

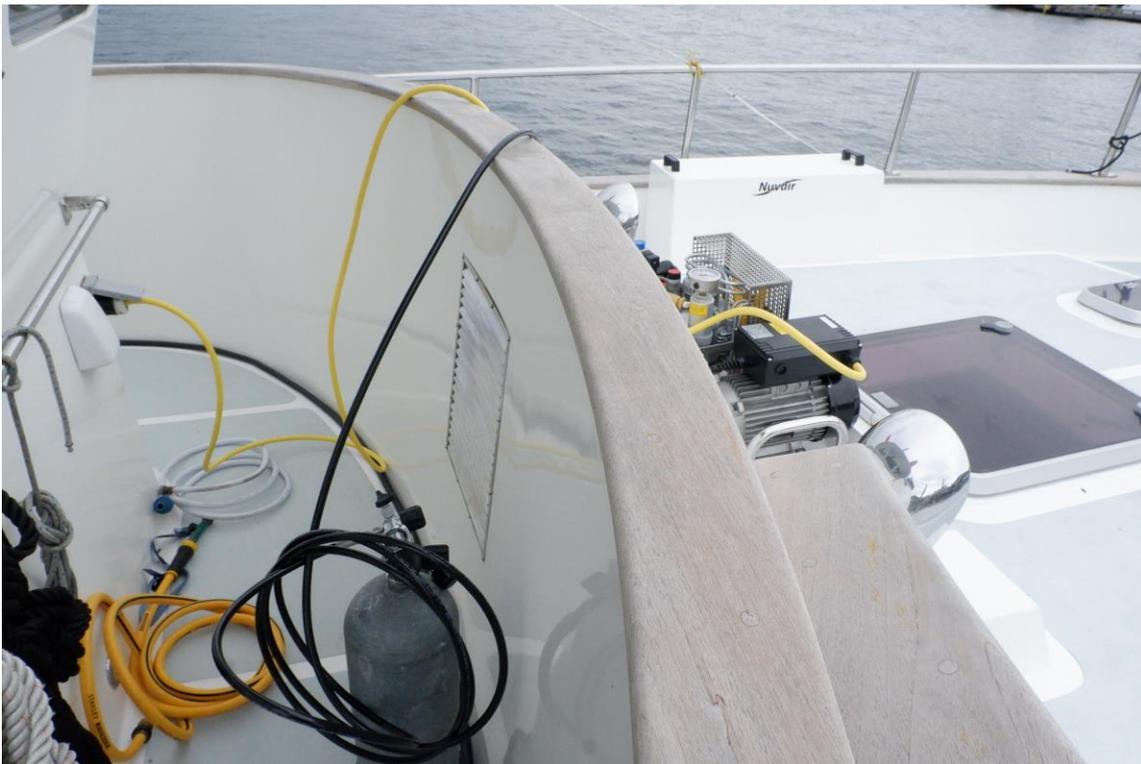
2016 -2017 Winter Projects

During the winter of 2016 – 2017 while we were in Sitka Alaska we caught up on a number of projects on the boat and I thought it would be interesting to summarize them in a single document. Several of the projects were routine maintenance items, several were repairs, and several were upgrades.

- SCUBA Compressor: We have talked for some time about adding a SCUBA compressor to Salish Aire but put it off as the cost was expected to be about \$5000 total and we weren't sure which precious bit of boat real estate to give up. We also hoped that we would find the compressor to be unnecessary as we would be able to carry enough air in our 4 existing tanks to meet our diving needs. We have not had to delay a dive opportunity yet because of a lack of air but have been forced to recognize that getting tanks filled at will is going to be more and more of a problem the farther we travel. We ended up having the compressor shipped to us here in Sitka and installing it in the location where our bow deck box had previously had been and then moving the bow box forward near the front of the bow deck. The compressor requires 220V which we confirmed our current generator would produce but we learned it had only been set-up for 110V so a bit of rewiring was required which included stringing a new large gauge wire forward to the pilot house. Our test run with the compressor went well with it producing less noise and vibration than we had expected.

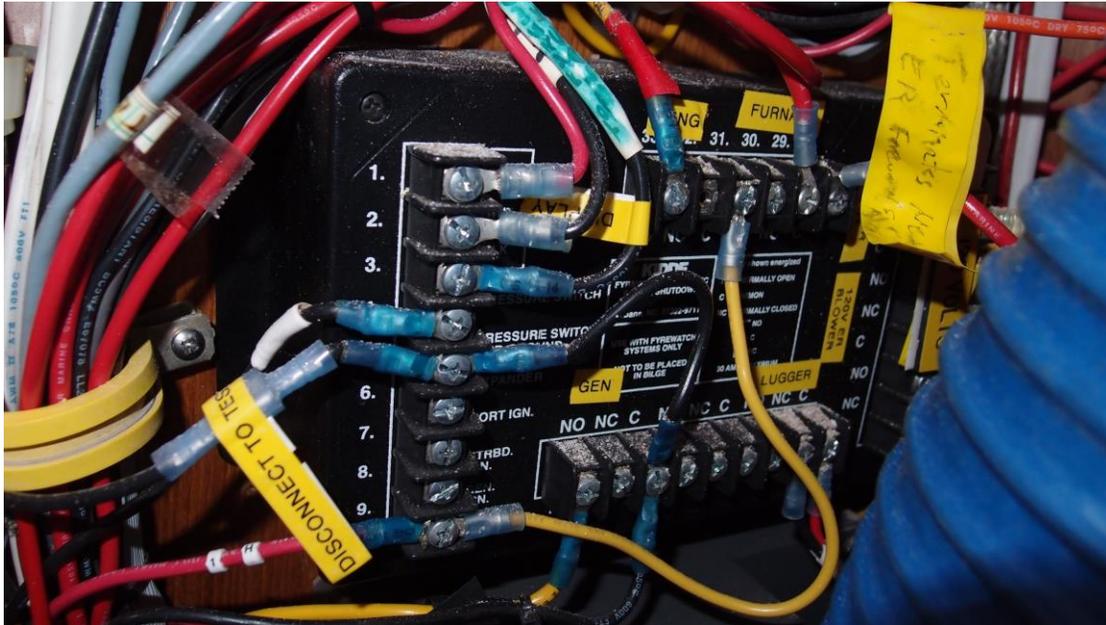
<http://ncgregory.larper.com/images/Compressor%20test%20run.mp4>





- Fire Suppression System: Salish Aire came to us with an engine room fire suppression system which was supposed to also shut down all fans, engines, etc in the engine room in case of a fire. I'm embarrassed to say we had never tested the shut-down system prior to this winter. When

we did we realized that the only piece of machinery connected to it was the generator. Adding the main engine and fans was not difficult (although it required some questions be answered about the capacity of the shutdown circuit board) but the Hurricane heater was not powered from the main panel in the pilot house and the wing engine had a manual cable shutdown system. Addressing those issue led to major projects of their own to be listed below.



- **Wing Engine Shutdown:** The early Yanmar engines such as ours were shut down by pulling a cable. Our cable is located near the entry door into the salon which has proven to be not only inconvenient but has led to us forgetting to shut down the engine on several occasions after we switch back to the main engine. There was no question that an electric shutdown in the main pilot house would be a nice improvement. It became a bigger issue when I realized we could not make the fire suppression system work as it was designed without an electric shut down. I pondered several solutions and eventually found a U-tube video of a conversion someone had done on a similar engine using a solenoid that I could purchase off Amazon. The solenoid and some cable from the local bicycle shop proved to be a viable option for shutting down the engine and so I moved forward with the project. Since a motivator for adding the solenoid was that I could hook it up to the fire suppression system I focused on how it would need to be wired as it has two electrical coils inside of it – one heavy coil to provide the initial pull of the cable, and a second light coil to hold the solenoid in the pulled position. I knew that I would want to use at least one relay so I wouldn't have to run a heavy enough wire clear from the pilot house (especially since there was an existing “abandoned” light wire already in place available for use). I ended up doing a fairly complex circuit involving 2 relays and a diode to make the solenoid activate from a “stop” button in the pilot house or from the fire suppression relay board and not burn out the heavy “pull” coil. The circuit depends on the oil pressure sending switch to tell it when the engine is shut down and inactivate the pull coil. Now my problem is that if the engine had an oil pressure failure it would have to be manually shut down with a trip

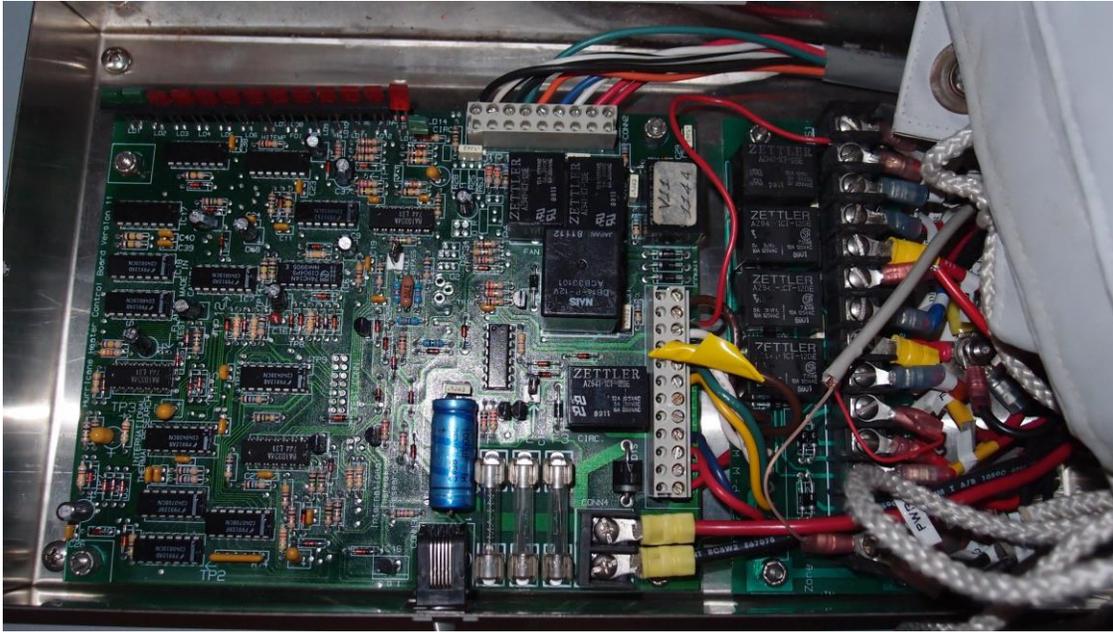
to the engine room – this has yet to be resolved but will likely involve re-purposing the original manual shutdown cable as a backup shutdown option.



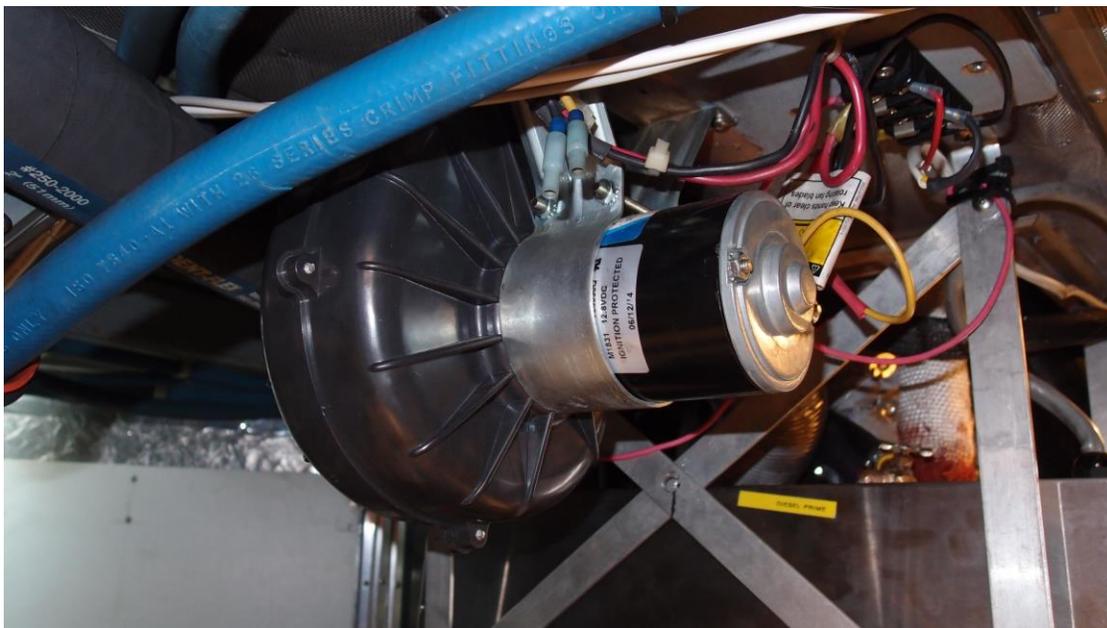
- Ongoing Hurricane furnace issues: The Hurricane boiler for our heating system continues to be a great thing when it works right and a pain when it doesn't. A friend reported that on Kadey Krogens it is common to see a Hurricane installation with a return line back to the fuel tank. The purpose is to push air in the fuel line back into the tank rather than running it through the burner where it will usually cause a flame-out. Our older boiler had a bleed screw but was not set up with a return line so we added a valve and hose and it has reduced our maintenance

headaches dramatically. We also realized that some of the air that is forced into the burner is making it past the cover gasket and reducing the efficiency of the burner so a new gasket and a couple of extra screws were added and the flame smoothed out considerably which made the heater run much quieter. Finally we believe that we may have solved the issue with the dripping fuel. This has apparently been an issue from before we got the boat as a previous owner had added a fuel catch pan under the furnace. We had removed the catch pan some time ago as we hadn't seen any leakage until the past few months when it has become an increasingly annoying issue as now the drips land on the main engine and floor. I have tried to troubleshoot this problem a number of times without success as I could never get it to do it while I watched. About a week ago a friend visited and commented on the leakage and I was shamed into trying one more time to find the source. This time it did leak while I watched. The problem was that when the burner would flame-out the flame sensor would not shut down the fuel resulting in fuel being blown into a non-burning burner chamber and eventually leaking out. After a long conversation with the factory that builds the furnaces we decided that it was most likely that the main electronic control board was failing and so \$400 later a new board is installed and we are watching to see if it makes a difference.

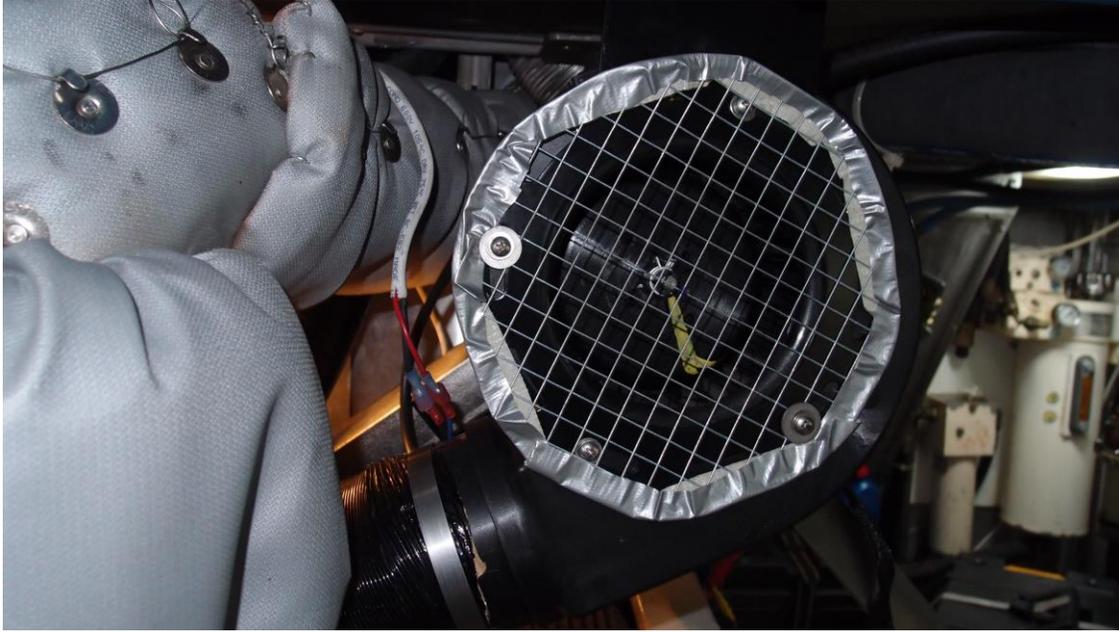




- Engine room exhaust fans: Another system that seems to need constant revising are our 12 Volt engine room exhaust fans. Eagle eyed Clarice noticed on the way north that our engine room temperature was slowly climbing a few degrees. During one of my checks I was able to catch one of our fans (which are new since we bought the boat) running very slowly. There were no proper thrust bearings in the fans and over time the squirrel cages had worked back and worn in a way that slowed the motors. The temporary fix was a lubricated washer as a thrust bearing. The final fix was to replace one fan with a, hopefully, superior model and add a proper thrust bearing to the second one.



(Older fan with new thrust bearing)



(Newer fan that we believe is a much better design.)

- Fuel line switch out: Salish Aire had two different generations of fuel lines for the diesel. The newer generation hose was installed when a fuel polishing (hyper filtration) and transfer system was installed and is in excellent condition. The older hose was original to the boat and starting to have cracking in the outer rubber cover so we decided to switch it out for the same style hose as the newer generation stuff. The problem was the cost – the hose was about \$17 / foot and each fitting (we used field installable fittings so we could do the labor ourselves) was about \$14 each. Since we needed about 100 feet of hose and about 30 fittings it added up quickly. Once we removed the old hose and saw how stiff it really was from age deterioration we were sure we had made the right choice. Clarice also checked and wiped out the four fuel tanks while we had them drained as part of our ongoing maintenance.





- Wifi access: We have access to a couple of wifi systems from our moorage spot but none of them has a strong enough signal to work at the boat without being amplified. We bought an amplification system and two different exterior antennas, a multi-directional whip style and a directional style. The system is useful and has saved on our cellular bill but has not lived up to what we had hoped it would considering the investment.



- Propane shutdown system: Propane is heavier than air and thus considered to be somewhat more dangerous on a boat than on land as leaking propane could collect in the lower parts of the hull and become an explosion hazard. On the other hand it is a really nice cooking fuel when compared to other options. We have a system that turns off a solenoid at the source propane tank (located where it can vent overboard) which will automatically shut down the propane if a “sniffer” detects fumes. The system we had installed when we purchased the boat was not working properly (and needless to say was out of warranty and the manufacturer completely revised the product) so it was replaced.



So we have kept busy especially when routine maintenance is added in (oil changes, filter changes, etc..)

