Catalina 470 National Association

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One of my most unfavorite things.

One has to be resigned to the fact that almost any service/maintenance job on a sailboat will be harder to do, take more time, and require more post-effort ibuprofen (and maybe scotch, too) than when doing the same thing elsewhere. This is particularly true of servicing the Yanmar 4JH3TE engine. Many C470 owners have taken a diesel engine service course where doing all the tasks is a breeze when the engine is resting on a mount at waist-height and there is free access from all directions. Later, aboard where it is hemmed in by cabinets, bulkheads and companionways, it is another world.

At the head of my list of terrible tasks is changing the impeller on the raw water pump. On the 4JH3TE, Yanmar did a superbly poor engineering design for service by mounting the raw water pump behind the drive gear housing with little space between it and the starter motor. Then add the need to service it through the back of the galley cabinet, which makes it difficult to get more than one hand on it. Meh! And, to make matters worse, the pump's mounting bolts are physically occluded by the engine mount! The new models of this engine have the raw water pump mounted in front where service is a snap. I look on these with envy.

Following the advice of other C470 owners, I replaced the original cover of the pump with a Speedseal unit. This cover has two holes and two slots for the four screws. To remove the cover, the two screws further from the engine are removed and the other two loosened to allow the cover to be slid off. Putting it back on can be readily done with one hand and no visibility of the process. It's a good idea to put a label on the cover to indicate proper orientation and the way the vanes of the impeller are turned. Speedseal replaces the original slotted screws with lager head diameter knurled-headed screws. In theory, one can just use fingers to loosen and tighten them. However, I've found this hard to accomplish given the pump location. I have replaced the knurled screws with hex socket head screws because it's easy to insert a hex key into them and tighten or loosen with one hand and without being able to see them.

Getting the old impeller out is another challenge. The first couple of times I did it, it just popped out in my hand and I wondered what all the fuss was about. Then I found out as each year they seemed to get harder to remove.

Impeller pullers are a big help if you can find one to fit the cramped space between the water pump and the starter motor. I haven't found one that's workable in the space. Instead, I bought special, long-handled pliers with a custom-bent needle nose to pull it out. But this is still a challenge as the hoses connected to the pump interfere so that getting the tines of the tool between the vanes and then getting sufficient leverage to extract the impeller is not easy.

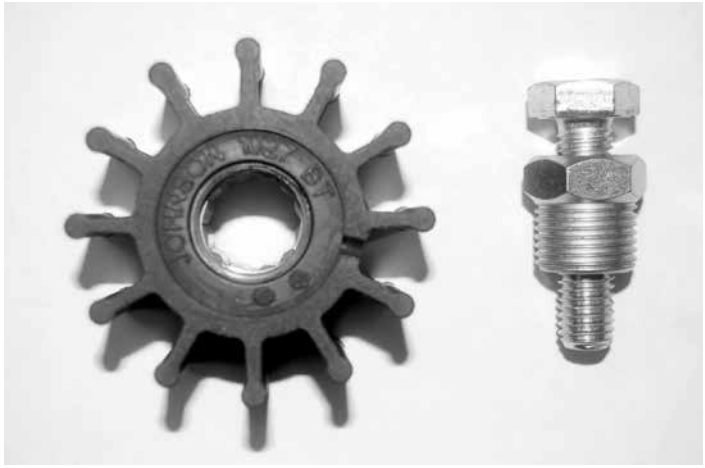
A few days ago, I had just gone through this miserable task and I decided to make yet another search for a better tool – perhaps a really compact impeller puller. I was talking to a Yanmar parts dealer and griping about the problem when he looked up with a thoughtful look, asked me to wait a sec, and then ran off into the back room. He emerged with a wonderful surprise!

It seems that Yanmar just redesigned the impeller. The new model that has one side of the hub unchanged. But on the other side, they have cut a set of female threads. There is a mating bushing with a threaded hole and a mating hex bolt. To remove the impeller, one screws the bushing into the threaded hole in the impeller and then the bolt into the bushing. Out comes the impeller! Wonderful.

I have a photo of the pump with the impeller in place so I can bend and compress the vanes on the new impeller to make it easy to insert. I have used a plastic wire tie to hold the compressed vanes in place as I inserted it. Sometimes the wire tie does too good a job and it is hard to get it off and slide the impeller into place. Recently, I found a stainless steel ring with a 1.75" inside diameter. I now put the compressed impeller inside it and then remove the wire tie. The impeller is kept compressed until it is properly on the shaft within the pump body. Then, it is very easy to push it through the ring and the rest of the way in. I lubricate the pump, impeller and drive hub using KY liquid as it is a water soluble polymer lubricant and will not damage the vane or gum up the pump.

The pump cover is sealed with a rubber o-ring which is just a tad smaller in diameter than the slot on the face of the pump. Trying to put and keep it in place with one hand while the cover is put on is a bear of a job. I found that putting a light film of Lanocote grease on the o-ring, not only makes it easier to slide into the slot without twisting, but is just sticky enough to hold it there. This lubricant (glue?) does not damage the o-ring or gum up the pump.

Don't forget to close the raw water intake through-hull valve before you start. When the change is complete, top up the water in the water strainer to eliminate air in the hoses. Also, make sure the strainer lid is well sealed to prevent any air leak. I once neglected to do this right. The pump was able to cope with a small air leak until a large sports fisherman went flying close by throwing a huge foamy wake. The additional air sucked in proved to be too much for the water pump to overcome; the engine temperature alarm went off; I shut it down and quickly fixed the problem. Never a dull maintenance. Enjoy!



New Yanmar raw water pump impeller, extraction bushing & bolt.