October 2016 Newsletter

Text and photos by Steve D’Antonio

Photo Essay: (Too Many) Bilge Pump Installation Flaws

On their own, common submersible electric bilge pumps have proven, for the most part, to be reliable. In the vast majority of cases, when I encounter an inoperative or

inefficient pump, the culprit is an installation issue, or issues.

The most common errors undoubtedly involve wiring. Bilge pumps are motors, and as such they are sensitive to voltage drop, a decrease in voltage caused by any number of factors, from a weak battery to corroded wiring, with the most insidious villain being under-sized conductors. Wires are, or should be, sized to ensure that as little voltage as possible is lost between the power source, the battery, and the consumer, the pump in this case. The loss is directly affected by wire size or gauge, the larger the wire, the lower the loss, the more efficiently the pump operates. The American Boat and Yacht Council Standards (ABYC), and their associated tables, call for a maximum allowable voltage drop of 10% *for non-critical items* (bilge pumps are clearly critical) and no more than 3% voltage drop for critical components. Most bilge pump installations I encounter, particularly on larger vessels, fail to meet the 3% standard.

Beyond this, connections for bilge pumps must be able to endure life in a wet environment. My own protocol calls for connections or terminals to be located a minimum of 18 inches above the base of the pump, or they must be fully waterproof (or both). In many cases I find that using heat shrink butt splices or tubing alone isn't enough, the insulation is often pierced when it is crimped, or two wires entering one end of a connector make for an ideal water channel. Inspect these unions carefully; waterproofing may need to be augmented with self-amalgamating tape or silicone sealant. Remember, you are likely to need your pumps most when connections are submerged.

The next most significant factor affecting bilge pump reliability and efficiency is plumbing, with runs that are too long, or too restrictive, as well as the use of check valves, being the most common offenders. The interior of the hose should be smooth, avoiding mitered or sharp 90° bends, presetting as little resistance as possible, and for multiple

reasons check valves should be avoided. While pumps can discharge into a common manifold, with some ABYC-mandated caveats, two pumps should never share the same overboard plumbing. Check valves, when they aren't stuck in the open or closed position, have proven, in my own testing, to reduce flow by up to 50%. I notice many boat builders and yards installing check valves without determining if they are actually needed. The only reason a check valve should be used is in cases where a very small bilge well leads to pump short cycling; under no circumstances should they be relied upon to prevent flooding (another ABYC requirement). In some cases, where a check valve is used, the pump is unable to overcome the weight of the water retained in the hose, in which case the pump will run, often indefinitely, creating lots of turbulence, and the appearance of work being carried out, when in fact no water is being pumped. Some installers drill a small hole in the plumbing just after the check valve, as a relief port of sorts, allowing water to drain from the hose and thereby preventing the valve from becoming stuck, however, doing so does defeat the purpose of installing the check valve in the first place.

Restrictions in bilge pump plumbing won't harm a pump per se (the pump doesn't "know" if the work it's doing is removing water or overcoming restrictions), they simply diminish its flow, which is why they are so dangerous, as they often lull boat owners into a false sense of security, in believing their bilge pumps are robust and capable, when in fact most are fighting with one hand tied behind their back.

The pump installation shown here is rife with electrical and plumbing flaws, wiring is sloppy and unsecured, sheathing lacks ABYC compliance, the corrugated hose adds resistance, and the high water alarm float switch is far too high.

Inspect your pumps. Better yet, inspect and test them regularly; the only way to ensure a pump works is by calling on it to remove water from the bilge. Finally, consider

measuring each pump’s actual, ‘as installed’ capacity, by pouring a known quantity of water into the bilge, and then measuring the time it takes the pump to discharge it.

Ask Steve

I’d like to thank all the readers who responded to my request for their customer care concerns. I was able to incorporate several of these into my lecture, delivered at the International Boat Builders’ Exhibition in Tampa just a few days ago. I’ve included a few of those letters below.
Steve,

What I care about is quality. Yes, I care about cost and I care about schedule, but in the end, I care about quality. I want to “have the feeling of confidence” that when I pay the bill and leave a facility to resume cruising, that I will not be troubled by that problem again. I want to have a high level of confidence that the problem is truly fixed.

Trust and confidence in the facility is essential. I want a facility to consult with me when goals can be accomplished in more than one way. For example, if the choice is to repair what I have or upgrade to new, I want that to be my informed choice; not driven solely by the revenue interests of the facility. Often, I think, yard managers deprive customers of the opportunity to make that decision, and I think many customers are not equipped to ask questions.

I’m in a facility now where I feel good about the marina part of the operation. But I would not have work done here, nor would I recommend the yard operation to anyone. They are lackadaisical about their work. Shortcuts are taken; there’s no urgency. It appears to me that management and oversight is

weak. In any project, there are obvious times to contact the customer, either for status or for decision-making and approval. This facility does not do that; at least, does not make it a priority.

When I need something done away from my home area, I ask for references and opinions on various Internet boating forums. User opinion is always valuable, and more-and-more today, available.

I’m not a wealthy man, but I know doing work twice is more costly that doing it right, once. So yes, I’ll use yards where I know I’ll pay a higher price for quality.

Jim

Peg and Jim Healy
Peg and Jim:

Thanks for taking the time to share these thoughts. When I ran a yard I often told my staff two things, ‘Everything is secondary to quality, I can fix the bill, and I can alter the schedule, but I can’t make up for poor quality’, and, ‘You keep the promises I make, if you fail the customer loses confidence in both of us and the yard as a whole’.

Steve,

I have had a boat at a marina (storage and work) for 42 years now. Over the 42 years I have used only 4 marinas, which I think is a pretty good track record. When I recently moved, I went to a marina with a dock and storage. I have always tried to make sure the marina knew my needs in the fall in terms of work and have given them some decent work over the years.

Recently I needed to re-bed the upper deck rails on our Nordic

Tug. I arranged with the Marina to remove the top rails and to store them over the winter. They approved me filling the holes with epoxy and then they would reassemble the rails and drill and tap bolts for the rails in the spring, prior to launch. Launching was scheduled for end of April 2016. When it came time for the marina to get the rail out of storage several sport fishing boats were in the way. They asked if I could delay launching for one week, so they could get to the rails, which I agreed to. The boat was launched without the rails, but they continued to promise next week they would be installed. This went on for four weeks, until finally they got the rail down and placed them on the top deck. But they did not have time to fasten them down, so they secured them with line and said they would get to it. The next week with some strong coaxing they finally got to it, five weeks in all… and not a happy customer having made the arrangements in the previous October.

Another problem was they serviced and stored my outboard for winter. When it was returned, the mechanic had it head down in a cart and the oil ran out. I advised the service manager immediately and he said they would get to it. That was a Friday Morning, Saturday, I asked and he had no idea when they would get to it. Motor was now on the dingy, in the correct orientation with oil not where it should be. I cleaned it up, drained the oil from the carburetor and finally got the engine running. Have never heard back from the service manager but did get a bill for winter storage of the motor and oil change.

As I think you know, I enjoy your articles, brain teasers and follow your photographic / sailing journeys. Many thanks for letting us tag along…

Regards to you and Katie,

Barry Shapiro
Nordic Tug 37 – Spray

Barry:

This is indeed a sad tale, and one that could have been avoided entirely and easily. It could be attributed to two challenges almost every yard faces, particularly during the spring rush, scheduling and communication. Often, service managers are spread thin during these times, which isn’t an excuse, it’s simply an explanation. Meticulous adherence to management of the schedule, with regular updates, daily during busy periods, which, for larger operations, requires the efforts of a full-time scheduler, is the solution to that problem. And, most folks aren’t born with excellent communication and responsiveness skills, these must be learned. In this case the manager would benefit from formal communication training.

Hi Steve, you asked for some feedback about problems with contractors so here goes. Bear in mind that a lot of our experience is based on more remote locations like Turkey, Greece, Italy, Croatia.
1. Arriving at agreed time
Often we agree on a time for the contractor to attend the boat. Many times they are hours late or don’t arrive at all on that day. Meanwhile we have wasted our time waiting for them when we could be doing something else. I believe contractors should arrive within 30 mins of the agreed time and they should phone if going to be late.
2. Arriving without adequate tools
We’ve had electricians arriving without multi-meters and mechanics without wrenches.
3. Claiming to have knowledge of the failed equipment. We always ask first “do you have specific knowledge of this failed product x?” Nearly always the answer is yes but as work progresses it is sometimes painfully obviously not the case.

Allied to this is using the wrong materials in fixing a problem e.g. using pvc hose for below waterline applications or non-approved hoses for sanitation applications. Often they will just try to use what they have or what is easily available. If a contractor doesn't really have specific knowledge of the equipment in question this should be made clear at the outset.
4. Not listening to what we say
Sometimes contractors want to tear into a job without first listening to what the problem is and what we think the solutions might be. Sometimes they fail to discuss different solutions but proceed without consultation.
5. Leaving a mess
We often have to ask contractors to remove their boots. Often they will leave spilled oil or coolant in the bilges or other forms of mess.

Having said this we also meet very good contractors who do tick all the boxes.

Cheers

Laurie Cranfield
Laurie:

Your points are all very well made, and I share your frustration with these shortcomings, all of which are avoidable. Being punctual is one of the most important aspects of good customer care, along with staying in touch, *especially if you aren't going to be punctual*. Your comment regarding listening strikes a chord with me, as I must confess, I had to, at one point in my career, teach myself how to be a good listener when my clients were explaining a problem. For service folks, getting as many clues as possible always makes good sense, doing so often makes the job easier.

Hi Steve,

You ask at the onset of your last email, for comments with regards to customer care. I suspect you will not be wanting for horror stories. You have written much about the attitudes and responsibilities of the professionals whom we ask to care for our vessels. I would want to write for my fellow boat owners some thoughts on our responsibilities in asking for help with our vessels. I believe we often set the stage for the type of service we receive and that we can go a good distance toward receiving good service by the following: (in no particular order)

1. Be clear what you wish to have done and how you want it accomplished. Go in with the attitude of a starting a consultation wishing to end with a collaboration on a clear, well delineated, plan.
2. Be clear about the time frame you are working with and be realistic about your flexibility in this regard. Then, similar to what will happen on any job you attempt on your own vessel, add extra time.
3. Get an estimate of the costs and ask whether there are areas where uncertainty might exist (for ex. The number of hours necessary to remove the fittings on a mast prior to painting, easy if all have been fastened with anti-seize, far far longer if the stainless bolts are corroded to the aluminum).
4. Do not expect that additional work you come up with as the job proceeds or for unexpected/unplanned problems to not affect the job time frame or costs.
5. Do not expect your mind to be read, nor expect that there are clear standards: for example, if you wish all wiring to be tinned make that clear from the onset.
6. Make sure you are easy to reach by phone or email.
7. Be sure the area of your boat to be worked on is clear and has easy access. No worker wants to go through a locker that has not been cleaned in years and where paper towels, now soggy, were stored and forgotten.
8. Be clear about what kind of feedback loop you want.

9. Be clear what kind of documentation you expect: for example, one can expect instruction and installation manuals to be passed on, but will probably have to ask (and pay extra) for electrical schematics to be executed of the work done: same with plumbing.
10. If you need the service manager to go over the job, make an appointment and tell him how much time you will need. Do not try to catch him on the fly.
11. Putting things in writing can often be a big help: for you in figuring things out and for the service manager in being clear for the job as you see it.
12. If the owner wants to participate in the work being done, spell that out ahead of time.
13. If the above meets with roadblocks and frustration, it may be time to pull the plug and find another service provider. It will only get worse once the job starts.
14. Pay promptly.

Dick Stevenson
Dick:

I’m not sure I could have written a clearer road map for success when working with a boat yard or marine industry contractor, you’ve nailed it. I’d add just one additional item, request that where applicable work be performed to American Boat and Yacht Council Standards. Doing so establishes a clear baseline for your technical expectations, and it lets the yard know they are working with an informed customer.

Steve D.