DATSUN 200SX, B210, 710 & 810 RECIRCULATING BALL

200SX
B210
710
810

DESCRIPTION

The steering gear used on these vehicles is a recirculating ball type. The worm shaft is joined to the steering shaft by a rubber shock-absorbing coupling. The steering linkage is a relay design, with the steering gear attached by a pitman arm to one end of the center link (cross shaft), while the other end of the center link moves on the idler arm.

REMOVAL & INSTALLATION

STEERING GEAR

Removal – Unbolt and remove heat shield from around steering gear (if equipped.) On 200SX, disconnect exhaust tube from manifold and remove bolt to transmission insulator. Unscrew worm shaft coupling bolt from rubber coupling. Remove pitman arm retaining nut, then use puller to extract pitman arm from steering gear. Unbolt and remove gear from vehicle.

Installation – To install, reverse removal procedure, aligning markings on pitman arm with markings on sector shaft.

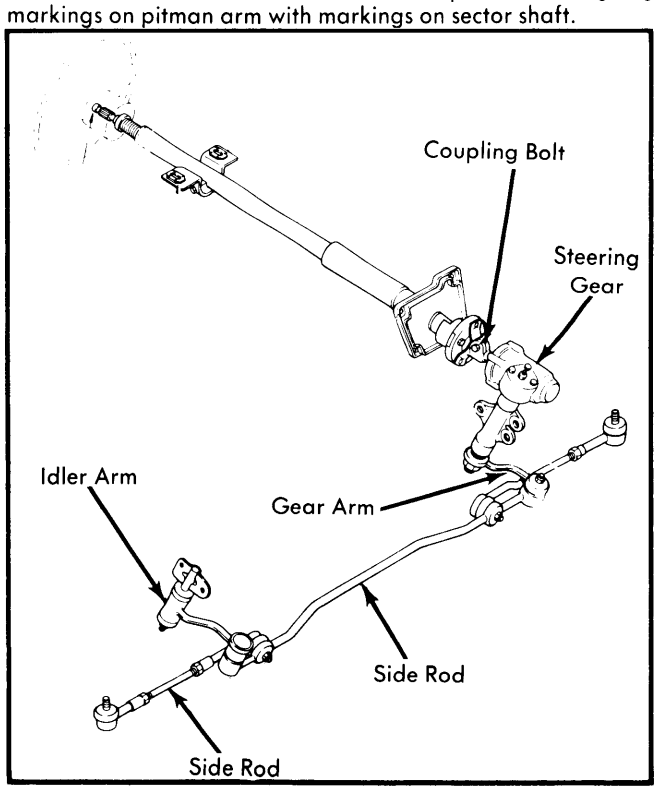

Fig. 1 Datsun Steering Gear Linkage (B210 Shown, Others Similar)

STEERING LINKAGE

Removal – Jack up front of vehicle and support with stands. Detach both outer tie rod ends from steering knuckles. Separate cross shaft from idler arm and pitman arm, then remove cross shaft and tie rods as an assembly. Idler assembly may be removed from side member, if necessary to replace bushing.

Installation – To install, reverse removal procedure, noting the following: Set tie rod end length to the prescribed setting, then check wheel alignment. See *Datsun in WHEEL ALIGNMENT section.*

Tie Rod Settings

Application	① In. (mm)
200SX, B210	12.05 (306.0)
710	12.33 (313.2)
810	
Steering Gear Arm Side	14.35 (364.5)
Idler Arm Side	14.19 (360.5)

① – As measured from center-to-center of tie rod ball studs.

ADJUSTMENT

NOTE – *Steering gear adjustments are performed during reassembly. See Overhaul as outlined below.*

OVERHAUL

STEERING GEAR

Disassembly – 1) Drain gear box of oil, then place unit in padded vise or on suitable holding fixture mounted in a vise.

2) Loosen adjusting screw lock nut and remove sector shaft cover screws. Turn adjusting screw a few turns clockwise and withdraw sector shaft. Remove rear cover. Withdraw bearing shims and worm assembly. Remove oil seal. **NOTE** – *Do not remove sector shaft needle bearings from housing. If defective, replace housing assembly. Do not disassemble ball nut; replace, if necessary, with worm shaft assembly.*

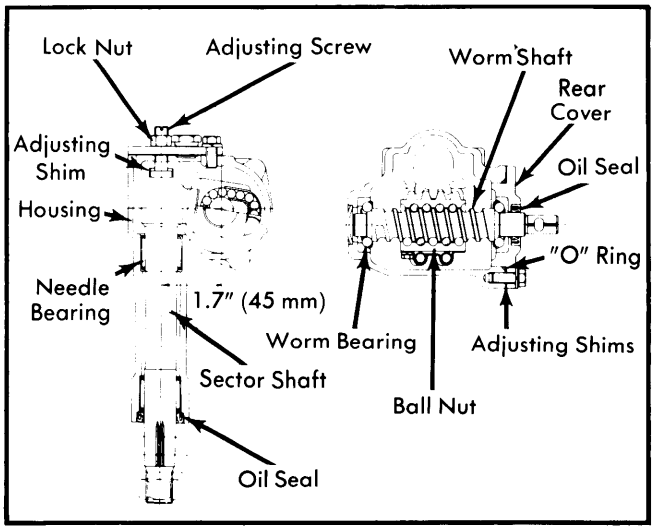

Fig. 2 Sectional View of Datsun Recirculating Ball Steering Gear

Inspection – Inspect gear teeth on sector shaft and ball nut for wear or damage; replace as necessary. Check bearings for wear or roughness during rotation. Ensure ball nut moves smoothly over its entire length of travel.

DATSUN 200SX, B210, 710 & 810 RECIRCULATING BALL (Cont.)

Assembly & Adjustment – 1) Lubricate bearings, gear, and other moving parts with gear oil. Apply suitable grease to oil seal lip and press seal into rear cover. Install "O" ring, worm shaft assembly, and worm bearing shims to gear housing. **NOTE** – *Be sure to install thicker shims to gear housing side.*

2) By selecting suitable shims, adjust worm bearing preload so that initial turning torque of worm shaft is as specified (see illustration). Rotate worm shaft a few turns to properly settle worm bearing before taking preload measurement.

Worm Bearing Preload

Application	Inch Lbs. (cmkg)
B210	3.5-5.2 (4-6)
200SX, 710 & 810	3.5-6.9 (4-8)

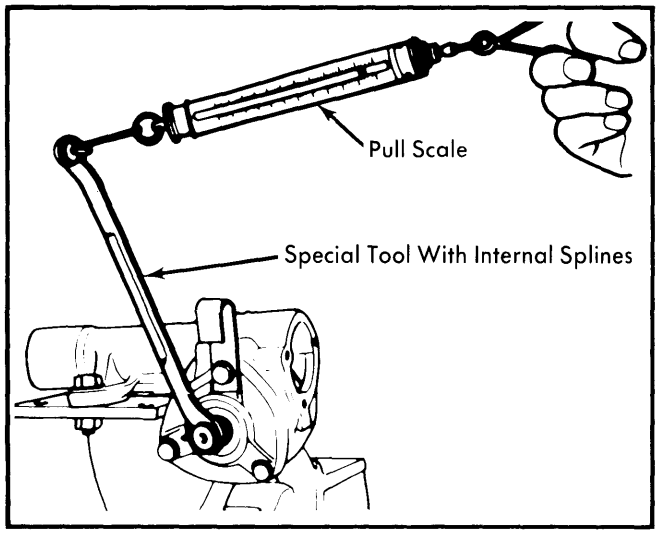

Fig. 3 Measuring Steering Gear Initial Turning Torque

3) Insert adjusting screw into "T" groove of sector shaft and adjust end play between shaft and screw head to .0004-.0012" (.01-.03 mm) by selecting appropriate shim size.

4) Rotate worm shaft until ball nut is in center of travel, then install sector shaft and adjusting screw in gear housing. Ensure center tooth of sector shaft is engaged with center of ball nut. Apply sealant and gasket material to sector shaft attaching face.

5) Turn adjusting screw counterclockwise to set cover on gear housing. Temporarily install retaining bolts. Turn adjusting screw further counterclockwise until sector shaft is drawn upward about .08-.12" (2-3 mm). Fully tighten cover bolts.

6) Push sector shaft against ball nut by gradually turning adjusting screw until sector shaft gear lightly meshes with ball nut gear, and temporarily secure adjusting screw with lock nut.

7) Install pitman arm to sector shaft and move it side-to-side several times to ensure smooth operation. Set pitman arm at center point and adjust backlash (by turning adjusting screw) such that free movement at top end of pitman arm is .004" (0.1 mm).

8) Turn adjusting screw clockwise approximately $\frac{1}{8}$-$\frac{1}{6}$ turn and tighten lock nut securely, after moving sector shaft several times. Fill gear housing with approximately $\frac{5}{8}$ pint (.27 litre) of suitable gear oil. Install filler plug.

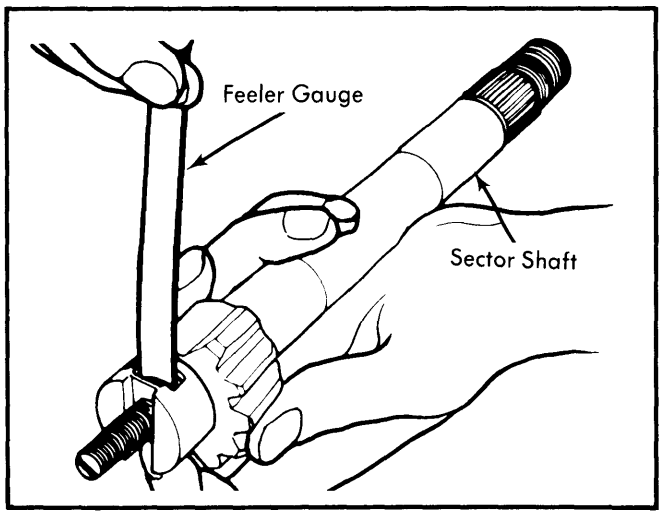

Fig. 4 Measuring Sector Shaft-to-Adjusting Screw End Play

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Pitman Arm-to-Gear	
200SX, B210 & 810	94-108 (13.0-14.9)
710	101 (14.0)
Front & Rear Cover Bolts	
B210	12-20 (1.66-2.77)
200SX, 710 & 810	11-18 (1.52-2.49)
Adjusting Screw Lock Nut	
B210	18-25 (2.49-3.46)
200SX & 810	12-18 (1.7-2.5)
710	22-29 (3.04-4.01)
Gear-to-Frame	
B210	43-58 (5.95-8.02)
200SX & 710	51-58 (7.05-8.02)
810	38-46 (5.3-6.3)
Idler Arm-to-Frame	
200SX	51-58 (7.0-8.0)
B210	43-58 (5.95-8.02)
710 & 810	32-44 (4.42-6.08)
Ball Stud Nuts	
B210	40-55 (5.53-7.60)
200SX, 710 & 810	40-72 (5.53-9.95)
Tie Rod Lock Nuts	
All	58-72 (8.02-9.95)
Worm Shaft Coupling Bolt	
B210	11-16 (1.52-2.21)
200SX, 710 & 810	29-36 (4.01-4.98)