

## SAGINAW VANE

American Motors  
Chrysler Corp.  
General Motors

### DESCRIPTION

Pump can be identified by having pressure hose attachment at rear of oval shaped reservoir. Rectangular pumping vanes carried by a shaft driven rotor, move fluid from intake to pressure cavities of cam ring. As rotor begins to rotate, centrifugal force throws vanes against inside surface of cam ring to pick up residual oil, which is then forced into high pressure area. Oil is forced into cavities of thrust plate and through two cross-over holes in cam ring and pressure plate. This empties oil into high pressure area between pressure plate and housing end plate. Filling high pressure area causes oil to flow under vanes in slots of rotor, forcing vanes to follow inside oval surface of cam ring. As vanes rotate to small area of cam ring, oil is forced out from between vanes.

### LUBRICATION, TROUBLE SHOOTING & TESTING

See *Power Steering General Servicing* in this section.

### REMOVAL & INSTALLATION

#### POWER STEERING PUMP

Place container under vehicle to catch any fluids lost during removal of pump. Disconnect hoses at pump or steering gear, and plug fittings to prevent contamination of system. Loosen belt tension and remove drive belt. Depending on engine and air conditioning configuration, it may be necessary to remove additional components to gain access to pump and mountings. On some models, power steering pump pulley may be removed to ease removal of pump. To install, reverse removal procedure.

**NOTE** — It may be necessary to remove pump bracket along with pump on some models. If bracket bolts extend into water jacket, coolant should be caught in drain pan.

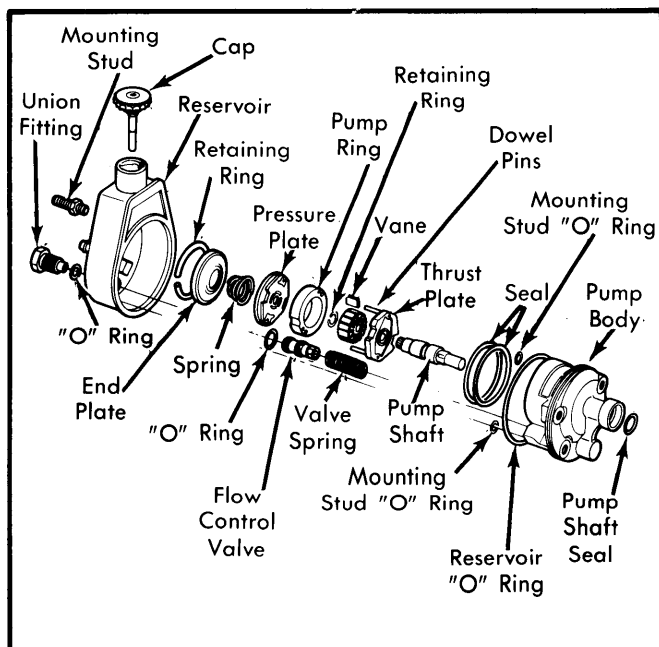


Fig. 1 Saginaw Vane Power Steering Pump

#### POWER STEERING PUMP PULLEY

Pump pulley is a press fit on shaft and must be removed and installed with suitable puller tools. DO NOT hammer on puller, pulley or shaft, causing possible damage to internal pump components. Clamp pump in vise at mounting bracket or front hub. Avoid clamping front hub too tightly with vise. Use suitable pulley remover tool, ensuring that it is aligned with shaft, and remove pulley. To install, use suitable installer tool

#### Pump Pulley Service Tools

Application	Remover Tool No.	Installer Tool No.
American Motors .....	J-25034 .....	J-25033
Chrysler Corp. ....	C-4068A .....	C-4063
General Motors .....	BT-7515 .....	BT-7515

### OVERHAUL

#### POWER STEERING PUMP

**CAUTION** — When clamping pump in vise or mounting fixture, do not exert excessive force on front hub as housing may be distorted.

**Disassembly** — 1) Remove pulley as previously outlined and remove key from shaft. Remove brackets from pump, drain reservoir, and clean exterior of pump. Using a vise with soft jaws, clamp pump (shaft down) between square boss and shaft housing. Remove pressure union and "O" ring seal. Remove retaining studs. Rock filler tube back and forth gently to loosen, and work reservoir off pump body. Discard all old "O" rings.

2) Using a punch, tap end cover retaining ring around until one end of ring is near hole in pump body. Insert punch in hole far enough to disengage ring from groove in pump bore and pry ring out of pump body. Tap end cover with plastic hammer to jar it loose. Spring located under cover should push it up. Remove pump body from vise.

3) Place pump in inverted position on flat surface, and tap end of drive shaft with plastic hammer to loosen pressure plate, rotor, and thrust plate assembly from body. Lift pump body off rotor assembly. Flow control valve and spring should slide out of bore also. Remove and discard end plate and pressure plate "O" rings. Remove drive shaft oil seal by prying out with a screwdriver.

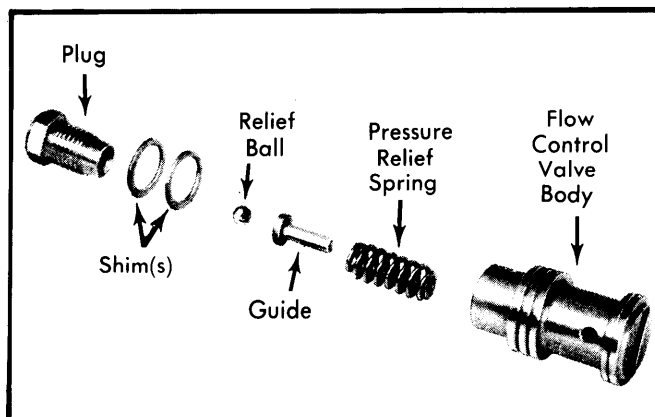


Fig. 2 Exploded View of Flow Control Valve

## SAGINAW VANE (Cont.)

4) Inspect seal bore in housing for burrs, nicks or score marks that would allow oil to by-pass outer seal surface. Lift pressure plate and cam ring from rotor. Clamp drive shaft in soft-jawed vise with rotor and thrust plate up. Remove rotor lock ring by prying off with a screwdriver. Use care to avoid nicking rotor end face. Discard ring and slide rotor and thrust plate off shaft. Remove shaft from vise.

**NOTE** — Flow control valve is serviced as an assembly and should not be disassembled. However, if pump is being overhauled because of dirt in system, valve can be disassembled for cleaning.

**Cleaning & Inspection** — Clean all pump parts in suitable solvent. Replace any damaged or worn parts. Inspect flow control valve for wear or damage. Inspect fit of vanes in rotor, excessively loose vanes require replacement of rotor and/or vanes. Examine inner surface of cam ring for heavy scuff or chatter marks. Replace if necessary. Inspect flat surfaces of pressure and thrust plates for wear or scoring. Light scoring can be removed by lapping on a flat surface.

**NOTE** — If pump is equipped with self-attaching magnet, ensure that all particles are cleaned from magnet.

**Reassembly** — 1) Lubricate all "O" ring seals and seal areas with power steering fluid. Place pump body on flat surface. Drive new pump shaft seal into bore with suitable installer or a 7/8" or 15/16" socket until seal bottoms on shoulder. DO NOT use excessive force or seal may be distorted. Clamp pump body in vise with shaft down. Install end cover and pressure plate "O" rings in grooves in pump cavity.

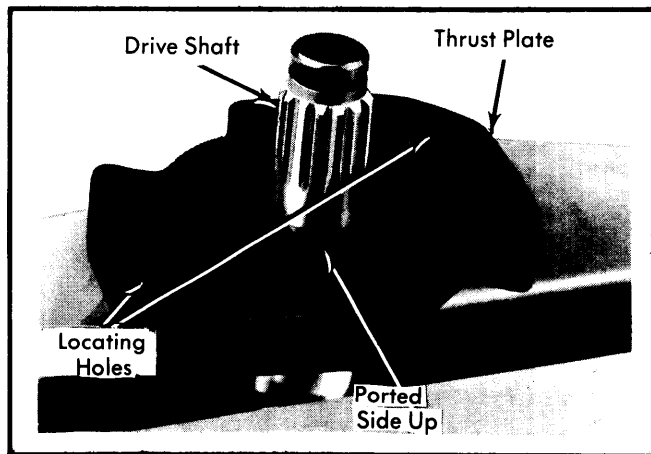


Fig. 3 Installing Thrust Plate

2) Insert both dowel pins in smaller 2 holes of thrust plate. Insert splined end of pump shaft through thrust plate and rotor and install snap ring on shaft. Rotor must move freely on splines. Install pump shaft assembly in pump body, ensuring that dowel pins are properly engaged in thrust plate.

3) Slide cam ring over rotor on dowel pins with arrow facing up. Install ten vanes in rotor slots with radius edge facing out towards cam ring inner surface. Position pressure plate on dowel pins. Place a 1 1/4" socket in groove of pressure plate.

Seat entire assembly on "O" ring in pump cavity by pressing down with both thumbs.

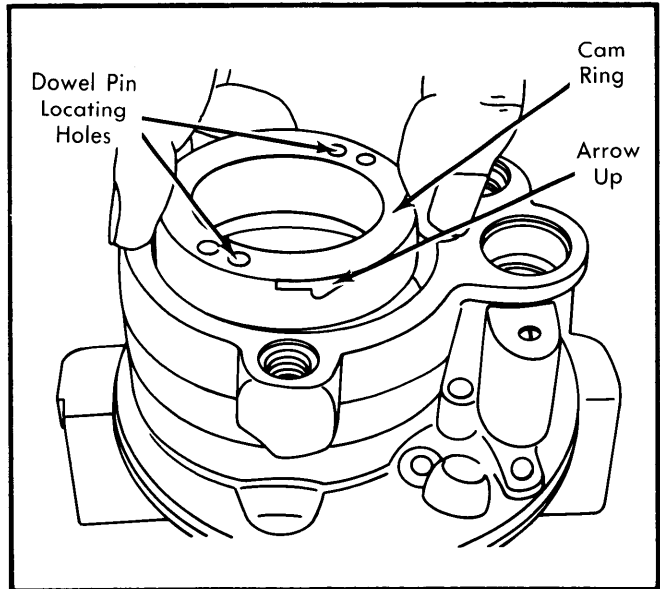


Fig. 4 Installing Cam Ring

4) Place spring in groove in pressure plate and position end cover lip edge up over spring. Press end cover down below retaining ring groove with thumb. Install ring making sure it is seated in groove. Care should be exerted to prevent cocking the end cover in the bore or distorting the assembly.

**NOTE** — If flow control valve was removed, install in pump bore with spring and hex end of valve facing interior of bore.

5) Using a punch, tap retainer ring ends around in groove until opening is opposite flow control valve bore. This is important for maximum retention of retainer ring. Replace reservoir "O" ring seal, two mounting stud "O" ring seals and flow control valve "O" ring seal on pump body, then carefully position reservoir on pump body. Visually align mounting stud holes until studs can be started in threads.

6) Press reservoir down on pump to seat on pump body. Place new seal on pump union and install union in flow control valve bore. Tighten mounting studs and install pump pulley.

### TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N•m)
Reservoir Mounting Bolt .....	35 (47)
Flow Control Valve Fitting .....	35 (47)
High Pressure Union .....	35 (47)
High Pressure Line-to-Union .....	25-35 (34-47)
Mounting Bracket Bolts .....	30-45 (41-61)
Flow Control Valve Plug .....	48 INCH Lbs. (5)