MAZDA

GLC Wagon
626
RX7
B2000 Pickup

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 2-pinion or 4-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 – 1) Raise and support vehicle; remove tire and wheel. Remove brake drum and brake shoes. Disconnect and plug hydraulic line from wheel cylinder. Disconnect parking brake cable. From inboard side of backing plate, remove 4 nuts from axle housing through bolts. Pull axle shaft, backing plate, bearing housing (pickup) and shims (if equipped) from axle housing with suitable puller. Remove oil seal from axle housing.

2) To replace rear bearings on Pickup, flatten locking tabs of lock washer. Loosen lock nut with spanner wrench (49 0259 710A). Remove lock nut and washer. Using a puller, remove bearing and housing assembly from axle shaft. Remove backing plate. Remove bearing and oil seal from housing. To reassemble, reverse disassembly procedure.

3) To replace rear bearings on all models except pickup, mount axle shaft assembly in vise or mounting fixture. Carefully grind down bearing collar, then chisel collar off without damaging axle shaft. Remove bearing and backing plate, using puller if required. Install backing plate and spacer on shaft (chamfered edge of spacer must face axle shaft flange). Press bearing onto shaft until seated, then press new bearing collar onto shaft without any lubricant.

CAUTION – *Do not press bearing and collar onto shaft at the same time. If bearing collar is installed with less than 2.7 tons pressure, replace bearing collar.*

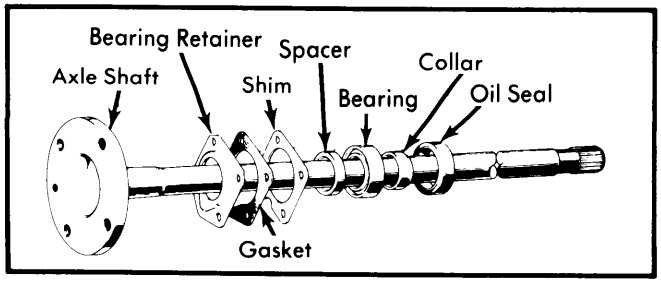

Fig. 1 Exploded View of Axle Shaft Assembly (Except Pickup)

Installation – 1) Apply a light coat of grease to oil seal and install oil seal in housing. Temporarily mount axle shaft and backing plate on axle housing with mounting nuts. Install dial indicator on backing plate and check axle shaft end play. End play should be .002-.006" (.05-.15 mm) on pickup and 0-.004" (0-.1 mm) on all other models.

2) On pickup only, if both axle shafts were removed, the end play of each shaft must be measured separately. The end play for first axle shaft installed should be .026-.033" (.65-.85 mm). The end play for the second axle shaft installed should be set to normal end play clearance of .002-.006" (.05-.15 mm).

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

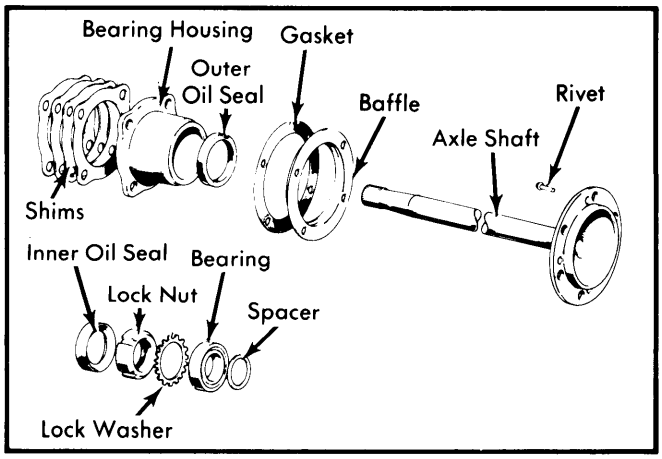

Fig. 2 Exploded View of Pickup Axle Shaft Assembly

DIFFERENTIAL CARRIER

Removal — Raise and support vehicle with jack stands. Remove drain plug and drain rear axle lubricant. Remove axle shafts. Mark propeller shaft and pinion flange for reassembly reference. 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.

MAZDA (Cont.)

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 and pinion gauging set (49 0727 570) and block (49 8531 555 for GLC Wagon, 49 0660 555 for pickup, 49 0305 555 for 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.

NOTE – *DO NOT install collapsible spacer.*

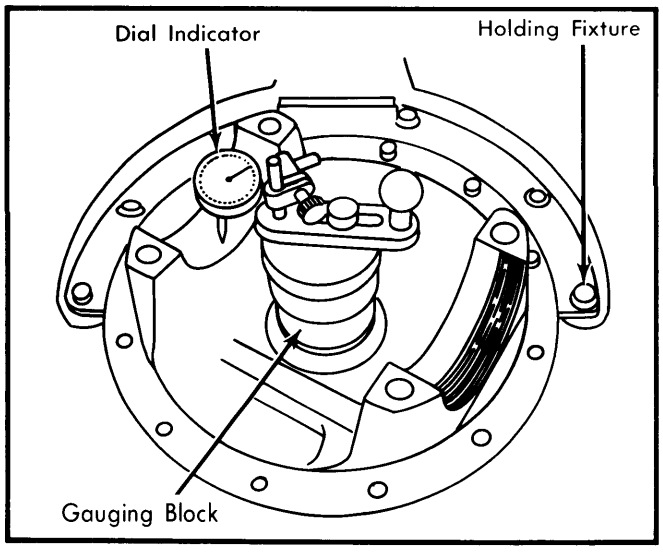

Fig. 3 Measuring Drive Pinion Installed Height

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) Select correct pinion depth adjusting shim to be used for reassembly by adding or subtracting the amount determined in steps **2)** and **3)** from the thickness of the original pinion depth shim used during gauging process. Position correct shim (from chart) 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)
41	.134 (3.41)
44	.135 (3.44)
47	.137 (3.47)

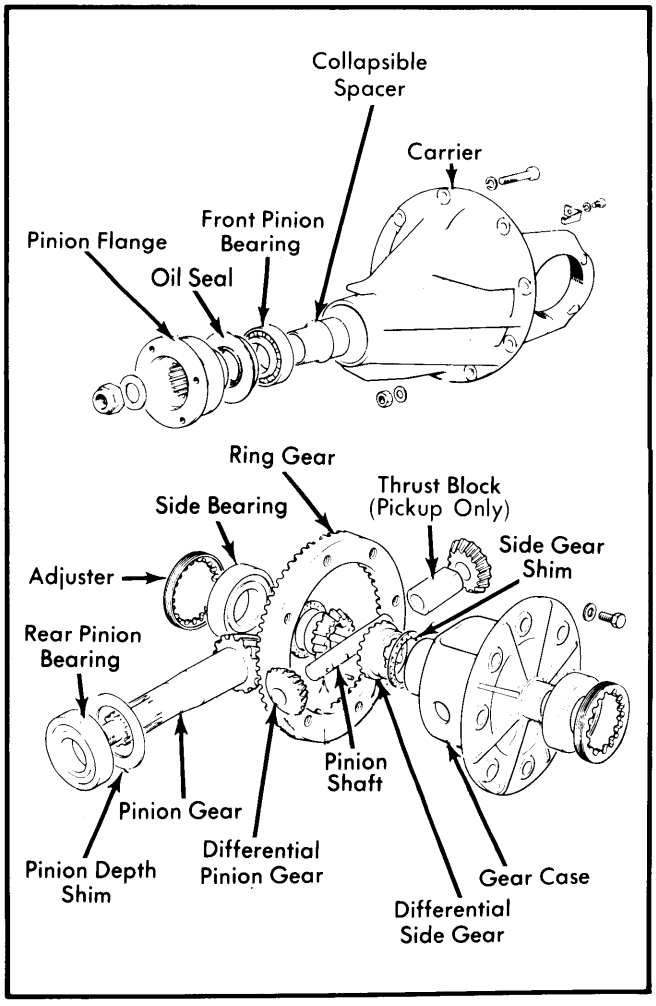

Fig. 4 Exploded View of Mazda Rear Axle Assembly

MAZDA (Cont.)

Pinion Bearing Preload — 1) Install collapsible spacer onto drive pinion assembly and install in carrier. Place front bearing in position on pinion. Hold pinion fully forward and drive pinion bearing over pinion until seated.

2) Apply grease to pinion oil seal lip and install seal into carrier. Install flange on pinion by tapping with 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 to initial torque specifications as shown in chart.

Initial Pinion Nut Torque

Application	Ft. Lbs. (N.m)
GLC Wagon	87 (118)
Pickup	145 (197)
All Others	94 (128)

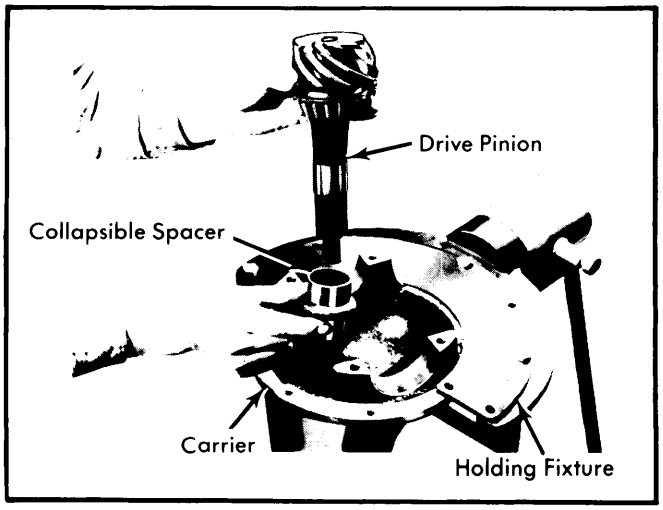

Fig. 5 Installing Drive Pinion Bearing Collapsible Spacer

3) With nut tightened to initial torque value, check preload using a torque wrench mounted on pinion nut. If preload is not as specified in specification table, 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.

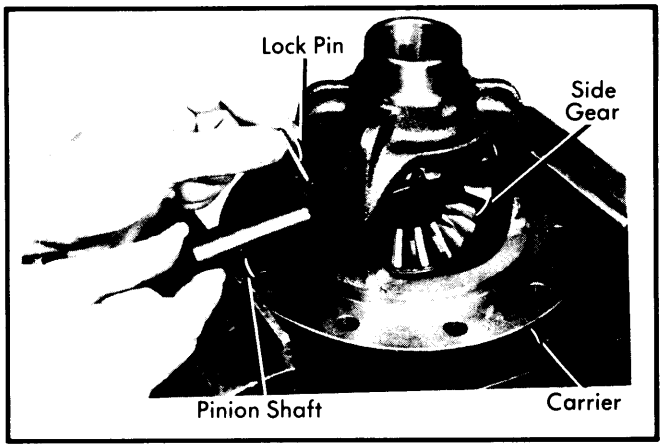

Fig. 6 Installing Pinion Shaft and Lock Pin

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.

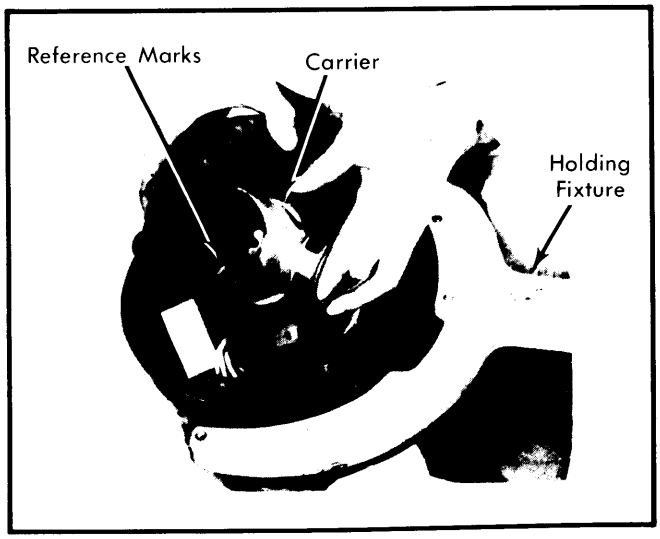

Fig. 7 Installing Differential Assembly in Housing

MAZDA (Cont.)

3) Differential bearing preload (case spread) is obtained by tightening both bearing adjusters equally. Tighten adjusters until distance between pilot sections of side bearing caps is 6.5133-6.5158" (165.437-165.50 mm) on GLC Wagon, 7.3004-7.3033" (185.43-185.50 mm) on 626 & RX7 or 8.0485-8.0513" (204.428-204.50 mm) on Pickup.

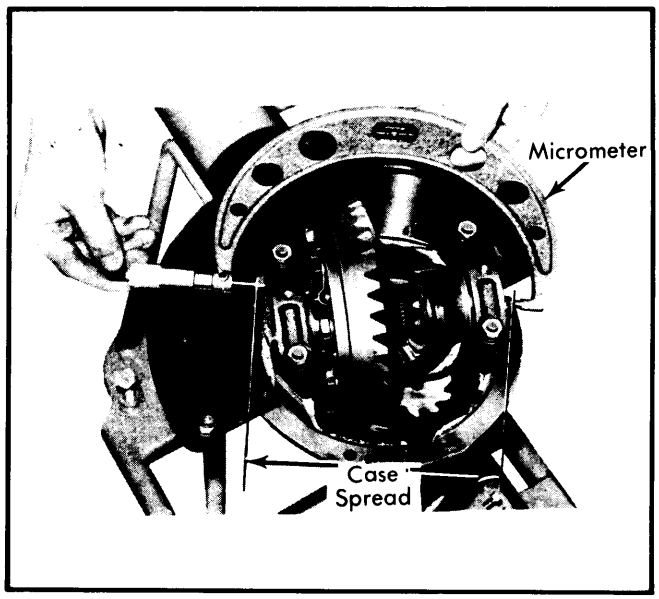

Fig. 8 Adjusting Differential Bearing Preload (Case Spread)

AXLE ASSEMBLY SPECIFICATIONS

Application	Specification
Pinion Bearing Preload①	
GLC Wagon	2.6-6.1 INCH lbs. (.29-.68 N.m)
Pickup	11.3-15.6 INCH lbs. (1.27-1.76 N.m)
All Others	7.8-12.2 INCH lbs (.88-1.37 N.m)
Ring & Pinion Backlash	
GLC Wagon	.0059-.0067" (.15-.17 mm)
Pickup	.0075-.0083" (.19-.21 mm)
All Others	.0035-.0043" (.09-.11 mm)
Side Bearing Preload	
GLC Wagon	4-9 INCH lbs. (.45-1.01 N.m)
Pickup	4-13 INCH lbs. (.45-1.47 N.m)
All Others	5-18 INCH lbs. (.56-2.03 N.m)
Side Gear & Pinion Backlash	
Pickup	0-.008" (0-0.2 mm)
All Others	0-.004" (0-0.1 mm)

①— Without oil seal installed.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Pinion Nut	
GLC Wagon	87-130 (118-177)
Pickup	145-253 (197-344)
All Others	94-130 (128-177)
Ring Gear-to-Differential Case	
RX7	51-61 (69-83)
All Others	54-61 (73-83)
Differential Bearing Cap Bolts	
GLC Wagon	23-34 (31-46)
Pickup	41-59 (56-80)
All Others	27-38 (37-52)