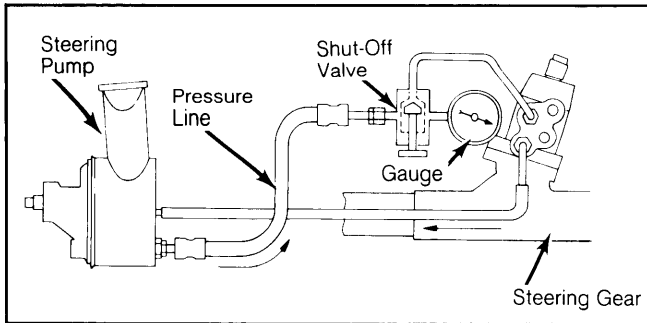


JAGUAR POWER-ASSISTED RACK & PINION (Cont.)

Fig. 2: Pressure Gauge and Shut-Off Valve Connections



By adding a shut-off valve you can isolate steering pump from steering gear.

SYSTEM BLEEDING

- 1) Turn wheels to full left lock, add fluid to "COLD" level mark on dipstick. Start engine and idle. Turn steering wheel lock-to-lock to expel air. Check fluid level.
- 2) Straighten wheels and run engine for several minutes. Turn off engine, check fluid level. Fluid should be up to "HOT" mark on dipstick.

REMOVAL & INSTALLATION

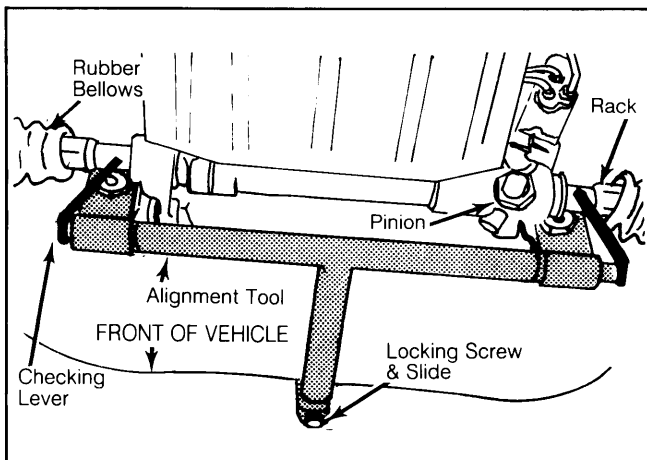
STEERING GEAR

NOTE: The amount and location of all washers and spacers must be noted for correct installation.

Removal

- 1) Remove lower steering column. Drain fluid from pump. Disconnect pressure and return lines, and cap openings. Disconnect ball joints from steering knuckles.
- 2) Remove rack-to-suspension bolt. Remove heat shield bracket and spacers. Remove remaining bolts from rack mounting and save washers. Remove steering gear from vehicle.
- 3) Disconnect ball joints from steering knuckles. Remove steering shaft from gear. Remove clamp from power steering lines. Disconnect pressure and return lines from steering gear.

Fig. 3: Installing Rack and Pinion Gear



It may necessary to bend shields slightly to locate tool.

4) Drain fluid and cap openings. Remove nuts and bolts attaching steering gear to sub frame. Position a jack under sub frame. Remove bolts attaching sub frame-to-frame.

5) Lower sub frame until rear mounting bolts just clear sub frame. Turn steering to full right lock. Move steering gear to right until left tie rod clears. Remove steering gear from vehicle.

Installation

- 1) Position rack against mounting brackets and center lugs on bracket. Insert shims between lug and bracket to insure a gap of .05" (1.3 mm) on both sides of rack lug and mounting bracket.
- 2) Insert retaining bolts but do not tighten. Repeat centering procedure on upper and lower mountings on pinion side of rack. Make sure heat shield mounting bracket is located on upper mounting bolt.
- 3) Remove clip retaining rubber bellows to rack housing and fold bellows back to expose inner ball joints. Install attachment brackets, of alignment tool (JD.36A), over large hex head bolts on lower control arms.
- 4) It may be necessary to bend shields slightly to locate tool correctly. See Fig. 3. Release locking screw and slide collar along tool to front of suspension unit until slot engages front weld flange of crossbeam.
- 5) Lock slide in this position. Rotate alignment tool until legs rest on tie rods. To adjust slack, loosen lock nut of single bolt mounting and raise or lower same side of rack assembly.
- 6) Remove tool, fully tighten rack mounting lock nuts. Reposition bellows and secure clips. On all models, reinstall tie rods and power steering hoses. Refill and bleed system. Check wheel alignment.

POWER STEERING PUMP

Removal

- 1) Remove air cleaner. Partially drain radiator and remove upper radiator hose. Drain fluid from steering pump. Disconnect and cap fluid lines. Loosen nut retaining adjusting rod to timing cover.
- 2) Remove bolt retaining adjuster rod to pump, swing adjuster clear of pump. Remove lower pump pivot nut. Move pump toward engine and remove belt. Remove lower pivot bolt and remove pump from vehicle.

Installation

To install power steering pump, reverse removal procedures. After replacement, adjust belt tension and bleed system.

CONTROL VALVE AND PINION

NOTE: No adjustment or repair is possible except the replacement of the pinion seal.

Removal

- 1) Remove steering gear assembly. Clean rack and pinion housing. Note position of pinion housing ports-to-valve cylinder pipes for reassembly reference.
- 2) Loosen rack plunger lock nut and adjusting screw to remove spring tension. Remove pinion housing bolts and remove pinion housing with pinion shaft.

Installation

To install, reverse removal procedures. Make sure pinion housing ports are aligned with cylinder pipes. Make sure recess on pinion shaft is in correct position with pinion housing.

Power Steering

JAGUAR POWER-ASSISTED RACK & PINION (Cont.)

OVERHAUL

RACK ASSEMBLY

Disassembly

1) Clean rack and pinion housing, drain assembly of fluid. Remove clips attaching bellows to tie rods and fold bellows back, exposing tie rod inner ball joint.

2) Straighten lock tab of tie rod inner ball joint. Remove tie rods from rack by loosening lock nut on inner ball joint. Note position of pinion housing-to-valve cylinder pipes, remove pipes. Remove air transfer pipe.

3) Remove Allen screw from end cap. Remove locking ring from end housing. Remove end housing. Remove rack plunger lock nut, adjusting nut, spring and plunger. Remove pinion housing cover. Remove pinion housing from rack housing.

4) Remove pinion from pinion housing. Remove snap ring, washer and seal from pinion housing. Remove rack from rack housing. Remove porting adapter and slide porting ring along cylinder until feed hole is exposed.

5) Using a scribe (or similar tool) pry seal until seal can be removed from cylinder with a hooked wire. Remove all seals, "O" rings and sleeves from rack housing.

NOTE: Do not remove seals from pinion piston.

Inspection

1) Clean all parts in solvent and dry. Do not wipe dry as lint could contaminate parts and cause malfunction when assembled. Check all parts for excessive wear, scratches, nicks or scoring. Replace parts as necessary.

2) Check rack teeth and pinion teeth for chips, burrs and other damage. Always replace all "O" rings and seals upon reassembly. Check rubber bellows for cracks, splits or holes, replace as necessary.

Reassembly

1) Lubricate all "O" rings, seals and sleeves before installation. Also lubricate all moving parts before installation. Install seal and "O" ring to end housing.

2) Install new center feed porting adapter to porting ring. Position ring to allow conical seating on adapter to engage with seating on cylinder and tighten.

3) Install rack seal over rack teeth up against piston. Install anti-extrusion ring to recess in back of rack seal. Lubricate inside of rack housing and grease rack. Insert rack into rack housing with firm steady pressure until seal seats against abutment face.

4) Make sure piston ring collapses and enters rack housing without damage. Install new seal, washer and snap ring to pinion housing. Install new pinion valve seal to pinion shaft (located against pinion bearing).

5) Lubricate pinion shaft, piston seals, and bearing. Carefully install pinion shaft to pinion housing, tap gear end of shaft lightly to make sure it is seated.

6) Grease pinion teeth and small journal of pinion. Install pinion and housing (use new gasket) to rack housing. Make sure rack teeth and pinion teeth mate correctly.

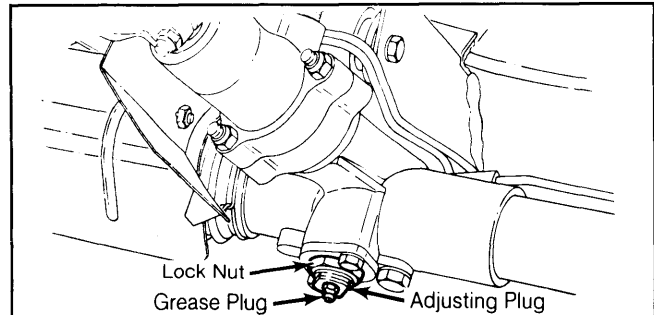
7) Make sure pinion housing ports are correctly aligned so cylinder-to-valve pipes can be installed. Install seals to end housing.

8) Install end housing-to-rack housing and screw locking ring into end housing just enough to hold mounting feet in parallel alignment.

9) With end housing and mounting feet in alignment, tighten locking ring. Install rack plunger, spring, adjusting plug and lock nut. Tighten adjusting plug, while moving rack through full stroke, until rack is hard to move.

10) Back off adjusting nut just enough to obtain a smooth rack movement (approximately 1/8 turn). Tighten lock nut while holding adjusting plug from turning.

Fig. 4: Rack End Play Adjustment



To obtain smooth rack movement, back off 1/8 turn.

11) Install air transfer pipe and cylinder-to-valve pipes. Place bellows onto tie rods, small opening towards outer ball joint. Install tie rod inner ball joint to rack. Make sure lock washer tab is aligned with slot in rack end.

12) Pull rack out until rack teeth can be held in soft-jawed vise. Tighten tie rod inner ball joint lock nut. Repeat procedure for other tie rod. Bend lock washer tab into rack slots with punch.

13) Place 1 to 2 oz. of grease into each bellows, attach bellows to rack housing and tie rod with wire clips. Remove plug in rack plunger adjusting plug and install grease nipple.

14) Using a hand grease gun, fill with approximately 5 strokes of the grease gun. Remove grease nipple and install plug.

POWER STEERING PUMP

Disassembly

1) Remove rear mounting plate and pulley from pump. Remove front mounting plate from pump and clean pump body. Remove pressure outlet union and mounting plate studs from rear of pump.

2) Tip pump and remove flow control valve and spring. Place pump in padded vise and tap pump casing from body. Remove "O" rings from pump body and magnet from flange.

3) With pin punch, push retaining ring free from groove and lever from body. Remove spring retaining plate and spring. Remove "O" ring from recess in pump body.

4) Remove Woodruff key from shaft. Tap roller spindle toward body. Remove pump assembly from body. Remove "O" ring from recess in pump body. Remove dowel pins.

Cleaning and Inspection

1) Clean all parts with lint-free cloth. Replace all "O" rings and seals. Check all parts for scratches, nicks, burrs or excessive wear.

JAGUAR POWER-ASSISTED RACK & PINION (Cont.)

2) Replace rotor ring and vanes if excessive wear or chatter marks are present. Check flow control valve for free movement in bore. Lubricate all parts with power steering fluid before reassembly.

3) Check interference fit between pump shaft and pulley. Replace parts if interference fit is less than .001" (.025 mm) or more than .0026" (.066 mm).

Reassembly

1) Lubricate drive shaft seal and fit into pump shaft housing. Fit "O" ring to lower recess in pump body. Place dowel pins in locating holes. With cutaway face uppermost, fit bottom plate to drive shaft.

2) Fit rotor over splines of drive shaft (countersunk face towards thrust plate) and secure with snap ring. Insert vanes in rotor with curved edge out.

3) Fit drive shaft and rotor to pump body. Make sure dowel pins locate through smallest holes of bottom plate. With arrow towards rear of housing, place pump ring chamber over rotor and dowel pins.

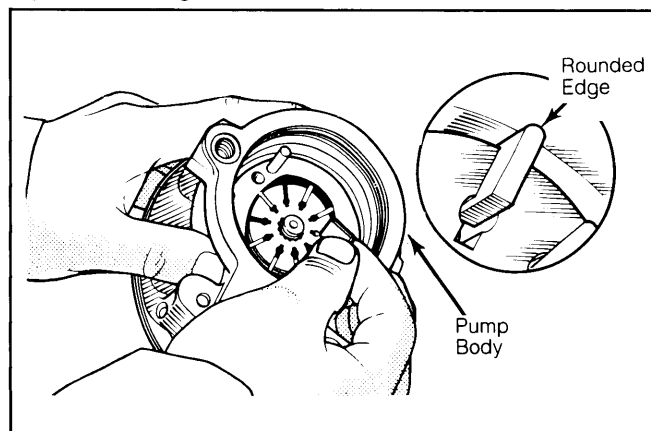
4) With spring recess up, fit chamber top plate over dowel pins. Push complete pump assembly home. Fit "O" ring into upper recess of pump body. Fit spring to recess in top plate.

5) Place retaining plate over spring and push into body. Fit "O" rings to port recess, and large "O" ring to outside pump body and magnet to flange.

6) Place pump casing over body. Locate mounting studs into outer casing and into pump body. Place outer casing over pump body. Tighten mounting studs.

7) Install spring and flow control valve. Fit pressure outlet union. Place Woodruff key in drive shaft spindle. Install pulley and mounting plates. Refill system with fluid and bleed system.

Fig. 5: Installing Vanes in Rotor Plate



Rounded end of vanes face out.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Center Feed Porting Adapter Ring	22-25 (30-34)
Pump High Pressure Fitting	25-40 (34-54)
Rack Housing End Plate Lock Ring ...	80-90 (109-122)
Rack Housing Mounting Bolts	49-55 (67-75)
Tie Rod Inner Ball Joint Lock Nut	45-55 (61-75)

Fig. 6: Exploded View of Power Steering Pump

