MAZDA RECIRCULATING BALL

GLC
626
B2000 Pickup
RX7

DESCRIPTION

Steering gear is a recirculating ball type with a variable ratio, depending on turning angle of sector shaft. The pinion shaft and steering shaft are an integral (nonseparable) unit on some models, while the shaft is separable from the pinion on others. Steering linkage is basically the same for all models, having a nonadjustable center link, two adjustable tie rods, an idler arm assembly, and pitman arm.

ADJUSTMENT

NOTE – *Adjustments are performed during assembly portion of overhaul. See Overhaul procedure in this article.*

REMOVAL & INSTALLATION

STEERING GEAR

Removal (GLC, B2000 Pickup) – 1) Disconnect negative battery cable. Remove steering wheel and switches. See *Mazda under STEERING WHEEL & COLUMN SWITCHES in this Section.* Remove bolts holding column to dash. Loosen dust cover screws, any other column bolts, and pull column jacket off shaft.

2) On GLC, disconnect center link from pitman arm with puller. Remove steering gear mounting bolts and pull gear forward after raising vehicle.

3) On B2000 Pickup models, remove air cleaner, brake master cylinder and power booster, clutch master cylinder, and EGR pipes and hoses. Drain coolant, then remove hoses and lines from intake manifold. Remove manifold and carburetor assembly.

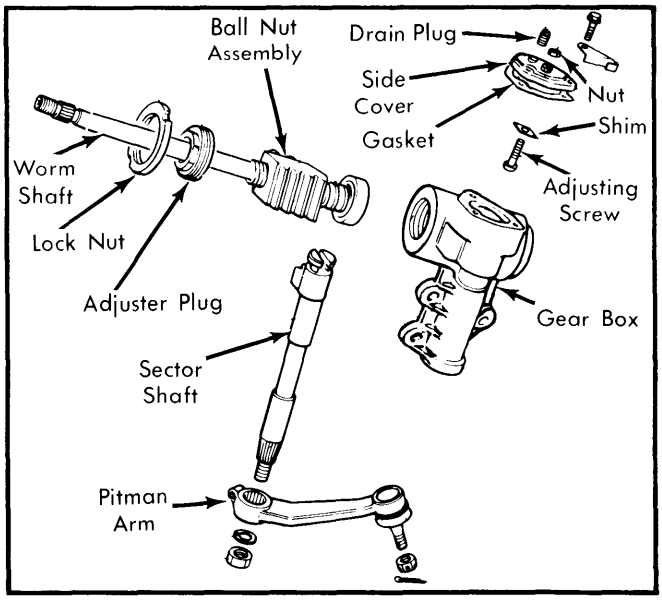

Fig. 1 Exploded View of GLC Steering Gear

4) Raise and support vehicle. Remove left front wheel, then disconnect and remove pitman arm. Place jack under lower left control arm and support. Remove upper left control arm, noting position of shims. Unbolt steering gear and pull up out of vehicle.

Removal (626 & RX7) – 1) Disconnect negative battery cable. Remove steering wheel and switches. See *Mazda under STEERING WHEEL & COLUMN SWITCHES in this Section.* Remove bolts holding column to dash. Tape holes to retain lubricant. Remove air duct.

2) Raise and support front of vehicle. Disconnect pitman arm and center link. Remove nuts and bolts retaining steering gear housing to body. Remove under cover, engine mount and stabilizer bar (626 only). Remove hood (RX7 only). Remove steering gear assembly from vehicle.

Installation (All Models) – To install, reverse removal procedure, ensuring any shims which were removed are installed in original positions.

NOTE – *To avoid damage to steering column components, do not apply bending or striking forces to steering shaft or column.*

STEERING LINKAGE

Steering linkage may be removed as an assembly or as individual components. Whenever tie rod setting is disturbed, toe-in must be reset. See *Mazda in WHEEL ALIGNMENT section.*

OVERHAUL

STEERING GEAR

Disassembly – 1) Drain gear oil from housing. Remove pitman arm from sector shaft if not removed previously. Unscrew side cover attaching bolts and loosen adjusting screw lock nut. Turn adjusting screw in to remove side cover from housing. Take adjusting screw and shim from slot in sector shaft. Withdraw sector shaft.

2) Unbolt end cover, then remove worm and ball nut assembly. On GLC and 626, worm and ball nut assembly is held in place by adjuster plug and lock nut. B2000 and RX7 models use a threaded end cover to retain worm and ball nut assembly.

Inspection – Check ball nut rotation on worm. If movement is not smooth for full length of travel, replace worm and ball nut assembly. Ball nut is not to be serviced separately. Check worm bearings and cups, sector shaft gear surface, and oil seal. If any component is defective, replace it.

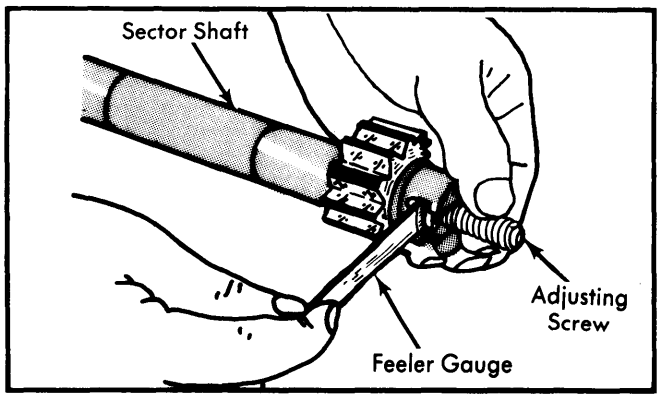

Fig. 2 Checking Adjusting Screw End Clearance

MAZDA RECIRCULATING BALL (Cont.)

Reassembly & Adjustment – 1) Replace oil seal in housing. Insert worm shaft and ball nut assembly into gear housing. On B2000 only, position end cover with bearing preload adjusting shims and install cover bolts.

2) On all models, attach an INCH lb. torque wrench to shaft and check preload. If below specification, reduce the number of shims; if above, increase the number of shims (B2000 only). On GLC and 626, tighten adjuster plug to set preload. On RX7 models, screw in the end cover to adjust preload.

Initial Worm Bearing Preload Torque

Application	INCH lbs. (cmkg)
All models	1.7-4.3 (2.0-5.0)

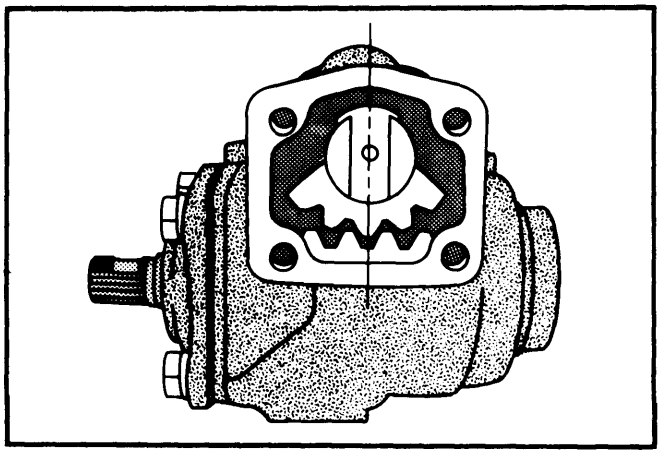

Fig. 3 Aligning Sector Gear & Rack

2) Insert sector shaft into gear housing, using care not to damage oil seal. Ensure center of sector gear is aligned with center of worm gear. See *Fig. 3*. Insert adjusting screw into slot in end of sector shaft. Check end clearance as illustrated and add appropriate shim to bring clearance within 0-.004" (0-.1 mm). Place side cover and gasket over adjusting screw and turn adjusting screw until cover is in place, install attaching bolts.

3) Install pitman arm onto sector shaft, aligning marks. Install and tighten retaining nut. Measure pitman arm backlash. If necessary, turn sector adjusting screw until zero backlash is obtained. Tighten adjusting screw lock nut, taking care not to disturb backlash adjustment.

4) Check worm shaft rotating torque. Attach an INCH lbs. torque wrench to worm shaft. If not to specifications, adjust as necessary. Fill gear housing with lubricant (SAE 90 EP).

Final Worm Bearing Preload Torque

Application	INCH lbs. (cmkg)
GLC, 626 & RX7	5.2-10.4 (6-12)
B2000	5.2-7.8 (6-9)

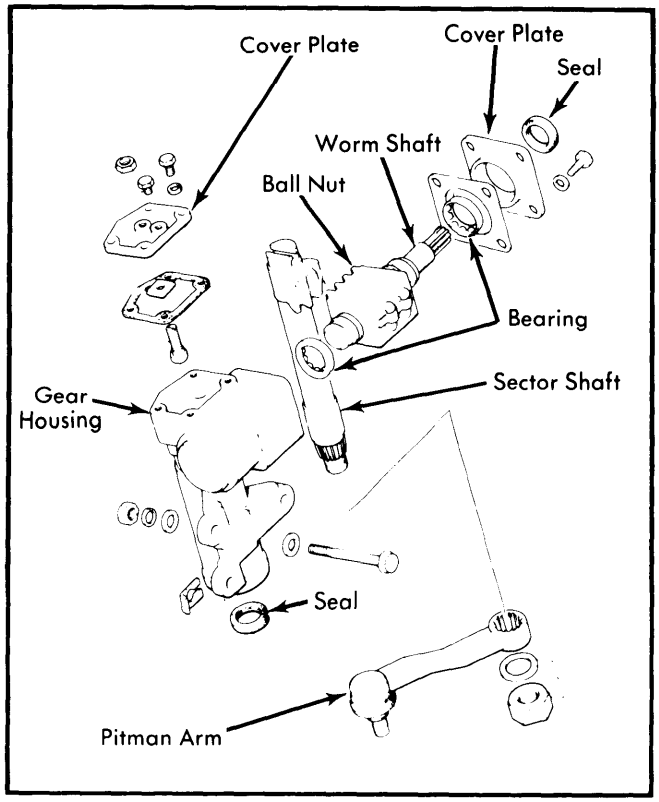

Fig. 4 Exploded View of B2000 Recirculating Ball Steering Gear (Others Similar)

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Gear Box-to-Frame	32-40 (4.4-5.5)
Steering Wheel Nut	22-29 (3-4)
Pitman Arm-to-Sector Shaft	
B2000	108-130 (15-18)
GLC, 626	58-87 (8-12)
RX7	94-123 (13-17)
Pitman Arm-to-Center Link	
B2000	22-29 (3-4)
All Others	22-33 (3-4.5)
Idler Arm-to-Frame	32-40 (4.5-5.5)