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NEWSLETTER

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Issue #60!!!! This issue marks five full years of the KR Newsletter!! When the Newsletter began five years ago it was going to be a page or two each month just to keep builders abreast of new developments and to answer whatever questions they may have while building their KR. Never did I suspect that it would last this long or that there would be so many questions. The modifications you guys come up with have been, for the most part, well thought out and of a very constructive nature. Most have seen their way into the Newsletter and many more are on file waiting their turn for available space. These modifications, by the way, are not necessarily approved by Rand/Robinson or even myself. It is just one way the builders have found that works for them. The building tips you send in to share with other builders are really appreciated. Not only by me, but by all the builders that are able to save time and money because of the experience you had in construction your KR. And the flight reports...even the reports of the flights that didn't turn out all that well are an immense benefit to the guy just about to make that first flight. He now knows what to expect from his aircraft and that makes a successful first flight more certain. There is another benefit to all of us, you, me, sport aviation in general....we are friends, even tho' KR builders are separated by miles, continents, or oceans, we have something in common with each other. A love of flying, a desire to build our own aircraft, and a willingness to share our hopes, frustrations and finally the exhilaration of flying the aircraft we worked so hard and long to build. I'm looking forward to the next five years. You guys are all right!!!!

#### KR CLUB NEWS

Have you made your Oshkosh plans yet? We have a couple of possibilities in the works right now. Bill DeFreze is driving his twenty umpteen foot motorhome back and will pull his KR-2 behind it. Bill is looking for someone (s) to go along and share expenses, gas, camping, etc. Write him a note or call him if you're interested in going along. His address and phone number is 7530 Ironwood Dr., Dublin, CA 94566 or phone (415)828-2111 (after 6 pm).

Ray Ellis meanwhile is making plans to fly his KR-1 to Oshkosh along with Steve Bennett and Keith Campbell in their KR-1s plus there are a couple of KR's in Ray's area that will be joining in. Dan Diehl will probably join them also along with Brad Hummel and Tom Criss for the L.A. area. Should you desire to join the group at Ray's or any place along the route, write to Ray Ellis, 2416 E Douglas, Des Moines, Ia 50317 or phone (515)265-3007, Brad Hummel, 15872 Puritan Circle, Huntington Beach, CA 92647 or phone (714)894-3888, Dan Diehl, 4132 E. 72nd St., Tulsa, OK 74136 or phone (918)492-5111.

Last time I talked with Ron Sorrell he was planning on flying his KR-2 to Oshkosh & may be looking for other KR's to join up. If you're in the eastern U.S. you might want to check with Ron. His address: 6505 Sassafras Dr., Independence, KY 41051 phone (606) 356-6242.

On a more down to earth note, Bill DeFreze has purchased a 23/32" drill ( $\frac{1}{2}$ " chuck) and a 20MM tap to make the crankshaft modification KR Newsletter #55. These tools are expensive and to save other builders from having to purchase these items for a one time shot, Bill will make the drill and tap available for free. There will be a \$30.00 deposit in case of damage though, and the builder would pay postage each way.

I plan on renting a travel trailer in the Oshkosh area and have made arrangements thru another KR builder in Wisconsin to reserve a trailer for me...Unfortunately I have misplaced his name, address, and phone number. Would he please write, or call me collect with this information? I shall be eternally grateful. See you at Oshkosh...

### III. Oiling System and Scavenge Pump

The oiling system for the turbo'd engine has drawn a larger range of opinions than any other area of the installation. I have tried most of the methods and found only one to work satisfactorily. It will be discussed here.

The heart of the system is a modified dry sump pump built by Scat Enterprises. It is a two stage pump with two completely isolated sets of gears. In its original form, the first stage was designed to pump the oil out of the engine and into a holding tank. The second stage or section was to carry the oil out of the holding tank to the cooler and bearings. The first section will be used to pump oil out of the sump through the cooler, and then to the bearings. This puts cooled oil to the bearings. The second section will suck the oil from the turbo and put it back into the engine sump. I have found through personal experience that all of the turbo oil will not gravity feed back to the engine sump. Although most of the oil does get back where it belongs, a small portion will be blown through the seals in the turbo, seeping into the intake and exhaust sections of the turbo. It is common to lose one quart of oil in 3 hrs. Operators of engines not equipped with a scavenge pump should pay very careful attention to oil level and carry a wiping rag and extra quart of oil on any extended trip. I have found that through the use of the scavenge pump and oil breather separator that no oil is needed to be added on my own 2200cc engine between its 25 hr. oil changes. I hope this clarifies the need for the scavenge pump.

To modify the pump, it must first be disassembled. Next, the port designed to run oil to the bearings must be plugged with a 1/4" pipe plug. Once screwed in tightly, grind it off flush with the pump body. Now, a new outlet must be put in the second stage. Place this hole so that it intersects the outlet side of the second stage pump body. A 3/8" pipe tap is recommended here. The outside ports are tapped for an S.A.E. straight "O"-ring thread. This fitting is often hard to find. By running a 3/8" pipe tap into the ports it will just clean up the threads and open them up a bit so a 3/8" pipe fitting can be installed. Once all ports are cleaned and the gears lubricated with 50 wt. oil, the pump can be installed on the engine.

The next step is to run the oil lines, assuming that the turbo charger, intake and exhaust system is also bolted on. First hook up the turbo. A 1/8" "T" fitting is screwed into the engine case in the hole provided for the oil pressure sensor. The sensor is screwed into one of the holes and a 1/8" I.D. line into the other. This line will run to the top of the turbo. From the bottom of the turbo, make a plate, (see drawing) for the hose connection. At least a 3/8" I.D. line is needed from the turbo. This line will run to the outside port on the left side of the second stage pump. From the outlet side just drilled and tapped, run a 3/8" line to the tapped hole on the lower right front side of the engine sump. This puts the oil from the turbo back into the sump. If you are wondering why only a 1/8" line into the turbo and 3/8" to 1/2" out, remember nearly any pressure you want can be run on the pressure side of a hydraulic pump but the best suction pump will only pull a vacuum of about 14 pounds at ideal conditions. The VW pump will produce between 25 and 45 pound at cruise so the 1/8" line is used to limit the amount of oil going to the turbo. Once the oil gets into the turbo it is cooling the bearings, thus in carrying away the heat it may reach a temperature of 500° turning into a milky foam. This foam does not flow as easily as it would in its liquid state and therefore is sucked out by the scavenge pump. Thus the oil in this less than ideal condition needs the larger line for proper flow.

The next step is the engine oil system. The primary or first stage of the pump will suck the oil from the engine sump in the same manner as the stock pump. From here it is discharged through the outlet side of the pump on the right side. The oil is routed through a 3/8" I.D. line to the oil cooler. I find the stock type III VW cooler to be very effective. A common remote filter cooler adapter will bolt to the cooler to allow for the 3/8" hose fittings. From the cooler the oil is routed to the main oil gallery that has already been drilled & tapped for this purpose. Now cool oil is being sent directly to the engine bearings.