JUDSON SUPERCHARGER REBUILD

Adding some life to an old blower

BY DAVE CORMACK

Many of you, at some point in time, have seen a Judson supercharger, perched atop an old 36- or 40-horsepower VW engine. Back "in the day," Judson Research & Manufacturing Company, of Conshohocken, Pennsylvania, advertised a 50% horsepower increase on a VW by using one of their superchargers. Judson Manufacturing made farm machinery, as well as superchargers for the Ford Flathead, Corvair, MG TD, TC, and TF, MGA, Triumph TR-3, Mercedes 190 SL, Volvo, and Austin-Healey Sprite, among others.

The Judson is a "sliding vane" type blower, in that the vanes only touch the blower housing, producing boost, when the blower is spinning at or above a certain rpm. The vanes slide in and out of the off-center rotor as they follow the housing wall, pressurizing the air/fuel mixture as it does, and forcing it into the intake manifold and combustion chamber. As a result, the air/fuel mixture volume to the combustion chamber is increased significantly, which results, of course, in increased horsepower.

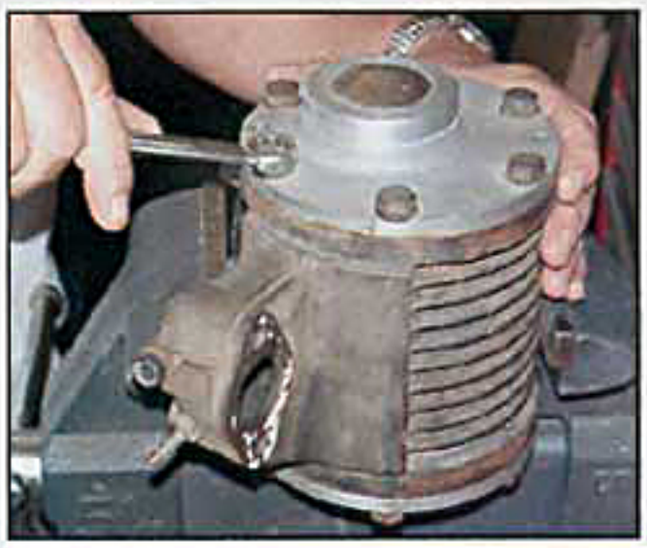
Unless you are lucky enough to find a 36- or 40-horsepower unit in NOS condition (the two superchargers are different, and not interchangeable), you'll have to settle for a used one — and any one you find today will probably need work. Judson relied on a supplemental oil delivery system to keep the phenolic resin-coated vanes lubricated, and once they were run out of oil, the vanes had a very short life span. Every Judson supercharger supplied by the factory had a device in the kit called a "Marvel Mystery Oiler," which was plumbed into the blower so the oil could be fed to the sliding vanes. Most of the Judson units you find at swap meets no longer have the oiler with them. Fortunately, they were made for just about every type of car imaginable, so finding a replacement normally isn't difficult.

So, you found a Judson supercharger at a swap meet for a price you can afford, and it's complete ... can you just "bolt it on and go?" Unless it has just been rebuilt, probably not. Chances are that the sliding vanes and the front and rear bearings and seals will need to be replaced, and the blower case itself honed, before your Judson will perform as it should.

Rebuilding a Judson supercharger is actually fairly easy, as long as the internal parts (like the rotor) are in good shape. When tackling the rebuild, remember that the supercharger was made in the USA, so you will be dealing with SAE threads, instead of metric. Also, when removing or replacing the bearings and seals, remember that these ends of the blower are made of aluminum, over 40 years ago, and the machined areas can be easily scratched or even broken, making for expensive repairs. When replacing the seals and the bearings, care must be taken to not damage them. The two front seals, that slide over a spacer on the rotor shaft, are especially susceptible to tearing. Another little known fact is that the Judson kit included a smaller air correction jet for the carburetor, and a stiffer fuel pump spring for the 36-horsepower models. The 40-horsepower version, however, had a larger main jet in the kit.

All of the parts needed to do a quality rebuild are available from aftermarket suppliers; even the special pulleys and air cleaners are being remade. Our parts came from Alejandro Martin, in Brussels, Belgium. Alejandro has been a Judson afi-

LEFT, this is what you are liable to find at a swap meet. Notice that the pulley has been installed backward. BELOW, the new parts from Alejandro Martin include the bearings, seals, vanes, belts, gaskets, badges and identification tag. The air cleaner housing, throttle linkage, and pulley holding tool are reproductions of the original pieces, also available through Alejandro. There is also the new fuel pump spring and another jet for the carburetor. BOTTOM, begin disassembly by removing the pulley and keyway. You may need a puller.



ABOVE, remove the six bolts that hold the back cover on. Remember, these are SAE threads, not metric. ABOVE CENTER, using two 5/16-inch bolts, screw them into the back cover and use them as jacking screws to pry the rear cover off the rotor shaft. ABOVE RIGHT, you can now pull the vanes out of the rotor, paying particular attention to the way they were installed.

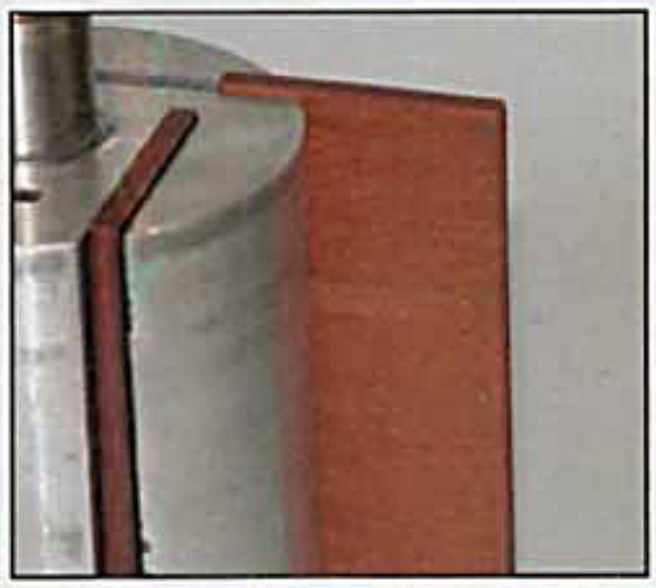
ABOVE, with the six bolts holding the front cover removed, the cover and the rotor can now be pulled out. ABOVE CENTER, if the slots in the rotor have a wider gap on the outside than the inside, then the rotor is worn beyond spec and should not be reused. This one is okay. ABOVE RIGHT, remove the snap ring on the front cover.

ABOVE, carefully drive the rotor out of the front cover. ABOVE CENTER, using a 3/8-inch socket extension, remove the metal cap in the rear cover. You can re-use this part or, if necessary, order another one. ABOVE RIGHT, with the plug out, you can remove the snap ring from this cover. Carefully remove the bearings and seals from both covers.

ABOVE, after having the blower case lightly honed, and the end plates machined to get them flat again, they were ready for re-assembly. ABOVE CENTER, the blower case received a quick shot of high-temp spray paint. ABOVE RIGHT, the aluminum pieces were taken to Mag Masters, in Santa Ana, CA, where they worked their polishing magic on them. What a difference !

ABOVE LEFT, the front cover has two seals, and they must go in as shown or the blower will not function correctly. ABOVE, after the seals are installed, the front cover bearing may be pressed in. Make sure it's a snug fit, you don't want the bearing spinning in the housing.

ABOVE, using a seal installer, or properly sized socket, install the rear seal and bearing. ABOVE CENTER, once you have the seals and bearings in place, and you are sure they fit snugly into the covers, reinstall the snap rings. ABOVE RIGHT, since we milled a little material off the end covers, we will need some paper gaskets to reestablish the correct clearance between the rotor and the side covers. You want to have about .010-inch on each end. If the rotor binds once the covers are tightened down, disassemble, and use thicker gaskets. Use only one gasket per end until you have the desired clearance.



ABOVE LEFT, the vanes should be soaked in some 10W oil before they are placed into the rotor for the final time. ABOVE CENTER, make sure that when you replace the vanes, the non-grooved end faces out towards the blower case, as shown. ABOVE RIGHT, with the gasket in place, the rear cover and rotor and vanes can now be slipped into the blower housing. Install the rear cover bolts, but don't tighten them yet, just snug them down, as you will probably need to add a different thickness gasket to the rear cover to get the correct vane-to-end cover clearance.

ABOVE, with the rear cover snugged down, but not tight, place the front cover over the rotor shaft. ABOVE RIGHT, make sure you don't tear the two seals in the front cover when you slide the cover onto the rotor shaft.

ABOVE, bolt down the rear cover, and check to make sure the rotor and vanes still spin freely in the housing. If not, find out where the binding is, either on the front or rear (or even both) ends, and shim with a gasket until the desired clearance is achieved. ABOVE RIGHT, when everything is tightened down, and still spinning easily, reinstall the plug in the rear cover. BELOW, the finished product.

ABOVE, after placing the new gasket on the blower housing, locate a deep socket that fits over the rotor shaft that is the same outside diameter as the bearing, and press the bearing and cover onto the housing. Make sure everything goes on straight.

cionado for a long time, and has complete rebuild kits available. Or, if you don't feel confident doing the work yourself, he will sell you a renewed Judson, either with a core or on an "outright" basis. If you elect to do it yourself, make sure you follow Alejandro's written instructions to the letter. Make a note of how the seals go into the end castings, this is important! Also note the relation of the vanes in the rotor; they must go back in the same way. Even the metal I.D. tags, and the metal badges for the body or fan shroud have been reproduced. So, as long as the body and the rotor are still in good condition, you can rebuild one with very little effort. Special thanks to John Moxon, of the Judson Registry, for all his help with this article. HAWS

SOURCE

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