

October 2019 Newsletter

Photo Essay: Emergency Tiller Use

During a recent vessel inspection, I asked the owner of the vessel if he'd ever tested the emergency manual tiller, the one that is to be used in the event of a hydraulic steering system failure. Not surprisingly, he'd neither fit nor used it; I had guessed as much since the tiller itself was still wrapped in the builder's plastic packaging.

Emergency tiller are an invaluable tool for a cruising vessel, particularly that cruise to remote locations, far from assistance. A steering system failure is debilitating, the vessel cannot move until it's corrected or overcome. However, even close to home steering system failures can be especially dangerous, when transiting a narrow and/or rough inlet (I recently conducted a sea trial aboard a 78-foot vessel, transiting the St. Lucie inlet, shortly after a hurricane had passed by the area, the helmsman had to work the wheel hard to maintain a heading, had the steering failed the vessel would have almost certainly foundered).

I frequently encounter two issues when fitting and testing manual tillers; one, the tiller's socket does not properly fit the rudder stock, and two, the key for the deck access plate is nowhere to be found, or the plate itself is seized. In this case it was the former, forcing me to improvise with what was available, two screw drivers and a windless clutch wrench.

Test your manual tiller, and its deck access plate make certain you know how to fit and use it quickly and easily.

Ask Steve

Steve,

I have a 61' trawler that has a 2 inch wide stainless steel rub rail. Over time it has incurred several scratches. Can these scratches be polished out and if so who would do it.

Thanks,

Raymond Harris

Ray:

Depending on their depth, yes, scratches in stainless steel rails can be polished. Any reasonably squared away boat yard should be able to do this. It may require a rouge-type metal polish and an electric buffer or even grinding using successively finer grit Emory cloth, again using an electric grinder. Under no circumstances should any ferrous metallic tools such as wire brushes be used, as they will embed ferrous material into the stainless steel, which will then stain brown. Ask for an estimate if not a quote. They, and you, may want to try a small section first as a test to determine the result and level of effort, and you should let them know your level of expectation, i.e. are you looking for a mirror-like shine, or would a uniform satin finish be acceptable?

Hi Steve,

We've pulled the chain plates out of our 1982 Skye 51 for inspection. (No idea whether they are original.) But how, exactly, do we "inspect them"? There is some surface rust—some pitting but not much. I've read about X-rays and dye tests but with a moderate amount of research still can't find out where to have those tests conducted, how much they would cost and whether that's the best approach.

Will & Sarah Ritch

Will and Sarah:

You are wise to preemptively pull these for inspection, far too many cruisers fail to do this and pay the price. Chain plates live in a challenging environment, one that's ripe for crevice corrosion and stress cracking.

I'm afraid I've never had a chain plate X-rayed, so I can offer no guidance on that front. However, carrying out dye penetrant testing is common and relatively easy to do. Begin by thoroughly cleaning the chain plates to ensure they are free of all bedding or staining. You can use 3M ScotchBrite pads for this, or Emory Cloth if you need something more aggressive. After cleaning carefully inspect for pitting or cracking. Use a magnifying glass under good lighting for this analysis. If cracks are found, you need go no further, the plate must be replaced. If chain plates pass the cleaning and visual inspection, you can then move on to a dye penetrant test. Kits such as 'Spotcheck', are available on line from industrial suppliers such as McMaster Carr and Grainger.

The area where chain plates are most likely to come to grief is just below the deck level, where water is most likely to be retained. Pay special attention to this location. Upon replacement, be certain to bed thoroughly. This article will provide additional insight into bedding prep.

While not a guarantee against failure, carrying out an inspection of this sort will provide additional peace of mind in the years to come.

Hi Steve,

How can I get my Honda 2000eu to run on my Mainship without tripping the galvanic isolator?

Tried for the first time and I went into ground fault fail mode?

Thank you,

Al Ressa

Al:

I strongly discourage the use of portable gasoline generators aboard. These gensets are not designed to be directly connected to a sub-electrical system, such as that found aboard a boat. In addition to that, there is the added risk of carbon monoxide poisoning, and the danger of storing and using gasoline in a device that's not designed for, nor complies with applicable marine guidelines.

Having said that, modern, post 2008 ABYC-compliant galvanic isolators are fail-safe and passive, they neither trip nor have a ground fault mode (earlier galvanic isolators may be equipped with a monitoring system, however, once again they are passive).

If, on the other hand, you are referring to an Earth Leakage Current Interrupter or ELCI, which is a fault sensitive circuit breaker, not unlike a GFI receptacle, then it would trip in the event of an imbalance on the hot and neutral lines being supplied by the genset. I'm assuming this does not occur when you plug into shore power. Why that's occurring I could not say for certain from afar, however, it's indicative of an unsafe scenario, somehow the hot and neutral are imbalanced when using this portable generator.

Once again, my strong recommendation is to avoid using portable gensets aboard a boat.

Hello Steve:

I have enjoyed reading your stuff online and particularly your section on grounding/bonding. I have a Southerly 135 Sailboat I purchased in Annapolis a few years ago, but now keep in Key West, FL. Eventually I would like to get one of your Ready for Sea inspections done when you are in South Florida sometime.

I did have a quick question if you had time I would appreciate your feedback. The attached picture shows some 'flanges' around my prop shaft. I'm not sure if they are supposed to bond the shaft or what. They don't appear to have a good low resistance connection.

Also I'm curious why that one nut is very corroded and no others are. Is it just a different metal or do I have an issue?

Thanks in advance if you can spare a few moments to respond.

Tim Hunsinger

Tim:

The "flanges" you are referencing are the actual stuffing box carrier and ram. As the nuts are tightened, they draw the ram into the packing carrier, compressing it, and thereby creating a mostly watertight seal. Neither are specifically designed to establish an electrical bonding connection with the shaft. The shaft/prop should have its own anode for corrosion protection. If you'd like to bond the shaft you can do so using a shaft brush.

With one caveat, see below, there's little or no harm in having both a brush and anode on the shaft. In fact, unless you go with a high end slip ring type brush like the Electro-Guard, corrosion and cathodic protection specialists for boats, yachts and small ships. The effectiveness of a standard brush is far from guaranteed. Having tested several different types, if you do go the economy route, the 'copper wand-style

carbon brush' offers the best chance for low resistance continuity. The resistance threshold here is quite low, Standards state that the maximum allowable resistance between protected metals and anodes cannot exceed 1 ohm. That's often difficult to achieve with wired systems, much less between a contact and rotating shaft. While the shaft is spinning contact is often good, it's when it stops, and sits idle for days or weeks that resistance often changes.

Brushes can, however, be a double edged sword. If the hull anodes are depleted, the shaft anode will, via the brush, provide protection to *all* bonded hardware, until it's depleted, which will happen quickly. Ultimately, I'd recommend a brush, while ensuring all anodes are maintained.

This article explains a bit more about brushes and how they work with bonding systems [Bonding Systems And Corrosion](#) | [PassageMaker](#)

As far as the rusty nut is concerned, I suspect it's either of a lower quality/corrosion resistance than the others, or it has been contaminated with mild steel in the finishing process. If you replace it I suspect the problem will not reappear.

One final observation, the stuffing box is "daisy-chained" with the bonding wires, i.e. the stuffing box is now a potential current path, rather than being a more desirable dead end for galvanic or stray current corrosion. Both ring terminals should be attached at the same point. The daisy chain issue is described in greater detail in this article. When attaching the ring terminals make certain they, and the surface where they will reside, are clean, a ScotchBrite pad works well, don't use a wire brush, and apply conductive paste to the connection surfaces before re-assembly. When complete, spray the terminals with corrosion inhibitor such as CRC Heavy Duty Corrosion Inhibitor.

