

#50

CONTINENTAL ENGINE STARTER DRIVE SEAL AND OIL PUMP HOUSING SEAL COMMENTS

You may recall that I added a drain line from the starter adapter and also installed a new baffle seal on the starter dog. The drain line worked well, the seal is a story in itself; but definitely worth telling. About 5-10 hours after the annual I started hearing what I thought was lifter noise. Others more knowledgeable on the subject, i.e., FAA licensed A & P's and IA's agreed that it was probably the lifter/lifters on number #2 cylinder. I pulled them and tested IAW the Army manual, they tested O.K. as far I was concerned but decided to get second and third opinions from the above mentioned FAA certified experts. Two out of the three thought they were fine, another said they needed replacing. Sooooo, I figured the vote was in, the lifters were probably good to go; and after a super cleaning and reinstalled the little devils. Guess what, the noise was still there. Two NOS lifters were ordered from Preferred, the old lifters removed (for the second time), new lifters installed; noise still there. The frustration factor is very high at this point. It's I give up time; and time to let another independent FAA certified expert run the engine and listen. After a very short engine run the verdict was either a very noisy gyro or a starter dog hang-up. Ah ha, alas, I had been thinking about a possible accessory noise; mags, vacuum pump also -- but not the starter. After all, the only thing new to the starter was a new baffle seal. I had already checked the gyros by removing the vacuum pump line and now the lifters had been eliminated as a noise source. Yes, I had checked all the lifters on the left side for noise and lash; everything appeared normal. I pulled the starter and found that the seal had torn (bad seal manufacture?) and the spring that puts the squeeze on the seal bound up; making the dog very slow to fully retract from the jaw. The noise we had been hearing was occurring after every start and would last for 10-30 seconds then quit. This was making the clickity clackity noise before the dog slowly lost contact with the jaw, making us think the lifters were slow to pump up. I got a new baffle seal (\$100.00 a pop) and took the starter up to Ramona airport to an old friend who is an expert in E-80's. By the way, he also does overhauls on our engine-driven fuel pumps and has been doing accessory overhauls for 40 or 50 years. He took it all apart, everything inside looked great, reset the clutch torque to a much lower value that he sets all the E-185 and E-225 Continentals to. He says the max torque of 425 is way to much for our little engines, that figure is designed for the P & W 985's. Both the dog and jaw were in fine shape and after measuring the extended and retracted positions for clearance with depth gauges and such I reinstalled it. So far, fingers crossed of course, all is well and no more noise. I now believe that I am the resident expert on removing Continental lifters. It's a Bitch of a job with a capitol "B" when it comes to removing the very small/thin snap ring that retains the lifter socket. Believe me Lycomings are a breeze when it comes to removing lifters. There is a trick to getting them out of Continentals that I will divulge to only to my closest friends. Misery loves company when it come to the non-friently types, they can find out the hard way. Moral of the story is don't get hung up on one area during a diagnoses and get that one last expert to do the final engine run. How do you know if you have found the "one last expert," well that solution eludes me. If you have any suggestions, let me know. I'll attach a couple pictures to show you what happened to the baffle seal. No one here has the slightest clue why it happened. And yes it was well lubricated. Again several schools of thought on that subject; DC-4, grease, or engine oil, take your pick, everyone has their favorites.

Now for item number two on my favorite redo list. The oil pump housing had been leaking a bit so I resealed it with the Hylomar and silk thread treatment. Everyone, yes

the FAA certified experts again, say that this Rolls-Royce stuff is absolutely the best. I was also cautioned/advised to be sure to re-torque the housing after about 10 hours. I had no leaks in 10 hours so as cautioned/advised I re-torqued and it and then it leaked like crazy. Not quite as much oil as when the oil cap is left off, but definitely a major oil leak. Now is where I come to some really nifty information. I've had the TCM web site bookmarked for some time and wondered if they had any information regarding sealing techniques, wow, do they ever. But before I get into that in detail I'll add that I completely reviewed the Army manuals for their 1960's techniques. It's interesting to note that you most often find the pump is sealed with Aviation grade Permatex and silk thread. But, one manual mentions that if that method doesn't work and the pump still leaks use a gasket. No parts manual even remotely addresses a numbered gasket, and who knows what a gasket might do as far as oil pressure is concerned; possibly nothing, but I really didn't want to experiment. Back to TCM, check out their site at <http://www.tcmlink.com> and select "Bulletins and Manuals." There are a lot of neat bulletins, instructions and service letters, but the good one here is titled SIL99-2A 08/27/2002 CURRENT LISTING OF SEALANTS, LUBRICANTS & ADHESIVES AUTHORIZED BY TCM. (OILS, OIL CHANGE INTERVALS, ADDITIVES). I remember you were interested in how long we can go between oil changes; this letter tells it all regarding intervals both with and without filters. . To get to the meat of the resealing issue they really have an interesting procedure. Basically it doesn't matter whether it's case halves or oil pump housings, all are sealed in the same manner. You'll find that they use Aviation Permatex 3D (the "3D" baffled me and others before I contacted Permatex and found that it's just the size of the can, 3D is 16 oz. and 3H is 4 oz.) on one side of the joining surface with the silk thread and TCM gasket maker on the other. Incidentally, don't use Loctite Aviation sealant, it has a harder cure than Permatex according to their specification sheets. They, Permatex and Loctite may work identically, but at this point I was not going to take any chances. If TCM wanted a certain Permatex, TCM part numbered thread and TCM Gasket Maker they were exactly what I was going to use; resealing pumps is not something I want to do for a living. Before slapping all of this mess together I went out to my trusted FAA certified experts with my new found information. No one could believe it! They all had their own methods, Hylomar threaded and non-threaded, Loctite 732 threaded and non-threaded, Permatex; you name it everyone had an opinion. And you know what they say about opinions, but I won't get into that. Now what to do with all these opinions? Well, why not go to the source, so I called the TCM experts in Mobile and talked to a very nice technical representative. I asked him if they were serious about their service letter concerning the joining of machined surfaces. His reply, "Dead serious!" He said they have engine seminars at the factory and all over the country where engine shops send their people and he couldn't believe all the methods these "Medicine Men and Snake Oil Experts" have regarding how they are sealing Continental engines. Seriously though, he said that the methods in the service letter do work and are the only materials that the factory will authorize. If it's good enough for TCM then it's good enough for me; so it's back to the hangar for another reseal. You'll find a bunch of oil pump housings in the service letter, none of which are exactly like what we have on our engines; but some are similar. I chose one that looked similar and had at it. One thing that I adopted this time around besides running the thread inside the hold-down studs, but also do a 360 around the two alignment studs as shown on several similar pumps shown in the letter. Again, if it's good enough for Continental it's good enough for me. I'm again keeping my fingers crossed, I've been doing a lot of that lately, but so far this puppy is bone dry -- I hope it stays that way.