

GENERAL MOTORS POWER RACK & PINION – "J" BODY

Cavalier
Cimarron
Firenza

J2000
Skyhawk

DESCRIPTION

The power rack and pinion steering system has a rotary control valve which directs hydraulic fluid to either side of the rack piston. The rack piston is integral with the rack gear and converts hydraulic pressure to linear force. This force assists the rack gear to move either left or right. If hydraulic assist is not available, manual control of steering is still maintained. However, without the hydraulic assist, an increase in steering effort can be expected. The power rack and pinion steering gear consists of an input pinion gear, a steering rack gear, a tube housing and a rotary valve assembly.

LUBRICATION, TROUBLE SHOOTING & TESTING

See *Power Steering General Servicing* in this Section.

REMOVAL & INSTALLATION

STEERING GEAR

Removal – 1) Remove driver's side hush panel. Move seal away from flexible coupling at bottom of steering column. Remove both pinch bolts from flexible coupling. Remove air cleaner and washer fluid reservoir. Disconnect pressure line from switch block and rack assembly. Disconnect return line from rack assembly. Remove steering gear attaching brackets.

2) Move steering gear away from cowl while separating flexible coupling from pinion shaft. Disconnect both tie rod ends from struts. Remove splash shield from inner left fender. Remove steering gear from vehicle through opening in inner left fender.

Installation – To install, reverse removal procedure.

OVERHAUL

INNER TIE RODS

Disassembly – Remove inner tie rod bolts, 1 at a time, and slide tie rod out from under support plate. After removing each tie rod, reinstall tie rod bolts to keep boot and guides properly aligned. Using a bushing driver (J-29809 or equivalent), remove bushing from inner tie rod end.

Reassembly – Coat inner tie rod bushing with a light film of grease and install in tie rod using bushing driver (J-29809 or equivalent). Make sure center housing cover washers are in place on boot. Reinstall tie rod ends and secure bolts with lock plate tabs.

INPUT SHAFT & VALVE ASSEMBLY

Seal & Bearing Removal – Remove retaining ring from input shaft. Remove dust cover from lower end of pinion housing. Hold input shaft and remove pinion shaft lock nut. Press on threaded end of pinion until flush with lower bearing. Remove seal and bearing from input shaft.

CAUTION – Damage to the pinion teeth will result if input shaft is not held when removing lock nut.

Installation – To install, reverse removal procedure.

Valve Pinion Removal – Center rack gear. Mark pinion and housing for reassembly reference. Press threaded end of pinion until removal of pinion assembly is possible. Check lower pinion bearing for wear or rough operation. If replacement of bearing is necessary, remove retaining ring and tap out bearing. If replacement of upper pinion bushing and seal is necessary, drive seal and bushing out of housing with a punch.

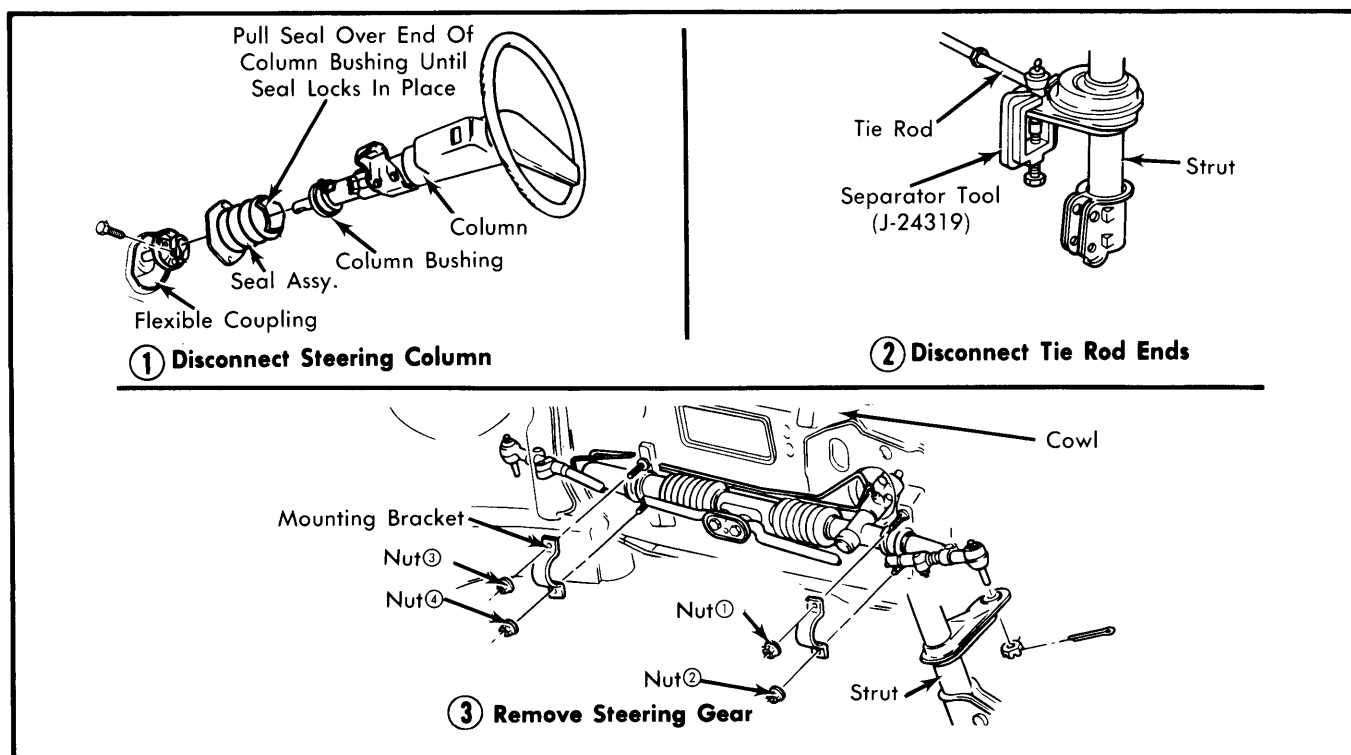


Fig. 1 Steering Gear Removal & Installation Procedure. Reinstall Mounting Bracket Nuts In Order Shown.

Power Steering

GENERAL MOTORS POWER RACK & PINION – "J" BODY (Cont.)

Installation – Install upper pinion bushing and seal into housing. Install lower bearing, making sure beveled edge of retaining ring is facing same direction as when removed. Install new valve body rings on valve if necessary. Center rack gear and install pinion, making sure that marks made at disassembly line up.

GEAR HOUSING & RACK

Disassembly – 1) Remove hydraulic cylinder lines, starting at the valve end first. Separate and remove right side mounting grommet. Remove and discard both boot clamps. Slide cylinder end of boot toward center of housing and place a rubber band in boot retaining groove. Slide boot off of housing. Remove rack guide and bearing guide from housing.

2) Loosen adjusting plug lock nut. Unscrew adjuster plug and remove from housing. Remove spring, rack bearing and "O" ring from housing.

3) Mark cylinder outer bulkhead to insure correct reassembly. Insert a small punch through access hole to unseat bulkhead retaining ring. Pry retaining ring out of housing. Thread an inner tie rod bolt into rack gear and, using a pounding motion, remove rack and cylinder from housing.

4) Pull on piston rod to remove piston and rod guide from cylinder. Place rack gear in a soft jawed vise and unscrew rod and piston assembly. Do not remove piston rod guide unless replacement of piston, rod, seal or guide is necessary. If replacement of piston rod seal is necessary, remove guide from rod, remove retaining ring from guide and pry seal out of guide.

Reassembly – 1) Install piston rod seal, backup washer and retaining ring in piston rod guide. Cover threaded end of piston rod to protect piston rod seal. Coat inside of seal with power steering fluid and slide piston rod guide onto piston rod. Tap piston rod into rack until threads engage. Tighten piston rod to specifications and stake rack against flats on piston rod.

2) Coat a new piston ring with power steering fluid and install on piston. Slide piston into cylinder and tap guide assembly into cylinder until seated. Replace "O" ring seals on each end of rack and cylinder assembly. Remove any burrs from snap ring groove in end of housing. Coat "O" ring seals with power steering fluid and install rack assembly in housing. Replace cylinder bulkhead using marks made at disassembly.

3) Replace retaining ring into end of housing making sure to align gap with access hole. Reverse remainder of disassembly procedure to complete assembly.

4) Adjust pinion preload by tightening adjuster plug to 72-132 INCH Lbs. (8-15 N·m), then backing off 50° to 70°. Check pinion preload and adjust plug if not within 8-16 INCH Lbs. (1-2 N·m).

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N·m)
Adjuster Plug Lock Nut	50 (68)
Flexible Coupling Pinch Bolts	37 (50)
Inner Tie Rod Bolts	65 (88)
Pinion Lock Nut	26 (35)
Piston Rod-to-Rack Gear	66 (90)

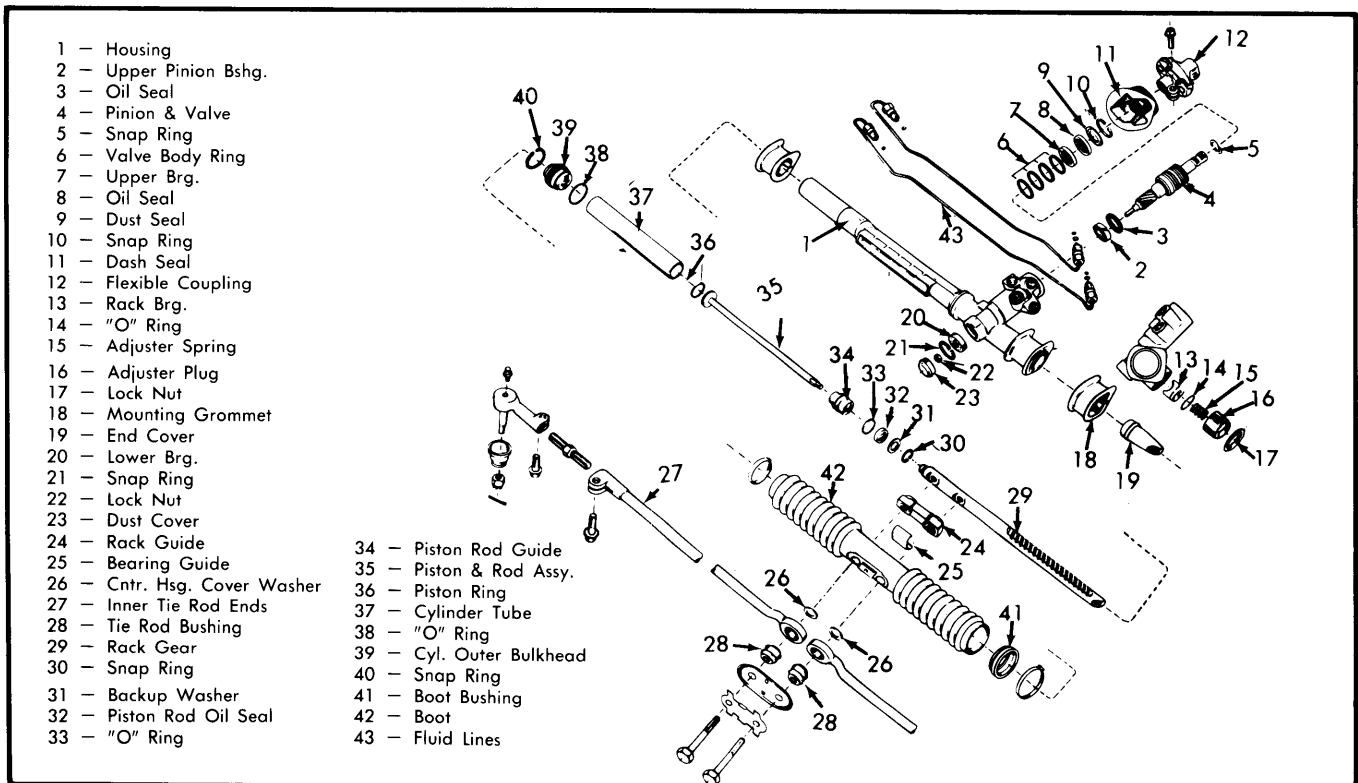


Fig. 2 Exploded View of "J" Body Power Rack & Pinion Steering Gear