

DATSUN POWER-ASSISTED RECIRCULATING BALL

200SX, 280ZX

DESCRIPTION

Power steering is composed of a power steering pump, steering gear and connecting hoses. The pump has an integral reservoir on 280ZX models and a separate reservoir on 200SX models.

Power steering gear is an integral unit consisting of a spool valve and power cylinder (worm shaft ball nut assembly) connected to the sector shaft. Power steering gear is pressure operated by the pump through the connecting lines.

LUBRICATION

CAPACITY

200SX 1.3 qts. (1.2L)
280ZX 1.1 qts. (1.0L)

FLUID TYPE

ATF Dexron

NOTE: Normal operating temperature of hydraulic system fluid is 140-176°F (60-80°C)

ADJUSTMENT

BELT TENSION

Apply thumb pressure of 22 lbs. (9.98 kg) midway between idler pulley and power steering pump pulley. Deflection should be .31-.47" (8-12 mm).

HYDRAULIC SYSTEM PRESSURE CHECK

1) Disconnect pressure line at pump and connect pressure gauge and shut-off valve. Check fluid level, open shut-off valve.

2) Run engine for about 5 seconds. Check fluid level and restart engine. Turn steering wheel from lock-to-lock several times to expel air from system.

3) Allow fluid to reach normal operating temperature. Slowly close shut-off valve. Pressure at idle should be 782 psi (55 kg/cm²) for 200SX models or 953-1123 psi (67-79 kg/cm²) for 280ZX models.

NOTE: Do not close shut-off valve for more than 15 seconds, as this may result in undue pump wear and abnormal increased lubricant temperature.

4) If pressure is below specifications, the pump is faulty. If pressure is above specifications, the pressure relief valve in pump is faulty. In either case, replace pump.

HYDRAULIC SYSTEM BLEEDING

1) Allow fluid to reach normal operating temperature when bleeding. Check fluid level in reservoir. Raise vehicle and support with safety stands.

2) With engine not running, turn steering wheel from lock-to-lock several times. Check fluid level. Start engine and turn steering wheel from lock-to-lock several times.

3) If system is not bled, turn steering wheel to left lock and open bleeder screw to expel remaining air.

BACKLASH

On Vehicle

1) Place vehicle on level dry floor. Inflate tires to specified pressure. Run engine until power steering fluid is at normal operating temperature.

2) With steering wheel in straight ahead (centered) position, turn steering wheel 1 complete turn (360°). Attach spring gauge to outer rim of wheel and measure turning force.

3) Turning force should be 6.6-7.7 lbs. (2.99-3.49 kg) for 200SX, 5.5-6.6 lbs. (2.49-2.99 kg) for 280ZX. If turning force is not to specifications, remove steering gear. Check turning force of steering gear.

NOTE: Center position can be found by turning gear to full lock position then turning back 2 1/8 turns.

Off Vehicle

1) With steering gear removed from vehicle, mount gear to a plate that can be clamped in a vise (special tool KV48100301 or KV48100300).

2) Attach a torque wrench to worm shaft splines (where steering shaft connects) and center steering gear.

NOTE: Worm shaft can be turned by placing vinyl tape on serrations and attaching socket.

3) Measure turning force of steering gear 360° from center position. Torque should be .8 ft. lbs. (1.1 N.m). Turn worm shaft back to center position and measure torque.

4) Torque at this point should be .9-3.5 INCH lbs. (.1-.4 N.m) more than torque measured at 360° from center position. If turning torque is not to specifications, loosen adjusting bolt lock nut.

5) Turn adjusting bolt (clockwise) until correct turning torque specification is obtained. If the correct turning torque cannot be obtained, replace steering gear.

REMOVAL & INSTALLATION

STEERING GEAR

Removal

1) Remove air cleaner. Remove bolt from universal joint to worm shaft. Disconnect fluid lines and plug lines to prevent fluid spillage. Remove nut and washer from sector shaft.

2) Remove pitman arm from sector shaft using a puller. Remove steering gear mounting bolts. Remove steering gear from vehicle.

Installation

To install, reverse removal procedures. Align 4 grooves in gear arm serrations with 4 projections of sector shaft serrations. Install and tighten lock nut.

STEERING PUMP

Removal

Disconnect fluid lines at pump and block off fittings. Remove pump retaining bolts. Remove drive belt from pulley. Remove pump from vehicle.

Power Steering

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Installation

To install, reverse removal procedures.

OVERHAUL

NOTE: Overhaul of steering gear is limited to oil seal replacement. If any further repair is necessary, replace entire steering gear assembly. Always check turning torque before disassembly.

ADJUSTING SCREW SEAL REPLACEMENT

Remove adjusting screw lock nut. Remove "O" ring from lock nut. Grease new "O" ring and insert in lock nut. Make sure "O" ring is installed correctly. Replace lock nut to adjusting screw. Adjust steering gear turning torque.

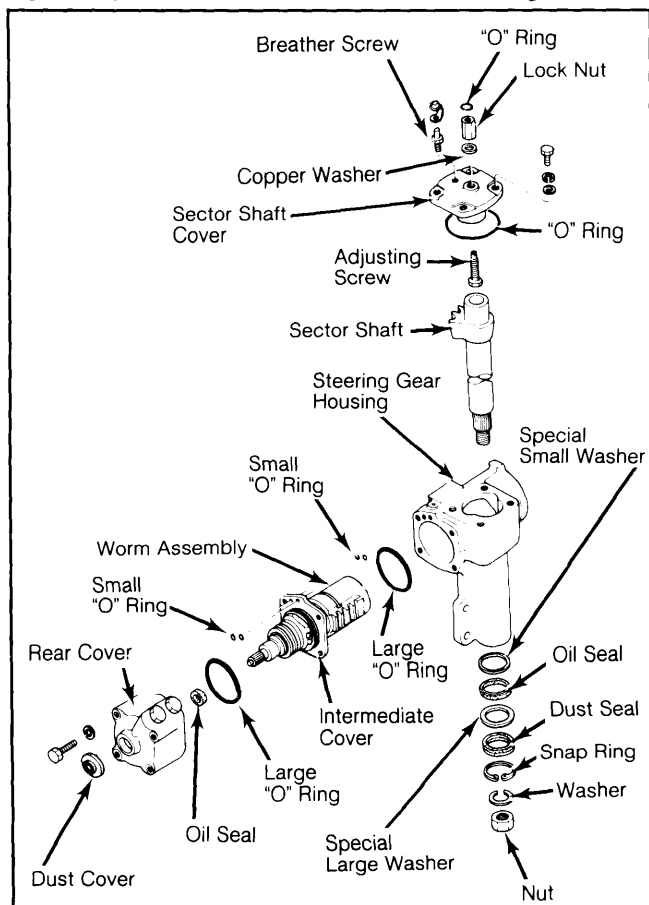
NOTE: Always use new copper washer when adjusting screw lock nut is removed.

SECTOR SHAFT SEAL REPLACEMENT

Disassembly

1) With steering gear assembly mounted in a vise, set sector shaft to center position. Remove sector shaft cover bolts. Using a mallet, tap sector shaft out approximately 3/4" (.75 mm).

Fig. 1: Exploded View of Datsun Power Steering Gear



NOTE: Wrap a piece of plastic film (stiff) around the sector shaft, approximately the same diameter as the sector shaft and approximately 8" (200 mm) long. This will prevent bearings from falling into gear housing.

2) Pull sector shaft from gear housing, at same time pull plastic film into gear housing. Remove snap ring from gear housing.

3) Remove dust seal, special large washer, oil seal, and special small washer. Remove "O" ring from sector shaft cover.

Reassembly

1) Install new special small washer, oil seal, special large washer, dust seal, and snap ring to gear housing. Be sure to grease oil seal and dust seal.

2) Make sure radius side of snap ring faces inside of gear housing. Install new "O" ring to sector shaft cover. Make sure worm shaft and rack piston is in centered position.

3) Wrap splined and threaded portions of sector shaft, with tape, to prevent damage to oil seal. Slowly insert sector shaft into gear housing, pushing plastic film out and being careful not to damage oil seal.

4) With sector shaft fully installed, plastic film removed and components operating smoothly, install and tighten sector shaft cover bolts. Check and adjust steering gear turning torque.

REAR HOUSING SEAL REPLACEMENT

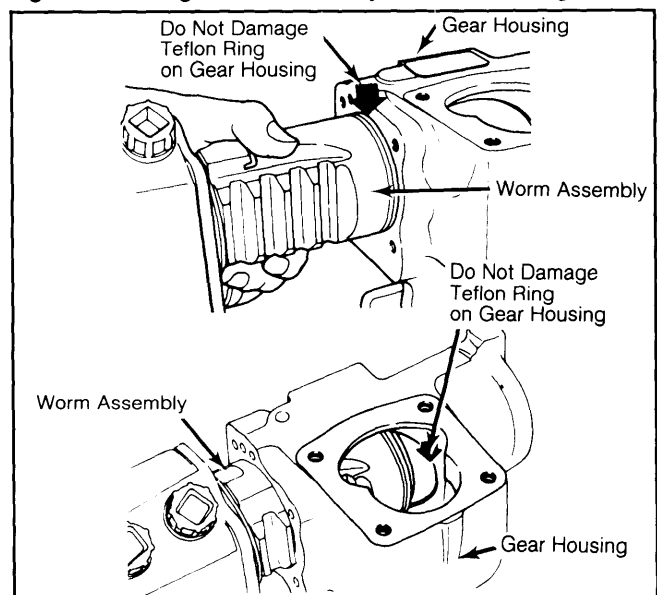
Disassembly

1) Install steering gear assembly to mounting plate and place in a vise. Loosen rear cover bolts approximately .20" (5 mm), do not remove.

2) Turn sector shaft clockwise slightly to raise intermediate cover through piston.

3) Place piston and worm shaft in center position and remove sector shaft. See Sector Shaft Seal Replacement for removal procedures. Remove rear housing bolts and pull out rear housing with intermediate cover and worm gear assembly.

Fig. 2: Installing Worm Assembly to Gear Housing



When half-way inserted, Teflon ring is deflected.

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NOTE: When worm assembly is removed, piston may turn and come off under its own weight. Hold piston to prevent this. Do not damage Teflon ring at piston end when removing.

4) Turn worm assembly upside down and lightly tap worm shaft against bench to remove rear housing.

5) Remove rear housing oil seal. Remove large and small "O" rings from both sides of intermediate cover.

Reassembly

1) Lubricate and install rear housing oil seal, sector shaft oil seal and intermediate cover "O" rings. Install worm assembly into rear housing then into gear housing.

CAUTION: Be careful not to damage Teflon ring at rear of piston when installing.

2) Tighten rear cover bolts in a crisscross pattern. Install sector shaft. See Sector Shaft Seal Replacement for installation procedures.

3) Make sure steering gear operates smoothly. Check and adjust turning torque.

TIGHTENING SPECIFICATIONS

| Application | Ft. Lbs. (N.m) |
|--------------------------------|-----------------------|
| Hose-to-Gear Housing | 36-51 (49-69) |
| Rear Cover Bolts | 20-24 (27-33) |
| Sector Shaft-to-Pitman Arm Nut | |
| 200SX | 94-108 (128-147) |
| 280ZX | 101-130 (137-177) |
| Gear-to-Body | 36-51 (49-69) |