February 2020 Newsletter

Photo Essay: Stuffing Box Hose Clamps

Conventional stuffing boxes leak, they are supposed to, it’s how they are lubricated and cooled. The trick is, to adjust them so they leak just enough to stay cool, but not so much that they become a flooding problem. The water that leaks from the stuffing box can only leave the bilge by one means, the bilge pump.

That leakage, however, can have other side effects. In most cases it runs out of the stuffing box, and often over the hose clamps that maintain tension between it and the hose that connects it to the shaft log, and the vessel itself. Because those clamps remain continuously wet, they live in an environment that is tailor-made for crevice corrosion, a phenomenon wherein stainless steel actively corrodes because it is robbed of oxygen (you can read this article to learn more about crevice corrosion) in order for stainless steel to remain corrosion-free, it must be continuously exposed to air. When robbed of air, it transitions from a passive to an active state.

The insidiousness of stuffing box hose clamp corrosion lies in where that corrosion occurs, along the lower hemisphere, between the 5 and 7 o’clock position, where it is least visible. The remainder of the clamp often looks pristine, leading the vessel operator to think all is well. Therefore, it is imperative that stuffing box hose clamps be inspected regularly, including and especially along the bottom portion of the hose. That inspection may require the use of a mirror, or small camera.

Because of the challenging environment in which these clamps live, only the most robust, most corrosion-resistant clamps should be used. This means solid rather than perforated bands, which utilize embossed threads, and all 316 stainless steel. Solid bands are highly resistant to striping, and fracturing between threads, even if over-tightened, and 316 alloy is the most corrosion resistant material available for this application. Alternatively, especially for larger stuffing boxes, you may use T-bolt clamps, provided they too are all 316 stainless, and of the interlocking rather spot-welded variety.

The sextet of perforated clamps shown here are severely corroded; they are on the verge of failure. They should be replaced without delay.

Ask Steve

Hi Steve,

I am wondering what to do about our fuel polisher. We're on a trawler, so it is definitely an important piece of equipment.

We have two 350 gallon tanks, with 1/2″ hoses to and from the fuel polisher. They match the size of the exit and entrance to the tanks. The fuel polisher has 2 Racor filters, in parallel, the 500 series, with capacity of 60gph each, for a total capacity of 120gph. The filters are on the suction side of the pump, both are mounted about 1.5 feet above the top the tanks. The fuel exits near the bottom of the tank, about 4 feet below the pump and filters. The pump is self-priming.

Here's the question. The pump is a gear pump, and has interchangeable gears. Using the 100gph gears, the fuel in the Racors is full of bubbles, indicating (at least to me, but

I might be wrong) that the vacuum pull is high. Using the 50gph gears, there's just a little bit of bubbling.

So I'm wondering, which is the better way to polish, 50gph or 100gpg? I have plenty of power, (I can run off my solars), so I can leave the polisher to pump all day.

It boils down to, is there a problem if it bubbles, and is 50gph enough throughput. Note that the engine takes fuel from about 2″ off the bottom of the tank whereas the fuel polisher takes fuel from the bottom of the tank.

By the way, the return to the tank is unfortunate, the fuel simply runs into the top of the tank – there is no pipe inside the tank that goes to the bottom.

Thanks in advance for your time, I hope I gave you all the relevant information!

Jonathan Quigley

Jonathan:

With the exception of the return not being plumbed to the bottom of the tank, it sounds like a well-designed system. It's not unusual or uncommon to see vacuum bubbles in a fuel polishing filter, the greater the restriction the more bubbles will form. The volume or flow rate is often sufficiently high that these are formed, however, they are for the most part harmless as they collapse as soon as they reach the discharge side of the pump. If they are air bubbles on the other hand, that's another matter, it means there is an air leak on the vacuum side of the system, somewhere between the filters and tank. At a high flow rate, and thus higher vacuum, more air would be entrained into the fuel, which would explain the increase with the higher flow gears. Again, in a polishing system it's not harmful per se, however, it is indicative of an air leak in the system, which may also leak fuel while at rest. If you plumbed a clear section of hose downstream of

the pump, temporarily, you could see if the bubbles remain, if they do they are air and not vacuum.

The fuel polishing filters should be equipped with a vacuum gauge. If the vacuum exceeds about 15 in. Hg, that's probably too much, and you run the risk of potentially damaging the filter elements, which would allow dirt to bypass the filter, lowering its efficiency.

All filtration is good, however, the higher the flow rate the better, as more fuel is filtered in a given time, and you are more likely to encourage turbulence within the tank, which is desirable.

Steve,

When I had my annual fire suppression system inspected last year the tech told me I would be required to replace the cylinder next year due to a 6 year expiration of the cylinder.

I asked the tech to have his company send me a quote which turned out to be a total of $1,280.00. (Cylinder $1,100 + Labor $180.00)

Can you recommend a more competitive alternative?

Could I simply purchase this device on-line and replace it myself? I have removed and replaced this bottle a number of time as required to do other mechanical services in my engine compartment which was simple to do.

Sincerely,

Mark Bradley

Mark:

You state you have a "Fireboy – Seafire FD300A". Fireboy and Sea-Fire are actually two competing systems. Assuming it's a

Sea-Fire FD 300, these systems are factory refillable, so if it were discharged, and it doesn't sound as if that's the case, you can send an empty cylinder back to Sea-Fire yourself, contact them for pricing and shipping information.

More importantly, however, these systems do not have a 6 year "expiration", that's simply wrong. In fact, they never expire, they can be inspected and kept in service in perpetuity. The installation manual for Sea-Fire FD models clearly spells out the inspection requirements, *"Model FD DOT 4B, 4BW and 3AL cylinders are reusable and must be periodically tested. DOT 4B and 4BW cylinders may be inspected by an external visual inspection in accordance with Section 3 of CGA C-6, Standard for Visual Inspection of Steel Compressed Cylinders, and shall be performed every 5 years except the cylinders do not have to be emptied or stamped under pressure. Inspection shall be made by competent personnel and results noted on a permanent record tag. Alternatively the cylinders may be emptied and subjected to a hydrostatic test every 12 years in accordance with 49 CFR. DOT 3AL cylinders must be emptied and subjected to a hydrostatic test every 12 years in accordance with 49 CFR."*

I would call the service company back, ask to speak with the owner or a manager, relate to him what you were told and ask him or her to confirm (or correct) the recommendation made by the technician. If they stand by this recommendation, then share with them the above quote and ask for an explanation. You can access the entire manual here.

Steve,

At the fuel dock, my motor was running and white smoke started to come out from the motor, and a lot of it. Do you have a suggestion on what that is? Also, just turned over the motor and it did not turn over. I have not tried to restart yet

before I get better knowledge.

Mark Thene

Mark:

White smoke can be an indication of several issues. If it's more steam than smoke (steam usually stays closer to the water while smoke rises more quickly), that's typically an indication of an impending overheat. Carefully check the temperature of the wet exhaust hose when the engine is running, it should be no more than warm to the touch.

Otherwise, white smoke can also be unburned fuel. You might find this article useful in further diagnosis.

Steve:

I have a 1999 Tiara 31…considered by most to be a quality, classic, diesel open cruiser. However, it is riddled with water intrusion through the forward deck and even through portions of the hull and above waterline thru-hull fittings. Yes, Tiara built it with balsa core construction.

The cost to repair is beyond my capabilities as I am 73 yrs old. I love the boat but I'm very disappointed in its construction. Do you have any thoughts on who I can turn to for assistance?

Thank you Steve!

Jeff Becker

Jeff:

I'm sorry to hear of your woes where the core is concerned on your 2009 Tiara. Indeed, many vessels from this era used balsa core, and many still do. Strictly speaking the core itself is not necessarily the problem, while the manner in

which it's been sealed or "closed out" is. Regardless of the core type, balsa or synthetic, core must be properly closed out to prevent both water entry and localized compression. Bedding compound or sealant is not an effective means of achieving either of these goals. You can read more about this subject here.

There are yards that specialize in core repair, however, it's often costly. I'm afraid I don't know of one in your area specifically. In some cases, if the core is wet but not deteriorated, a reasonable, more cost-effective approach involves simply stemming the tide as it were, preventing more water (and mold spores) from entering the structure, and correcting any localized compression around hardware installations. The water will remain, however, the damage it is doing can be arrested or at least slowed.

After reading the above-mentioned article you'll be armed with the knowledge of how such repairs should be carried out; you can then use that information to evaluate those you are considering for the project. If you decide to proceed, I would not do so without a quote or firm estimate. Depending upon the extent of the damage, repair costs may exceed the value of the vessel.

I'm sorry, I wish I had a more positive uplifting response.