September 2018 Newsletter – Means of Reboarding

Photo Essay: Means of Reboarding

"If you fall overboard, there's no way to re-board the vessel without assistance". I uttered those words just last week, while reviewing my findings after a vessel inspection with its owner. He looked at me quizzically at first and then said, "How can that be? How could the builder do that?" That was a very good question, particularly since the vessel's builder purported to participate in the stringent, albeit voluntary, "NMMA Certified using ABYC Standards" program, wherein vessels are built to encompass guidelines set forth by the American Boat and Yacht Council.

ABYC Standard H-41, "Reboarding Means, Ladders, Handholds, Rails and Lifelines", calls for a means of reboarding that can be used or deployed by a person in the water, defining 'reboarding means' as, "[A] Rigid or flexible fitting or part of the hull which allows a person to reboard from the water without assistance." Further stating, "Means of unassisted reboarding shall be provided on all boats. The reboarding means shall be accessible to, and deployable by the person in the water. The top surface of the lowest step of a reboarding ladder… shall be at least 22 inches (559 mm) below the waterline with the boat in the static floating position". It's straightforward enough, and yet too few vessels incorporate this all too important feature. My definition of "waterline", for the purposes of this ladder, is the actual level of the water, and not the top edge of the anti-fouling paint.

While I'm a proponent of this guideline, for the most part I find it to be too lax. Indeed, a ladder or other means of

reboarding should be present for virtually every vessel. However, the “22 inches below the waterline” standard is, in my opinion, simply inadequate; that’s less than two feet, which may be Ok if you are wearing a bathing suit, and are physically fit. Imagine, however, you are fully clothed; wearing shoes or boots, and the water is cold and it’s dark, and you are in a seaway. Hoisting yourself up a short ladder, or no ladder, in these conditions can prove challenging if not impossible for many folks.

Good reboarding ladders include a minimum of three rungs *below the surface*, which takes into account the height of the surface to which the ladder is mounted above the sea surface. Additionally, I’ve encountered ladders which, while deployable from the water, are likely to strike the person in the water as they are pulled into place. In other cases, ladders are simply too complicated to deploy, or they are prone to corrosion and seizing, again making deployment difficult or impossible.

In short, anyone aboard your vessel, should be able to deploy a reboarding ladder, with minimal training, easily, quickly, while in the water and fully clothed, and in the dark. Reboarding ladders, particularly those of the telescoping variety, should be inspected and deployed monthly, they should be kept free of corrosion and lubricated or waxed if necessary. The ‘splash zone’ found at the swim steps is among the most corrosion prone areas aboard the entire vessel.

The ladder shown here cannot be easily deployed from the water, the snap shackle securing it is small, and difficult to access, especially if it’s dark.

This video set illustrates the difficulty required to climb out of the water when fully clothed, without the benefit of a ladder, compared to using a proper, easily deployed means of reboarding. My dry clothing weight was 145 lbs., after falling in that jumped to 155 lbs. Which ever ladder

arrangement you select, be sure to test it, clothed, and with your eyes closed to simulate darkness. Be sure someone is standing by with a throwable PFD to assist you if necessary.

After posting this article, I received the following letter from a client…

Steve specified an emergency boarding ladder for my 55 which I purchased and installed. Less than 30 days after it was installed a live aboard boater friend was visiting us in VA in late October. We were going to dinner. It was dark and cold night. Lorraine was below deck and I was away from the boat. Our friend decided to get off the boat from the side door to the dock and something happened. Down he went between the dock and boat. He was severely injured and under the dock with no one even knowing it. He made it to the back of our boat and there was the new emergency ladder. He was able to deploy it and we found him later lying on the swim platform. Thank you Steve D because most likely you saved his life.

In another situation we were in Nova Scotia with two other vessels and one of their crew came back late at night in a kayak. He fell off the kayak while trying to board the boat (the kayak floated away) with no emergency ladder. The owner was just lucky enough that he found him in time, exhausted and holding onto the staple with hypothermia and unable to get up on the swim platform. This was a young guy in reasonable shape.

In my younger life I did a stint in the Coast Guard as a small boat coxswain doing search and rescue. During that time I picked out of the water several bodies that had fallen overboard and died not being able to get back on their boat.

Steve's advice is spot on and to be taken very seriously. If you don't have an [easily deployable] emergency ladder, please get one. Once you get one, make sure all onboard know it is there and know how to deploy it.

Steve, thank you again for saving a life with this.

Ask Steve

Hi Steve,

I've read your "Water Heater Primer" article and have done some additional research in an attempt to clarify one issue pertaining to heating water using the engine's closed cooling system. We're talking about a basic 6 gal marine water heater run off coolant from a 27 HP Westerbeke sailboat propulsion engine. Normal engine operating temperature is 160-170 deg F.

The only way I can make hot water is to run under load for an hour or more at 2,600 RPM or more. Running at around 1,500 RPM, not under load, at 160-170 deg F for half an hour does practically nothing to even warm the water, even though the coolant hoses at the water heater are very hot to the touch. Does it make sense that hot water can be made only when running the engine under load?

Thank you.

Len Krauss

Len:

Diesel engines are known for not producing much in the way of excess heat unless they are under load, that's true, and, even when under load, a small diesel doesn't produce much heat, further challenging its ability to make domestic hot water.

Having said that I'd rule out a few potential problems first. The "normal" operating temperature seems low, 160°-170°F is below most thermostat ratings for diesel engines. Start there, ensure the thermostat is correct and operating

properly. Ensure that the water heater's heat exchanger and all plumbing between it and the engine are below the level of the pressure cap on the engine's cooling system. Confirm there are no blockages between the engine and water heater and within the water heater heat exchanger (scale can build up in this portion of the closed cooling system, as well as on the outside of the water heater's heat exchanger, impeding heat transfer), and confirm coolant is flowing through these hoses at something more than a trickle. Some engines, including Westerbekes require a restrictor to be placed in the cooling system to divert more coolant to the water heater circuit, if your model requires this make sure it's present.

Steve,

The engine on a Nordic Tug 37 (22,000 lbs) I am looking at buying will not reach full RPM. The engine is rated at 2800 RPM and we only reached 2625 RPM at WOT when on a sea trial with the boat mostly loaded (fuel full, water at half, many cruising items on board with 5 passengers). Since this vessel will be operated routinely at about 1400 RPM (give or take a few hundred RPM), is it still important to have the prop adjusted or even replaced should we proceed on the purchase?

Thanks for your advice,

Tom Easterbrook

Tom:

This is a common occurrence, under-revving or over-loading, during sea trials, particularly in pre-purchase scenarios. On roughly a third of the vessels on which I carry out Pre-Purchase Inspections, engines fail to reach their rated rpm.

In short, even if you never intend to operate the engine at

wide open throttle, it is important that the engine and transmission gear reduction match the propeller loading. You don't mention the year of the vessel, however, most engine manufacturers require engines to reach the wide open throttle rating. Where new vessels are concerned, engine manufacturers are likely to decline to activate the engine's warranty until it reaches the rated rpm. Under-revving, which is what this vessel is experiencing, is of much greater concern, because it can lead to over-loading, wherein damage can occur. Even if you claim you will never operate the engine at that rpm, engine manufacturers must assume, rightly, that users will operate the engine within its listed specifications of rpm and load.

If, on the other hand, an engine reaches the governed rpm, in which case it's over-revving, and under-loaded; while that's undesirable, it's not harmful per se, the operator simply isn't obtaining the horsepower the engine is capable of producing. It's typically not grounds for denial of warranty coverage.

Before any adjustments are made to the propeller of an under-revving engine, new or used, exhaust back pressure should be checked. If it's excessive (in Cummins' case anything above 5" Hg is too high), it could lead to a decrease in rpm. For used engines only, valve clearance should also be checked, if it's excessive, maximum rpm could be affected. This article will give you additional insight into wide open throttle testing, and engine surveys http://stevedmarineconsulting.com/the-art-of-the-engine-survey/

Hi Steve,

I've read your articles and can't seem to find an answer to

what I think may be a very common encounter.

I have a 1.25″DIA x 81”L shaft, supported about 60 inches at each end via a cutlass sleeve bearing at the propeller strut and a split flange coupling at the transmission end (see attached diagram). Approximate max shaft speed is 3000rpm.

I initially align the the cutlass strut bearing to the center of the shaft log and to the transmission flange with a 20gage shotgun laser mounted in a 2”OD (cutlass ID) barrel that is slid into the cutlass.

I then install the shaft and let it sit in the coupling via the coupling’s register. I assume the shaft weight causes a slight static sag (approx .010″ of runout) and a vertical gap on the top of the coupling. – Based on my reading of your technical literature, I should keep the sag and adjust the engine/transmission mounts to take out the gap in the coupling rather than simply tighten the coupling to pre-strain the shaft into a straight position?

Thanks Steve for any wisdom you can offer!

Brian Wiseman

Brian:

I like your shotgun boresight laser set up, that’s creative. V drives, particularly the type where the shaft passes through he gearcase, can be a bit more challenging, as what would normally be the laser target, the gear flange center, has a hole in it, into which you’d now have to insert a temporary target.

To answer your question, no, you should not align the gear output flange to the “sagging” shaft. Instead, the gear flange should be centered using the laser, which eliminates the potential sag, and then the engine aligned to that center, just bringing the gear flange parallel with the shaft flange.

As an aside, the rough rule of thumb for shaft supports (these include bearings and output flanges/transmissions, and fixed rather than floating stuffing boxes) is every 40 shaft diameters. Therefore, a shaft that's 1.25" in diameter should be supported every 50". The rule is frequently violated, and while I've never seen a shaft break because of inadequate support, they can generate a substantial whipping motion, which in turn causes vibration.

Hi Steve,

I have spoken to people who say it is not important to have dirty fuel polished if one changes the [primary] Racor filters often. Is this true? Can we damage the engine by following this procedure?

Thank you

Bob Harris

Bob:

I've heard this comment before, essentially implying that your primary fuel filter is an effective polishing system, since most diesel engines circulate far more fuel than they actually burn.

"Dirty" is relative, all diesel fuel contains some contamination, however, the degree to which it is contaminated can vary considerably. "Average", more on what that is in a moment, contamination can typically be contended with by the standard primary (which should use a 10 or 30 micron element) and on engine secondary fuel filters. If the primary filter requires replacement, as indicated by excessive fuel filter vacuum, i.e. greater than 7" Hg, prior to the engine having burned 1,000 gallons of fuel, then I consider the level of

contamination excessive, and therefore not average, as well as being an indication of fuel tank contamination.

In most recreational cruising applications, polishing systems are not mandatory. However, the difficulty involved in replacing filters, the operator's familiarity with doing so, the known quality of the fuel being taken aboard, and the conditions under which the vessel operates, should be considered when deciding whether or not a polishing system is worth the expense. While most primary filters are not terribly difficult to replace, especially in the case of tandem systems, in the vast majority of cases secondary filters should be replaced when primary filters become clogged, and replacement of these filters is often more daunting and more time consuming for most vessel owners. And, doing so requires the engine to be shut down. Therefore, given the choice, polishing fuel before it is sent to these filters means they are almost always replaced on a routine rather than acute basis, raising the confidence level of the vessel operator, while reducing the likelihood of an unexpected engine shut down, and the risks that entails.

In short, a primary fuel filter is not tantamount to a polishing system, and equating it to one, with the notion that filters can simply be changed more often, is both unrealistic and dangerous.