



## Oh, the Pressure of It All!

Disparate power steering line pressures have always given swappers headaches. Now there's another fix—an adjustable one

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→→ Figuring out that whole Mustang II suspension thing for rods in the late '70s and early '80s was quite a piece of work. If you looked at it right, you could say a good part of the street rod industry today revolves around that basic suspension and its derivatives. If for nothing else, you could at least give the Mustang II credit for introducing the average rodder to the intricacies and advantages of a workable independent suspension.



Here it is, the heart of the valve itself, the needle and orifice. Well, at least a cut-away of it. Imagine the lower, smaller passage is the pressure line from the pump itself. The valve will work equally from left to right, but for orientation's sake, imagine pump input is from the lower left. When the valve is fully closed, the full amount of fluid at full pressure passes through the block and goes straight to the lower right outlet and subsequently to the rack. From there, the fluid does what it needs to do inside the rack and returns to the upper right fitting. Once again, since the valve is fully closed, the return fluid just passes

through the upper passage and returns back to the reservoir via the upper left fitting. The magic happens when the valve knob is turned counterclockwise. Turning the knob counterclockwise takes pressure off a spring that holds the needle in the orifice. At idle and at very low pump speeds and pressure, the needle stays firmly entrenched in the orifice to maintain full power assist. Full assist makes it easier to negotiate parking lots at slow speeds. When the pump speeds up and creates more line pressure, the pressurized fluid pushes the needle up and bleeds off a specific amount of fluid and pressure into the upper return line, and subsequently back to the reservoir via the upper left fitting. Turning the knob out more takes yet more pressure off the spring, therefore bypassing more line pressure and consequently reducing the power assist at speed. If you can imagine, it's a little variable depending on engine speed.

But if you ran that Mustang II with a stock GM power steering pump you could give it credit for introducing a touchy, light steering wheel. For whatever reasons, in the early '70s Ford designed their new power steering racks to operate in the 700- to 800-psi range, and it worked just fine with Ford pumps—after all, they were designed for it. The problem was that a whole bunch of rods ran GM engines. Actually, engines weren't the problem. The real problem was that GM engines ran GM pumps—and for whatever reasons, GM designed the pumps for 600- and 800-series steering boxes to operate in the 1,000- to 1,200-psi range. So as you can imagine, things got a little spooky—especially at speed. Some of these idyllic swaps and conversions that looked so good on paper often flopped once on the pavement.

Being good sports and inventive as we were, we came up with a few good solutions, each with its own assets and detractors. Some of the more popular solutions worked for most applications but required frequent trips under the car to get just right.

But Gary Heidt of Heidt's Hot Rod Shop fame got fed up with constantly crawling around under cars to reset line pressures. He also got fed up with those few cars that he couldn't "tune" to within range with off-the-shelf parts. What he came up with was not a pump or rack modification, but an adjustable valve that could bring line pressure back into line—for any application. What he came up with was a way to bleed off excess line pressure, much like how a fuel injection system governs fuel line pressure.

What sets Heidt's valve apart is that it doesn't restrict the fluid flow, it simply feeds the unnecessary line pressure back into the return line. That's it. No excessive pump-head line pressures, no restrictions, and no excess heat buildup. Just a simple bypass—and the best part is it's adjustable.

Heidt's valve relies on a simple needle and bleed-off port. Perched atop the valve body is a large, black knob and jamb nut. The knob controls a spring that tells the needle how far to protrude into the bleed-off port. Crank



**We laid all the components out and took an inventory. There's enough -6 Teflon-lined stainless-braided hose to fit most applications. There are also 1/4-, 3/8-, 1/2-, and 5/8-inch fittings and brass seat adapters to fit most GM/Ford applications.**



**Conti wrapped the steel fittings with sealant tape and screwed them into the block itself. Familiarize yourself with the different-sized fittings beforehand to ensure the valve gets installed with the correct orientation.**

it all the way in, and the bypass totally closes. Now you've got whatever line pressure your pump is able to generate—no more or less than it made without the valve. Spin the knob all the way out and the valve fully opens, bypassing nearly all the line pressure and imparting an almost full manual steering feel. The beauty of the valve is that it can be adjusted like a carburetor—literally tune the power steering line pressure and subsequent feel with the twist of a knob.

And that's just what this particular '37 Ford needed. The car's builder buzzed a Mustang II-derived front suspension system into place about 15 years ago. Then, like many rods, he shoehorned a small-block Chevy with—you guessed it—a GM power steering pump. The owner complained of a twitchy, nervous feeling at speed. He said the wheel offered no resistance at all—sort of like the car was on a service rack at all times with the wheels off the ground. A cursory examination revealed the suspension was up to snuff and set correctly. Further investigation revealed the builder hadn't lowered the line pressure at all; it was maximum pressure.

Our own Dominic Conti graciously offered his time to rectify the touchy steering system. With stopping for photos and a soda break or two, we were back on the road in a little over an hour. With all the parts and fittings Heidt's supplied us, it was a breeze. The only thing we had to provide was a handful of zip ties and a little sealant tape—easy stuff.



**Then he determined a suitable location for the valve. The valve can be mounted any direction with any orientation, as long as the smaller passage is the pressure side and the larger is the return/bleed-off side. It just so happened that the valve fit within arm's reach in the engine compartment.**



**Heidt's equips the kit with serviceable steel fittings. These fittings don't require swedging to fit and if needed they can be refitted to the hose again. To fit the hoses, he cut them with a 32-tpi hacksaw blade. The hoses can be cut by blade or chop-saw, but not by any kind of compression cutter like diagonal cutters or shears for risk of damaging the Teflon liner. He slipped the outer collar over the hose and separated the braided sheath from the Teflon liner. He then pressed the nipple portion of the hose into the Teflon liner.**



**Once the pieces seated, he tightened them with two wrenches. Yet an easier way would be to hold the fitting's collar in a vise and tighten the nipple portion with a wrench.**



With the hoses terminated, he connected them to the pump, valve, and rack. The Heidt's-supplied brass seat adapters fit right into the Mustang II rack and converted it to use the AN fittings.



Conti then filled the system, checked for leaks, then tried the car out on the rack before lowering it.

Per instructions, he got the system close on the service rack, dropped it, and checked and adjusted again. This time, though, he drove the car at low speeds on the road and adjusted the valve accordingly. After setting, he snugged up the jamb nut and drove the car in various conditions to ensure its safety and comfort. If need be, the car's owner can reset the knob if he ever changes components or feels he wants more or less assist. And that's all there is to it!



### ...BUT DON'T EXPECT MIRACLES

As valuable and versatile this valve is, it is in no way a cure-all for suspension or steering maladies. All line pressure manipulations are intended to do is create pump/rack compatibility. In other words, line pressures should only be manipulated to make up for pump/rack pressure discrepancies, not geometric problems.

Some steering sensitivity and handling problems are in no way connected to power steering line pressure. There are many geometric settings that can affect a car's road feel and handling characteristics. These settings include caster, camber, contact patch, steering gear internal ratio, roll center, and even tire size just to name a few. In poor geometry cases, reducing line pressure is merely a Band-Aid for a compound fracture—it won't fix the geometric problem. We here at *STREET RODDER* and the people at Heidt's firmly believe that safety takes precedence, no matter what the modification—especially steering and brakes. We suggest calling Heidt's themselves and discussing your particular car's combination. The people at Heidt's are more than willing to talk with you about your particular system, no matter what manufacture. All of us like seeing you at shows and hearing from you—we don't want to jeopardize that.

But for those of you with unequal pressure requirements, we think you'll delight to this valve's convenience and versatility. Yet another way to skin a cat! **SR**

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