

STEERING SYSTEM - POWER

1990 Volvo 740

Disassembly (740 & 760 Series Cam Gear Type)

- 1) Clean housing and remove oil pipes. Turn pinion back and forth to pump oil out of gear. Place rack in center position.
- 2) Remove clamps and boots. To prevent pinion damage, hold rack with adjustable wrench. Unscrew left steering rod completely. Loosen, but do not remove, right side steering rod. Remove right side locking wire.
- 3) Remove steering rod. Remove lock sleeve, plastic ring and bushing. Remove rack preload assembly. See Fig. 10.
- 4) From top of pinion, remove dust cover and lock ring. Remove lower pinion cover and pinion nut. Lift out pinion and spool valve. Remove rack from housing.
- 5) Remove lock ring from lower pinion bearing and drive out bearing. From center of pinion housing, drive out pinion lower seal.
- 6) Tap rack seal and spacer from inside of tube. DO NOT score inside of housing when removing seal. Replace piston seal if damaged or with more than 25,000 miles on vehicle.
- 7) Remove dust cover, lock ring, seal and upper bearing from spool valve assembly. See Fig. 8.

CAUTION: DO NOT remove 4 Teflon rings from spool valve assembly. Replacement rings are not available. If rings are worn, replace entire steering gear.

CLEANING & INSPECTION

Replace all seals except 4 Teflon rings on spool valve. If pinion or spool valve is damaged, replace entire steering gear. Clean and inspect rubber boots and replace if necessary.

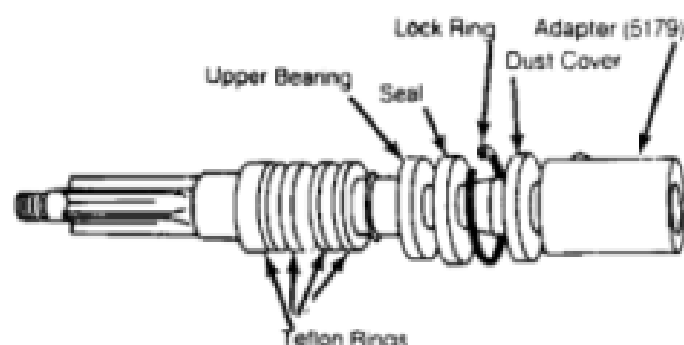


Fig. 8: Cam Gear Spool Valve Assembly (740 & 760 Series)

Reassembly

- 1) Coat all parts with ATF before assembly. Install new "O" ring and Teflon ring on rack piston. If difficult to install, heat Teflon ring in water to about 100°F (40°C).
- 2) Using Seal Drive (5277) and Handle (1801), install lower pinion seal and guide sleeve in housing. Seal ring lip must face up. If seal is not centered properly, pinion will not turn easily.
- 3) Install lower bearing and lock ring. Wrap rack teeth with tape. Install seal with lip facing piston seal. Install tapered spacer with tapered side facing seal. Install flat spacer.
- 4) Press 2 spacers together. Remove tape from rack. Lube rack teeth. Install rack in housing. As rack seats, lightly push on rack to seat seal and spacers.
- 5) To ensure seal is correctly positioned, look through pressure tube opening to ensure at least half of piston seal retainer has passed center of opening. Position rack so the end protrudes about 3/4" from end of housing next to pinion housing.
- 6) Clean end of rack with wet fine-grit sandpaper. Clean rack and wrap one turn of tape around rack edge. Lubricate rack and tape.
- 7) Install plastic spacer with beveled side facing toward seal. Install lock sleeve and bushing onto rack. Use small screwdriver to lift edge of seal on end of rack.
- 8) Position end of lock sleeve so cut-out sections face end of rack. Ensure rack opening for locking wire is in line with elongated hole in tube. Install locking wire. Turn bushing until wire is positioned correctly.
- 9) Center rack in housing and lubricate teeth with grease. Place pinion in housing with flat side in any one of 3 correct positions. See Fig. 9. End of rack should protrude 2.2" (55 mm).

CAUTION: Only remove 4 Teflon rings from spool valve if damaged.
Replace rack piston seal only if damaged or after 25,000 miles.

Cleaning & Inspection

Replace rubber boots if defective. Check all parts for wear, corrosion or damage. Replace as necessary. Replace entire steering gear if spool valve assembly is damaged.

Reassembly

1) Lubricate all parts with ATF before reassembly. Install "O" ring and Teflon ring on rack piston. If difficult to install, heat Teflon ring in water to 104-122°F (40-50°C).

2) Install seal over rack teeth with lip facing piston. Lubricate rack piston teeth. Place spacer ring next to seal.

3) Install rack with seal and spacer ring into housing. When rack seats, gently push it in farther to seat seal and spacer ring. Rack is positioned correctly when rack seal is visible in center of outlet tube hole.

4) Position rack so end protrudes about 3/4" from pinion housing end of rack housing. DO NOT push rack farther into housing or seal may be damaged.

5) Install bushing, spacer washer and seal in end sleeve. Seal lips face outward from end of sleeve. Drive end sleeve in housing and secure with snap ring.

6) Install "O" rings and Teflon rings (if removed) on spool valve. If necessary, heat Teflon rings in water to 104-122°F (40-50°C) to ease installation.

7) Install bearing and "O" ring in upper bearing housing. Install seal with lip facing bearing. Install lower pinion seal in pinion housing with lip facing up. Install lower pinion bearing and lock ring.

8) Install pinion and spool valve assembly in pinion housing. Install upper bearing housing, spacer washer, snap ring and dust shield. Pack bottom of dust shield with grease.

9) On bottom of pinion and spool valve assembly, install spacer washer and tighten lock nut to 11 ft. lbs. (15 N.m). Fill pinion housing lower cover with grease and install.

10) Center steering rack in housing. Install preload spring WITHOUT "O" ring. Install spring in piston.

11) Install Counterhold (2985) on steering rack. See Fig. 12. Install dial indicator with stem on rack housing. Zero dial indicator.

12) Turn dial indicator so tip rests on face of preload piston. Note reading.

13) Move rack from lock to lock and note maximum indicator reading. Subtract .004" (.10 mm) from maximum indicator reading to achieve total thickness of shim to be installed.

14) Remove dial indicator and counterhold. Install "O" ring on preload piston. Install preload piston with spring, shim and cover. Tighten bolts to 79 INCH lbs. (9 N.m).

15) Install boot "O" ring and steering rods. Stake steering rods to rack to secure in position. Install boots and clamps.

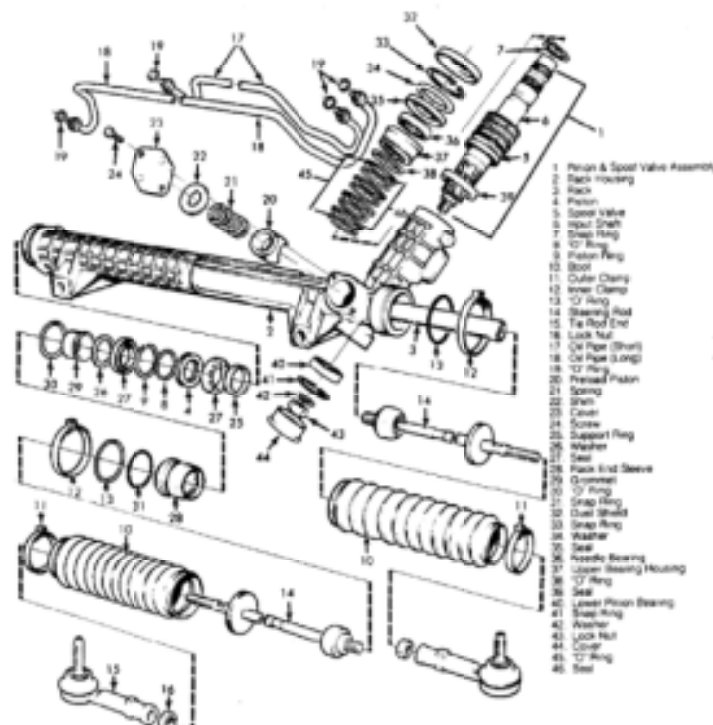


Fig. 11: Exploded View of ZF Steering Gear (740 & 760 Series)
Courtesy of Volvo Cars of North America.

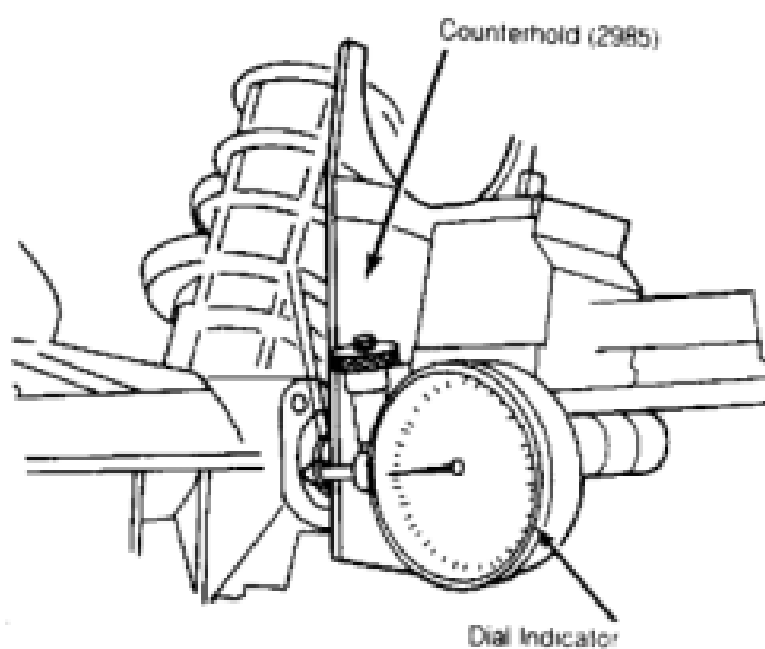


Fig. 12: Checking Rack Preload (740 & 760 Series ZF Steering Gear)

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
240 Series (ZF Steering Gear)	
Oil Line Fittings	15 (20)
Preload Piston Cover	16 (22)
Tube Assembly-to-Pinion Housing	88 (120)
Valve Housing-to-Pinion Housing	18 (25)
740 & 760 Series (Cam Gear Type)	
Pinion Cover Bolts	12 (17)
Pinion Lower Lock Nut	27 (37)
Rack Mounting Bolts	32 (44)
740 & 760 Series (ZF Steering Gear)	
Rack Mounting Bolts	32 (44)
INCH Lbs. (N.m)	
740 & 760 Series (ZF Steering Gear)	
Rack Preload Adjusting Cover Bolts	79 (9)
