September 2026 Newsletter – Fuel Tank Condensation

Photo Essay: Fuel Tank Condensation

It’s a refrain I hear very often, ‘water in fuel tanks is the result of condensation’. But is it? My guess is it’s less common than many think. One winter, I carried out an inspection of the interior of several fuel tanks aboard vessels in storage; these included aluminum, steel and fiberglass tanks. During regular interior inspections, including after the passage of warm fronts, which can include dramatic swings in temperature and humidity, I never once encountered any evidence of the formation of condensation inside these tanks.

Having said that, it is possible for condensation to form, and I have seen it do so on many occasions on the underside of fuel caps. This does make sense, since the caps themselves can cool enough overnight to reach the dewpoint for water vapor inside a tank. However, this does not mean condensation is forming on all of the exposed inside surfaces of the tank; in order to do so the temperature of the tank walls would also need to be at dew point, which is unlikely if the tank is within the vessels cabin structure. Still, it’s always disconcerting to me to see water inside a fuel system.

If you encounter the scenario pictured here, and the fuel tank has a water drain valve, which is typically located in a well at the lowest portion of the tank, it’s a good practice to open this to check for water (you should do this periodically, preemptively, in any event). If the tank does not have a water drain, then consider using water finder paste on a dowel lowered onto the bottom of the tank. If it comes back positive, the next step is water removal, which, for a tank

without a drain, usually means using a stripper tube. More on that here.

Ask Steve

Hello Steve,

After reading your article on stuffing boxes including Tides Marine that I have, maybe can you help me.

I bought last October a Galleon 420 on Lake Geneva with two Cummins 425 Hp diesel engines; they have 470 engine hours and from my second outing, I noticed that there was a very loud noise. While buying I heard nothing at all, but I had not opened the engine hold while sailing at reduced speed.

- Boat makes a lot of noise when returning to neutral.
- In navigation, there was no noise:
- The boat was towed for 1 hour with the 2 engines off:

Unfortunately, the previous owners never had the water flow checked, and as we are on a lake, it is possible that the limestone has partially clogged; I will check.

After viewing the noises, do you think that the problem could come from the lack of water supply? Any other ideas?

Regards,

John Krief

John:

This sounds like stuffing box squeal, which can occur if the stuffing boxes have overheated. As a start, I would recommend close inspection of the stuffing boxes, which may require a haul out.

Towing a vessel with Tides or other dripless seals usually requires special measures, either immobilizing the shafts by removing the props, or by pumping water into the seals with an external pump. Lashing the shafts is another option, however, this is often difficult to do safely and reliably without a proprietary shaft brake or lock.

Hi Steve,

I have tremendous respect for industry experts such as yourself. I’m retiring in two months and my wife and I are about to make a huge financial commitment buying a 2001 Riviera 43 with twin Cummins 6CTA8.3’s.

Our mechanical surveyor just shared the engine oil analysis… super high aluminum. During a recent oil change, the new oil was pumped in through the Reverso. The seller’s broker’s theory is that this mixed contaminated oil sludge with the new oil and thus causing a faulty test. Plan is to change the oil twice, run the boat 15-20 hours and retest. The analysis also showed high levels of additives which is believed to be from the fuel additive being used by the owner. The owner will be draining the tank and adding clean fuel.

I would appreciate your opinion on the theory and course of action being proposed. I would also greatly appreciate any further actions I should take.

Regards,

Steve Sims

Steve:

While it’s not uncommon, using an oil change system to refill an engine with oil can have an effect on oil analysis accuracy (the pump itself can also shed copper if it uses bronze hears); for this reason, I recommend against using the change

system to refill engines and generators (was the genset sampled as well?). Whether that's the case here or not is hard to say, it does seem odd that both engines have nearly identical readings.

If genuinely present, these metals, aluminum and chromium, are worthy of concern, as they are indicative of wear on pistons and rings respectively, which could be the result of a fuel or oil supply issue to one or more cylinders. If not genuine, where did those metals come from?

In reviewing the reports you shared, the engine's "UNIT TIME" is shown as 0 (this is the 'engine hours'), which indicates to the lab that these are new, never been run, engines, making this essentially break in oil, and clearly that's not the case. While that may not be immediately relevant here, it does show a certain sloppiness on the part of the individual taking and submitting the samples. All the data supplied with a sample must be complete, and correct in order to ensure the greatest degree of accuracy for the analysis.

I can't say it's impossible, however, I've never had fuel additives skew oil additive metal readings, and it seems unlikely for 25 hours of lube time. The next analysis should include a reference sample, a sample of new, unused oil that is the same as what's being used in the engine. That will tell you the additive levels present in the oil when new.

Also, the "LUBE TIME", the amount of time on the oil, is shown as '25 hours', that seems like an awfully round number, is it correct? 2% (technically less than 2%) fuel dilution for 25 hours of lube time seems high to me, but normal for more hours. Also, the TBN was not tested, this is a measure of the oil's acid neutralizing ability, it can often be used to roughly determine the lube time, the lower the number, starting from about 10, the older the oil. TBN testing is often an option, for which you pay a slight upcharge; it is well worth it in my estimation.

The lab has called for a resampling at “half interval”, meaning half the usual oil change interval for this engine. That may not be practical, so you may have to settle for 25 hours.

I would also recommend a borescope of the cylinders, under the circumstances it would not be an unreasonable request, however, it requires removal of injectors.

This video demonstrates the correct means of taking an oil sample.

This article covers oil analysis in detail.

Hi Steve,

My question has to do with the anchoring stability / behavior of the Nordhavn 60 vs. Selene 60. Since most boat owners have only spent time on one or the other, it is hard to get an unbiased, informed opinion. From what I have been able to research so far, the Nordhavn 60 is a taller, and heavier boat. My guess is the center of gravity is higher than on the Selene 60.

I have heard from Selene owners, they swear their boats are very comfortable at anchor. It seems like maybe the stern of the Selene is more conducive to stability at anchor, but that is not a very informed opinion on my part. Now with boats offering stabilization at rest, maybe both boats will be similarly stable.

If it matters, we plan on doing predominantly PNW (or high latitude boating as you call it). As of right now, thinking more of coastal cruising, and probably not trying to cross oceans, but you never know. We like the styling of both the Nordhavn and Selene. Selene seems to have made a lot of progress in the last few years. Having been on several

Selenes, they are extremely well-built boats, that seem to hold up will over time.

Thanks in advance for any advice you might have on the topic.

Best,

Corbett Kull

Corbett:

You pose a good question, one to which I'm not sure there is a clear answer. Short of scientific analysis, including an incline test, the stability at anchor of one vessel over another is mostly subjective, and I suspect the only way you could hope to get a reasonably accurate answer, albeit and again a subjective one, would be from someone who has spent considerable time cruising and anchoring aboard both vessels. While polling owners on their experience is valuable, many believe their vessels are perfect, it's a simple truism of this industry, and not a bad one.

I once carried out an inspection of a full displacement cruising vessel, not a Nordhavn or Selene, and was surprised at her tenderness; the moment I set foot aboard I could feel her propensity to roll, even when subject to my meager 155 lbs. of mass. After a stability test was carried out, it was determined that she required several thousand additional pounds of lead ballast. I have never experienced this when setting foot aboard an N60 or S60.

Of these two vessels, the hull forms aft of amidships are quite different. The Nordhavn has a gentle radius under the quarter guard, to reduce slap, and she keeps the rounded deep bilge, which does little to prevent rolling. The Selene has very soft chines and the hull tapers back with flatter sections (similar to semi-displacement hull forms), which would tend to reduce rolling. Both have addressed (Nordhavn as an option) the slap in the flat section below the swim

platform, which is another consideration.

I have sea trialed many Nordhavns 60s, and several Selene 60s, and I have conducted inspections of new builds at both yards, however, I have spent little time at anchor aboard these vessels, so I can't answer the question personally. The N60's official displacement is 138,000 lbs., while the Selene's is 127,000. The question is, where is that 10,000 lbs. of difference? The ballast on a N60 is approximately 8,500 lbs., while the Selene 60s is 2,645 lbs. However, as you note, the center of gravity may be more relevant in this analysis. Again, short of an incline test, a scientific comparison would be difficult. Every Nordhavn model has an incline test performed, this is a requirement for CE approval and sale there, and I'm fairly certain the same is true for Selenes (builders are often reluctant to share stability/incline test results, but you could ask). Both vessels have an ISO CE Category A Ocean rating, which requires the completion of such a test.

Stability at rest is an option, hydraulic, electric and electro-hydraulic, however, in my experience it's little-used unless you are cruising in known rolly anchorages, like the Caribbean. I doubt you'd find it mandatory for either vessel. Flopper stoppers are also an option.

Enthusiasm and loyalty among owners of both models is, in my experience high, so I suspect your selection will come down to issues unrelated to stability at anchor, such as availability/timing, options, ABYC compliance, and cost.