

This file is available for free download at <http://www.iluvmyrx7.com>

This file is fully text-searchable – select Edit and Find and type in what you’re looking for. This file is intended more for online viewing than printing out so some graphics may not print 100% legibly, you can zoom in on them if you need to.



www.iluvmyrx7.com

ARTICLE BEGINNING

1984 Clutch

Mazda: B2000, 2200, RX7

DESCRIPTION

The clutch assembly for all models is a single plate, dry disc, diaphragm spring type. The clutch release system used on RX7, B2000 and B2200 Pickups is hydraulic, using a firewall-mounted master cylinder and a slave cylinder attached to the clutch housing.

REMOVAL & INSTALLATION

CLUTCH ASSEMBLY

Removal

1) Disconnect negative battery cable. Place shift lever in Neutral. Remove shift knob. Remove console box (if equipped). Remove shift lever dust boot, lever and related components. On RX7, remove air cleaner.

2) On all models, raise and support vehicle. Drain transmission. Remove drive shaft. Remove under covers. Remove any interfering exhaust components. Remove clutch slave cylinder without discharging system.

3) On all models, remove starter, speedometer cable and related electrical connections. Place support under rear end of engine. Remove bolts attaching transmission to engine. Remove crossmember.

4) Slide transmission back until input shaft is clear of bell housing. Remove transmission from vehicle. Install Flywheel Holding Tool (49 0118 271A) for B2000, (49 E301 060) for B2200 or (49 1881 060) for RX7. Index mark pressure plate-to-flywheel position.

5) Install clutch assembly Alignment Tool (49 SE01 310). Loosen pressure plate mounting bolts evenly, in a diagonal pattern. Remove clutch disc and pressure plate. Remove release bearing and fork. See Fig. 1.

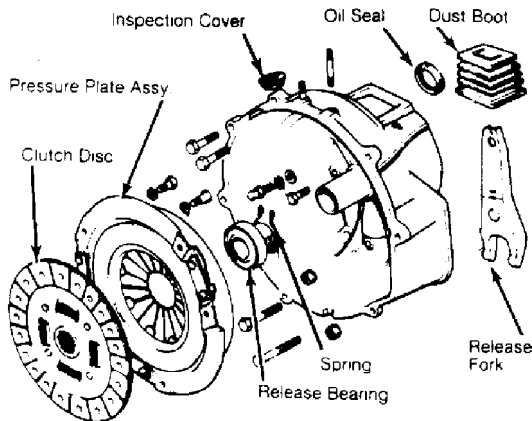


Fig. 1: Exploded View of RWD Clutch Assembly

Inspection

1) Check disc for loose rivets, worn springs or oil contamination. Minimum lining height above rivet heads is .012" (.).

30 mm). On RX7, minimum disc free thickness is .276" (7 mm) and .327" (8.3 mm) on Pickup models.

2) Inspect flywheel and pressure plate friction surfaces for burns, scoring or grooves. Friction surface warpage limit is .002" (.05 mm). Resurface or replace flywheel and/or pressure plate as necessary. If flywheel ring gear is replaced, ensure the chamfer on flywheel teeth faces engine.

3) Mount clutch disc on input shaft. Check runout using dial indicator. Maximum runout is .039" (1 mm). Check disc hub and input shaft splines for excessive wear. Hub must slide smoothly on input shaft splines.

Installation

1) Lightly coat input shaft splines and release bearing contact areas with MOS2 grease. Use clutch alignment tool to center clutch assembly. Clutch cover and flywheel "O" alignment marks must be aligned.

2) Tighten pressure plate bolts evenly, in diagonal pattern. To complete installation, reverse removal procedure.

RELEASE BEARING & FORK

Removal & Installation

1) With clutch assembly removed, remove release bearing and fork. Check release bearing by turning by hand in thrust direction. Replace if bearing feels rough or noisy.

2) Inspect release fork for cracks or damage. Replace if necessary. Lightly apply molybdenum grease to clutch component contact areas and sliding surfaces. To complete installation, reverse removal procedure.

CLUTCH MASTER CYLINDER

Removal & Installation

Disconnect hydraulic line and mounting nuts from master cylinder. Unhook clutch pedal from push rod. Remove cylinder. To install, reverse removal procedure and bleed hydraulic system.

CLUTCH SLAVE CYLINDER

Removal & Installation

Raise and support vehicle. Disconnect fluid hose and plug. Remove nuts attaching slave cylinder to clutch housing. Remove cylinder. To install, reverse removal procedure and bleed hydraulic system.

PILOT BEARING

Removal & Installation (RX7)

With clutch components removed, check pilot bearing for roughness, looseness and any damage. If necessary, remove bearing and oil seal with Puller (49 1285 071). To install new bearing, use Driver (49 0823 072A). Apply MP grease to bearing and install oil seal.

Removal & Installation (Except RX7)

Pilot bearing is pressed into flywheel. To replace, install flywheel holding tool and remove flywheel. Using arbor press and driver, press old bearing out. Press new bearing in until it is flush with flywheel surface. Lubricate with MP grease. Install flywheel and holding tool. Tighten mount bolts evenly, in a diagonal pattern.

FLYWHEEL

Removal & Installation (RX7)

1) With clutch assembly removed, lock flywheel in position using holding tool. Loosen and remove lock nut with Box Wrench (49 0820 035). Remove flywheel using Puller (49 0823 300A). Turn tool handle and lightly tap puller head. Once lock nut is loose, DO NOT drop flywheel.

2) Inspect rear oil seal for leakage and replace as necessary. Before installing flywheel, apply sealer to surface of lock nut that contacts flywheel and install. Tighten lock nut to specification. To complete installation, reverse removal procedure.

OVERHAUL

CLUTCH MASTER CYLINDER

NOTE: Master cylinders used on B2000 and B2200 Pickup have a different external appearance, but procedure is the same.

Disassembly

1) Drain brake fluid. On RX7, remove reservoir connector bolt and reservoir. On B2000 and B2200 Pickups, remove hydraulic line adapter, washer, 1-way valve, spring and pin.

2) Remove piston stop ring, washer and piston assembly. Separate piston, cups and return spring. See Fig. 2. Clean parts in denatured alcohol or brake fluid. Blow dry with compressed air.

3) Check all parts for wear, damage or deformation. Standard piston-to-cylinder bore clearance is .001-.004" (.032-.102 mm). If clearance exceeds .006" (.15 mm), replace master cylinder. Coat all components with clean brake fluid before assembly.

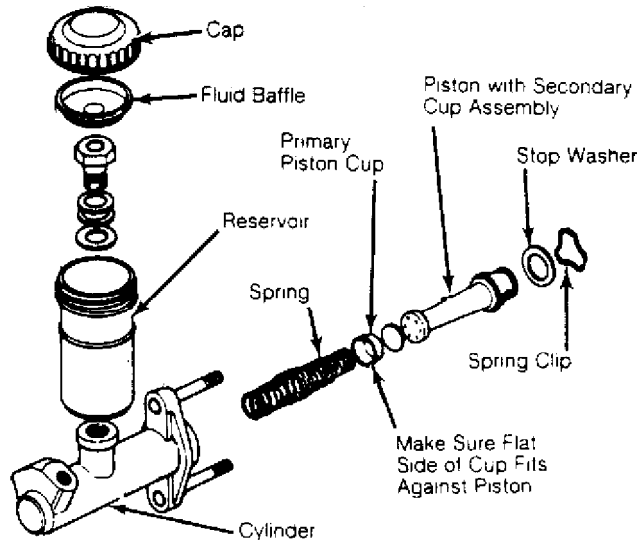


Fig. 2: Exploded View of Clutch Master Cylinder

Reassembly

1) Install primary cup with flat side against piston. Ensure compensating port is open. To complete assembly, reverse disassembly procedure. After assembly, fill reservoir with clean brake fluid.

2) Bench bleed master cylinder by holding finger over outlet port and operating piston with screwdriver. Pump piston until air is ejected at outlet port and fluid pressure is felt. Install master cylinder and bleed hydraulic system.

CLUTCH SLAVE CYLINDER

Disassembly

With slave cylinder removed, detach dust boot and release rod. Remove piston and cup assembly from cylinder, using compressed air if required. Remove spring, bleeder screw and valve. See Fig. 3.

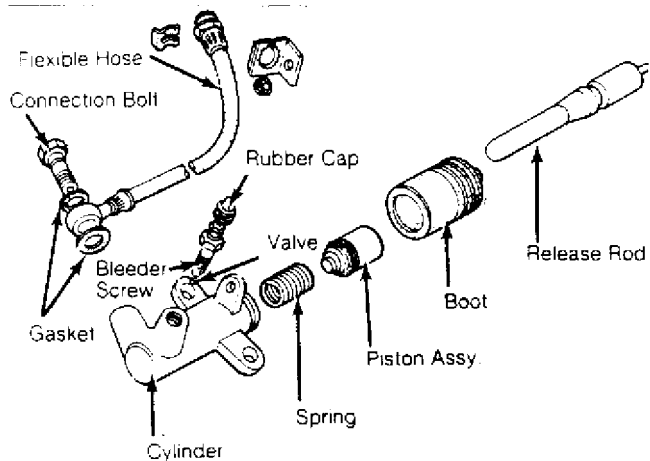


Fig. 3: Exploded View of Clutch Slave Cylinder

Reassembly

1) Wash parts in clean brake fluid or denatured alcohol. Blow dry with compressed air. Check all parts for wear or damage. Standard piston-to-slave cylinder bore clearance is .0016-.0049" (.040-.125 mm). If cylinder bore-to-piston clearance exceeds .006" (.15 mm), replace piston and/or cylinder.

2) Before assembly, coat pistons and cups with clean hydraulic fluid. To complete reassembly, reverse disassembly procedure.

ADJUSTMENTS

CLUTCH PEDAL HEIGHT

On RX7 and Pickup, measure distance from center of upper surface of pedal pad-to-dash insulator. To adjust height, loosen lock nut. Turn stopper bolt. Tighten lock nut after adjustment is made. See Fig. 4.

CLUTCH PEDAL FREE PLAY

On RX7 and Pickups, adjust clutch pedal free play, measured at pedal pad, to .02-.12" (0.6-3.0 mm). Loosen lock nut and turn pedal stopper bolt to specification. Tighten lock nut. See Fig. 4.

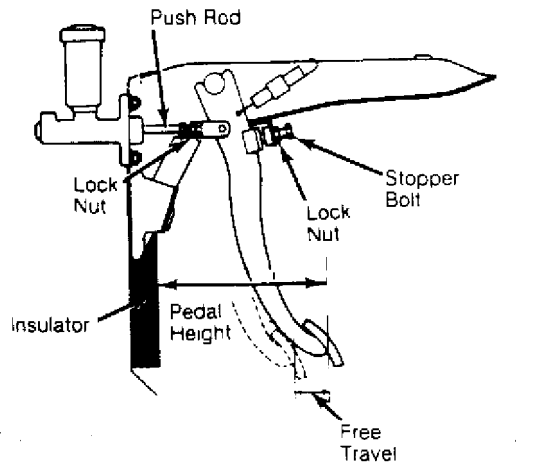


Fig. 4: Clutch Adjustment Location
 Check clutch pedal for proper height and free play.

CLUTCH PEDAL HEIGHT SPECIFICATIONS TABLE

Application	In. (mm)
RX7	7.5-7.7 (190-195)
B2000	8.07-8.20 (205-210)
B2200	8.46-8.66 (215-220)

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Flywheel-to-Crankshaft	
B2000	112-118 (155-163)
B2200	95-137 (131-190)
Flywheel-to-Eccentric Shaft (RX7)	289-362 (400-500)
Pressure Plate-to-Flywheel	13-20 (18-27)

END OF ARTICLE

DRIVE AXLE

Article Text

1984 Mazda RX7

For iluvmyrx7.com

Copyright © 1998 Mitchell Repair Information Company, LLC

Sunday, June 09, 2002 06:21AM

ARTICLE BEGINNING

1984 Drive Axles
MAZDA

RX7, B2000 Pickup, B2200 Pickup

DESCRIPTION

Axle housing is banjo type with removable differential carrier and semi-floating drive axles. 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 drive axles are retained in housing by ball bearings and bearing retainers at axle housing outer ends. A clutch pack limited slip unit is available on RX7 models.

AXLE RATIO & IDENTIFICATION

All Mazda models use one basic type of rear axle assembly. Any differences in servicing procedures will be noted where they occur.

Axle ratio on all B2200 and B2000 Pickup automatic transmission models is 3.90:1, on B2000 Pickup manual transmission models is 3.31:1 and on RX7 models is 3.93:1 (4.08:1 on models equipped with E.G.I. system). To determine axle ratio, divide number of ring gear teeth by number of pinion teeth.

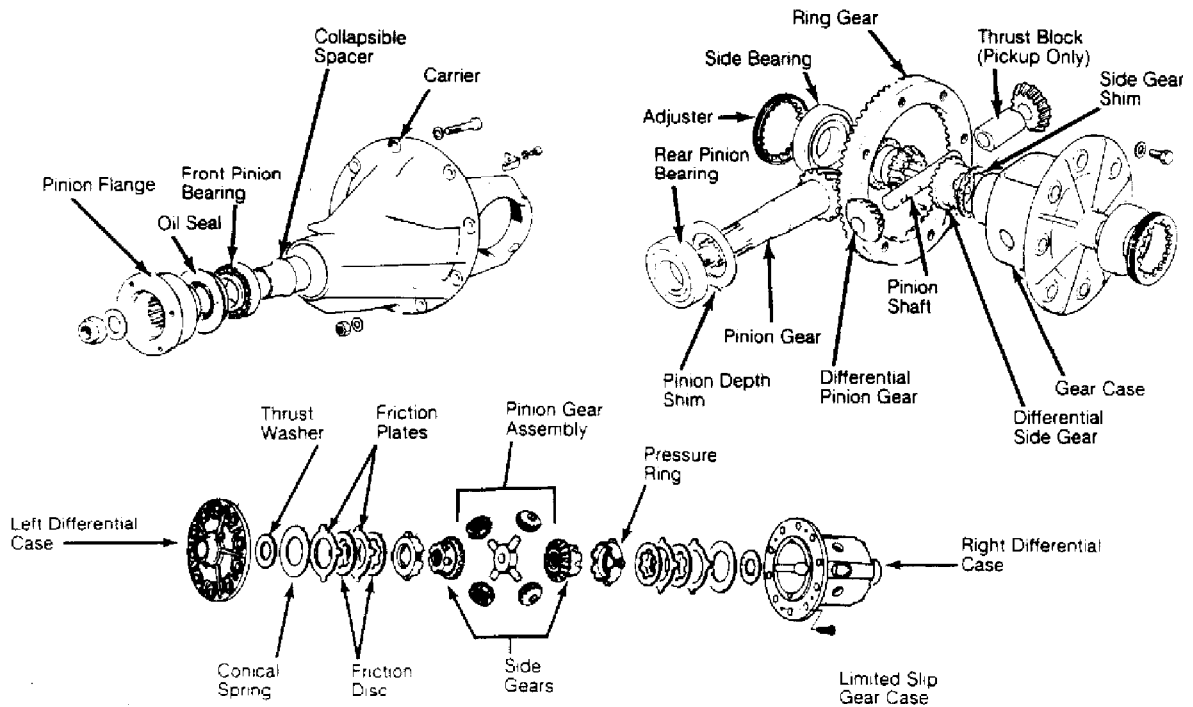


Fig. 1: Exploded View of Mazda Rear Axle Assembly

REMOVAL & INSTALLATION

AXLE SHAFTS & BEARINGS

Removal

1) Raise and support vehicle. Remove wheel. Remove brake drum and brake shoes. Disconnect and plug hydraulic line from wheel cylinder. Disconnect parking brake cable. On RX7 models with rear disc brakes, remove caliper and brake rotor.

2) From inboard side of backing plate, remove nuts from 4 axle housing through bolts. Pull drive axle, backing plate, bearing housing (Pickup models) and shims (if equipped) from axle housing with Drive Axle Puller (49 0223 630B). Remove oil seal from axle housing.

3) On Pickup models, loosen lock nut with Rear Shaft Bearing Wrench (49 0603 622A). Remove lock nut and washer. Using Bearing Pullers (49 0187 520 and 49 0187 523), remove bearing and housing assembly from drive axle. Remove backing plate. Remove bearing, spacer and oil seal from housing.

4) On RX7 models, grind notch in bearing collar and then remove collar with chisel. Press bearing and backing plate from axle using Bearing Separators (49 8531 746 and 49 0259 747).

Installation

1) Install backing plate and spacer on shaft with chamfered edge of spacer must face drive axle flange. Using Bearing Attachment (49 1011 748), press bearing onto shaft until seated. 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 requires less than 2.7 tons pressure (2,451 kg) to install, replace bearing collar.

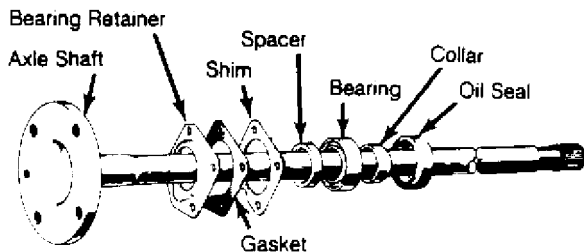


Fig. 2: Exploded View of RX7 Axle Shaft Assembly
Chamfered edge of spacer must face drive axle flange.

2) Apply a light coat of grease to oil seal and install oil seal in housing. Temporarily mount drive axle and backing plate on axle housing with mounting nuts.

3) Install dial indicator on backing plate and check drive axle end play. End play should be .002-.006" (.05-.15 mm) on Pickups and 0-.004" (0-.1 mm) on RX7 models.

4) On Pickup models only, if both drive axles were removed, the end play of each shaft must be measured separately. Insert one axle shaft and check end play. The end play for first drive axle installed should be .026-.033" (.65-.85 mm).

NOTE: Adjust end play for first drive axle before inserting second drive axle. Use shims to adjust end play.

5) The end play for the second drive axle installed should be set to normal end play clearance of .002-.006" (.05-.15 mm).

6) After installing correct shim pack, install and tighten all attaching bolts and nuts. Install brake shoes and drum. Connect

system.

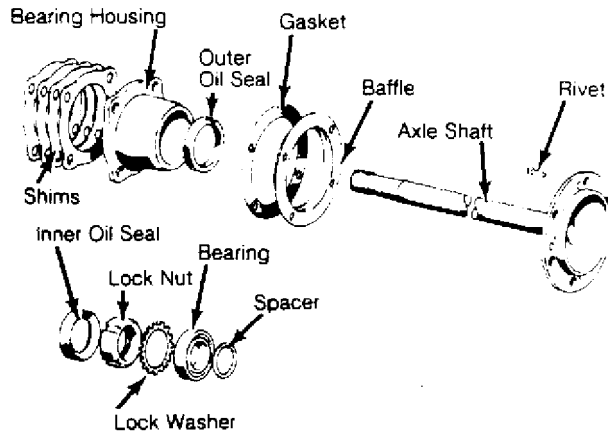


Fig. 3: Exploded View of Pickup Axle Shaft Assembly
If both drive axles were removed, end play of each shaft must be measured separately.

DIFFERENTIAL CARRIER

Removal

- 1) Raise and support vehicle with jack stands. Remove drain plug and drain rear axle lubricant. Remove drive axles.
- 2) Mark drive shaft and pinion flange for reassembly reference. Disconnect drive shaft. Remove attaching nuts and withdraw carrier from axle housing.

Installation

To install, reverse removal procedure. Make sure to refill axle with lubricant.

OVERHAUL

DISASSEMBLY

- 1) Mount carrier in a 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.
- 3) Using Puller (49 0839 425C), remove side bearings from gear case. Straighten lock tabs, remove ring gear attaching bolts and separate ring gear from gear case.
- 4) On limited slip differentials, gradually loosen attaching screws until distance between left and right half of differential case is about 0.12" (3 mm). Then carefully separate differential halves. Remove following parts: Thrust washer, conical spring, friction plate, friction disc, pressure ring, side gear, pinion gear and spider. Keep parts in order for reassembly. See Fig. 1.
- 5) On conventional differentials, 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.
- 6) 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.

7) 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.

8) Inspect all parts for chipped or worn teeth, damaged bearing journals, cracks, flaking or any damage. Replace defective parts as necessary.

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

REASSEMBLY & ADJUSTMENT

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) On limited slip differential, measure thickness of 2 conical springs and record measurements. Measure thickness of clutch pack excluding conical springs. Check clearance by subtracting total of these measurements from inside dimension of case.

3) If clearance is excessive, use oversize friction disc. Standard clearance is 0-.0079" (0-.20 mm). Maximum clearance is .0394" (1.0 mm). Friction discs are available in .0827" (2.1 mm) oversize.

4) Measure thickness of side gears with thrust washers in place. Check clearance by subtracting thickness from inside dimension of case. Standard clearance is .0063-.0165" (.16-.42 mm). Maximum clearance is .0315" (.8 mm). Thrust washers are available in .0709" (1.8 mm) oversize.

5) Install parts in following order into right side differential case: Thrust washer, conical spring, friction plate, friction disc, friction plate, friction disc, pressure ring, side gear, pinion gear and spider assembly, side gear, pressure ring, friction disc, friction plate, friction disc, friction plate, conical spring and thrust washer. See Fig. 1.

6) Install left side differential case. Securely tighten differential case attaching screws. On standard differential, check backlash between side gears and pinion gears. Backlash should be 0-.004" (0-.10 mm) on RX7 models and 0-.008" (0-.20 mm) on Pickup models. If not, install selective thrust washers to bring backlash within specifications.

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

7) 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.

8) On all models, mount ring gear on case, then install and tighten ring gear attaching bolts. If removed, install differential side bearings.

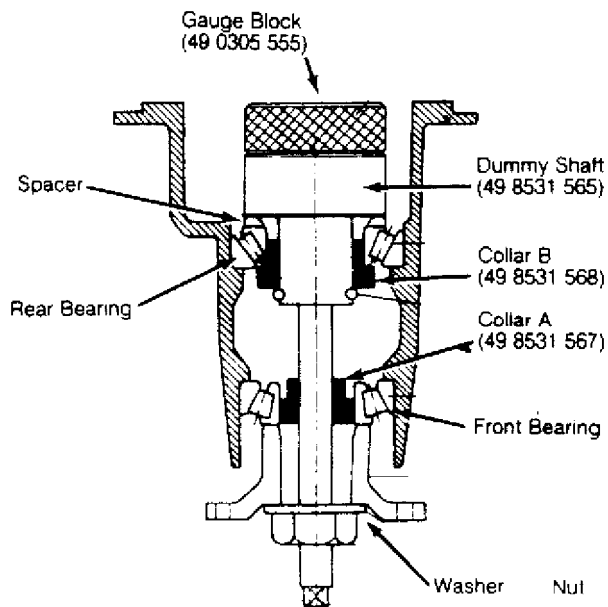


Fig. 4: Dummy Pinion Shaft and Gauge Block
Never use collapsible spacer when checking pinion depth.

Drive Pinion Depth

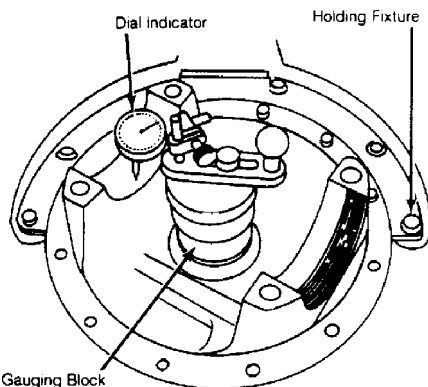
1) Make sure differential bearing bores are free of dirt and burrs. Install front and rear bearing races. Install spacer, rear bearing, Collar "B" (49 8531 568) and Dummy Drive Pinion (49 8531 565) in carrier and hold in place with "O" ring. See Fig. 4.

2) Install front bearing, Collar "A" (49 8531 567), companion flange and washer. Tighten nut so that drive pinion turns freely.

3) Install dial indicator on Gauge Body (49 0727 570), place gauge body on a surface plate and preload indicator. When preloaded, turn outer ring of dial indicator to zero.

4) Place Gauge Block (49 0660 555) on pinion and position indicator assembly on block so button of indicator contacts lowest portion of differential bearing support bore. Measure both bearing bores.

NOTE: DO NOT install collapsible spacer when checking pinion depth.



DRIVE AXLE

For iluvmyrx7.com Copyright © 1998 Mitchell Repair Information Comp

Fig. 5: Measuring Drive Pinion Installed Height
The use of a dial indicator, pinion gauge set and gauge block are required for this procedure.

5) Record the amount the 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.

6) Add bearing bore measurements together and divide by 2. 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 in hundredths of a millimeter.

7) Select correct pinion depth adjusting shim to be used for reassembly. Position correct shim on pinion and install pinion bearing. See PINION DEPTH ADJUSTING SHIMS chart.

PINION DEPTH ADJUSTING SHIMS

Identification	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)

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.

3) 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 INITIAL PINION NUT TORQUE chart.

INITIAL PINION NUT TORQUE

Application	Ft. Lbs.	(N.m)
Pickups	145	(197)
RX7	94	(130)

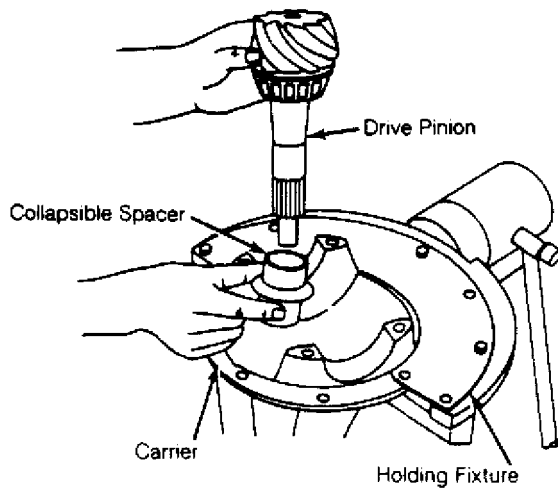


Fig. 6: Installing Drive Pinion Bearing Collapsible Spacer
If preload specifications are exceeded, collapsible spacer must be replaced.

4) 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.

Backlash & Side Bearing Preload

1) Place differential case assembly into carrier making sure index marks on ring and pinion gears are aligned. See Fig. 7. Install bearing adjusters and bearing caps, then tighten bearing cap nuts or bolts finger tight.

2) Turn adjusters with a spanner wrench 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.

3) Mount a dial indicator to carrier flange so button of indicator contacts one of the ring gear teeth at a right angle. Check backlash between ring and pinion gears.

4) Using the spanner wrench, turn both bearing adjusters equally until backlash is as specified in AXLE ASSEMBLY SPECIFICATIONS table.

5) 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 7.3004-7.3033" (185.43-185.50 mm) on RX7 or 8.485-8.0513" (204.428-204.50 mm) on Pickups.

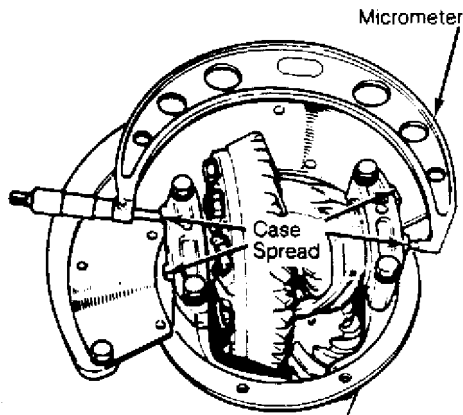


Fig. 7: Adjusting Differential Bearing Preload (Case Spread)
 When adjusting side bearing preload, care must be taken not to affect the ring and pinion gear backlash.

AXLE ASSEMBLY SPECIFICATIONS TABLE

Application	INCH	Lbs. (N.m)
Pinion Bearing Preload (1)		
Pickups	11.3-15.6	(1.27-1.76)
RX7	7.8-12.2	(.88-1.37)
Side Bearing Preload		
Pickups	4-13	(.45-1.47)
RX7	5-18	(.56-2.03)
		In. (mm)
Ring & Pinion Backlash		
Pickups	.0075-.0083	(.19-.21)
RX7	.0035-.0043	(.09-.11)
Side Gear & Pinion Backlash		
Pickups	0-.008	(0-0.2)
RX7	0-.004	(0-0.1)
		Qts. (L)
Oil Capacity		
Pickups	1.4	(1.3)
RX7	1.3	(1.2)

(1) - Without oil seal installed.

TORQUE SPECIFICATIONS

TIGHTENING SPECIFICATIONS TABLE

Application	INCH	Lbs. (N.m)
DRIVE AXLE Article Text (p. 8)		
Pinion Nut		
Pickups	145-253	(197-344)
RX7	94-130	(128-177)
Ring Gear-to-Differential Case		
Pickups	54-61	(72-83)
RX7	51-61	(69-83)
Differential Bearing Cap Bolts		
Pickups	41-59	(56-80)
RX7	27-38	(37-52)

NEW SERVICE DIFFERENTIAL ASEMBLY REPLACEMENT INFO CAT. 9, NO. 007/86

Article Text

1984 Mazda RX7

For iluvmyrx7.com

Copyright © 1998 Mitchell Repair Information Company, LLC
Sunday, June 09, 2002 06:24AM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

APPLICATION

1984-85 RX7 & 1986-87 B2000

SUBJECT

New Service Differential Assembly

REFERENCE

Mazda Motors Corp., Service Bulletin, No. 9 007/86, September, 1986

SERVICE INFORMATION

The manufacturer has released new service differential assemblies as service parts for 1984-87 RX7 and 1986-87 B2000 vehicles. The new service differential assemblies (1984-85 - M0Y5 27 200, 1986-87 B2000 - M0Z5 27 200) have gear cases with increased wear resistance.

END OF ARTICLE

REAR WHEEL DRIVE PINION HEIGHT ADJUSTMENT INFO CAT. 9, NO. 014/83

Article Text

1984 Mazda RX7

For iluvmyrx7.com

Copyright © 1998 Mitchell Repair Information Company, LLC
Sunday, June 09, 2002 06:25AM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

PINION HEIGHT ADJUSTMENT

Models All Rear Drive Models
Bulletin No. 014/83
Category 9
Date 12/23/83

DESCRIPTION

If the differential pinion height adjustment is necessary for rear wheel drive vehicles, the number on the end surface of the drive pinion should be used to obtain the adjustment value.

There are two types of markings:

1. Handwritten marking with electric pen. This number should be used for the adjustment value. See Fig. 1.

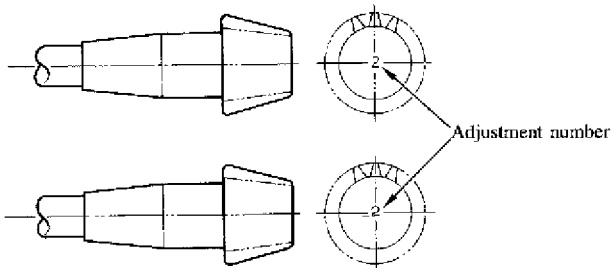


Fig. 1: Location of Adjustment Numbers

2. No handwritten marking. If there is no handwritten marking on the end surface of the drive pinion, the adjustment value is zero (0).

NOTE: 1. There are some cases of numbers stamped on the end surface of the drive pinion, however, these numbers do not indicate the adjustment value.

2. It is essential to check tooth contact after assembling the differential even though the pinion height adjustment has been made. Please refer to the Service Information for the proper tooth contact.

END OF ARTICLE