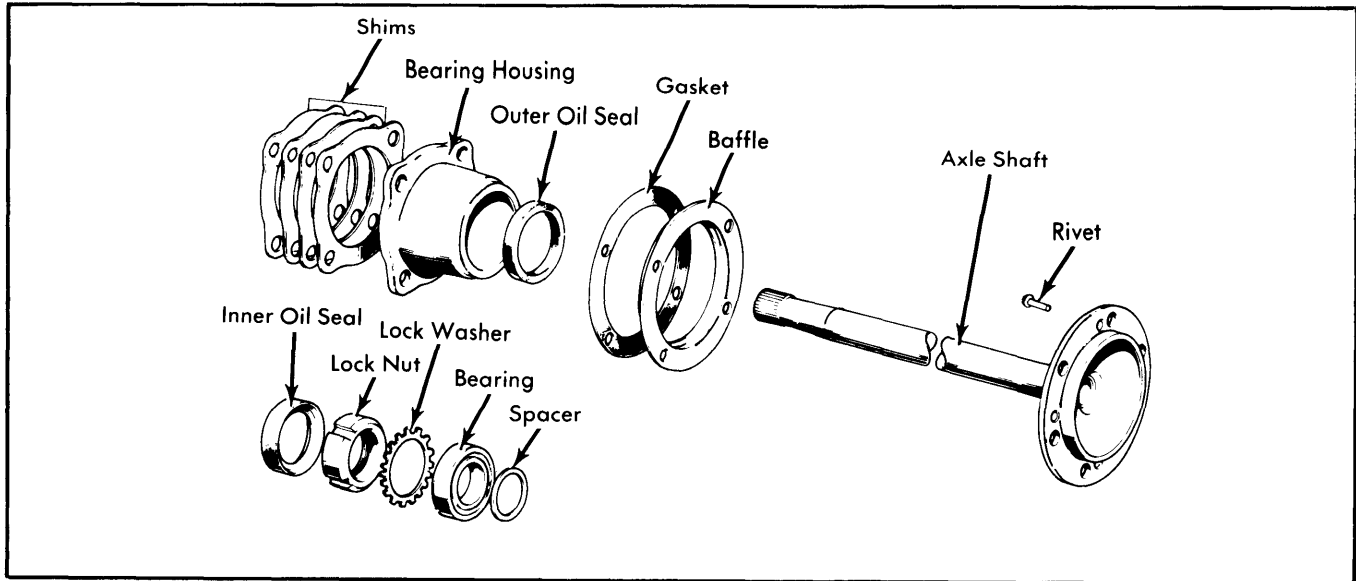


Fig. 2 Axle Shaft Assembly (Pickup)

Installation (Pickup) – 1) Install axle shaft, backing plate, and bearing housing to rear axle housing, temporarily attaching with two bolts and nuts. Mount dial indicator on backing plate and check axle shaft end play. End play should be .002-.006" (.05-.15 mm).

NOTE – If both axle shafts were removed, a special procedure must be followed: The end play for the first axle shaft installed should be set to .026-.033" (.65-.85 mm). The second axle shaft installed should be set to the normal end play of .002-.006" (.05-.15 mm).

2) After installing correct shim pack, install and tighten all attaching bolts and nuts. Install brake shoes and drum. Connect fluid lines to wheel cylinders, adjust brakes, and bleed system. Install wheel and tire assembly.

DIFFERENTIAL CARRIER

Removal – Raise vehicle until rear wheels are clear of ground. Remove drain plug and drain rear axle lubricant, reinstall plug and tighten. Remove axle shafts. Mark propeller shaft and pinion flange for reassembly reference, then disconnect propeller shaft. Remove carrier attaching nuts and withdraw carrier from axle housing.

Installation – To install, reverse removal procedure, making sure to refill axle with lubricant.

OVERHAUL

DISASSEMBLY

1) Mount carrier in a suitable repair stand. Punch identification marks on side bearing supports of carrier, differential bearing caps and side bearing adjusters. Remove adjuster lock plates, loosen bearing cap attaching nuts or bolts, and slightly back off adjusters to relieve preload.

2) Remove bearing caps and adjusters, then withdraw differential assembly from carrier, making sure side bearing races remain with their respective bearings. If necessary for replacement, use a suitable puller and remove side bearings from gear case. Straighten lock tabs, remove ring gear attaching bolts, and separate ring gear from gear case.

3) Drive out differential pinion shaft lock pin with a punch and remove pinion shaft. Rotate pinion gears 90° and remove gears, thrust washer, thrust block (if equipped) and differential side gears.

4) Remove pinion nut and pinion flange. Remove drive pinion and rear bearing assembly, adjusting shims (if equipped), spacer and bearing collar (if used). Remove front oil seal and withdraw front pinion bearing. Using a press, remove rear bearing from drive pinion, then lift off pinion adjusting shim. If necessary for replacement, use a drift punch and remove pinion bearing races from carrier.

NOTE – It may be necessary to tap end of pinion with a soft hammer to remove from carrier.

REASSEMBLY & ADJUSTMENT

NOTE – The use of a suitable dial indicator assembly and pinion gauging set (49 0305 555 on 626, 49 0660 555 on all others) is required for this procedure.

Drive Pinion Depth – 1) Install dial indicator on gauge body, place gauge body on a surface plate and preload indicator. When preloaded, turn outer ring of indicator assembly to "O" gauge.

2) Make sure differential bearing bores are free of dirt and burrs, then install drive pinion, dummy bearing, and original pinion depth shim into carrier. Place gauge block on pinion and position indicator assembly on block so button of indicator contacts lowest portion of differential bearing bore.

Drive Axles

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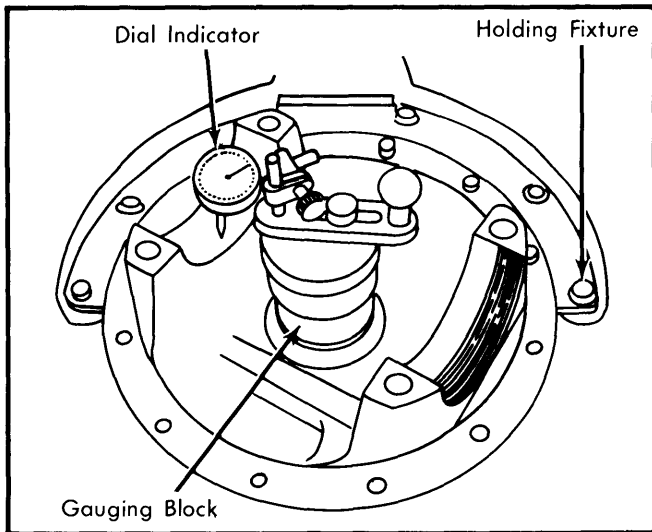


Fig. 3 Measuring Drive Pinion Installed Height

3) Record the amount indicator moves in a "+" (plus) or "-" (minus) direction from zero. Remove gauging assembly and pinion from carrier. Check rear face of pinion for the machining correction figure. If pinion is marked "+" (plus), SUBTRACT amount specified on pinion from dial indicator reading; if marked "-" (minus), ADD amount to indicator reading.

NOTE — Figures on pinion are hundredth millimeters.

4) Place dummy bearing and rear pinion bearing on surface plate and compare heights. If pinion bearing is higher than dummy bearing, SUBTRACT difference from dial indicator reading; if pinion bearing is lower than dummy bearing, ADD amount to indicator reading.

5) Select correct pinion depth adjusting shim to be used for reassembly by adding or subtracting the amount determined in steps 2), 3) and 4) from the thickness of the original pinion depth shim used during gauging process. Position correct shim on pinion and install pinion bearing.

Pinion Depth Adjusting Shims	
Identification Mark	Thickness In. (mm)
08 .....	.121 (3.08)
11 .....	.122 (3.11)
14 .....	.124 (3.14)
17 .....	.125 (3.17)
20 .....	.126 (3.20)
23 .....	.127 (3.23)
26 .....	.128 (3.26)
29 .....	.130 (3.29)
32 .....	.131 (3.32)
35 .....	.132 (3.35)
38 .....	.133 (3.38)
41134 (3.41)
44135 (3.44)
47137 (3.47)

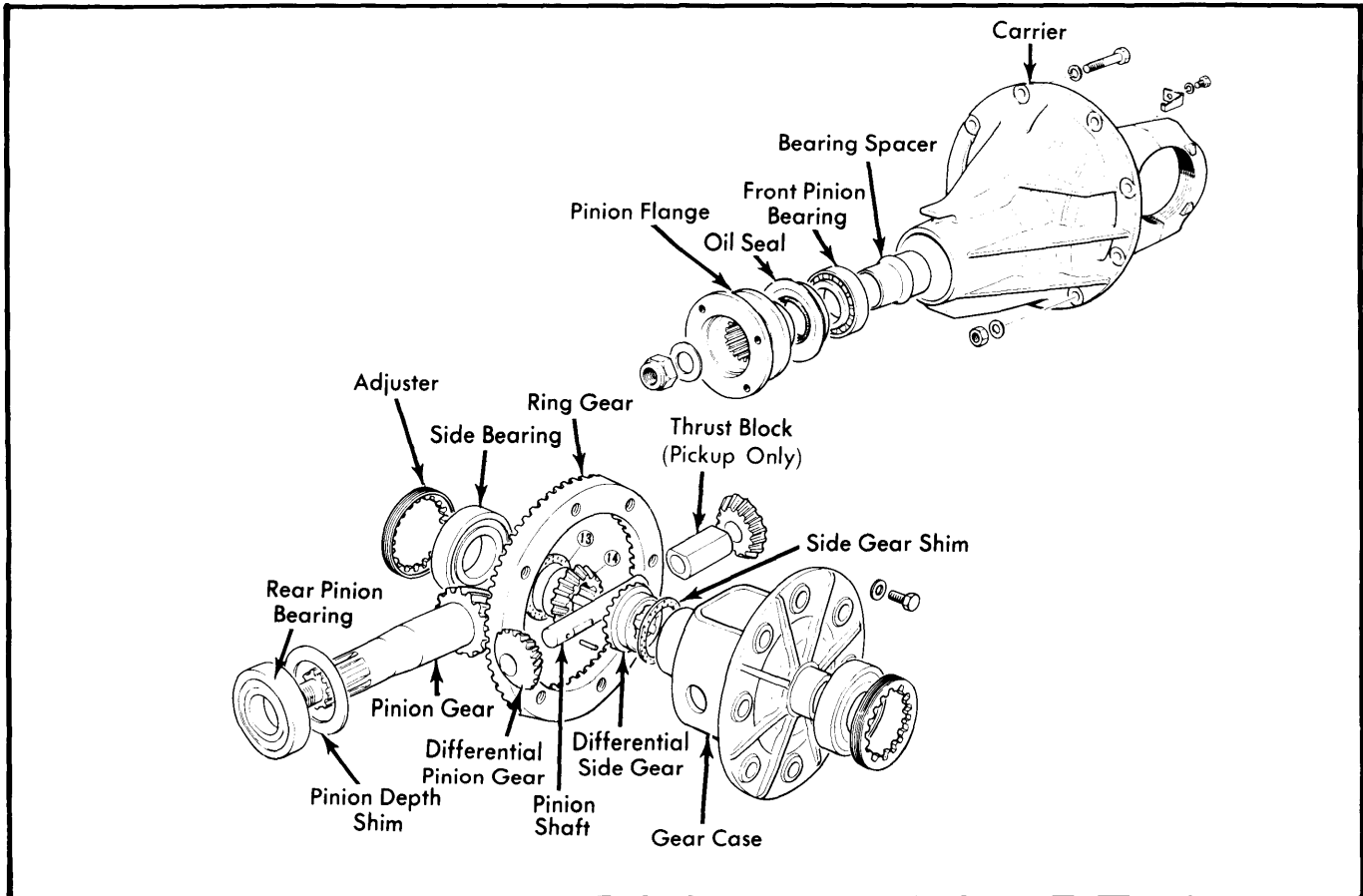


Fig. 4 Exploded View of Mazda Rear Axle Assembly

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Pinion Bearing Preload — 1) Position drive pinion in carrier and install bearing spacer. Place front pinion bearing into position on pinion gear, hold gear fully forward and drive bearing over pinion until seated. Apply grease to lip of pinion oil seal and install seal into carrier. Install flange on pinion by tapping with a soft hammer. Install pinion washer and nut. Before tightening nut (when pinion preload is zero), check oil seal drag using a torque wrench. Tighten pinion nut as shown in chart.

Initial Pinion Nut Torque	
Application	Ft. Lbs. (mkg)
GLC	87 (12)
Pickup	145 (20)
All Others	94 (13)

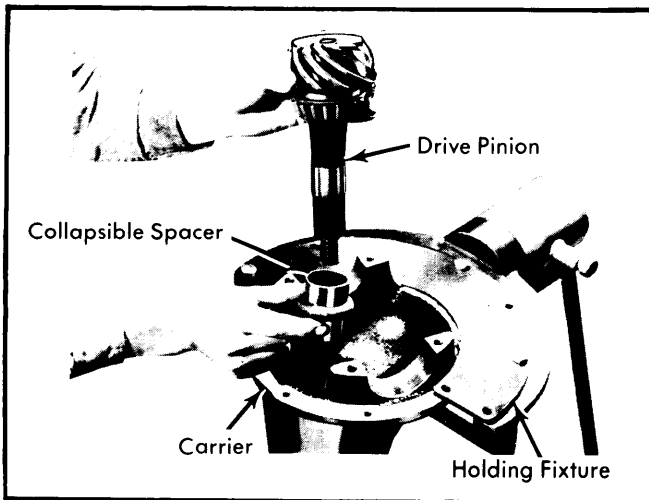


Fig. 5 Installing Drive Pinion Bearing Collapsible Spacer

2) With nut tightened, check preload using a torque wrench mounted on pinion nut. If preload is not as specified (see Axle Assembly Specifications), continue tightening nut and checking preload until specified preload is obtained.

CAUTION — Preload builds quickly. Nuts should be tightened a little at a time and preload checked after each slight amount of tightening.

Case Assembly — 1) Install a thrust washer on each differential side gear and install into case. Through openings in gear case, insert pinion gears exactly 180° opposite each other. Rotate pinion gears 90° so holes in gears line up with pinion shaft holes in gear case. Insert pinion shaft through case and pinion gears.

2) Check backlash between side gears and pinion gears. Backlash should be less than .008" (.2 mm) on pickup and less than .004" (.1 mm) on all other models. If not, install selective thrust washers to bring backlash within specifications.

NOTE — Always use same thickness thrust washer for both side gears.

3) If equipped with thrust block, remove pinion shaft, install thrust block and reinstall pinion shaft. On all models, install lock pin into case to secure pinion shaft. Using a punch, stake lock pin hole to prevent pin from working loose. On all models, mount ring gear on case, then install and tighten ring gear attaching bolts. If removed, install differential side bearings.

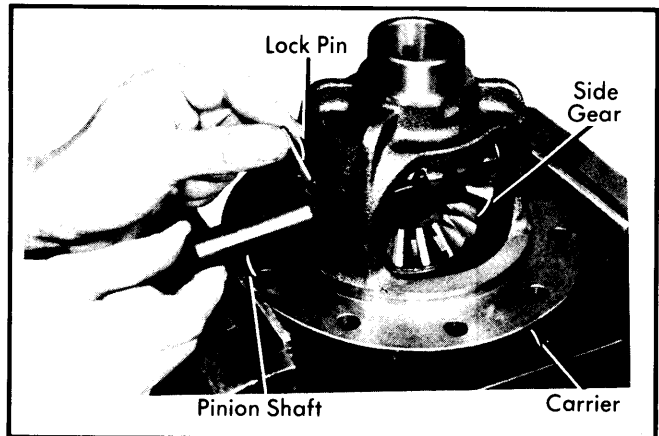


Fig. 6 Installing Pinion Shaft and Lock Pin

Backlash & Side Bearing Preload — 1) Place differential case assembly into carrier making sure index marks on ring and pinion gears are aligned. Install bearing adjusters and bearing caps, then tighten bearing cap nuts or bolts finger tight. Turn adjusters with a suitable spanner wrench (49 0259 720) until bearing end play is eliminated and some backlash exists between ring gear and pinion. Slightly tighten one bearing cap nut or bolt on each side of carrier and measure backlash.

2) Mount a dial indicator to carrier flange so button of indicator contacts one of the ring gear teeth at a right angle, then check backlash between ring and pinion gears. Using the spanner wrench, turn both bearing adjusters equally until backlash is as specified in Axle Assembly Specifications.

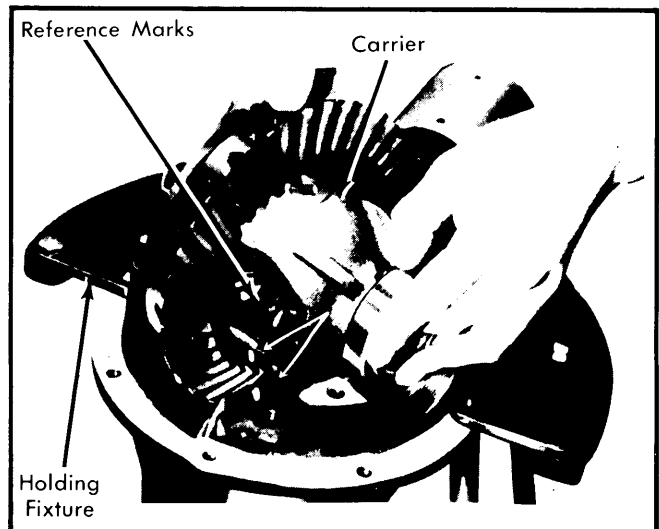


Fig. 7 Installing Differential Assembly in Housing

Drive Axles

MAZDA (Cont.)

3) Differential bearing preload (case spread) is obtained by tightening both bearing adjusters equally. Tighten adjusters until the distance between pilot sections of side bearing caps is 6.5133-6.5158" (165.437-165.50 mm) on GLC, 7.3004-7.3033" (185.43-185.50 mm) on 626 & RX7 or 8.0485-8.0513" (204.428-204.50 mm) on pickup. Tighten bearing cap nuts or bolts, then recheck backlash adjustment. Make a gear tooth pattern check to insure correct assembly, then install adjuster lock plates on bearing caps.

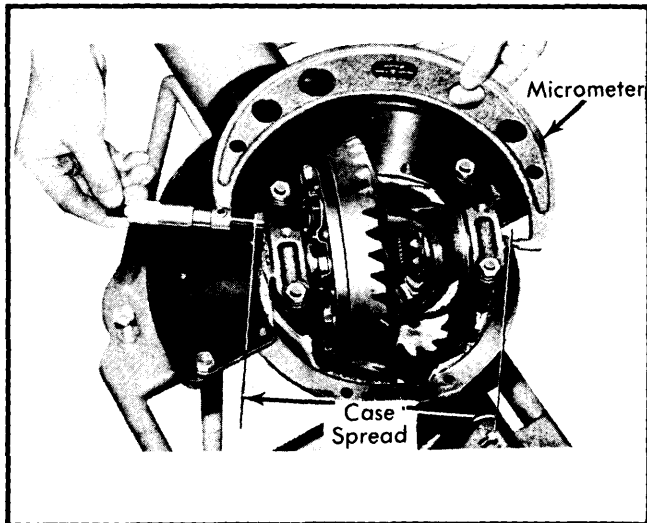


Fig. 8 Adjusting Differential Bearing Preload (Case Spread)

AXLE ASSEMBLY SPECIFICATIONS

Application	Specification
Pinion Bearing Preload	
GLC	2.6-6.1 INCH lbs. (3-7 cmkg)
Pickup	11.3-15.6 INCH lbs. (13-18 cmkg)
All Others	7.8-12.2 INCH lbs. (9-14 cmkg)
Ring & Pinion Backlash	
GLC .....	.0059-.0067" (.15-.17 mm)
Pickup .....	.0075-.0083" (.19-.21 mm)
All Others .....	.0035-.0043" (.09-.11 mm)
Side Bearing Preload	
GLC	4-9 INCH lbs. (5-10 cmkg)
Pickup	4-13 INCH lbs. (5-15 cmkg)
All Others	5-14 INCH lbs. (6-16 cmkg)
Side Gear & Pinion Backlash	
Pickup	0-.008" (0-0.2 mm)
All Others	0-.004" (0-0.1 mm)

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Pinion Nut	
GLC	87-130 (12-18)
Pickup	145-253 (20-35)
All Others	94-130 (13-18)
Ring Gear-to-Differential Case	
RX7	47-54 (6.5-7.5)
All Others	54-61 (7.5-8.5)
Differential Bearing Cap Bolts	
GLC	23-34 (3.2-4.7)
Pickup	41-59 (5.6-8.2)
All Others	27-38 (3.8-5.3)