

PUMPED UP

Keep that original GM feeling with a power steering pump rebuild

TEXT AND PHOTOGRAPHY BY TOM SHAW

EVER SEE A SHINY MUSCLECAR WITH SLICK PAINT AND LOTS OF NEW CHROME? OBVIOUSLY THE GUY SPENT SOME LARGE DOLLARS ON COSMETIC STUFF, BUT WHEN THE CAR IS MOVED, THERE ARE PUDDLES OF STUFF LEFT BEHIND. CARS THAT LOOK GOOD ARE GREAT, BUT THEY'RE EVEN BETTER WHEN THEY WORK RIGHT.

So to further that cause, we're showing you how to rebuild your GM car's power steering pump. We recently dropped by Power Steering Services in Springfield, Missouri, and followed along as Chip Woyner worked over a typical "reservoir" pump.

The outer sheetmetal reservoir can vary from year to year and from GM's various divisions. Be sure you have the correct pump and parts before beginning. If you're piecing together a system, say on a car that originally had manual steering, both pulleys have to match. The wrong pulley can cause the correct pump to malfunction.

You can buy a replacement pump from most auto parts stores, but some are rebuilt more thoroughly than others. Chip replaces all service parts inside as standard procedure. There are cheaper pumps, but none better, and Chip backs up his work with a lifetime warranty.

"I guarantee that my pump will work with my gearboxes for life, and if you ever have a problem, I'll take care of it," Chip says.

Pricing varies from pump to pump (call for a specific quote), but he'll knock off \$10 if you have the pump rebuilt at the same time as the steering box.

DISASSEMBLY

1 Every power steering pump rebuilt by Power Steering Services gets all new parts and seals. That's why it can carry a lifetime warranty. Vanes, cam, bushings and seals are all replaced.





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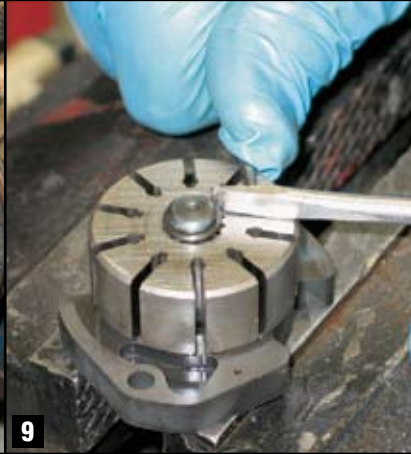
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2 With goggles or safety glasses on, disassembly begins by removing the pulley on the front with a power steering pulley puller (for pressed-on pulleys). A regular gear puller that grabs the outside of the pulley will ruin the pulley. The puller must act on the pulley's hub. If the pulley is retained by a nut, remove the nut, support the pulley's hub from behind, then tap squarely on the shaft's center with a soft mallet. Threading the nut to where it's flush with the edge of the shaft will also prevent the threads from being damaged. With the pulley off, the keyway is removed from the front shaft. These parts will be reused, so set them aside. Moving around to the back, remove the two studs/bolts (some pumps have only one), and the pressure hose fitting.

3 On the pressure hose fitting is an O-ring. It's got to come off and a pick works nicely.

4 Inside the opening where you just removed the pressure hose fitting is the pressure flow valve and spring. They need to come out too, and a magnet wand pulls them right out.

5 Now the sheetmetal reservoir is removed by tapping on the edge with a blunt driver. Work around the circle and don't get in a hurry. Lots of lighter tap are much better than a few he-man blows. Too much force can distort the sealing surface, and that's bad.

6 With the reservoir removed, the pump is exposed. Around the edge is a big O-ring that seals the reservoir. Remove it. On the back of the pump, remove the O-rings from the holes where the bolts and pressure fitting went.

7 Now it's time to get into the pump's internals, which are held in place by a snap ring. A punch inserted through the release hole on top will lift the ring out of its groove so you can pry it out. Take care that it doesn't go flying. It's also a good idea to hold a rag over the hole as the snap ring releases as there is some spring pressure beneath the end cap.

8 With soft driver and mallet, gently tap on the front of the shaft and get ready to catch parts as they come out the back. In order, they are: end cover, pressure spring, pressure plate, cam ring, two guide pins and vanes. The rotor and thrust plate will come out as an assembly. There are two O-rings in there that also have to come out. Next, pull the seal out with a puller, then with a hammer and driver, drive the bushing out from the back of the pump.

9 One more step in disassembly. With the rotor and thrust plate assembly in a vise, remove the snap ring holding the rotor onto the shaft. It's a stout ring, and will probably take some careful effort.

POWER STEERING PUMP REBUILD



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10 Cleanup starts with a hot detergent bath for parts that will be reused, then it's into the solvent parts washer. Next stop is the wire wheel where particular attention is paid to the sealing surfaces. Only the reservoir then goes

into the bead blaster while the machined shaft gets a light cleanup on the cloth wheel. Heavy corrosion here calls for replacement from a donor pump, which Power Steering Services stocks plenty of.

ASSEMBLY

11 A new bushing is pressed into the pump's shaft bore. Once it is completely seated, a new seal is also pressed into place.

12 The rotor is replaced with a new one from the kit. It is splined to the shaft and held in place with the stout snap ring from photo 9. Take extra care when handling this snap ring—they love to fly off into the darkest corners of the shop. Once in place, Chip makes sure it's seated with a firm squeeze from a large pair of pliers.

13 Two new O-rings are also installed in the large round bore in the back of the pump case where the pump internals are about to be installed. Now the rotor shaft is lubed with hydraulic fluid, then the rotor/shaft/thrust plate assembly is dropped into place.

14 Next, install the two guide pins into their holes. They align the rest of the pump components during reassembly.

15 Slide the vanes into the slots on the rotor. There is no top or bottom, but they have to move freely. One of ours didn't and had to be lightly de-burred on a piece of fine grit emery cloth. If you're reusing a rotor and vanes, the rounded edge of the vane goes outward towards the cam ring surface. With all the vanes in place and moving freely, slide the cam ring over the guide pins and around the rotor, taking care not to scratch its polished surfaces. It has to be oriented correctly. One of the small holes in the ring is slightly elongated. Place the elongated hole face down on the dowel pin farthest from the pressure port. This is the only way the pump will function correctly. It is not dummy-proof—it can be installed wrong, in which case you'll have no pump pressure. Once everything is installed, make sure it turns freely, and that the vanes move freely.

16 Lubricate the rotor and vanes with a few good squirts of power steering fluid because they're about to get covered up. The machined surface on the pressure plate is lapped with a few strokes across the emery cloth, then installed in the pump case. Heavier wear from running dry or from high miles requires replacement.



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17 The big spring goes in next, and sits in the groove cut for it. Obviously, the side with the spring groove goes towards the back of the pump.

18 Install the end cover and compress it in a press. With the end cover compressed, install the snap ring and make sure it's fully seated before releasing the press.

19 Four rubber O-rings go on in preparation of installing the reservoir; the big one around the edge of the pump case, the next largest goes in the discharge opening, and the other two go in the holes where the studs/bolts go. The O-ring groove gets a dab of grease, as does the flange on the pump case once the O-ring is in place. Next, the spring for the pressure flow valve is greased and installed, followed by the pressure flow valve. The screen side of the valve goes towards the front of the pump.

20 Lightly grease the areas of the reservoir that contact the O-rings. With the reservoir on, but not tight, the pump is flipped over in the vice and the O-rings are checked to make sure they're centered. Once any adjustments are made, the reservoir is fully seated with a clean rubber mallet, then the two studs/bolts (one for Pontiac) are installed.

21 The pressure hose fitting gets a new O-ring too, but be sure that the O-ring goes in the groove nearest the nut. If it accidentally goes in the adjacent groove with the hole, you won't have the proper pressure and the pump will not function right. With the O-ring in the right groove, apply a little grease to seal it, then install it and tighten it with a 1-inch socket. The keyway is then tapped into the front of the shaft.

22 The finished pump is prepped and painted with either enamel as standard finish, or with lacquer for extreme detailing. If the customer sends the pulley with the pump, the pulley will also be refinished at no extra charge. Brackets are extra. ■

SOURCE

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