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.

GENERAL SERVICE

HYDRAULIC SYSTEM LUBRICANT

Capacity
200SX - 1.3 qts.
280ZX - 1.1 qts

Type – ATF Type DEXRON

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

BELT TENSION ADJUSTMENT

Apply thumb pressure of 22 lbs. (10 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 and run engine for about five seconds. Check fluid level and restart engine.

2) Turn steering wheel from lock-to-lock several times to expel air from system and allow fluid to reach normal operating temperature. Slowly close shut-off valve. Pressure at idle should be 782 psi (55 kg/cm^2) for 200SX models or 953-1123 psi (67-79 kg/cm^2) for 280ZX models.

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

3) 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

NOTE – *Allow fluid to reach normal operating temperature when bleeding.*

Check fluid level in reservoir, raise and support front of vehicle. 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. If system is not bled, turn steering wheel to left lock and open bleeder screw to expel remaining air.

ADJUSTMENT

BACKLASH

On Vehicle – 1) Place vehicle on level dry surface, inflate tires to specified pressure and run engine until power steering fluid is at normal operating temperature. With steering wheel in straight ahead (centered) position, turn steering wheel 1 complete turn (360°).

2) Attach spring gauge to outer rim of wheel and measure turning force. Turning force should be 6.6-7.7 lbs. (3.0-35 kg) for 200SX, 5.5-6.6 lbs. (2.5-3.0 kg) for 280ZX. If turning force is not to specifications, remove steering gear and 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). 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.*

2) Measure turning force of steering gear 360° from center position. Torque should be 10 INCH lbs. (1.1 N.m). Turn worm shaft back to center position and measure torque. Torque at this point should be .9-3.5 INCH lbs. (.1-.4 N.m) more than torque measured at 360° from center position.

3) If turning torque is not to specifications, loosen adjusting bolt lock nut and turn (always tighten to adjust) adjusting bolt 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 them 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, then remove steering gear from vehicle.

Installation – To install, reverse removal procedure. Align 4 gooves 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 mounting bolts and remove drive belt from pulley. Remove pump from vehicle.

Installation – To install, reverse removal procedure.

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, then replace lock nut to adjusting screw. Adjust steering gear turning torque.

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

DATSUN POWER-ASSISTED RECIRCULATING BALL (Cont.)

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 ¾" (.79 mm).

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 and 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. Also make sure radius side of snap ring faces inside of gear housing.

2) Install new "O" ring to sector shaft cover. Make sure worm shaft and rack piston is in centered position. Wrap splined and threaded portions of sector shaft, with tape, to prevent damage to oil seal.

3) Slowly insert sector shaft into gear housing, pushing plastic film out and being careful not to damage oil seal. 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.

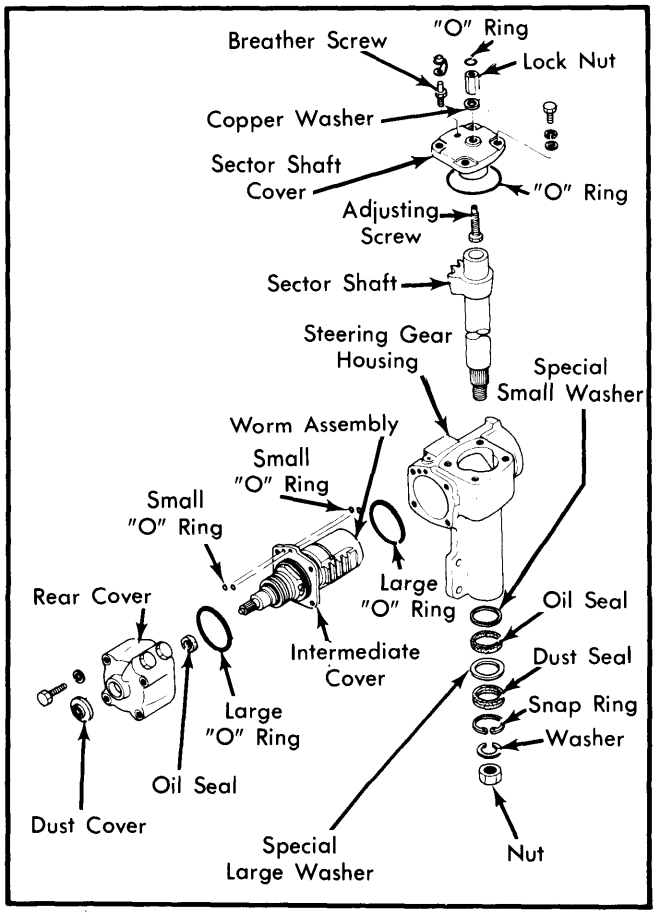

Fig. 1 Exploded View of Datsun Power Steering Gear

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), but do not remove. Turn sector shaft clockwise sightly to raise intermediate cover through piston.

2) 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.

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.*

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

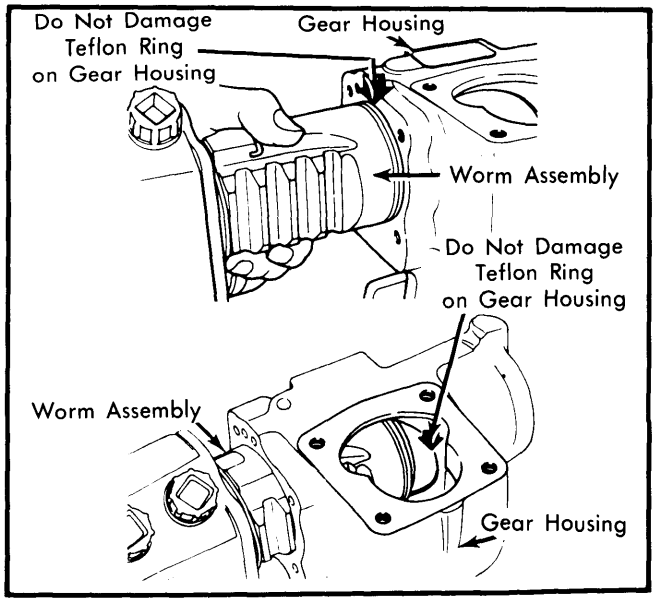

Fig. 2 Installing Worm Assembly to Gear Housing. When Half-Way Inserted, Teflon Ring is Deflected.

2) Tighten rear cover bolts in a crisscross pattern. Install sector shaft. See *Sector Shaft Seal Replacement for installation procedures*. Make sure steering gear operates smoothly, then 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)