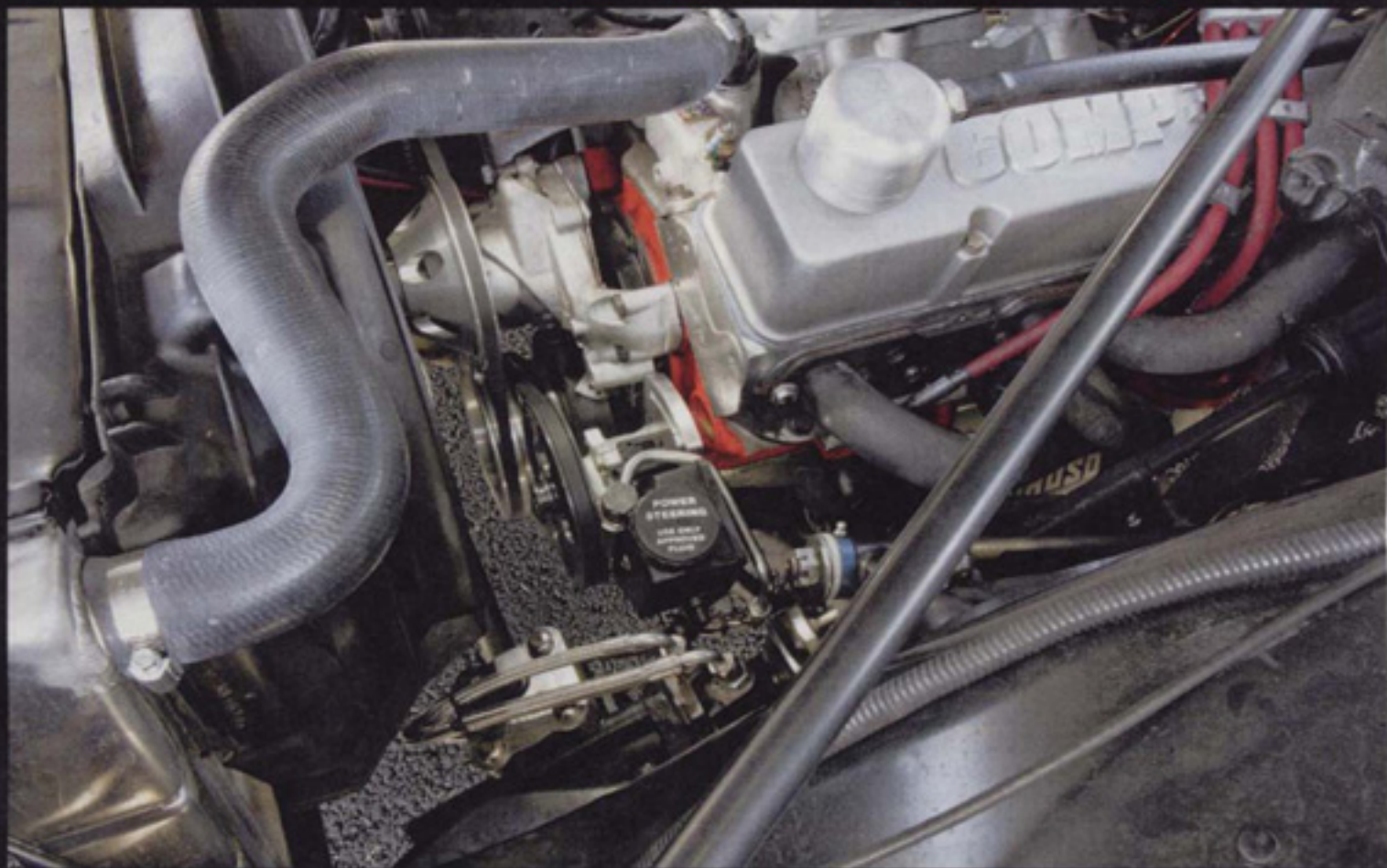




# PUMP IT UP!



**A lightweight late-model power steering pump from Detroit Speed is the perfect match for an updated fast-ratio steering box.**

**By Johnny Hunkins • Photography by the author**

**T**he embarrassment was almost too much to bear. By the time we arrived at the Goodguys show in Scottsdale, Arizona, the power steering pump in Project Laguna was all but shot. For two years, we've nursed the Type I (aka P-style) Saginaw pump that originally came with our '75 Laguna, and as we've upgraded the suspension, wheels, tires, horsepower, and steering gearbox, the 35-year-old pump has become increasingly taxed by the rising performance level. When we arrived at

Scottsdale's Westworld after a 400-mile drive, that old pump was in its death throes, howling like a banshee.

One solution is to replace the old pump with an otherwise identical rebuilt Saginaw P-style pump. In fact, there's nothing wrong with using a new or rebuilt P-style pump, and for many vehi-

cles and applications, they are more than adequate. Our situation, however, demanded an upgrade to a Type II pump (also called Gen II, or TC pump, for "transverse compact bearing"), which has the capability of producing between 3 and 3.4 gallons per minute at 1,500-rpm shaft speed, and a pressure between

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This is our Laguna's old Saginaw "Type I" power steering pump. These were offered on GM cars from 1965 to 1979, and also came on trucks well after that. It's a work-horse pump, but it has little regard for weight savings, mechanical efficiency, or bulk. Ours was putting out almost no pressure due to a vacuum leak on the inlet side.



Detroit Speed & Engineering supplied everything we needed to convert to a lighter, quieter, more efficient, and more compact Type II pump. These pumps were original equipment on GMs made from 1980-up, and offer compact accessory routing, higher output, and less mass. It's important to note that all DSE's Type II pumps are brand new, not remanufactured. Our total cost for the conversion: \$495.50, including the pump, pulley, bracket kit, hose kit, hard line, fittings, spacers, and all fasteners.

1,250 and 1,450 psi. (An optional flow-control valve is recommended for applications using Mustang II steering. This will reduce flow to approximately 2 gallons per minute.) Type II pumps are also less sensitive to radial belt loading than other types of pumps, making them ideal candidates for hard-core abuse. With the Laguna topping the scale well over 4,000 pounds, and our future plans of autocrossing and road racing, a Type II pump was practically a necessity for the immense sustained pressure it would need to supply.

As luck had it, the folks from Detroit Speed & Engineering were at Goodguys, and they happen to sell a complete line-up of GM Type II pumps and accessories. Going from a Type I pump to a Type II isn't as simple as pulling one off and bolting on the other. The two pumps share few dimensions or boltholes. DSE not only offers the Type I pump in several flavors (cast iron, cast aluminum, polished aluminum, with and without integral reservoir), DSE builds or offers



DSE's small-block Chevy mounting bracket kit consists of a billet bracket plate, spacers, and fasteners. This piece is really trick, and mounts to the block with two hardened, anodized Allen head bolts. DSE provides a pair of billet spacers that go between the bracket and the block, but their thickness may need to be fine-tuned per the application. The pump's belt adjustment employs a nut captured in a channel behind the curved slot, which makes tightening the belt a cinch.

everything you could conceivably need to mount a Type II pump on any small-block, big-block, or LS engine. That includes fluid lines, fittings, pulleys, brackets, reservoirs, and fluid.

We chose the basic cast-iron pump with integral fluid reservoir, which runs



Whether you use one of DSE's pulleys (made by CV Products) or not, you will need the right tool to press the pulley on and off. This implement is KD tool, PN 2897. DSE warns that you should never use a hydraulic press on a press-on pulley as this will damage the pump and/or pump seal. Most press-fit pulleys ride on a .662-inch interference-fit shaft.



The CV Products power steering pulley (DSE PN 090801, \$65) features a very deep groove for belt retention, a hard coating for durability, and lightening holes that also serve for tool access. Note how all three boltholes can be accessed without turning the pulley. As with all press-fit pulleys, you will need to make slight adjustments to the pulley depth—there is no standard pulley position, and it can vary by as much as a few inches.

\$165. Although a lighter aluminum pump is available, the cast-iron Type II pump is significantly lighter than the old Saginaw pump. That's a drop in the bucket for our 2-ton Laguna, but every bit helps. You can buy everything you need right from DSE, but if you've already got a Type II pump off a '80-up GM passenger car, and want to install it on your muscle car, you'll still need all the brackets, spacers, and other accessories required to make it work, and DSE can help you with that as well. (Be warned, however, that some Type II pumps have a .75-inch diameter shaft, so check the compatibility of your pump before ordering a pulley.)

We asked DSE's Kyle Tucker to help with the installation on our Laguna, and he agreed. Tucker is a great guy to hang out with, which we discovered in the

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three hours it took to complete the swap. It was really cool to pick Tucker's brain about the many parts DSE sells—many of which Tucker (an ex-GM engineer) designed—and to talk with all the *PHR* readers who took the time to check out the Laguna while we swapped the pump at the DSE hauler. Tucker had us up and running by noon, and we noticed an immediate difference in terms of reduced effort, lower noise, and more smoothness in turning the wheel. Now we're nearly ready to attack the track! **PHR**

It is necessary to trial fit the pump/pulley assembly on the bracket several times to check belt alignment with the water pump and crank pulleys.



Adjustments to the pulley position or the bracket spacers may be needed. A straight-edge on the back of the pulleys—as well as a length of fishing line—works great for checking this.

DSE makes a set of short and tall spacers for the pump bracket, and we ended up using the tall ones, cutting them down about a half inch to arrive at the proper height. The small-block application uses two of these while the big-block uses three of them. When you order the bracket kit, we suggest you get both sets of spacers, and return the ones you don't use.



While it's not always a necessity to get the high-pressure hard line for \$52.50, it will simplify the connection and routing of the high-pressure pump hose to the steering box. In some instances, such as with Vintage Air's Front Runner accessory system, it's a must-have if you want to access the fitting. A large banjo fitting with two copper crush washers reroutes power steering fluid through the hard line behind the pump and to the other side. Here, the fitting can be easily accessed.



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The low-pressure return side of the sealed system can be susceptible to vacuum and fluid leaks. Kyle Tucker says the seal between the plastic reservoir nipple and the Teflon-lined return hose is prone to leakage, and he's found that a short length of high-quality Raychem heat-shrink wrap alleviates the problem. This is included in the kit, and gets applied to the nipple prior to clamping the return hose on.



The pump outlet fitting on the high-pressure hose uses a ferrule and compression fitting. The wedge-shaped ferrule is inserted inside the hose, then is clamped in place by the two pieces of the -6AN fitting. You'll need 3/4-inch and 7/8-inch box wrenches for this operation. Before tightening, it's a good idea to check how you want the fitting clocked relative to the steering box end. This will affect how nicely the hose runs between the box and pump.



We used DSE's braided -6AN hose kit, which includes a high-pressure braided line, a low-pressure (return) braided line, -6AN gearbox adapter fittings (choice of flared compression style, or late-model metric O-ring), and pump fittings. The lines need to be cut to length after you have planned your hose runs carefully. Note how the hose has been taped first to keep the ends from fraying during the cutting process.



### WHERE THE MONEY WENT

Description:	Source:	PN:	Price:
Cast iron steering pump with reservoir	DSE	091001	\$165
SBC power steering pump bracket kit	DSE	092101	\$68
Steering hose kit	DSE	091101	\$145
Pressure hose hard line	DSE	091702	\$52.50
CV power steering pulley	DSE	090801	\$65
<b>Total:</b>			<b>\$495.50</b>

### THE COST SO FAR

Description:	PHR Issue:	Cost:
'75 Chevy Laguna	Oct. 2008	\$5,000
Phoenix 700R4 trans, flexplate & converter	Feb. 2009	\$2,800
Sherwin Williams paint, materials & labor	Mar. 2009	\$3,979.73
Makeover (tires, wheels, graphics, seats, etc.)	Apr. 2009	\$2,989.95
408ci solid-roller small-block	May 2009	\$7,685
Global West rear suspension	June 2009	\$1,699.36
Global West front suspension	July 2009	\$2,569.83
Global West front brake upgrade	Sept. 2009	\$1,118.45
Engine and trans installation	Oct. 2009	\$3,430.36
CPP 500 Series steering box	Dec. 2009	\$428
Interior restoration	Feb. 2010	\$485.65
Flowmaster exhaust system	June 2010	\$359.85
DSE power steering pump	July 2010	\$495.50
<b>Total:</b>		<b>\$33,041.68</b>



Some gearboxes use the older-style flared fluid ports (boxes built from 1965-'81) while others have the updated metric O-ring ports ('81-up). Our 14:1 500 Series box from CPP is manufactured for the late-model metric O-ring seal, making it more compatible with modern components. (We'll note that CPP also includes retro fittings to convert to flared compression hoses, so it wouldn't matter on this particular box.) The type of ports on your gearbox will determine which DSE hose kit you order, since the appropriate -AN adapters are included with the DSE hose kit.



Once the hoses are routed and connected with a tubing wrench (the low-pressure return hose connects with a hose clamp, so use a nut driver on that one), you can torque the banjo fitting on the pressure-side hard line to 32 ft-lb. Our original V-belt measured 36 inches long, but was too long for the more compact DSE system. We used a 34.5-inch belt, but a 33.5- or 33-inch belt would've been ideal. The shorter belt run and deep-groove CV pulley significantly reduce the possibility of throwing a belt at high rpm.



DSE only uses power steering fluid from Joe Gibbs Driven. Tucker says the Joe Gibbs product has never let him down, and he's a firm believer. We'll soon find out when we thrash Project Laguna on the autocross!

**SOURCE:**

**DETROIT SPEED  
& ENGINEERING**

704-662-3272

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