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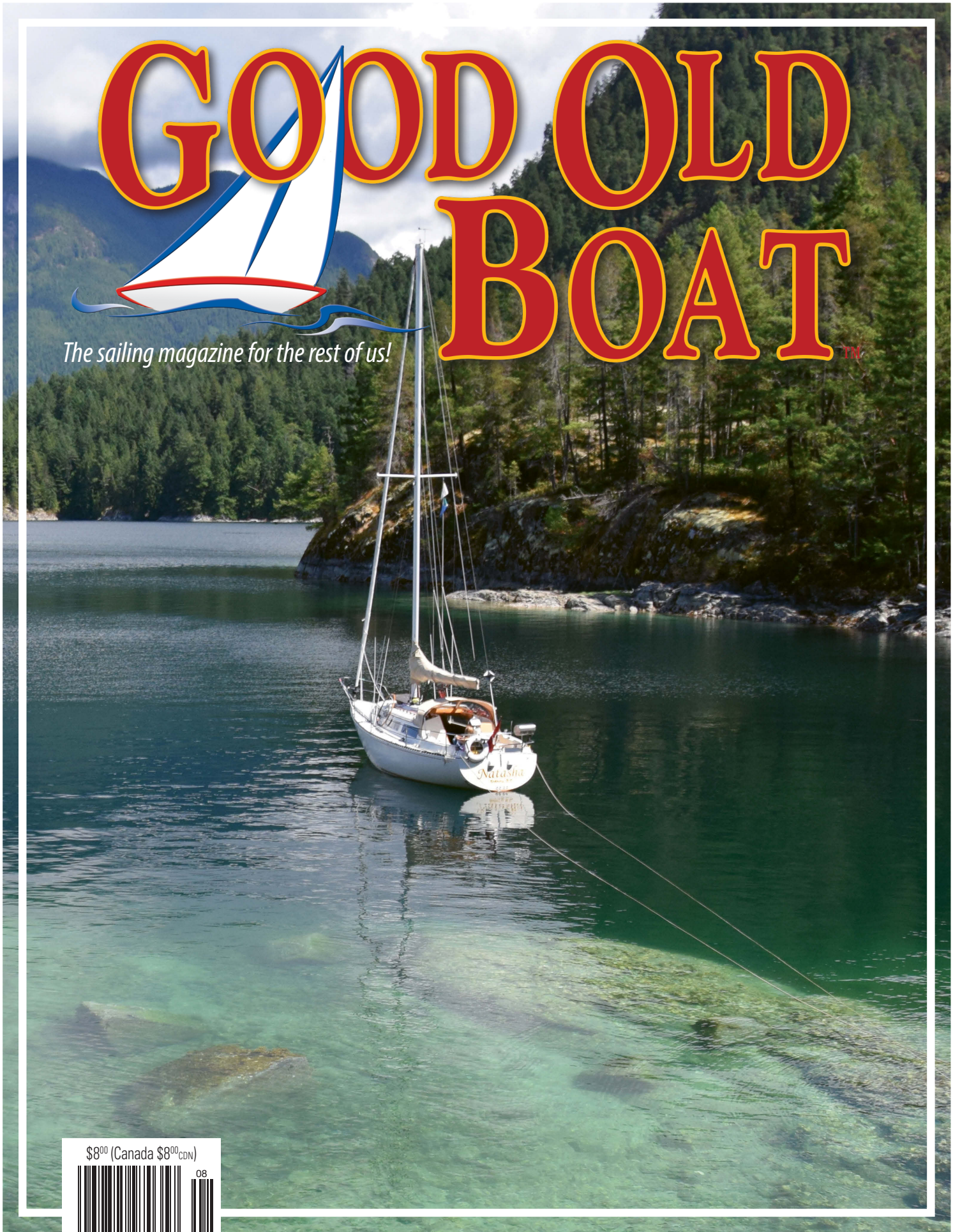

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Issue 127 July/August 2019

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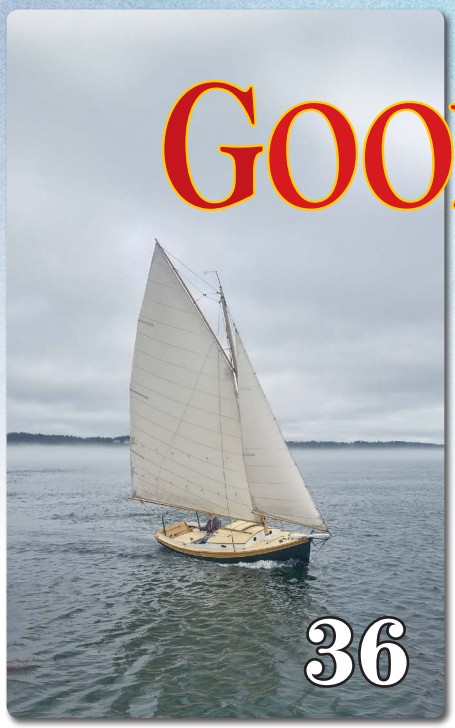

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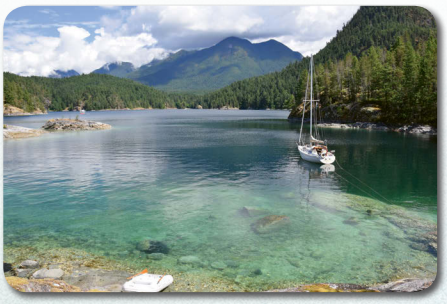

One can only presume that, on the day George Vancouver named Desolation Sound, in British Columbia, the weather was not the same as when longtime contributor Bert Vermeer took this photograph.

Speaking Seriously

What's More

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The sailing magazine for the rest of us!

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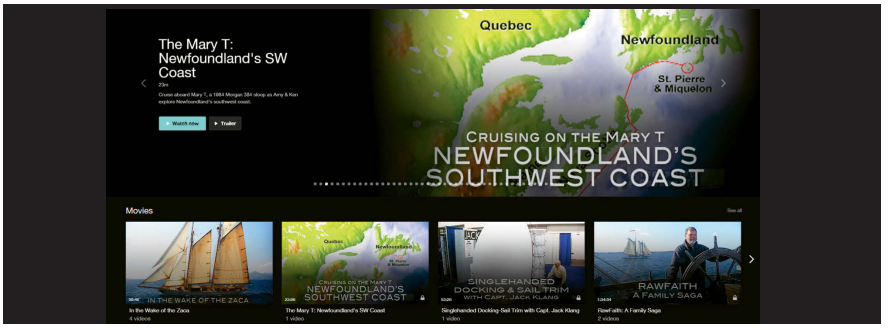
BOATING WRITERS INTERNATIONAL

Webb on the Web

"Just last week, I was asked why, after compiling so great a body of work, I continue. My answer was simple: I'm not yet used up." The author of that quote is 77 years old. He's blind in his right eye. He recently finished his sixth solo circumnavigation, this time aboard a 2,000-pound 1979 Moore 24. He's the author of seven books. He's married to his sixth wife. During his second circumnavigation, he was falsely imprisoned by Saudi Arabia for spying. We're talking about Webb Chiles, one of the most interesting characters in the world of sailing. His personal website is a place to get lost for days. From his introduction: "People who know of me at all probably do so as a sailor; but I have always thought of myself as an artist, and I believe that the artist's defining responsibility is to go to the edge of human experience and send back reports. Here are my reports." Check out inthepresentsea.com



SailFlix

There's a place for amateur sailing channels: YouTube. Then there's a place for a wide and growing library of professionally produced current and classic sailing documentaries and how-to films: sailflix.com. Watch the trailers, start a free trial, see what you think. There's a lot of good stuff there that makes subscribing worthwhile — and it's all from the same folks who started The Sailing Channel. We can vouch for the quality. Dave and Jaja Martins' *Ice Blink* sucked us in and we kept going with *Red Dot on the Ocean* (about Matt Rutherford). Films by John Rousmaniere, Lin and Larry Pardey, Gary Jobson, Don Street, Margie Woods, and William F. Buckley are all there, as are 5 seasons of *Latitudes & Attitudes* TV, and much more.

Wear It Proudly

Within the niche world of sailing periodicals, *Good Old Boat* magazine has its own niche. So on the docks or at the watering hole, *Good Old Boat* apparel has always been popular among *Good Old Boat* readers because it sets us apart. This season, we offer the classiest way to protect your face from the sun: our ever-popular hat in a new navy color. We also have a new women's-cut T-shirt, "Boat hair don't care." And there's more. Our gear is high-quality, priced fairly, and found at goodoldboat.com.

Selling the Family Home

Memories make up for the deficiency in dollars recouped

BY MICHAEL ROBERTSON

Hopefully, by the time this issue goes to print she'll be gone, out of my life. She'd better be, she's sitting unattended in the Tropics. Do you have any idea what happens to an unattended boat in the Tropics? Termites, cockroaches, and mold — times ten! Sure, I asked, and the broker promised to open her up from time to time and "check on things," but after a couple of months, after the first deal collapsed and I returned to the boat to attend to some matters, I realized there's a tremendous gulf in understanding between the broker and me in terms of boat care.

I found the stainless steel boarding ladder (the one my family had used without incident for 8 years) sitting on the deck, twisted, mangled, and covered in barnacles. "I didn't email you about that?" the broker responded. "Big storm that came through. Weeks later, I noticed the ladder gone and asked the diver to check. He found it right away!" At some point on its journey to the bottom of the marina, the boarding ladder gashed the hull.

"We can't sell the boat like this," I said, waving my arms at the ladder and the gash in the hull.

"The last couple interested in the boat didn't seem to mind. It's no big deal."

I brought the ladder to a machine shop and had it welded and straightened. Then I polished it. Over the next week or so, I replaced the house battery bank, cleaned all the mold off the surfaces in the cabin, and left some boric acid for the roaches. I didn't find any evidence of termites. I cleaned and exercised all the pumps, the engine, and the through-hulls.

Of course, the broker is a realist. She knows full well she has an old cruising boat for sale, and if a few roaches make themselves at home while she waits for a buyer, or the stainless steel stanchions lose their shine, these things won't make a material difference with regard to when or for how much the boat sells. Her commission will not change. She's on the right side of a cost-benefit analysis.

But still.

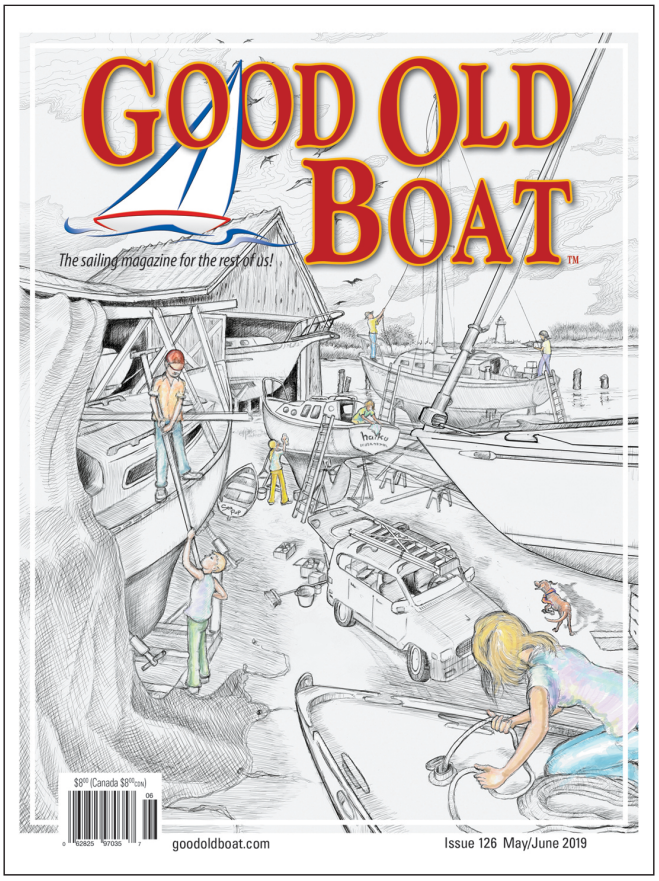
Assuming this new deal goes through, the only thing that might temper my joy is the size of the check I'll be sent. Apart from the broker's commission and the unfavorable foreign-currency exchange rate, the value of heavy-displacement 1970s-era sailboats has been in decline. Contributing editor Drew Frye just sent me an article in which he talks about the cost-per-pound of various types of sailboats. He bemoans the aging cruising monohull that may be worth as little as $5 per pound. I paused to do the math . . . yikes! I'd be lucky to get half that.

When we bought our 12-ton, S&S-designed home in 2010, we got a heck of a deal, paying only $64,000. But in 2019, we're not going to get all of that back. I'm only now coming to terms with the fact that the boat's new mainsail, new mainsail cover, new running rigging, new standing rigging, new instruments, new upholstery, and other new things we spent tens of thousands of dollars on over the years, are no longer new. Most of them are either at or nearing the end of their lifespans and the new buyer will be looking to replace them.

And none of that really matters. I did a thought experiment the other day, asking myself whether I'd trade the time we owned our boat, the thousands of miles we'd sailed aboard her, the hundreds of nights we'd slept aboard her, and the cruising memories my daughters own for twice what we paid for the boat and all the money we'd ever put into her. Nope. And I didn't have to think long. Our 40-year-old 40-footer owes us nothing.

The irony is that if everyone could understand her value in that way, she'd be priceless. But the number of us who see that value is still smaller than the number of boats available. And I don't see that as a problem, just a temporary opportunity for a new generation of sailors. Older fiberglass boats aren't going anywhere, thus the number on the market keeps growing. And now, the barriers to owning a 25- to 45-foot sailboat are lower than ever before. Imagine that! In the past three years, I've shared anchorages all over the South Pacific with numerous 20-somethings having the times of their lives in modest Ericsons, Cals, Catalinas, Columbias, and Tayanas that they bought, some with their earnings waiting tables or tending bar. These people, and many more, have learned how much these old hulls have to offer. And that's a beautiful thing.

Cover Lover, Faithful Fan, and More



Stunning cover !

The May 2019 cover is a classic. You should make it into a T-shirt. (I'll buy one.) It is great just the way it is with the *Good Old Boat* title and issue info. Children could color it in with fabric pens. You could have a contest for the most creative ideas for decorating the shirt, a way to involve younger sailors. It could be a bestseller! Keep up the great work!

–Fred McCarthy, *Small World*, 1977 Catalina 25, Seattle, Washington

Faithful fan

Thank you for all you and your staff do to produce such a great magazine. As the owner of a couple of good old boats (a Catalina 25 and a Coronado 15), I depend on the articles and insights I get from *Good Old Boat*. No other magazine is quite like it or addresses the needs that we good old boat owners have.

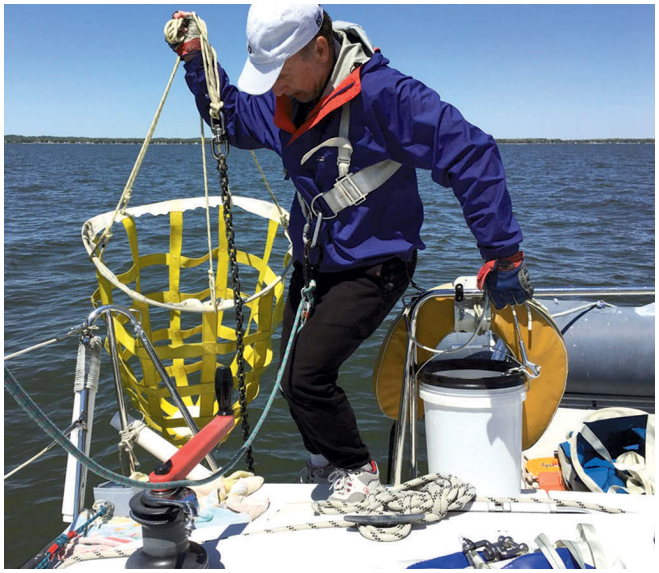
–MaryAnne Moseley, Missoula, Montana

Thank you for the kind words, MaryAnne. It's a labor of love for all of us. Ours is one of the few remaining independent national magazines (boating or otherwise), so we work closely and each wear a lot of hats. Interestingly, our close working relationships are all virtual, as we work from our homes (or boats) and live all over the place, from Mexico (Behan) to Montana (Dan) to North Dakota (Karla) to Florida (Nancy) and everywhere in between. ***–Editors***

Good old mind reading

How did *Good Old Boat* know I was buying a drogue/sea anchor? I bought one online yesterday, just before I received the May issue today. The timing of this article could not be better; it helps me understand where I am going with my 200 feet of line and a 57-inch drogue. Thanks for the article (and the rest of the issue)!

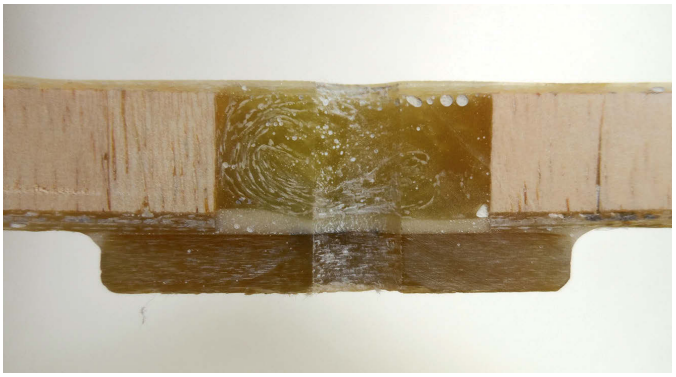
–Gregg Bruff, Escanaba, Michigan



Clarifying bolt backing

In his article "Better Bolting and Backing," May 2019, Drew Frye calls for covering the backing plate with thickened epoxy and then clamping it in place. Yet, Don Casey, in his *Complete Illustrated Sailboat Maintenance Manual*, says not to seal backing plates. Who's right?

–William C. Winslow, New York, NY



on Backing Up Bolts

Drew Frye responds

Thanks for the question, William. Both Don Casey and I are correct. Don advises against bedding a through-bolt on the inside of the cabin. This is so that any water that leaks through the exterior bedding will freely follow the bolt threads and exit into the boat's interior and not be forced into the deck's core by encountering interior bedding. For the same reason, he advises against bedding a backing plate, as the sealant might migrate to the fastener threads, thereby sealing the bolt on the inside of the cabin.

Note that, in my article, the fiberglass backing plate is not bedded to the interior surface, it's bonded with epoxy and then drilled (see photo bottom of page 6). A fiberglass backing plate that is bonded becomes a part of the hull (or deck), making the hull stronger in that area. It is as though there was more laminate laid in that area, with no distinction between the plate and the pre-existing hull. This is the most structurally efficient way to strengthen an area.

It's at this point, having drilled through the bonded backing plate and when preparing to through-bolt the deck hardware, that we all benefit from heeding Don Casey's advice by not attempting to seal the inside of the bolt fastener. When all the steps I describe in my article have been followed, the core is no longer vulnerable, but benefits come from not trapping water and from being able to readily identify topside leaks.

–Drew Frye, *Good Old Boat* contributing editor

Figuring out ferrites

I arrived home after work today to find the May 2019 issue of *Good Old Boat.* After making dinner for my wife and me, I happily dove into the issue.

I was pleased to see David Lynn's article, "Ferrites Run Interference," about using ferrite cores to reduce or eliminate the effects of RFI. The advice David presents is solid. I am an amateur radio operator and electronics hobbyist at night and a computer engineer by day, so RFI is a familiar and sometimes pervasive foe. While trial and error is often necessary, as David suggests, finding the culprit(s) in the first place can take a bit of effort. My advice to readers is: Don't be afraid to reach out to a local amateur-radio club for assistance. I know there are hams (some of whom are also boaters) who would be more than willing to help out for a pizza, a beer, or a sail! There may even be a ham lurking quietly in your marina who would love to help a fellow boater get their RFI under control.

In addition to the resources cited at the end of the article, Palomar Engineers (palomar-engineers.com) has a ton of online resources dedicated to helping anyone through the process of reducing RFI. They also sell a wide variety of ferrite cores in all shapes and sizes, including kits of various cores to handle different types of RFI. An important point for anyone going through the process is that there are different types of ferrite cores, and they will attenuate interference better at some frequencies than others. Using the wrong kind of core usually won't cause major issues, but it can make the job a lot harder than it needs to be. And to be clear, I am in no way affiliated with Palomar, I'm just a happy customer who has been using their products and information for quite some time.

–Jonathan Woytek,
New Kensington, Pennsylvania

continued on page 54

Dan Ancona caught some sea lions lounging on the "HR" buoy on San Francisco Bay. *Rejoice*, the Hallberg-Rassy 39 in the background, is about to tack, pass under the Golden Gate Bridge, and then turn left for Mexico with Dan's friends James and Kristie aboard. Dan shot this from his own Hallberg-Rassy, *Resolute*, a 35-foot Rasmus built in 1972.

Seafarer 26

A good and forgiving starter boat for coastal cruising

BY
ALLEN PENTICOFF

For a boat its size, the Seafarer 26 has nice proportions. A distinctive and attractive feature of the design is the highly cambered coachroof.

Rich Sutorius first became interested in sailing from watching a 1960s-era *National Geographic* special about Irving Johnson sailing the 96-foot brigantine *Yankee* around the world. After vacationing in Tahiti and Jamaica, where he saw "lots of boats," he says the sailing bug really bit him. In 1979, he took sailing lessons on a 30-foot Lancer on Carlyle Lake, Illinois, near St. Louis, and before he knew it, he owned a Seafarer 22. A few years later, seeing a 1981 Seafarer 26 in the slings at the West Access Marina on Carlyle Lake, he and his wife, Carolyn, acquired it to accommodate their growing family, which by then included two daughters. Rich and Carolyn live in St. Charles, Missouri. He recently retired from work as a mechanical engineer, and Carolyn describes herself as a technical analyst who works with computers and people. They named their Seafarer 26 *Mañana*.

Rich is a fan of the Seafarer series of boats, and due to his interest and long experience with them he has become something of a historian of the company (see "Seafarer Yachts," page 12, for the history of Seafarer as Rich knows it). The 26 has long been out of production, and how many are out there is not known.

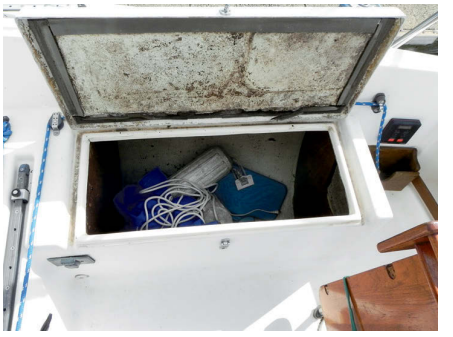
On a typical review, I sail with the owners once. In this case it was three times. Rich and Carolyn came out the first time, in late October 2017, on their home waters of Carlyle Lake. The weather was nasty — very windy, misty, and cold. My wife, Ruth, and Carolyn justifiably hid out in the Boulder Marina clubhouse. Optimistically, Rich and I sailed. My photos were marred by raindrops. The lake was too choppy to take under-sail photos from our MacGregor 26D. We vowed to return.

A year later we came back. Rich's marina friend, Steve Rice, provided the photo boat, a San Juan 28. After I'd shot my under-sail photos and video, Steve and Rich rafted alongside so I could transfer onto the Seafarer. We enjoyed a nice fall day sailing across the wide lake and back.

Design and construction

The Seafarer 26 was built by Seafarer Yachts in Huntington, New York, to a McCurdy & Rhodes design. (An earlier Seafarer 26 was designed by Philip Rhodes.) Some were sold in kit form. All were built between 1977 and 1985, when the company went out of business. It has a fin keel and skeg-hung rudder, but with a displacement of 4,600 pounds and a sail area/displacement ratio of 15.7, is more of a cruiser class than a sport boat. Although no speed demon, it is a good, steady, solidly built boat. Outboard power was standard, and Edson wheel steering and diesel power were options.

The hull and deck are constructed of hand-laid woven rovings and mat with balsa core in the companionway hatch slide and cockpit seat areas only. The solid laminate is ⅝ inch thick at the centerline, ⅜ inch at the topsides, and a hefty 1 inch at the chainplates, which are mounted outboard on the hull just below the sheerline. The chainplates and stanchions are backed by ¼-inch plywood, which on *Mañana* had deteriorated. Rich replaced the plywood with fender washers until such time as he



The T-shape of the cockpit provides room to step around the pedestal and wheel, at top, but at the expense of shortening the port and starboard seats, making them less conducive to napping.

The helm seat lifts to provide access to the rudder head for quick installation of an emergency tiller, above center. This space could be used for stowing items that tolerate getting wet.

Large lockers port and starboard offer plenty of dry storage, above.

could fabricate stainless steel backing plates (the bolts are in shear through thick fiberglass). To get to the bolts, he had to cut access holes.

The hull-to-deck joint is an outward flange fastened with stainless steel screws and glassed over on the inside. The rubrail is held on by short screws that do not penetrate the flange. Rich reports *Mañana* has not leaked at this joint. The overhead liner is textured fiberglass. Although not obvious, due to the builder's liberal use of wood trim, the furniture pan is fiberglass as well.

The lead-filled keel is integral to the hull with fiberglass covering the ballast and forming a shallow bilge that has no sump for a pump. The rudder is hung on a partial skeg with a bottom bearing. Some owners have had trouble with the bottom bearing, though Rich has not.

In Rich's opinion, one shortcoming is that the wiring is not as good as it should be.

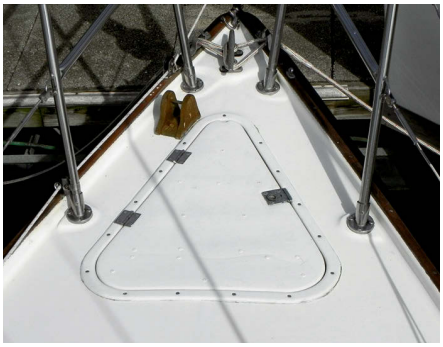
On deck

The standard companionway entrance has two dropboards (*Mañana* has three for easier storage). Rich removed the 1½-inch teak trim from *Mañana*'s hatch slide when he found water leaking into the balsa core at the mounting screws. He cleaned out the rot, filled the holes, and decided he did not need the trim. There is no sea hood for the hatch slide.

The T-shaped cockpit well has two drains aft. Two large lockers, one under each cockpit seat, allow access to the engine and provide plentiful storage — the designer did not try to wedge in tiny quarter berths. There are cubbies in the seatbacks, but the top edge of the coaming is a bit hard. The wide aft seat lifts for access to the rudder head and would also provide a good place to store outboard-motor fuel tanks. The bridge deck does not hinder access to the companionway.

Unfortunately, the Seafarer 26 earned a low Penticoff Napability Index (PNI) rating of 2 out of 5. The seats are wide enough for a nap, but far too short, and instruments mounted on the bulkhead make it uncomfortable to lean against without a big cushion. Easily made panels to connect the cockpit side seats with the helm seat would improve the PNI to a 4.

Because the anchor locker was added as an aftermarket feature, many boats may not have one. Access to the spacious foredeck is easy via the relatively wide sidedecks, and there is adequate space on the cabin trunk for working at the mast. Rich has fabricated line guards for the two cowl vents forward to keep them from being removed by jibsheets. *Mañana* has bow and stern pulpits with double lifelines and gates. I found getting on and off the boat quite easy.



An aftermarket anchor locker at the bow solves the problem of where to stow ground tackle, far left.

The chainplates are mounted outboard, leaving the sidedecks uncluttered, at left, and the deck molding is nicely detailed around the hatches and Dorade vents. There are no handrails on the forward cabintop.

Rigging

The Seafarer 26 is a masthead sloop with single lower shrouds and externally mounted chainplates. On *Mañana*, the wire size is 5/32 inch. She is equipped with a foam-luffed 130 percent genoa on a CDI furler. While there is a winch on the mast for the headsail halyard, *Mañana* does not have one for the mainsail, and I found it difficult to attain sufficient luff tension just by sweating the halyard. Rich has fitted *Mañana* with lazy-jacks and jiffy reefing on the mainsail.

Accommodations

In the main cabin, an attractive table made of solid wood folds down from the bulkhead, revealing cabinets behind it, and opens very wide with slide-out supports. There is storage under the settees and above and behind each of the settee seatbacks. The batteries are under the starboard settee. Rich did a good old boat redo of the teak-and-holly sole with a vinyl product.

The galley, tucked under the bridge deck, has an icebox to port and a

Comments from owners of the Seafarer 26

I owned a 1977 Seafarer 26 for nine years. I found that it was tender until heeled to about 20 degrees. I had reefing points put on the jib, as it was larger than the main. I reefed at about 15 mph of wind. The hull inside was finished with a coarse woven mat and painted. The chainplates were bolted to the outside of the toerail, so there was zero chance of leaks through the deck. The cockpit was deep with a good bridge deck that had the mainsheet on a traveler right in front of the helmsman, and you could stand up without worrying about being hit by the boom. I only had one real problem and that was a leak in the port hull-to-deck joint that I could never get to stop. This was a well-thought-out boat for just 26 feet.

–**Harold Jaussi,**
Eagle Mountain Lake, Texas

Contrary to Seafarer's brochure claim that the rubrail provides substantial collision protection, in actuality the rubrail on our 1977 model was a C-shaped molded extrusion held in place with rivets and there more for aesthetics than protection. When we purchased the boat, the molded-in deck non-skid was fairly worn. I scrubbed the deck and cockpit non-skid areas with domestic floor-wax remover and then painted the non-skid with EasyPoxy one-part paint. I sprinkled model-railroad sand granules on top of the wet paint, and painted a second coat on top of the granules.

The original sail plan was undersized for the boat. Sailing in company of Pearson 26s, we were the last ones to get into port.

The original bulkheads separating the main and forward cabins were pressed plywood covered with a vinyl type of material simulating a dark wood. A winter project was replacing those bulkheads with good-quality marine plywood stained a deep red/brown. I replaced the boards below the port and starboard settees in a similar way. Although the brochure states the bulkheads were teak, on our 1977 version they were not.

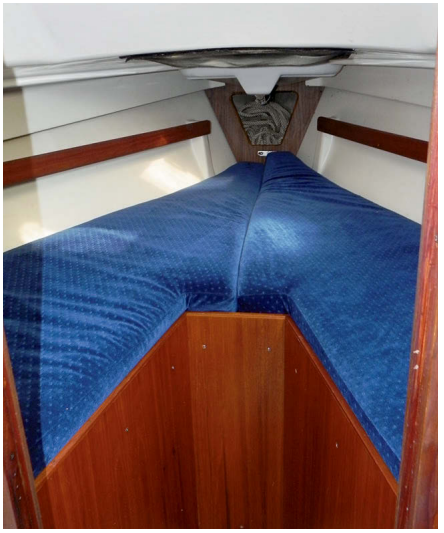
–**Paul and Kym Cournoyer,**
Portland, Maine

Overall it is very easy to sail. I can singlehand with ease. I do find that it doesn't sail very tight to the wind. Still, it does very well with light wind and generally can maintain 4 to 5 knots of speed. The hull is super thick and solid. You really can't hurt this boat. Paired with the Yanmar YSM8 engine, it's a solid combo. There's a nice amount of amenity inside, too, although I will say that some of the trim is cheap. This is a great pocket cruiser that will provide tons of sailing dependability and is a stable platform for weekend and overnight trips.

–**Tony Wisniewski**, Ossining, New York

She is slow. We tried to race her in the club races, and even with a PHRF of 284, we still lost and almost always came in last. She leaks along the deck-to-hull joint when it rains. If you are looking for a boat for daysailing or short overnight trips, the Seafarer 26 is a great little boat. If you plan to take long cruises, or join in the club races, buy a bigger boat.

–**Susan Sherrod**, Deale, Maryland



The two straight settees in the saloon make good berths, at top. The port-side one slides out to make it wider if needed.

Fully opened, the table reaches both settees, above center.

The V-berth is roomy and an insert makes it comfortable, above. Fiddled shelves are fitted above the berths and the anchor locker does not intrude into the foot space. Light items could be stowed in the large finished space under the V-berth — too much weight forward can accentuate hobbyhorsing in a seaway.

two-burner alcohol stove to starboard that Rich never uses (when they want to cook, they go to the nearby Boulder Marina clubhouse). There is storage space under the stove. Headroom in the galley is 6 feet 2 inches under the companionway hatch slide.

The main bulkhead is veneered with simulated-wood plastic. The double doors between the forward cabin and the head have been removed on *Mañana*, but there is a door to close off this area from the saloon.

There is a fixed portlight in the head, which is to port, an opening port above the vanity opposite, and an opening hatch above the space between the head and the vanity. This hatch and another over the V-berth have been replaced with Bomar hatches. Although most of the Seafarer 26s I viewed online seemed to have fixed portlights only, *Mañana* has one fixed and another opening portlight in the forward cabin. After the original large fixed portlights on each side in the saloon deteriorated, Rich overlaid them with 3⁄16 inch tinted polycarbonate. Two cowl vents forward send plenty of air through the cabin.

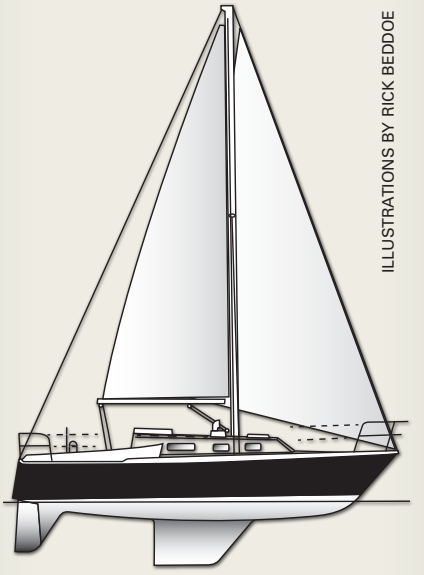
Under sail

Due to carrying too much headsail, and despite luffing the mainsail, we experienced considerable weather helm while heeled over hard in 20 knots of wind. Even after we reefed the main, weather helm remained significant, although I think some work on sail trim would have reduced it. Coming about, the boat responded normally, if not quickly. She did not pound into the 2-foot chop but her motion was quick. Downwind, rolling was normal, and off the wind she tracked as if on rails and needed little input from the helm.

The steering wheel, being on the small side, demands moderate effort but provides good feel and feedback. The emergency tiller is easy to attach. From a seated position aft of the wheel, forward visibility is good; I had no problem seeing over the cabin trunk. The mainsheet traveler extends the width of the bridge deck, but its location makes reaching around the wheel for the mainsheet a bit awkward.

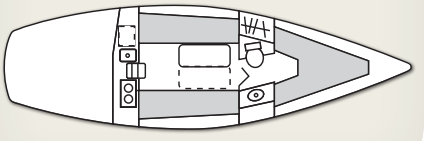
While steering at high heel angles, I found myself hanging onto the windward rubrail. When standing to steer, I had to step aside so the backstay wasn't against my shoulder, and I was warned that if I braced my foot against the base of the leeward seat, I might get a wet foot from water coming out of the cockpit scupper. I found a comfortable position by curling up my legs while

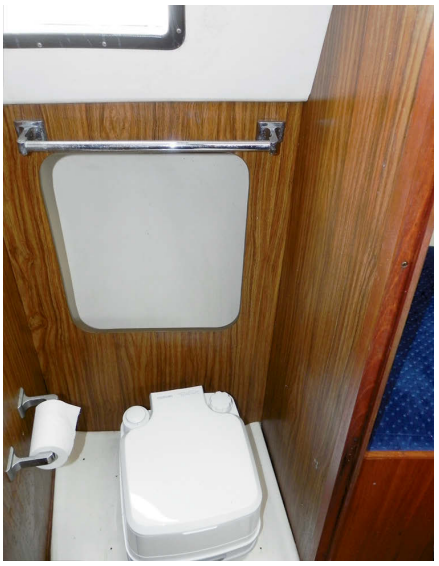
Seafarer 26



ILLUSTRATIONS BY RICK BEDDOE

Designer	McCurdy & Rhodes
LOA:	25' 9"
LWL:	22' 9"
Beam:	8' 3"
Draft:	3' 9"
Displacement:	4,600 lb
Ballast:	1,775 lb
Ballast/disp. ratio	.39
Sail area:	270 sq ft
Sail area/disp. ratio:	15.6
Disp./LWL ratio:	174
Fuel:	10-12 gal
Fresh water:	20-43 gal





Between the saloon and the V-berth, a portable toilet (in the case of *Mañana*) is to port, far left, and a vanity with mirror and sink is to starboard, at left.

Seafarer Yachts —Rich Sutorius

Seafarer Yachts was founded in 1959 by Englishman Brian Ackworth, an airline pilot who routinely flew between Europe and the US and set himself up as the US distributor for the Netherlands-based builder G. de Vries Lentsch. The Swiftsure 33, Meridian 26, and an 8-foot dinghy imported to America, all designed by Philip Rhodes, were known for being well-built and sailing well. Bill Tripp Jr. designed the Polaris 26, the well-known Javelin 38, and the Tripp 30, which were also built in Holland.

When it became unprofitable to build boats in Holland, in 1965 Ackworth set up a new manufacturing plant in Huntington, New York. Because of the high cost that shipping the molds to America would incur, the company commissioned new designs and tooled new molds for production. The earliest New York-built boat I could find was a Tripp-designed 31-footer. A 39-footer, also by Tripp, soon followed. The Sparkman & Stephens-designed 48 debuted at the 1965 New York Boat Show. It was the largest boat ever produced by Seafarer and it's thought that fewer than five were built. Eventually this design became the Hughes 48/Northstar 48, which was built in Canada.

The majority of Seafarers built in the 1970s were designed by McCurdy & Rhodes, including the 22, 23, 24, 26, 29, 30, 31, and 37. Most shared a common design DNA of a swept-back keel with encapsulated lead ballast and the rudder on a partial skeg. A shoal-draft option was listed for some models, and several were available with a swing keel and lift-up rudder. Two deck styles were offered for some models: a traditional version with a normal, somewhat truncated cabin trunk and a "Futura" version on which the cabintop sloped farther toward the bow for a more streamlined look. This style increased the headroom in the V-berth area while sacrificing working room on the foredeck. Some hulls and decks could also be ordered as kits.

While the designs were all well done, and the basic structures were solid, Seafarer had recurring issues with interior build quality and timely deliveries. Seafarer Yachts eventually ceased production in 1985, a victim of the mid-'80s boatbuilding decline that claimed many sailboat builders. It's not known how many of each model the company built, but a loyal following of owners readily shares information and hints on how to keep these good old Seafarer sailboats sailing.

For information on Seafarer boats:
seafarer-research-center.com
facebook.com/groups/seafareryachts

sitting on the seat behind the wheel and leaning against the backstay.

The cockpit seats are wide and I could brace my feet against the opposite seat, but I'm 5-feet 10-inches tall, and my back was against the hard edge of the coaming. A cushion would take care of this, but it makes one wonder why the builders didn't put a generous radius on this edge. Tradition? This is a 1981 boat without wooden coaming caps. It is far too common a problem on older boats.

Getting around the cockpit table and the wheel is a bit hard while under way. The winches on *Mañana* have been moved aft from their original location to aid in singlehanding and are not easily operated by helmsman or crew. In their original forward position they would not make for easy singlehanding but would be fine for crew. A good compromise might be to have winches in both positions.

Mañana is pushed along by an 8-horsepower Yanmar 1GM diesel (which Rich had rebuilt 20 years ago) turning a fixed two-blade prop. He finds that this engine is adequate except when he's forging into a strong headwind. It started for us in relatively cold temperatures without pre-heat. Under power, the boat handled normally for an inboard-powered boat, making tight-radius turns and doing the usual prop walk to port when backing.

Conclusion

Having been aboard a number of 26-foot boats, I can say for certain there are only a few interior layouts that work out, and this one does. In a limited amount of space, it offers a lot: standing headroom, plenty of storage, comfy lounging and sleeping, dining with friends in comfort, a good night's rest. This might not be a boat to live aboard, but it's certainly adequate for a weekend or short vacation.

The galley, tucked under the bridge deck, occupies the full width of the cabin, at left. A handy "everything" drawer is fitted behind the companionway ladder, center, but even with both it and the ladder removed, access to the front of the engine is limited, at right. Large removable panels in the cockpit lockers provide better access. Stuffing box maintenance is not difficult.

The Seafarer 26 had a substantial options list; boats of similar vintage at similar prices might be differently equipped and have variations in their capacities for fuel and water. I found a number of Seafarer 26s listed at prices ranging from $3,500 for a 1983 model with a gas outboard to $8,000 for a 1984 diesel-powered boat. The median price is in the $4,000 to $5,000 range regardless of the type of engine.

Allen Penticoff, a Good Old Boat *contributing editor, is a freelance writer, sailor, and longtime aviator. He has trailer-sailed on every Great Lake and on many inland waters and has had keelboat adventures on fresh and salt water. He owns an American 14.5, a MacGregor 26D, and a 1955 Beister 42-foot steel cutter that he stores as a "someday project."*

VIDEO

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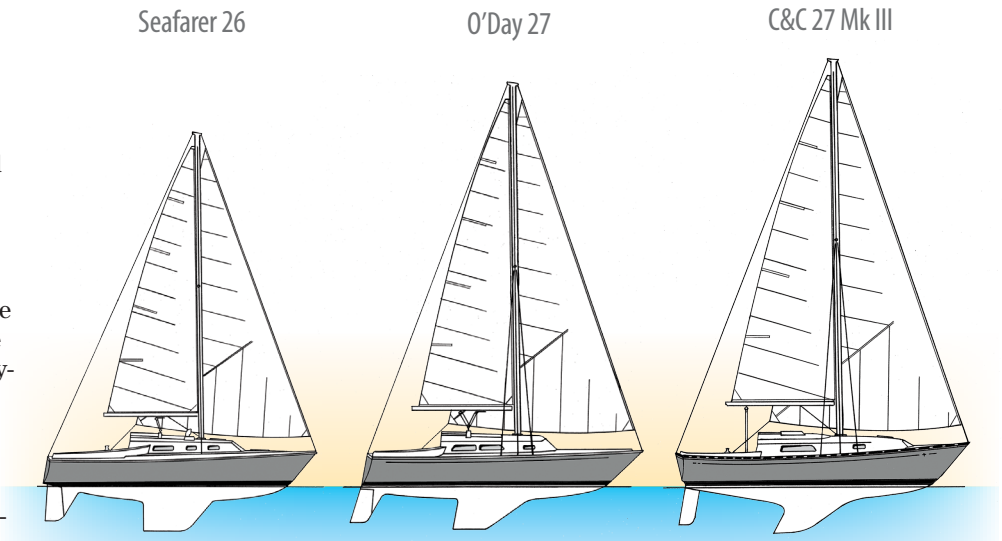
The Seafarer 26 . . .

. . . and two more proper little yachts

BY ROB MAZZA



The McCurdy & Rhodes-designed Seafarer 26 is a proper little yacht, with full standing headroom, an enclosed head, a full galley, and sleeping accommodations for a family of four. It's therefore appropriate to compare it to two other proper little yachts from the 1970s, the Alan Gurney-designed O'Day 27 and the Mk III variation of the popular C&C 27.

The C&C was a major retooling of its Cuthbertson & Cassian-designed Cruising Club of America (CCA) predecessor under the guidance of C&C's chief designer, Rob Ball. The purpose was to make her more oriented to the International Offshore Rule (IOR) and qualify for a ½ Ton rating. This was accomplished by increasing the sail plan, paradoxically reducing the ballast, adding "bumps" at the measurement points, and updating the stern and rudder. The 6-inch increase in length that resulted pushed the LOA to almost 28 feet.

Note that the published LWLs of the three compared boats are within 1 inch of each other, which is probably as good a way as any to say that they are all the same "size." However, the choice of criterium (dimension) for grouping boats of similar size has always been contentious, with the British traditionally using displacement or "tonnage" as the equalizer, and marketing people usually reverting to overall length as the criterium. LWL has always been the racing criterium in North America, where most rating rules have been formulated to achieve an approximation of LWL for handicap calculations.

In the tradition of the proper little yacht, each boat sports a fixed keel and an inboard, rather than transom-mounted, rudder. The LWL dimension can be artificially lengthened by the addition of a skeg over the rudder, which I expect is the case for all three of these boats. A transom-mounted rudder is never included in the measured LWL, but a skeg that fairs the top of the rudder to the hull is normally included. This skeg extends the LWL without adding any meaningful volume. As an example, the LWL for the earlier versions of the C&C 27 was 22 feet 2 inches, a full 8 inches shorter than the published

	Seafarer 26	O'Day 27	C&C 27 Mk III
LOA	25' 9"	27' 0"	27' 10"
LWL	22' 9"	22' 9"	22' 10"
Beam	8' 3"	9' 0"	9' 2"
Draft	3' 9"	4' 0"	4' 9"
Displacement	4,600 lb	6,700 lb	5,500 lb
Ballast	1,775 lb	2,230 lb	2,116 lb
LOA/LWL	1.13	1.19	1.22
Beam/LWL	.36	.40	.40
Disp./LWL	174	254	206
Bal./disp.	.39	.33	.38
Sail area (100%)	270 sq. ft.	340 sq. ft.	372 sq. ft.
SA/disp.	15.6	15.3	19.1
Capsize number	2.0	1.9	2.1
Comfort ratio	18.1	23.1	18.3
Year first built	1977	1972	1974
Designer	McCurdy & Rhodes	Alan P. Gurney	C&C Design
Builder	Seafarer Yachts	O'Day Corp	C&C Yachts

LWL of the C&C 27 Mk III. At C&C, we got around this dilemma by listing the DWL (designed waterline length) as well as the LWL that included the skeg. The former was the actual distance between design stations 0 (the forward end of the waterline) and 10 (on these boats, the center of the rudder stock), and thus a better indicator of the length of the distributed volume of the hull. Needless to say, a longer LWL was a valuable marketing asset.

Each of these three designs has a deep sheltered cockpit from which to work the boat. These are boats you sit in not on, reflecting their proper-little-yacht character. However, only on the C&C was an inboard engine standard. The Seafarer and the O'Day mounted outboards instead.

Each of these boats also sets a sail plan heavily influenced by the later CCA and early IOR, with large foretriangles, overlapping headsails, and narrow "ribbon" mains. While Allen Penticoff, in his review of the Seafarer 26, maintains that 26-footers in general are well-suited to singlehanded sailing, these masthead rigs aren't ideal, although a 130 percent jib would partially alleviate that problem. They are certainly not self-tacking, nor is it easy to reduce sail.

Displacements vary greatly, with the Seafarer being a full 2,100 pounds lighter than the O'Day and 900 pounds lighter than the C&C. Those variations in weight on boats with essentially equal waterline lengths result in a spread in displacement/length ratios from a very competitive 174 for the Seafarer, to a still sprightly 206 for the C&C, to a more moderate but acceptable 254 for the heavier O'Day.

Sail areas also vary considerably, with an anemic 270 square feet for the lighter Seafarer and 340 and 372 for the heavier O'Day and C&C. Thus the sail area/displacement (SA/D) ratios for the lighter Seafarer and the heavier O'Day are almost equal in the 15 range, but the C&C's is a much more competitive 19.1.

There is no question that the heavier O'Day with a low SA/D ratio of 15.3 will stand up better in a breeze without having to reef early, while the C&C 27, with the highest SA/D ratio, will excel in lighter air, but will certainly be reducing sail first.

The capsize numbers are all at the high end, which is not surprising for boats of this size, as they really are not designed for offshore passages. These are three pretty little mini-cruiser/racers. Maybe I'm biased, but to me, the C&C 27 is the prettiest of the three.

Rob Mazza is a Good Old Boat *contributing editor. He began his career as a naval architect in the late 1960s, working for Cuthbertson & Cassian. He's been familiar with good old boats from the time they were new, and had a hand in designing a good many of them.*

Voyagers Confront the

They quell fear of the unknown with caution and careful planning

BY MARCIE CONNELLY-LYNN

Many old nautical charts bore the warning "Here Be Dragons" scribed across uncharted regions. When my husband, David, and I moved aboard *Nine of Cups*, every aspect of our lives became an uncharted area: our lifestyle, the boat, and living aboard. Mapping our new life meant applying new labels to the most common things. The kitchen became the galley, the toilet became the head. Here be dragons.

Unlike some fortunate sailors, we weren't educated in the sailing life as youngsters. David always dreamed of a life at sea, and even joined the Navy, but in his entire 6-year naval career, never spent one day on a ship. I grew up near the East Coast, but the only boat I ever stepped aboard was Grandpa's rowboat on the local lake. To become sailors in our 40s, David and I had to work hard. We read everything we could lay our hands on about sailing and boats. We gobbled up the sailing magazines, in awe of those folks who lived aboard and cruised in exotic places like the Caribbean or the South Pacific. We took sailing lessons, safety and first-aid courses, an intense week aboard a real yacht with a captain who taught us "everything there is to know about sailing." We bareboat chartered.

After years of dreaming, we retired from our jobs, sold the house, furnishings, and the cars, and headed to Kemah, Texas, where our newly purchased 1986 Liberty 458 sat waiting. Oh, my! David might have been ready for this, but I was having second thoughts as we crammed our worldly possessions aboard. What did we really know about sailboats and sailing and living on the water? It was overwhelming. We were really doing this, but were we ready? Was I ready?

Enter the dragons, those things that cause angst, the fear and anticipation that gets the heart pounding, adrenaline pumping, and stomach churning. This wasn't what we'd planned for; it was time to start thinking in a new way. We began to view "harrowing experiences" as adventures. Scary mishaps were learning opportunities. Each time we overcame a fear, we said we'd "slayed a dragon." There was a dragon to slay the first time we backed our new boat out of the marina berth, the first time we were out of sight of land, and the first time we waited for a bridge to open. It was a world of firsts.

After a comfortable month berthed in a protected, cushy marina, leaving the dock unleashed a host of dragons. Casting off meant we were setting out across the Gulf of Mexico on our first multiple-day passage, and would experience our first night watch. Get the armor, shields, and lances ready!

We watched the weather and waited for a good window. As night approached that first evening and it was my turn to stand watch alone, I could barely contain myself. Night watch? What I dreaded the most turned out to be a time of silent contemplation I could never have imagined I'd enjoy as much as I still do. The stars and moon never seemed so bright or so close. I could hear the dolphins exhale as they danced their ballet beside the boat. Bioluminescence sparkled in our wake. I could sing loudly (and off key) to my heart's content and never be heard by my partner sleeping below. The passage was calm, and the most difficult part was the constant work required to maneuver around the never-ending oil platforms. We did have a small fire aboard (dragon's breath, we think) when a plastic toolbox that was too close to the engine exhaust began to melt. The engine quit a couple of times, but David managed to get it started again. As we handled each fresh challenge, our confidence grew and, one by one, dragons faded into the mist . . . only to be replaced by more dragons, sometimes larger ones, as we ventured further.

Dragons of the Deep

ILLUSTRATION BY NANCY KOUCKY

Dragons come in all sizes and shapes; not all of them arise from heart-pounding experiences. When we determined in Ecuador that the cost of replacing the dodger and bimini was too dear for the budget, we decided that I'd make new ones. I'm not a seamstress and my dread was palpable. What if I screwed it up? What if I wrecked all that expensive fabric? What if I failed? Take a deep breath, Marcie. Think it through. Do some research. Talk out the plan with David. Start the project. Not right? Tear it out and do it again. Be patient. We ended up with a new dodger, bimini, sailcover, winch covers, hatch covers, and more. Because by slaying one dragon, I gained the energy and confidence to take on more.

Everyone who's sailed long enough has experienced their share of hairy moments. The first few nasty squalls that come out of nowhere will cause anyone to wonder what the hell they're doing out in this miserable weather with waves breaking over the bow. We've hit rocks and reefs, we've dragged our anchor, and a dragging ship almost hit us in Fiji. The good thing about experiences like these is that we learned from them and emerged stronger, ready to face bigger dragons.

Our philosophy has become "just a little further." When we set sail back in 2000, we didn't name Cape Horn or Tasmania or Africa as our destination. That would have felt overwhelming and dangerously daunting. We set smaller goals of overnight destinations and two- to three-day passages. We practiced heaving-to, anchoring and docking techniques, and man-overboard drills until we felt confident in our ability to cope with most situations we might face. We continue to learn, because Neptune is a hard taskmaster.

And it must be said that dragon slaying isn't for everyone. We've learned that our lives are much richer and that we are much stronger for not giving in to our fears. Experience is the best teacher, and we've learned that advance discussion, careful planning, and practice significantly diminish the fierceness of any dragon. After 18 years and nearly 90,000 miles, our reward is that dragons are fewer and farther between. Being able to ease my grip on my shield and lance makes sailing much more enjoyable.

Marcie Connelly-Lynn and her husband, David Lynn, lived aboard Nine of Cups, *their Liberty 458 cutter, for 18 years, during which time they put nearly 90,000 nautical miles under her keel and visited more than 36 countries on five continents. They now travel by foot and in a tricked-out Ford Transit van named* Blue. *They blog regularly and maintain an extensive website at justalittlefurther.com.*

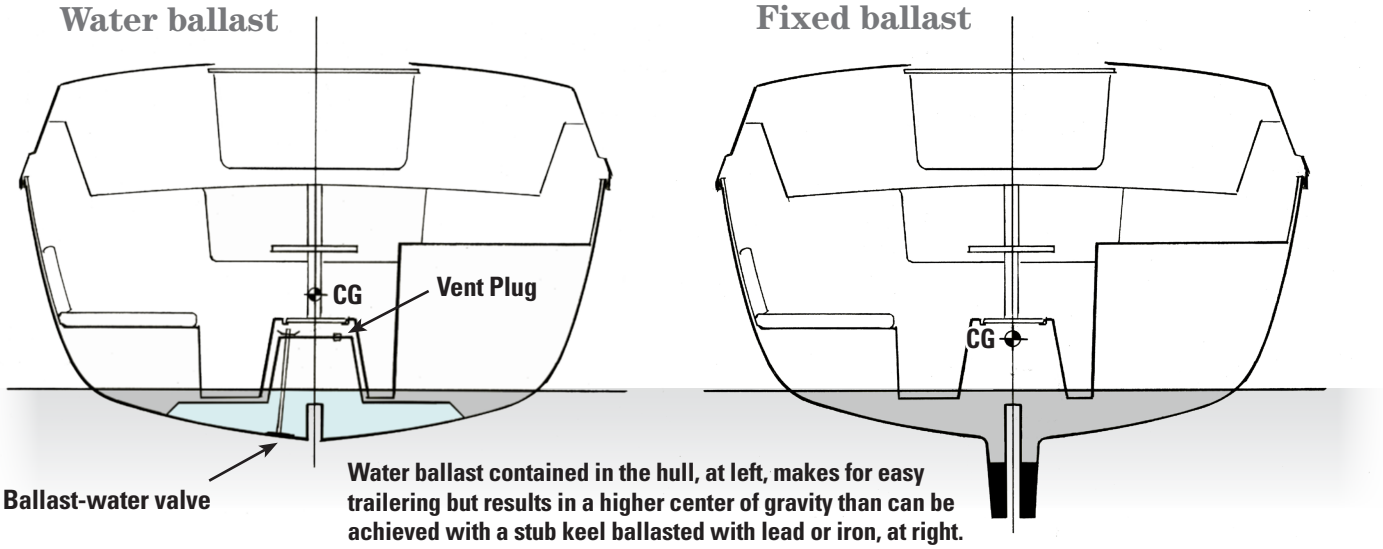
Water Ballast for Trailer-Sailers

BY
ROB MAZZA

Leave the weight in the lake and tow a lighter boat

MacGregor Yacht Corporation introduced the concept of using water ballast in a trailerable sailboat in its MacGregor 26.

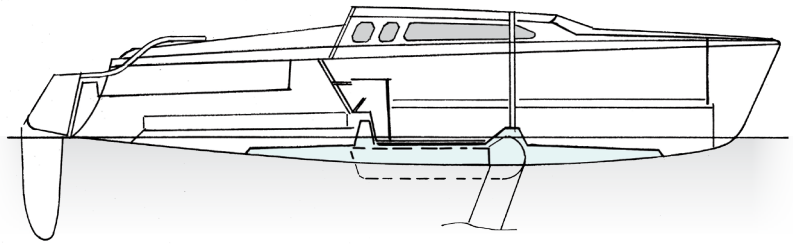
Water can be used in various ways to increase a boat's stability. One method is as old as yachting itself. Æmilius Jarvis recounts that, when he was racing as a youngster in the 1870s, the crew would fill the yacht's dinghy with water and haul it up on the yacht's leeward deck prior to a tack. After the tack, the weight of the dinghy and water was then perched well out on the weather deck, adding a substantial amount of stability when sailing upwind. At that time in the history of yachting, such a maneuver was not illegal. More recently, around-the-world racers have employed water-ballast tanks located on each side of the boat at the point of maximum beam to place a substantial weight of water well out on the weather side. However, after an accidental tack or jibe, that water ends up on the new leeward side, where it detracts from stability and increases heel angle. That is why the amount of water ballast in these applications is often restricted. These are old and easily understood



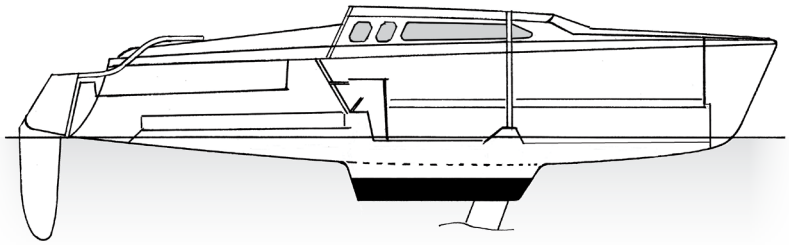
Water ballast contained in the hull, at left, makes for easy trailering but results in a higher center of gravity than can be achieved with a stub keel ballasted with lead or iron, at right.

PHOTO COURTESY OF CAROL SEVERSON

Water ballast



Fixed ballast in a stub keel



ILLUSTRATIONS BY ROB MAZZA

uses of water ballast to achieve higher stability.

The way water has been used as ballast more recently is perhaps not as easy to understand because, unlike in the above examples, the water is housed as low in the bilge as possible, on centerline, and below the waterline. When fixed in the bilge, water makes an ideal ballast material for trailerable boats, as it can be easily taken on after the boat is launched and allowed to drain out during haulout, usually on a trailer at a launch ramp. That eliminates the need to haul several hundred pounds of deadweight behind the tow vehicle. Indeed, the use of water ballast in these applications is, to my knowledge, exclusively restricted to boats that are launched and retrieved by trailer on launch ramps.

The first boat to popularize water as ballast in this way was the ubiquitous MacGregor 26, which was introduced with a daggerboard in 1986 and a swing keel (centerboard) in 1990. Hunter and Catalina were soon to follow. When I joined Hunter Marine in February of 1992, the project on the drawing board was the water-ballasted Hunter 23.5, with a lot of the design work already completed by my then-new associate Lynn Myers. It should surprise no one that a MacGregor 26 was sitting in the Hunter test pond behind the plant. The successful Hunter 23.5 was launched in 1992, and it was quickly joined by the water-ballasted Hunter 19 in 1993 and the Hunter 26 in 1994. The water-ballasted Catalina 250 came out in 1995.

How water ballast works

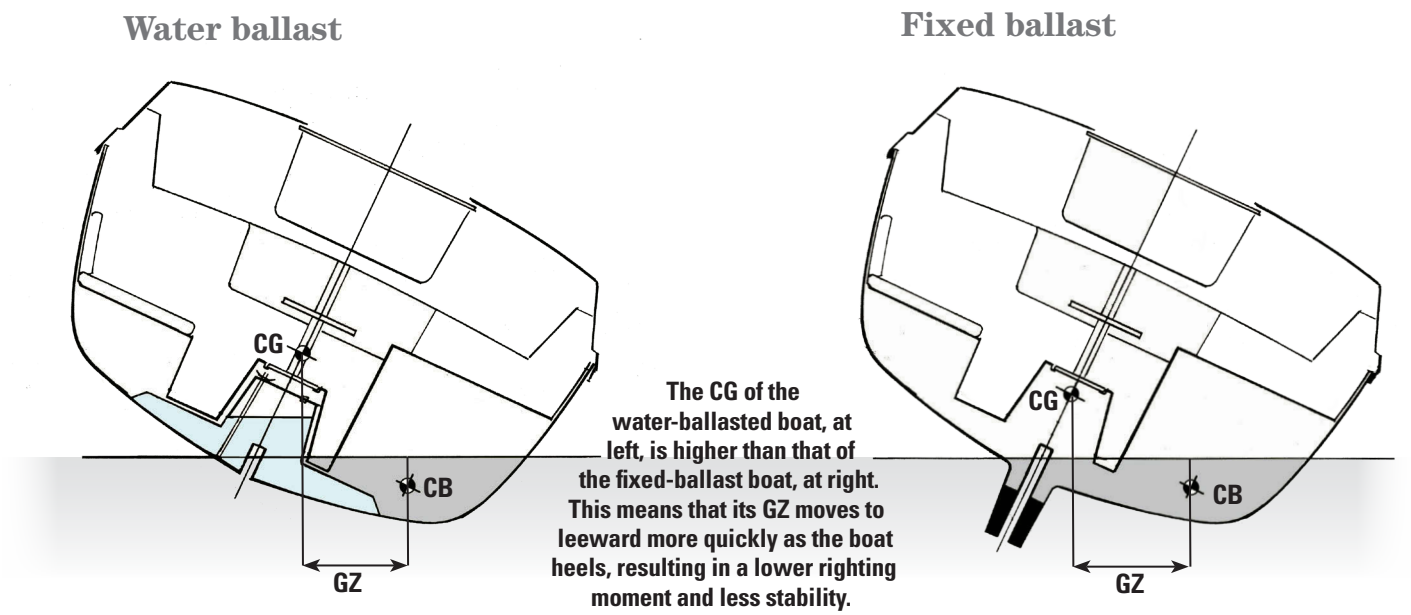
Some people have trouble grasping the concept of water used as ballast in this way: How can a material that has neutral buoyancy in water act as ballast? Doesn't ballast have to be heavier than water (lead, iron, or concrete) to increase stability? The answer is no. This harks back to the old children's riddle of which weighs more, a ton of lead or a ton of feathers. Obviously, they both weigh a ton, and both, if used as ballast, will increase the boat's displacement and thus stability.

Just as the ton of feathers will certainly occupy more volume than a ton of lead, the requisite weight of water will occupy more volume than an equivalent weight of lead or iron, but it is the weight that is important. As long as the water is restrained, its weight accounts for 35 to 50 percent of the total displacement or weight of the boat, and if located as low as possible in the boat, it will act as ballast. The result is that the boat's total center of gravity has been lowered and its stability increased.

On these water-ballasted trailerable boats, the water is always carried in a tank located between the cabin sole and the hull, and acts like the inside ballast used in the broad-beamed centerboard sloops of the 19th century. This concept of ballast located low in the hull and not in the keel was used in the 1978 Canada's Cup winner *Evergreen*, where the entire lead ballast was cast in the shape of the bottom of the hull and bolted to a flat on the hull designed to accept it.

The principle behind the use of ballast, whether water or lead, is exactly the same: Stability is increased by increasing the boat's displacement and lowering its center of gravity (CG). Keep in mind, though, that water ballast will occupy more than 10 times the volume of the same weight of lead, and this will affect the location of the CG. Due to its much smaller volume, the lead ballast would have a lower CG than the water, and this would lower the total CG of the boat more than the water ballast would. To partially compensate for the higher CG location, the weight of water ballast used is often greater than that of the lead ballast required to achieve the same stability.

There is a reason to concentrate as much ballast as low in the keel as possible. A yacht's heeled stability is generated by the shift of the center of buoyancy to leeward as the boat heels under a press of sail. The center of buoyancy (CB) is the center of the volume of the hull below the waterline.



The CG of the water-ballasted boat, at left, is higher than that of the fixed-ballast boat, at right. This means that its GZ moves to leeward more quickly as the boat heels, resulting in a lower righting moment and less stability.

The buoyancy, equal to the total displacement of the hull, acts as a force upward through the CB. The weight of the boat, which is equal to its displacement (Archimedes established that a body floating in water displaces its own weight of water), acts downward through the boat's CG. The horizontal distance between these two forces is the righting arm, referred to by naval architects as the GZ. A "moment" is a force times a distance, so the "righting moment" is equal to GZ times the weight of the vessel.

When a boat is upright, the CB and the CG are in the same vertical line and the GZ is zero. As the boat heels, the CB and CG separate horizontally and GZ increases until the righting moment is equal and opposite to the heeling moment generated by the wind force on the sails and the hydrodynamic lift on the hull and keel. Therefore, for a given weight of boat, the righting arm, and thus the righting moment and stability, can be increased by maximizing the horizontal distance between these two forces of buoyancy and weight.

The righting arm can be lengthened by increasing the beam of the vessel so that more hull is immersed farther to leeward as the boat heels. The wider beam is said to contribute to form stability. The righting arm can also be increased by lowering the center of gravity of the vessel so that there is little movement to leeward of the CG as the boat heels.

Stability constraints

Water-ballasted trailerable boats, unfortunately, are caught in a bit of a bind with both paths to higher stability. With regard to form stability, increasing beam is limited by the maximum vehicle width allowed on the highways, which is almost universally 8 feet, and possibly 8 feet 6 inches in some jurisdictions. Any boat wider than that will require a wide-load permit for each state or province through which it travels. The MacGregor 26 mentioned above has a 7-foot 10-inch beam, the Hunter 23.5's is 8 feet 3 inches, the Catalina's is 8 feet 6 inches, and that of the Hunter 26 is a pushing-the-limits 9 feet. So, increasing form stability by increasing beam on boats in this size range is strictly limited. This is also the reason that, to maximize beam at the waterline, most water-ballasted trailerable boats are somewhat slab-sided.

Increasing stability by lowering the ballast CG is limited because these boats are designed to be launched off trailers at boat ramps. A number of trailerable boats use lead ballast contained in a short stub keel that also houses the centerboard. This locates the CG of the ballast as low as it possibly can go, but the ballast is fixed, and adds about 40 percent of the weight of the boat to the load on the tow vehicle when compared to a water-ballasted boat.

However, by concentrating and lowering the ballast, the boat's total CG is also lowered substantially. As seen in the accompanying illustrations (above) of both ballast configurations at 25 degrees of heel, the righting arm (GZ) of the water-ballasted boat is about 15 percent shorter than that of the shoal-draft boat with fixed lead ballast. This results in a direct 15 percent reduction in stability and sail-carrying ability. Obviously, if a deeper-draft fixed keel were used, the CGs of the ballast and the boat would be lowered even more, with a corresponding increase in GZ and stability.

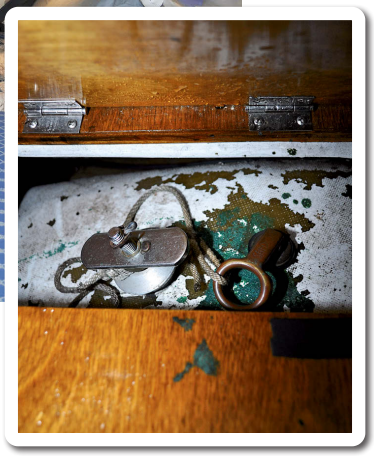
Because of the lower stability of the water-ballasted boat, it's advisable to be able to quickly dump wind from the mainsail when hit by a gust. For that reason, all the water-ballasted trailerable boats, with the exception of the Catalina 250, have fractional rigs with larger mains and smaller jibs.

Water-ballast management

Water ballast used in place of the same weight of fixed lead ballast occupies 10 times as much volume. This greater volume consumes most of the space between the sole and the hull, and there needs to be some way to admit water into the ballast tank after the boat has been launched. This is achieved by removing a vent plug from the top of the tank and opening a valve in the hull bottom to let water flood the tank. The vent plug must be well above the waterline so that, when the tank is completely filled, water will cease to enter, despite the valve and

ILLUSTRATIONS BY ROB MAZZA

PHOTO COURTESY OF CAROL SEVERSON



On the MacGregor 26, the water-ballast controls are under the companionway. The stainless steel handle is for the ballast entry and discharge valve and the bronze-colored handle is the vent plug.

vent still being open. For that reason it is often located in a molded step at the companionway. When the tank is full, and water has stopped flowing, the hull valve is closed, usually against a rubber pad, and the vent plug is reinstalled.

For the system to work properly, the tank must be completely full and the valve tightly closed. If the tank is only partially filled, not only is the amount of ballast reduced and the boat's total CG higher, but a "free surface" is created, and when the boat heels, water will flow to the leeward side of the tank, shifting the ballast CG to leeward and further shortening the righting arm.

Ensuring that the tank is completely filled might require "burping" it by walking around the boat to heel it on both sides and trimming it bow-down so any air in the tank shifts aft to the vent plug. To encourage trapped air to flow to the area of the vent plug, the top of the ballast tank is usually sloped fore and aft.

Because the vent plug sometimes does not provide a completely airtight seal, especially if it's not installed properly, it is important not to overload the boat to the extent that the vent plug might go beneath the boat's flotation plane. This can happen if there are too many people in the cockpit and the boat is fully loaded for extensive cruising. If the boat is overloaded and the vent plug is not installed properly, water might weep into the boat, causing it to float even lower in the water, making the situation worse. (Just such an incident at a Hunter Rendezvous led to an associate of mine coming to the rescue of a family aboard a 23.5, which later led to a romance with the daughter and a very happy marriage.) It is also important that the vent plug be high enough on centerline that water in the ballast tank does not reach the level of the plug even at high angles of heel.

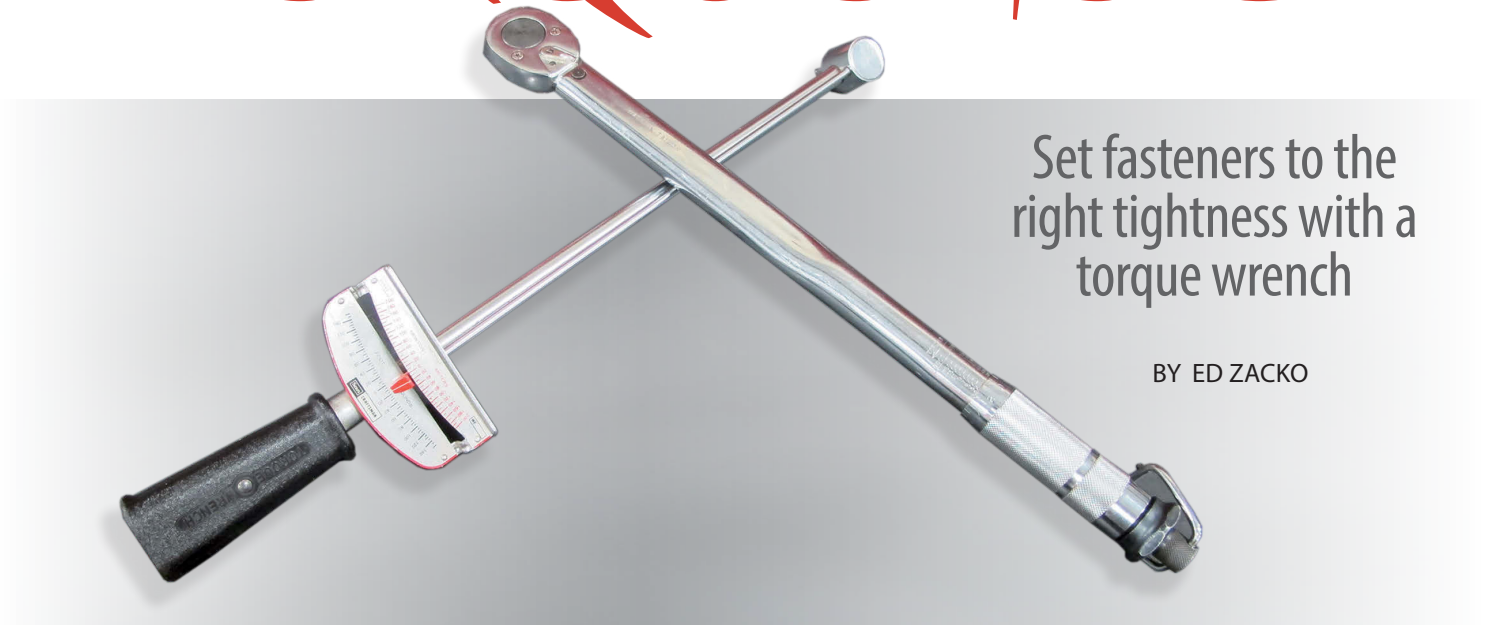
One other caution with water ballast, especially on freshwater lakes, is the obvious fact that in cold temperatures, water will freeze, and when it does, it expands 2 percent in all directions. If the water in the ballast tank is allowed to freeze it can do severe structural damage to the hull or ballast tank. It's advisable, therefore, to always drain the tank completely after hauling the boat, and to avoid leaving the boat in the water in freezing conditions.

If transporting the boat between different lakes, it is certainly necessary to drain the tank so as not to transport invasive species. A useful precaution is to add a little bleach to the water as the tank is filling.

The use of water ballast has created an expanded market for trailerable pocket cruisers, because these lighter boats can be hauled great distances behind smaller vehicles and easily launched and retrieved from most public launch ramps. The concept works well, but it's important to recognize the compromises in reduced stability as a result of a higher CG and the restriction on beam. These boats were designed primarily for inshore and lake use, and perform that function very well. Any departure from that should be considered carefully.

Rob Mazza's bio can be found on page 15.

TORQUOLOGY



Set fasteners to the right tightness with a torque wrench

BY ED ZACKO

"Remember, Eddie, one hand on the socket end of the wrench and your other hand perpendicular to the end of the handle. Now, pull gently until . . ."

Snap went the handle!

"I broke it!"

"No, Eddie, that's the way it's supposed to work. Pull until the wrench clicks and that's it."

I was 16 years old, in an ice-cold Pennsylvania garage pit under a car with Big George. We were replacing the main bearings on a '51 Plymouth and I had just used a torque wrench for the first time. I was doing a real grown-up job with a real grown-up tool and I was being taught by the best. Big George looked like Jimmy Stewart and his delivery was that same Jimmy Stewart drawl.

"Now, let's try the other side. Left hand on the socket. Nice steady pull. When you feel the click, stop."

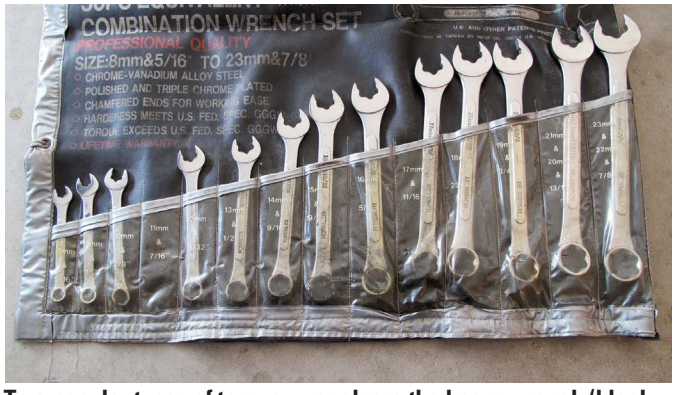
Click! I was hooked!

Torque is a twisting force that operates in a way to rotate or turn an object. Those of us who get up close and familiar with our good old boats use wrenches frequently to apply torque to a nut or bolt to loosen or tighten it. When tightening, we usually keep going until that "feeling" tells us it's tight enough, but who hasn't at one time or another applied so much torque that the bolt has broken or the head has twisted off?

In many applications, getting the torque right is critical, and engineering organizations have calculated tables of specific torque values for every size of nut and bolt (see the table on page 25). Exceeding these values risks stretching or breaking a bolt, stripping threads, or damaging a part the bolt is being used to secure.

In a set of standard open-end or box wrenches, the length of each wrench is matched to the size of the fastener it is used for — short for smaller-diameter fasteners and longer for larger ones. The purpose is to limit the amount of torque that can be applied. If the wrench is used properly, there should be little danger of over-tightening unless you pull like Hercules. This is fine where the tightness of an assembly is not critical to its function, but when working on machinery, such as that Plymouth's transmission or its engine's cylinder head, torque matters. The car's manufacturer will have developed a specific torque value for every bolt in the assembly. The mechanic must know what those values are (they are in the service manual) because over- or under-tightening can lead to serious problems.

Enter the torque wrench, a special kind of socket wrench with a built-in mechanism that can be adjusted to tighten a nut or bolt to a specific torque.



Two popular types of torque wrench are the beam wrench (black handle) and the click wrench (silver handle), at top of page.

Standard wrenches are made in lengths to roughly relate to the torque they are meant to apply under normal use: short wrenches for light torque, longer wrenches for higher torque, above.

Purist engineers say that the only truly accurate way to measure tightness is by measuring bolt tension through "bolt stretch," that the torque wrench is a poor proxy for measuring bolt tension, and that tightness derived from a torque wrench is prone to many inaccuracies. While this may be true in the strict engineering sense, such measurements are far beyond the resources of us mere mortals, especially at sea. Thus, the lowly torque wrench will have to do. Besides, manufacturers of engines and other complex machinery have done their homework and established torque values for every nut, bolt, and screw in their products. Every car, truck, boat, or aircraft engine assembly I have ever witnessed employed a torque wrench. Plus, if it's good enough for NASA . . .

Measuring torque

In the US, the most common units used to express torque are the foot-pound (ft-lb), for larger fastenings, and the inch-pound (in-lb), for smaller fastenings that need lighter torquing.

A foot-pound of torque is defined as one pound of pull on a lever one foot long, the pull being perpendicular to the lever.

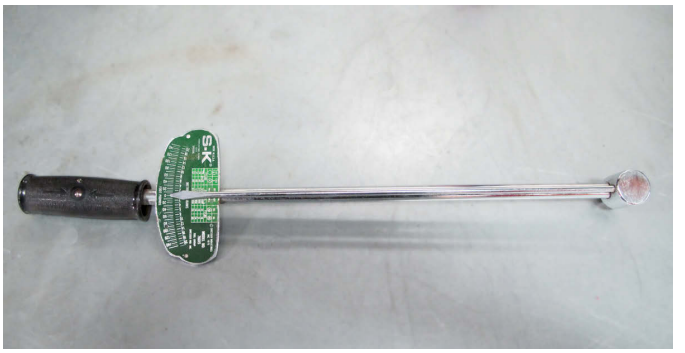
The metric units are the newton meter (N-m) for large fastenings and meter kilogram (M-kg) for small fastenings.

Applying 65 pounds of "pull" to a 1-foot-long wrench creates 65 foot-pounds of torque. The torque wrench is designed to measure this exactly. Torque wrenches are made in lengths to suit the torque values they are intended to measure — shorter for lower values and longer for higher values. Whatever the actual length of a particular torque wrench, it is constructed and calibrated to precisely achieve the desired torque.

Types of torque wrench

The beam wrench is simple and inexpensive. While not terribly accurate, it is better than nothing. The main drawback to this design is that reading the gauge at any angle other than from directly above can result in a serious error. Because the head does not ratchet, I found this wrench very difficult to use in the confines of our engine room aboard *Entr'acte*, where there was insufficient room to swing the wrench and read it correctly.

The click wrench is a vast improvement over the beam wrench. It is built with internal mechanisms that can be preset to the desired torque. To operate it, twist the handle until the indicator reads the desired torque, fit the wrench to the fastener, and pull gently. When the applied torque reaches the set value, the handle flexes with an obvious "click" that can be felt as well as heard. A lock at the bottom of the handle prevents the setting from changing while the wrench is being operated. This design is far more accurate than the beam wrench and not overly expensive. The click wrench is most desirable because its accuracy does not depend on the user being able to see anything. You can be in the most convoluted position putting all of your thought and energy into pulling that handle until you hear that rewarding "click." The click wrench has a ratchet head that makes it easier to work with in a confined space.



The beam wrench is not expensive, nor is it very accurate. Because the user must watch closely for the pointer to reach the desired torque on the scale, errors are possible.

The click wrench is more accurate and reliable than the beam wrench. These two, above, are sized and calibrated for different ranges of torque, the smaller in inch-pounds and the larger in foot-pounds.

The ratchet mechanism, at right, is essential for working in confined spaces.

This wrench is set to 27 foot-pounds or the metric equivalent of 9.5 newton meters. A locking handle is important to prevent changes while tightening.

Torque wrenches come in many sizes. Larger ones are calibrated in foot-pounds (newton meters) and smaller ones are calibrated in inch pounds (meter kilograms). They typically have the US scale printed on one side and the equivalent metric scale on the other.

The range of settings for a standard torque wrench can vary. The most common ranges are 10 to 150 foot-pounds, 20 to 200 foot-pounds, and 30 to 250 foot-pounds. For torque values above 220 foot-pounds, a larger wrench or a "torque multiplier" would be needed, but such high torque values are extremely rare.

Using a torque wrench

When embarking on a project that requires the use of a torque wrench, first determine, from the engine service manual or a table of torque specifications, the torque values needed for each fastener, and write them down. Then check them again.

Make certain that whatever you are torquing cannot move! Applying 60 foot-pounds of torque even to a heavy engine could move the engine unless it is properly secured, and that could lead to injury or damage to the boat.

Clean all friction surfaces thoroughly using either brake cleaner or acetone.

Lubricate all threads and friction surfaces with a quality oil. Engine oil works best. Avoid light oils such as 3-in-1 or WD-40.

Install each fastener in the proper sequence and turn them by hand until they are finger tight.

Set the torque wrench to one-third of the final desired torque (click wrenches). For a final torque of 88 foot-pounds, begin by applying 29 foot-pounds to each fastener in the prescribed sequence.

Using a torque wrench is always a two-handed operation. If you neglect to support the fulcrum with one hand you will at best be inaccurate but will also stand a very good chance of breaking a bolt or your hand.

Position your body and brace yourself so that you can make a nice smooth steady pull. (This can be a real challenge in a confined engine room.)

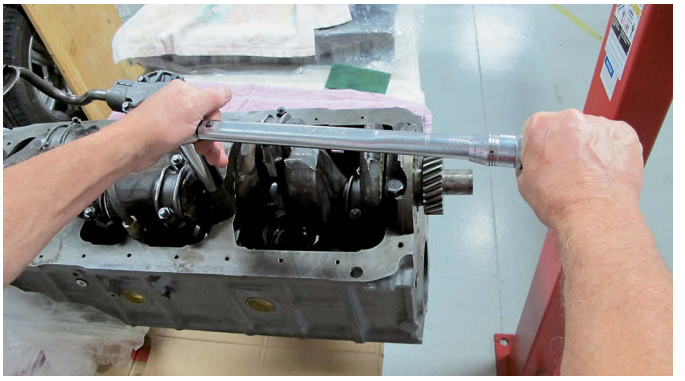
Make certain the ratchet is fully engaged.

Use precisely the right size socket for the fastener.

Never use a socket that is worn or has visible cracks — if the ratchet or socket slips or breaks it can damage the fastener or cause a hand injury.

Fit the socket onto the bolt or nut and place one hand on the socket end of the wrench to support the fulcrum. With your other hand, grasp the handle of the wrench perpendicular to the handle with your fingers facing into the direction of pull. Yes, this matters! Look directly at the needle (beam wrench), and with a gentle motion, pull steadily until the gauge reads 29 and stop. Do not jerk on the wrench and do not push it! With a click wrench, pull steadily until you hear and feel that unmistakable "click" and stop. Do this for each fastener according to the prescribed sequence.

Reset the wrench to 58 foot-pounds (two-thirds) and repeat the sequence.



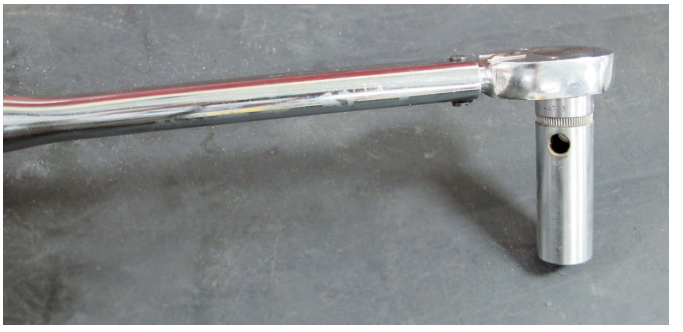
When using a torque wrench, one hand should be steadying the fulcrum while the other pulls steadily at right angles to the handle.

Finally, reset the wrench to the final figure of 88. In confined spaces with limited swinging room, the ratchet head of the click wrench is a definite advantage, but be careful. When using a click wrench it is possible to overtighten a fastening. As soon as the wrench clicks, *stop*! That's it!

Avoid long extensions and crowfoot accessories, as they flex and result in false readings.

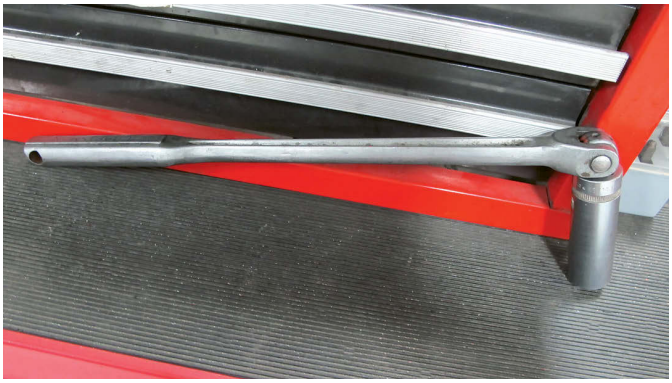
Using a torque wrench is serious business. If visitors drop by, ask that they return when you are done. There is a real danger that any distraction from the task could cause you to misread the manual or make some other dumb mistake.

To loosen and remove bolts, use a breaker bar, not the torque wrench. Working in the reverse sequence to that used



Crowfoots, extensions, and adapters, above upper, should be avoided, as they flex, twist, and slip, seriously reducing torque and compromising accuracy.

Deep sockets, above, are OK to use with a torque wrench as long as they are sound, a perfect fit, and free of cracks.



A proper breaker bar should be used to release fastenings from tension. Using a torque wrench as a breaker bar could damage it.

for installing them, release the tension in stages of approximately one-third at a time. This prevents undue stresses and damage to critical metal castings.

Maintenance

A torque wrench is a fine precision instrument and should be treated as such. Keep it in a sealed plastic box and stow the box where it cannot be splashed on or become immersed in water. Should the wrench get wet, rinse it with fresh water, dry it, and oil it well. Rust will destroy it. Inspect it periodically. After 25 years, our wrench looks and behaves as if new.

Never store a click wrench with the spring under tension, not even a little, but release the tension completely after use. A spring stored under tension will weaken and compromise the wrench's accuracy, which could result in stretched, broken, or stripped bolts, stripped nuts, cracked engine castings, and prematurely blown gaskets.

Who needs a torque wrench?

A torque wrench is not needed for tightening every nut or bolt on board. In most cases a standard open-end or box wrench will do nicely. A torque wrench will more than earn its keep, though, should a cylinder-head or exhaust gasket blow in an area far from the nearest mechanic (see "Dead in the Water," January 2015). Even if you carry the engine manual and spares for these two gaskets on board, and you should, without a torque wrench, your repair will be very short-lived and lead to serious engine damage. Perhaps you don't have the confidence to perform the engine work yourself, but having a torque wrench on board would enable someone with the experience to assist you who, without the proper tool, would be powerless to help.

Aside from complicated internal engine work, the torque wrench is valuable for many seemingly mundane tasks as well. Almost every part of an engine is designed to be installed and tightened to a specified torque. When installing

Sample Torque Values for Stainless Steel and Non-Ferrous Fasteners

Bolt Size	18-8 Stainless Steel		316 Stainless Steel		Silicon Bronze	Monel	Brass	2024-T4 Aluminum
	Dry	Lubricated	Dry	Lubricated				
4-40	5.2 in-lbs	4.4 in-lbs	5.5 in-lbs	4.7 in-lbs	4.8 in-lbs	5.3 in-lbs	4.3 in-lbs	2.9 in-lbs
6-32	9.6	8.2	10.1	8.6	8.9	9.8	7.9	5.3
10-24	22.8	19.4	23.8	20.2	21.2	25.9	18.8	13.8
10-32	31.7	26.9	33.1	28.1	29.3	34.9	25.9	19.2
5/16-18	132	112	138	117	123	149	107	80
7/16-14	376	320	393	334	349	427	317	228
— — //— — — — — — // — — — — — — // — — — — — — — // — — — — — — // — — — — — — // — —								
1/2-13	43 ft-lbs	37 ft-lbs	45 ft-lbs	38 ft-lbs	40 ft-lbs	48.7 ft-lbs	35.2 ft-lbs	26 ft-lbs
5/8-11	92	78	96	82	86	111	76	60
1-8	286	243	299	254	265	344	235	184

Every bolt or nut has a suggested torque value relative to its size and the material from which it is made. These values do not refer to the maximum load but to the tightness at which the fastening will perform at optimum level in a given application without causing damage from overtightening. Notice that there are different values for lubricated and non-lubricated threads.

Note also that torque values are different for fasteners of the same diameter but different threads (see 10-24 and 10-32, for example). In this table, the units change from in-lbs to ft-lbs at the ½-inch bolt line. Tables from other sources might use a different breakdown.

Comprehensive tables can be found at engineershandbook.com/Tables/torque.htm.

such items as water pumps, fuel pumps, and thermostats, we usually tighten them by feel, but when is a bolt or nut tight enough that it won't vibrate loose? When is it too tight? Reading the sections about these items in the engine manual will reveal that their torque values are surprisingly light. When you use a torque wrench, there is no doubt when you have the tension right.

Even the lowly hose clamp is assigned a suggested torque value; for a #8 clamp (½-inch hose) it's 24 to 35 in-lbs and for the #20 clamp (1½-inch hose) it's 45 to 60 in-lbs. These are quite low values, far lower than we are tempted to apply by feel, and explains why our attempts at clamping hoses fail, either by cutting the hose or by overstressing the clamp.

I also use the wrench in certain rigging applications, such as chainplate installations or whenever multiple fastenings are involved, to ensure that they are all uniformly tight.

Choosing a torque wrench

When buying a torque wrench, assess your personal needs and select what works for you. I find that a small wrench of 20 to 200 inch-pounds (16 foot-pounds) and a larger one of 10 to150 foot-pounds have covered the entire range of anything I have encountered on board. The only exception is the large trailer-hitch bolts (250 foot-pounds) for our 15,000-pound-capacity trailer.

A quality click wrench can be purchased for as little as $50 and upwards. Don't look for a bargain. Whatever you might pay, remember, if it saves you a single dockside mechanic's bill, it has paid for itself three times over. Yes, using it is an acquired skill, but with a bit of practice you take one giant step closer to being self-sufficient when dealing with your good old boat.

Ed Zacko is a Good Old Boat *contributing editor. Ed, the drummer, and Ellen, the violinist, met while playing in the orchestra of a Broadway musical. They built their Nor'Sea 27,* Entr'acte, *from a bare hull, and since 1980 have made four transatlantic and one transpacific crossing. After spending a couple of summers in southern Spain, Ellen and Ed shipped themselves and* Entr'acte *to Phoenix, Arizona, where they refitted her. They have since towed her to the Southwest US and have also been cruising on her in the Bahamas. Follow them on enezacko.com.*

Read, Check, and Check Again —EZ

I learned the hard way how important it is to read the engine manual carefully more than once and to write down the torque values and tightening sequence before working on the cylinder head.

Way back in the "before time," I was retorquing *Entr'acte*'s cylinder head. I had clearly read the number 13 in the manual, and even though a little voice told me that this was a ridiculously light cylinder-head torque, I set the bolts at 13 foot-pounds. The engine started and ran well, and we proceeded to cross the North Atlantic without incident. After we'd arrived in the Azores, we had to change our mooring. The engine started, then immediately shut down with a sudden belch as water ran freely from the air intake, a classic example of a blown cylinder-head gasket.

The head-bolt torque in the manual was indeed 13 — newton meters — and next to it in parentheses was its equivalent: 86.8 foot-pounds. The manual had clearly given figures for both metric and US units, and had I read it more closely, I would have used the 86.8-foot-pounds number in parentheses. This is a very common mistake.

We were perhaps lucky that I made my mistake on the cylinder head, and luckier that the damage was not greater — an improperly tightened cylinder-head gasket will leak and allow cooling water to mix with the lubricating oil, or warp or crack the cylinder head causing an engine failure, perhaps at an inopportune moment. Had I made the same mistake on the exhaust manifold, the result might have been exhaust gases inside the boat, which could have been deadly, as those gases include carbon monoxide.

Heads-Up on Hose Clamps

BY JERRY POWLAS

The ClampTite alternative is more effective and less injurious

When most sailors think of hose clamps they think of the ubiquitous worm-drive steel clamp. Worm-drive clamps are easy to use, remove, and reuse but they don't seal as well as other clamps, in part because of the hard spot created under the screw housing, which can only conform to one radius. Another reason I dislike worm-drive clamps is that I would need to carry a stock of them in several sizes to be able to replace the variously sized clamps on my boat. And . . . whenever I put my hand into a confined space full of those clamps, it almost always comes out bloody.

There are other types of hose clamp. OEM engines and other manufactured devices tend to use simpler, cheaper wire clamps that work well but cannot be easily removed or reused and are not adjustable. T-bolt clamps are robust and don't suffer some of the shortcomings of worm-drive clamps, but they are expensive and their adjustment range is narrow.

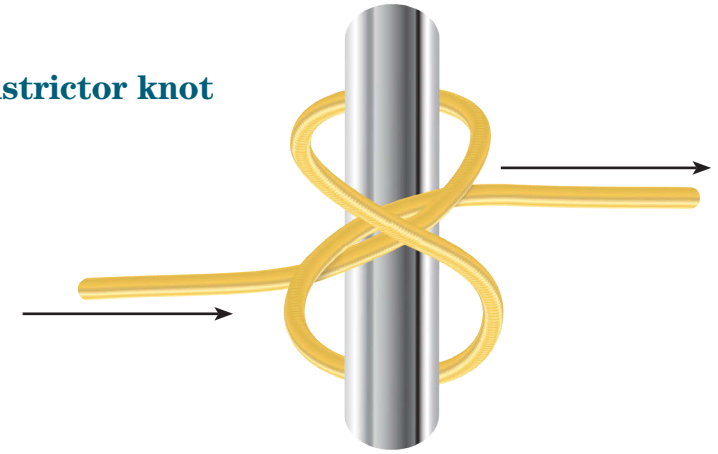
ClampTite sells a tool for making clamps out of wire. I'm of the opinion that every boat whose crew has plans to go out of sight of their mooring should have a ClampTite tool on board. I own one and think that, in most cases, the clamp it makes is much better than a worm-drive clamp. But I've found another way to use the ClampTite tool.

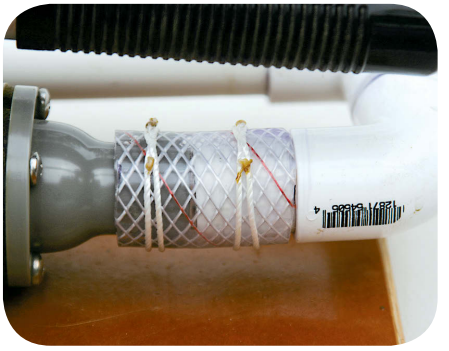
For years I've made very reliable well-sealing clamps out of the kind of nylon seine twine that can be found in almost every hardware store. I do so by tying a constrictor knot in the twine and tightening it around the hose with a ClampTite tool.

The constrictor knot is useful but not well known. Most knots can be tied and then untied, but the only way to remove the constrictor knot is to cut it — it gets that tight. Of the many ways to make a constrictor knot, the easiest is to start with a clove hitch and then make one last pass, as in the illustration below.

Once I've tied the basic constrictor knot around the hose, I attach the ends of the twine to the ClampTite tool with several cleat hitches, one on top of the other, at each end of the tool, then tighten it using the nut on the tool. To finish it, I simply trim the ends of the resulting clamp with a sharp knife or scissors.

Constrictor knot





The ClampTite tool, at top of page, is a device for making clamps out of wire, but it also makes a clamp out of a constrictor knot tied in nylon seine twine. The finished constrictor knots drawn up tight with the ClampTite tool on a pump assembly, above, show how much easier these knots can be on a sailor's knuckles.

My seine twine (and wire) clamps offer a significant advantage over worm-drive clamps in that they apply fairly uniform pressure all the way around the clamped surface. I've used seine twine clamps to fix leaky connections that resulted from using worm-drive clamps.

One clamp or two?

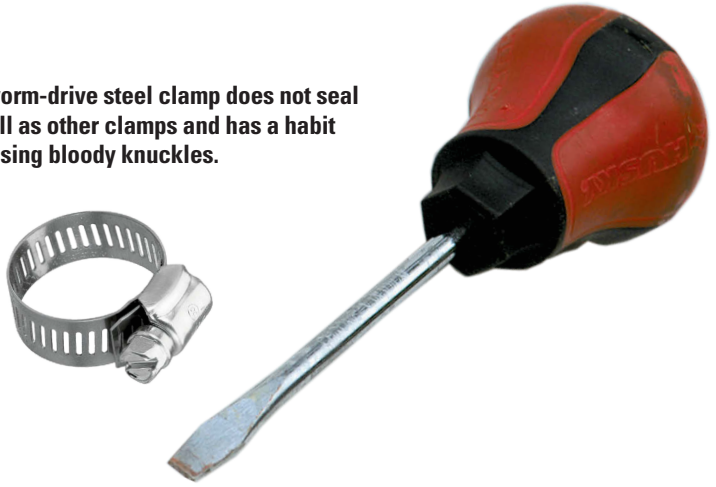
Exhaust-hose connections and fuel-fill-hose connections should have two clamps, per a respected authority used as a reference by many surveyors. These fittings normally have room for two clamps. Other fittings might not, and one of the advantages of clamps made with a ClampTite tool is that they are much smaller than worm-drive clamps and two of them will fit more easily on the clamped joint.

In any case, for most connections, the philosophy that if one clamp is good, two clamps are better, does not apply, no matter the kind of clamp. In fact, installing a second clamp where there is not adequate space for it on the barb or pipe can cause serious problems. In the event of having to please some authoritarian double-clamp-type person, put on the second clamp (of whatever type) loosely. If using worm-drive clamps, think of the second one as a spare.

ClampTite considerations

In most cases, twine will make a nice low-cost clamp that is easy on the hands and will not suffer the corrosion that can beset metal clamps. Of course, these seine-twine clamps have limitations.

- Using a ClampTite tool requires some operating room. There may be situations where a worm-drive clamp can be fitted but there is not enough space around the fitting to make a ClampTite clamp.
- The only way to remove a ClampTite clamp is to cut the wire or the twine. When securing a hose that must be removed often, it would be better to use a clamp of another type.
- With the ClampTite tool, it's easy to make a clamp that is too tight, so watch the effect that the twine or wire is having on the hose. A benefit of being able to make a very tight clamp (far tighter than a worm-drive clamp) is that it's possible, using wire, to effectively clamp a broken tiller or hammer handle.
- Be aware that a constrictor knot will not work at all if the body of the knot is not pressing down on the hose — it just won't lock. The clamped surface must be round and fairly regular. In cases where it's not, make the standard ClampTite clamp with wire.
- Where heavy-wall hard-to-compress hoses are involved, or extremely tight clamps are needed, use wire.



The worm-drive steel clamp does not seal as well as other clamps and has a habit of causing bloody knuckles.

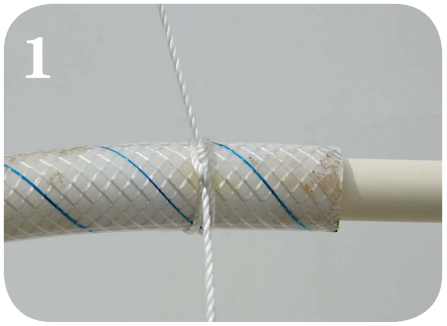
Jerry Powlas and his wife, Karen Larson, the founders of Good Old Boat, *have been sailing their C&C 30,* Mystic, *on Lake Superior for more than 20 years. Since retiring in 2017, they have been learning the very different sailing characteristics of their trailerable C&C Mega 30,* Sunflower.

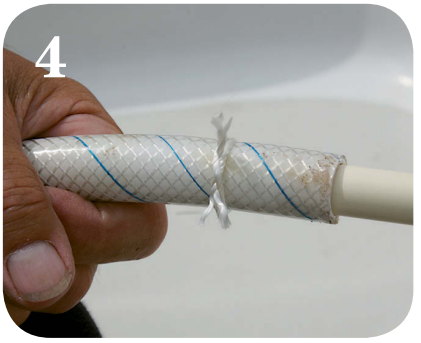
Tips for Using Worm-Drive Clamps —JP

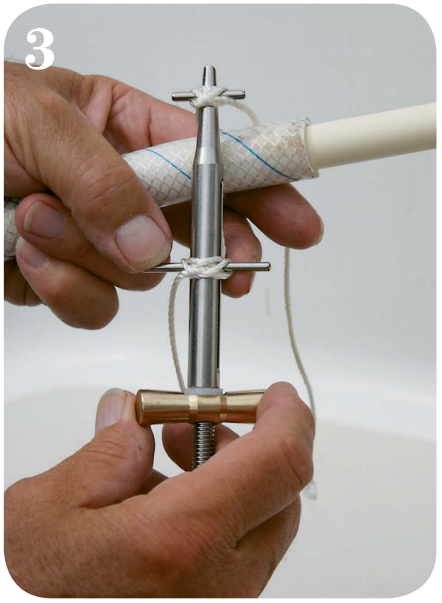
If using a worm-drive clamp, use the smallest clamp with the narrowest band available. The larger the clamp, the larger the non-conforming hard spot under the worm-drive housing, and the greater the chance of this causing a leak.

It's OK to keep cheap plated-steel worm-drive clamps in a spares kit. Simply spray them with WD-40 and store them in a sealed plastic bag. But, at the earliest opportunity after using one, make sure to replace it with a quality stainless steel clamp. The plated clamps won't fail right away, but they will eventually fail from corrosion. For permanent repairs, use only high-quality clamps with all parts of the clamp made from stainless steel. The cheaper stainless steel clamps have stainless steel bands but the screws are not stainless steel.

Joints mating hose with tubes or pipes vary in their characteristics. If the hose fits tightly over the tube and there is a large overlap, all the clamp has to do is retain the tube so it does not slide off. If the hose fits loosely on the pipe, the clamp must squeeze the hose down evenly on the tube to prevent leaks. The wider the band on a worm-drive clamp, the harder it is to squeeze a loose-fitting hose and make a seal. Some tubes will be metric, some will be made to inch measurements. Some hoses will be made to a fixed outside diameter and some will be made to a fixed inside diameter. Metal pipe and tubing is usually made to a fixed metric or inch outside diameter.







1. To make the ClampTite clamp with seine twine, start with a constrictor knot (see page 27).
2. With one end of the twine, make a cleat hitch of several turns around the ClampTite, then do the same with the other end of the twine.
3. Use the ClampTite nut and thread to tighten the constrictor knot.
4. Cut the twine.
5. The ends can be finished with a drop of Super Glue or by burning them with a small flame.

Resources

Tying the constrictor knot:

Teresa and Ben Carey offer a simple method on how to tie a constrictor knot. YouTube.com/watch?v=2GxOVLuxP-M

This method uses the "under the X" method, which ties the same knot but is more difficult for people to learn. animatedknots.com/constrictorend/index.php

In "The Jug Sling or Hackamore," in the May 2007 issue, Geoffrey Toye describes how the hackamore knot can substitute as an emergency hose clamp.

T-bolt clamp

ClampTite clamp

Wire hose clamp

The T-bolt clamp, upper left, is robust but expensive. ClampTite clamps, upper right, are compact and secure. The wire hose clamp, above, cannot be adjusted and can be difficult to remove.

Fabricating a Steering Quadrant

Where cast aluminum failed, mild steel became the material of choice

BY
ISAAC ADAM-AZIKRI

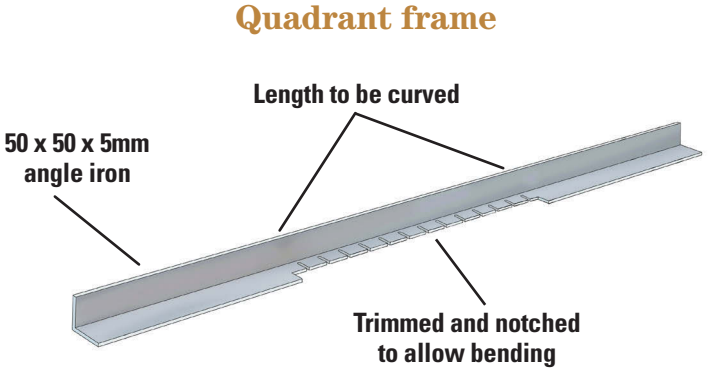
The cast-aluminum steering quadrant on *Rhythm* had been in use for approximately 15 years. When I removed and examined it in 2006 during a major refit, it looked perfectly sound. Three years later, we were sailing in a storm in the middle of the Tasman Sea when the port steering cable broke. The loose rudder slammed to port against the rudder stop, causing the quadrant to break apart. Luckily, we carried a spare quadrant and cables with which to effect repairs.

I'd never heard of a steering quadrant breaking to pieces, but after talking to several sailors, I learned that it has happened to others. Since that incident, I've had little faith in production steering quadrants. To keep costs down, most of them are cast in aluminum or some other alloy, and while cast metal is plenty hard, it has no give, is brittle, and is vulnerable to shock. Worse still, most steering quadrants have holes drilled in them for attaching accessories such as a rudder indicator or the autopilot ram. These holes significantly weaken the casting.

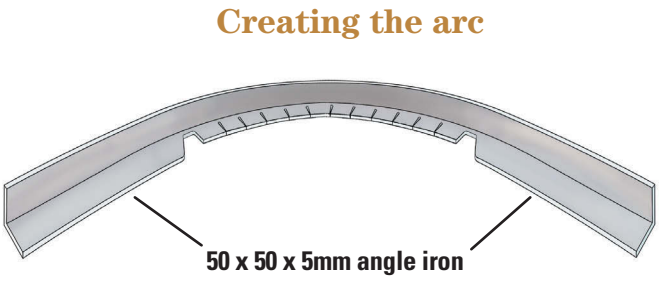
Now, I am not an engineer, but I do like to fabricate or improve things. And because I was recovering from a broken pelvis and eager to do something constructive after lying on my back for two months, I decided to fabricate and fit a stronger quadrant than the replacement then in use.

My goal was to fabricate a cheaper-but-better product using only basic tools and a welding set, with no machining. For this reason, I decided to use mild steel. The only challenge I could foresee was how to make the

After the cast-aluminum steering quadrant on *Rhythm*, his family's Callisto 385 steel cutter, shattered in a storm, Isaac decided to fabricate a steel replacement.



Angle iron for frame trimmed and notched for bending



The first bend in the quadrant frame

keyway that locks the quadrant to the 2-inch rudder stock.

Getting started

I placed the old quadrant on a piece of ¾-inch plywood and drew a reasonably accurate outline. This would be my reference during fabrication. I'll note that my outline included the wire channels on the arc of the quadrant's frame, as they would be welded on later and increase the overall size.

Angle-iron frame

For the framework of the new quadrant, I used 50 x 50 x 5mm-thick angle iron. I found it best to start with a slightly longer section than required and trim it to size later. I marked the center of the bar, which would also be the center of the quadrant's arc, or angled section. From this centerline, using the outline as my guide, I measured left and right to the points where the angle iron was to be bent to give it a triangular shape.

To make it possible to form the arc and bend the corners, I cut and trimmed the sections as shown in the drawing "Quadrant frame," above.

Creating the arc

To form the arc, I bent the prepared angle iron over an old steel boiler, checking against the outline drawing as I went. An anvil or similar robust former could be used. The result was as shown in "Creating the arc," above.

Forming the bends

Once I'd formed the arc, I bent the corners to complete the triangular shape of the quadrant. First, I ground away a 2.5-inch section of "teeth" from the two bend corners. (Adding the strongback plate later on restored the strength to the assembly.)

I clamped the angle iron in a vise together with a length of 25mm (1-inch) steel pipe at the measured point. The pipe was at right angles to the angle iron and served as a form around which I bent the angle iron. To add leverage, I slid a 1-meter length of 60mm-ID pipe over the angle iron. As I worked, I checked the shape frequently against the outline drawing.

After repeating the procedure to form the second bend, I placed the frame on the 6mm flat plate (that would become the strongback) to ensure it was all in the same plane.

After bending the quadrant frame to the desired curve, Isaac formed the corners by bending them around a 1-inch pipe held in a vise.

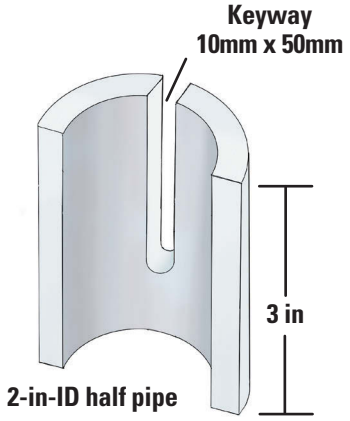
Making the boss clamp

My rudder stock has an outside diameter of 2 inches, so I used a 3-inch length of 2-inch-ID pipe with a 4mm wall thickness for the boss clamp. The idea was to slice the pipe in half lengthwise and layer the two halves to form the boss section. By doing this, I could cut the keyway in the inner layer without using a lathe.

At the same time, I cut another 3-inch length of the 2-inch-ID pipe and sliced it, too, in half lengthways. I would use one half later when making the rear boss clamp.

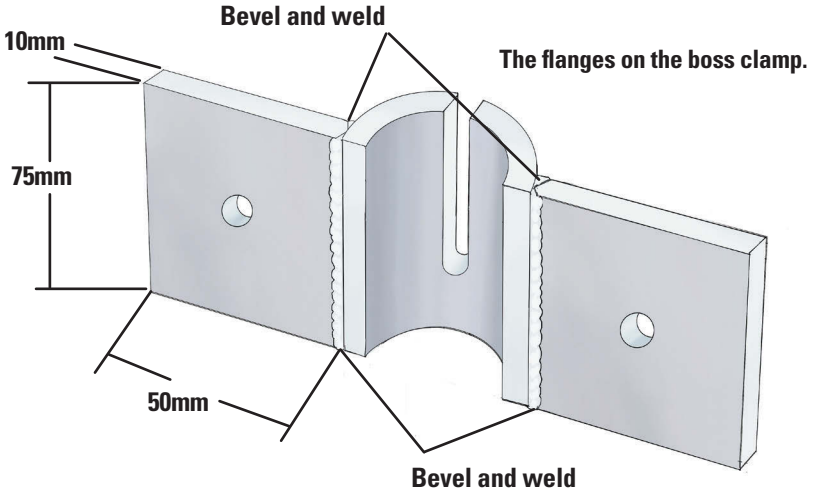
ILLUSTRATIONS BY FRITZ SEEGERS

Boss clamp inner shell



The finished keyway in the half pipe

Boss clamp flanges



For the keyway, I marked an area 10mm wide x 50mm high in the center of one pipe half, then made two parallel cuts with a hacksaw. I finished the keyway by drilling a 10mm hole at the bottom of the hacksaw cuts. I practiced a few dummy runs with the hacksaw, cutting on the waste side of the scribed line and filing the slot to size.

I made the two boss flanges from 75- x 10mm flat plate and tack welded them to each side of the keyed boss (half pipe). When I was satisfied everything was true, I fully welded the flanges in place, taking care to avoid distortion.

The second half-pipe provided the outer shell of the keyed boss, closing the third side of the keyway. To allow it to fit snugly against the keyed boss, I had to trim and bevel it to fit between the flange plates. Once I'd trimmed it, I drilled and countersunk four holes in it, two on each side of the keyway area but well away from it. These holes provided apertures for spot welds. I used a 6mm drill bit for the holes and a 10mm bit for the countersink.

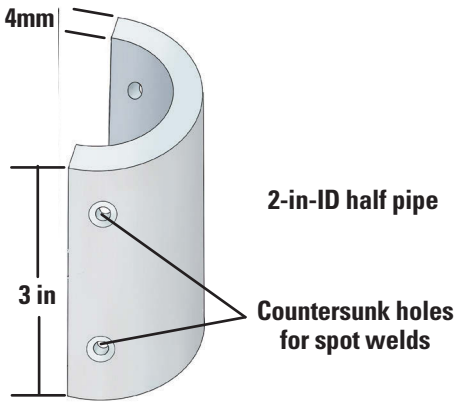
I offered the second half-pipe to the keyed boss, clamped the two together in the vise, and closed the vise until they touched all around the perimeter, then welded them together all around the perimeter including to the flange plates. To avoid obstructing the keyway, I did not weld inside the keyway or around the top of it.

Using low power on the welding gun, I welded through the spot-weld holes to add further adhesion and reinforcement between the two half shells. The boss, with its 8mm wall thickness and 4-x 10-x 50mm keyway, was now complete. After grinding and dressing the excess weld, I drilled four 11mm holes in the flange plates to take the 10mm bolts that would fasten the boss to the quadrant.

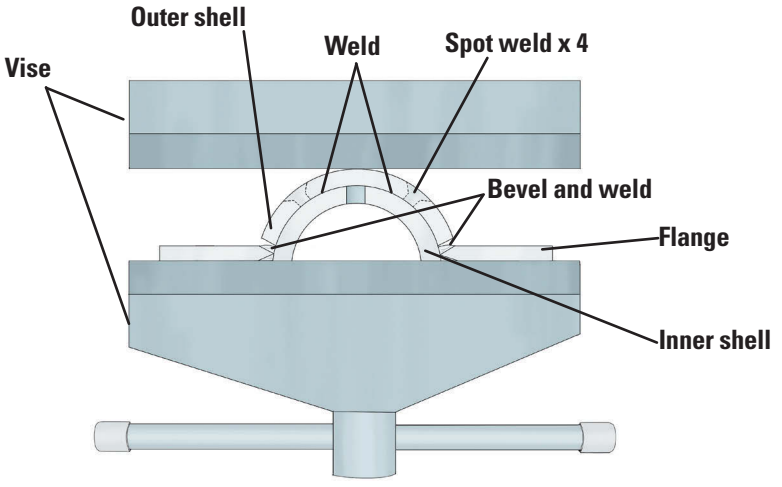
Throughout the welding process, I allowed the work piece to cool down between weld runs to minimize distortion.

ILLUSTRATIONS BY FRITZ SEEGERS

Boss clamp outer shell



Boss clamp in vise



After bending the quadrant frame to shape, Isaac set to work on the boss clamp.

Frame and boss assembly

I positioned the angle-iron quadrant frame and the boss clamp over the plywood drawing, marked the frame at the correct length and angle for fitting it to the boss clamp, and cut it accordingly. I then placed both components on the 6mm steel plate so as to have a flat base on which to assemble the two parts.

After aligning the quadrant frame and boss clamp to tally with the original quadrant, I tack welded them together, then checked the alignment again. I found the best way to check the alignment was to fit the assembly temporarily to the rudder stock. This also allowed me to make sure the quadrant would be properly aligned on the stock. When I was sure this was so, I completed the welding, working in sequence and taking breaks to minimize heat distortion.

To further reinforce the quadrant, I added a few extra gusset plates to the joints between the keyed boss, the frame, and the strongback.

Strongback plate

After making an accurate template of thick paper for the inner shape of the quadrant, I transferred the outline onto the 6mm steel plate. I also marked a cutout slot for the rudder-stop bolt. I then used an angle grinder to cut out the strongback and the slot for the rudder stop.

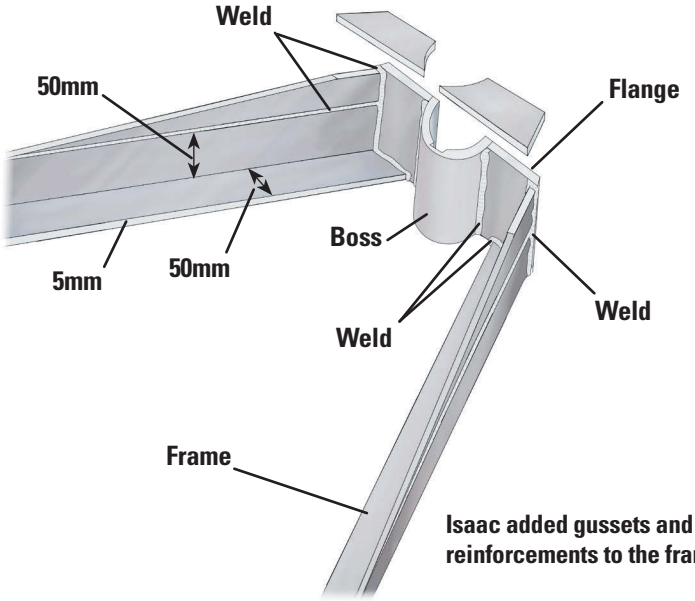
I inserted the strongback plate into the quadrant frame from the top, then welded it intermittently, top and bottom, around its perimeter to the frame and to the boss. To keep distortion to a minimum, I used weld runs up to 30mm.

Cable channels

I used three pieces of 15-x 4mm flat bar to make two channels for the steering wires on the outside of the quadrant arc. So I could bend them, I slotted each piece on one side with a disc cutter.

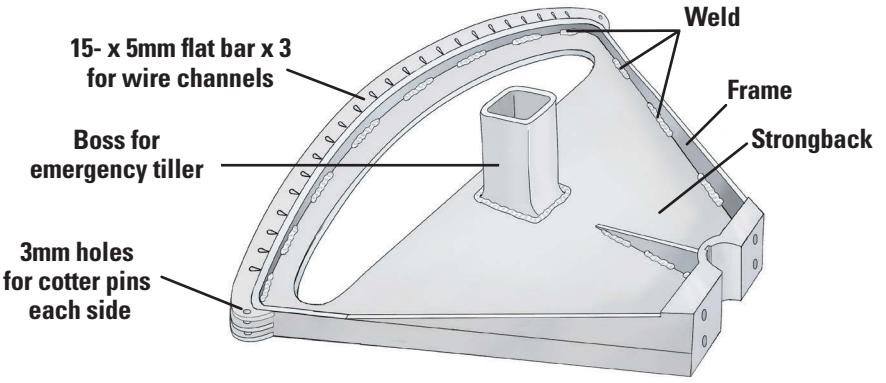
When I'd formed all three bars, I welded them to the quadrant's outer

Frame and boss assembly

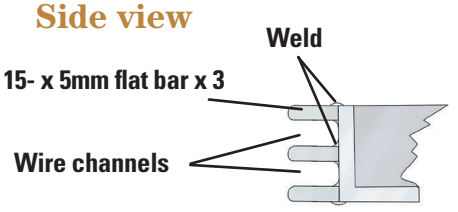


Isaac added gussets and other reinforcements to the frame.

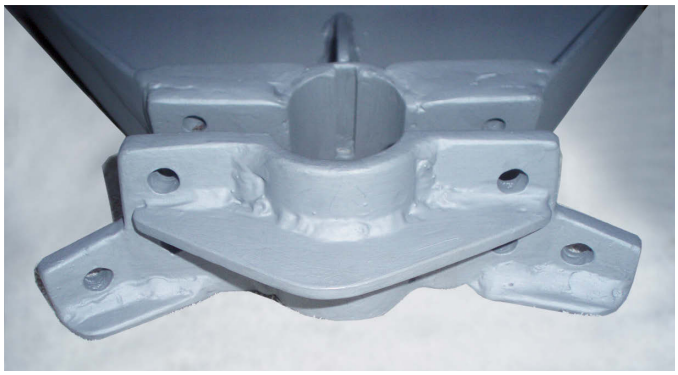
Wire channels



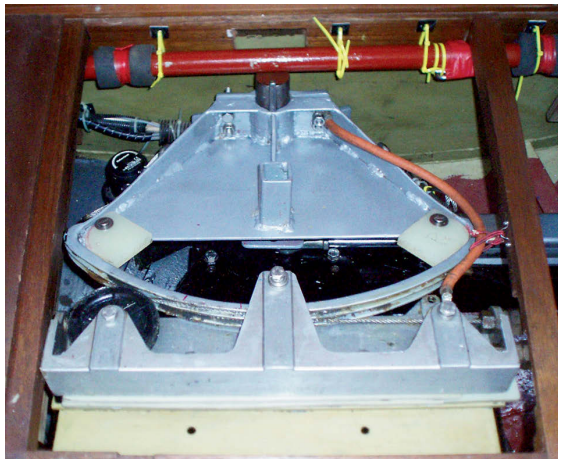
Side view



To complete the quadrant, Isaac welded the frame to the strongback, added the guides for the steering cables, and welded on a boss for the emergency tiller connection.



Finishing details included the rear boss clamp with connecting points for the steering cables, at left, and a connection for the autopilot, lower left. *Rhythm*'s new quadrant installed and ready for service, below.



Materials and Tools —IA-A

Steel
Pipe: 2-in-ID x 4mm wall thickness
Angle iron: 50 x 50 x 5mm
Flat bar: 75 x10mm
Flat bar: 15 x 4mm
Flat plate: 600 x 600 x 6mm

Consumables
Welding rods: 2.5mm x 1kg
Grinding disc: (8 in)
Cutting discs: (4 in) x 5

I also used some scrap steel pipe and plywood that was lying around the house as formers and templates.

Total cost of materials and consumables in Australia in 2012: $60

Tools
Angle grinder, power drill, hammer, vise, hacksaw, arc-welding set, tape measure, files.

Construction time? Plenty! I view it as occupational therapy.

arc, the top and bottom ones first then the middle one. I used offcuts to complete the ends of the channels so they wrap around the corners of the quadrant, and drilled 3mm holes in the corners to accept cotter pins to keep the cables in the channels.

Once the welding was complete, I used a disc grinder to remove the excess weld material from the channels and provide a smooth passage for the steering cables.

Finishing touches

I fabricated the rear boss clamp, which attaches the quadrant to the rudder stock, in the same manner as the keyed boss clamp. Because it requires no keyway, I did not have to use a double thickness of the 2-inch-ID pipe, which made the fabrication simpler. Now both halves of the boss were complete, I drilled 11mm holes through them for the 10mm bolts that would clamp them to the rudder stock, and holes for the steering-cable tensioning bolts.

The emergency steering on *Rhythm* is incorporated in the quadrant. To accommodate this, I welded a square box-section stub to the top center of the strongback plate.

I also added a bracket to which to connect the autopilot drive arm and an anchoring point for the autopilot's rudder indicator.

To protect the quadrant, I dipped it in hydrochloric acid, then washed and painted it. Galvanizing would have been a suitable alternative.

Anyone with basic skills could fabricate the parts for a quadrant in a similar manner, and someone with no knowledge of welding could hire that work out to a welding shop. Much of the metal cutting could also be hired out.

We fitted this new quadrant in July 2010, while we were in Australia, and it steered *Rhythm* back home to England. It is robust and should last a lifetime. The weakest point in the system is the steering cables, which, after all, are consumables.

Isaac Adam-Azikri became a professional skipper in 1977, then retrained as a commercial diver and worked in the North Sea for 20 years. In 2013, he completed a 7-year circumnavigation of the world with his family aboard Rhythm, *a Bill Dixon-designed 12-meter steel cutter.*

Bay of Fundy Fundamentals

Father and son answer a long-dormant desire for coastal cruising

BY PETER MCKELVEY

Since buying back *Quelle Vie*, the Grampian Classic 31-foot sloop my father bought new in 1966 and I sold in 1993 (see "Just Like Old Times," November 2017), my son John and I have pursued an intensified interest in sailing. We keep *Quelle Vie* in a marina on Grand Bay, Saint John, New Brunswick, about 5 miles from the mouth of the Saint John River.

New Brunswick is unique in that it offers cruising in both fresh and salt water. While most local boaters restrict their endeavors to the river, which, in the summer, offers 350 miles of cruising in warm sheltered water through bucolic pastoral scenery, John and I have felt drawn to the salt water of the Bay of Fundy, where navigational hazards that include fog, rocky shores, and the tidal currents that accompany some of the greatest tidal ranges in the world put our navigation skills to the test. The reward is beautiful vistas and the satisfaction of a voyage well executed.

Just getting to the Bay of Fundy from Grand Bay is a challenge, as it requires negotiating the Reversing Falls, rapids that reverse direction with the rise and fall of the tide. When the tide is rising and the water level in the bay is above that in the Saint John River, the water flows upriver. When the tide in the bay falls below that in the river, the flow reverses. The rapids created are dangerous, and often impossible, for a small boat to navigate. The idea of traversing the Falls intimidates many visiting sailors, but the passage is easy at slack tide.

Which is why, on our second foray into the bay aboard *Quelle Vie*, our father-and-son cruise in 2018, John

On the first evening of their cruise, Peter (standing) and John took an alongside berth at North Head, Grand Manan.

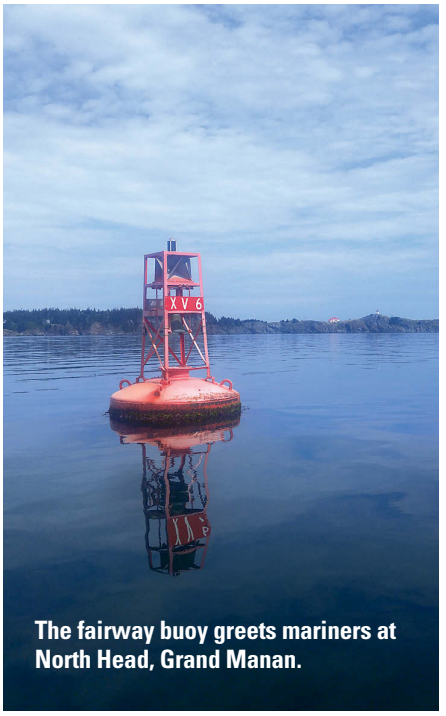
In this view, the Reversing Falls at Saint John look benign. At full flood or full ebb, it's a different story.

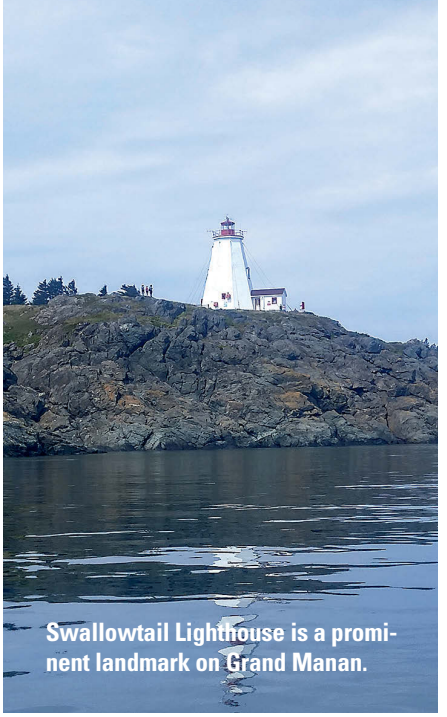
and I left Grand Bay at 0830 to ensure we arrived at the Reversing Falls about 30 minutes ahead of slack tide. This allowed us to speed through with a 3-knot current pushing us.

Wanting to make our longest passage first on the way to our prime cruising ground, we set out for Grand Manan, the "Queen of the Fundy Isles," an intriguing and enchanting place that I always long to return to. The largest and most remote of the "Fundy Isles," Grand Manan is at once isolated and cosmopolitan, dominated by commercial fisheries and a modest tourist industry. Its striking scenery and friendly people leave a lasting impression on visitors.

What followed was a long, hard thrash to windward. The passage got

Sights on Grand Manan include lobster-pot-buoy decor, at left, the mini-donut stand at North Head, below left, and the old Grand Manan Post Office, below.


The fairway buoy greets mariners at North Head, Grand Manan.


Swallowtail Lighthouse is a prominent landmark on Grand Manan.

complicated when I went below and my feet got wet. As we were 3 miles offshore and the water temperature was 60°F, this was cause for concern. Soon after we started pumping, we calmed down when we saw we were gaining on the water. Nonetheless, we anxiously lifted floorboards and opened lockers to check all the through-hull fittings. Unable to find a point of entry, we concluded that water already in the bilge had caused the bilge pump to turn on and, because the boat was heeled enough to put the discharge line under water, initiate a siphon. After we turned off the electric bilge pump and pumped out by hand, water stopped coming in.

And then the engine died. We'd been motorsailing to make time, and this put the fuel tank on the lee side. Because there was not a lot of fuel in the tank, the pickup tube eventually drew air. A fill-up from a jerrycan solved that problem.

Having dealt with these setbacks, we passed Point Lepreau and set out across the bay and into the world of seabirds. We saw gannets, three kinds of shearwater, and razorbill auks.

When we finally rounded the breakwater and tied up to a wharf in the peaceful harbor of North Head on Grand Manan, we were feeling wind-blown and wave-tossed. Our first order of business was to find fuel.

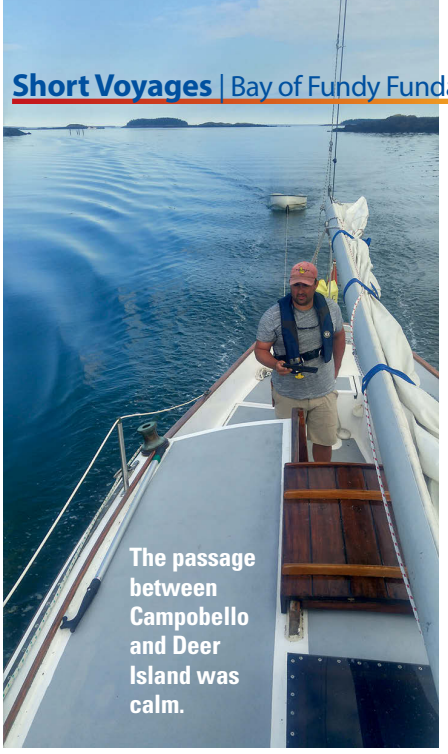
Encounters with islanders

It felt good to get off the boat, and John and I walked up to the wharf and asked directions of the first person we saw. He pointed in the direction of the service station and then said, "Take my truck, the keys are in it." I guess it would be hard to steal a truck on an island, but the kindness of the gesture wasn't lost on us. After that, I took a half-mile stroll to the general store for tea bags, only to find it closed. On the way back, I struck up a conversation with a bed-and-breakfast operator who was in his garden with his dogs. When I mentioned I was in search of tea, he ran inside and came out with a bag full of tea bags. Island people share a connectedness that we've lost in much of our society. And experiencing that, on the first stop of our 2018 father-and-son voyage around the Bay of Fundy, made up for the sail across the bay to get there.

Following our pleasant encounters with the locals, we indulged in a Grand Manan specialty — mini donuts. Island residents Al and Are MacDonald operate a small stand outside their home each summer where they sell fresh coffee, ice cream, and their famous mini donuts, made on the spot. We bought a couple of bags and found it took a lot of self-control not to return for a couple more.

That night, *Quelle Vie* was one of three yachts amid the fishing fleet. Aboard the others were a couple from Vermont who had sailed from Lake Champlain and two guys who'd sailed from neighboring Deer Island. Over evening libations with the latter crew, we shared tales of our sailing adventures to top off an eventful day.

The next morning, we awoke to a glassy calm and waited until noon, hoping for some wind. After lunch, we rounded the Swallowtail Light and enjoyed a lazy sail, sometimes motoring to make time, alongside the 30-foot yawl of our friends from the night before. We were again surrounded by seabirds: murres, black guillemots, puffins, dovekies, and more shearwaters.



The passage between Campobello and Deer Island was calm.

Lords Cove, Deer Island, provided a tranquil second night for the cruise.

We could see several boats and a concentration of birds off the tip of Campobello, and as we drew closer, we saw numerous dolphins. Then the back of a whale emerged slowly from the water. For about a half hour, we watched at least four finback whales. I always experience a primordial sense of humility on seeing these huge creatures. I was heartened to learn that this was an exceptional season, with more whales seen than in many years prior.

We passed Campobello and sailed the east coast of Deer Island, a course that took us through a magical maze of small islands topped with greenery

Relics of a maritime history punctuate the shore at Deer Island.

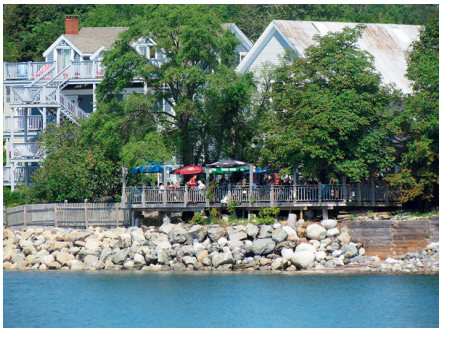
and girdled with seaweed-laden rocks exposed by the falling tide. Although the passage looks intimidating on the chart, with careful navigation by GPS we made a safe passage. Our destination was Lords Cove, a small fishing harbor on Deer Island that we approached from the east through a narrow passage.

As it's closer to the mainland, Deer Island is less exposed and more verdant than Grand Manan. It's quiet, with a small population, and very pretty. We tied up to a fishing boat in the well-sheltered harbor. Except for our friends on the yawl, who keep their boat on a mooring there, we were the only yacht in the harbor.

While waiting for the tide the next morning, we took a walk up to the general store, which was reminiscent of the 1950s. From there we walked along the shore, admiring the Victorian houses festooned with gingerbread. Around the next headland, we watched a crew pumping herring from a weir into a sardine carrier for delivery to the sardine cannery in nearby Blacks Harbour.

Tide rips and tourists

Our planned passage for the day was to sail to St. Andrews on Passamaquoddy Bay. There are three ways to get in to



On the third evening of the cruise, *Quelle Vie* tied up in St. Andrews Harbour, at top, where Peter and John were joined by their spouses for a meal on the terrace at The Gables restaurant, center and above.

Passamaquoddy Bay from Lords Cove: the passage past Eastport, Maine, to the west of Deer Island; Little Letete Passage to the east; and Letete Passage farther to the east. Seeing it as the more direct route, we chose Little Letete. While this wasn't a bad choice, navigating this channel between beautiful uninhabited islands proved to be an adventure. The pass is narrow and the current at mid-tide exceeds 5 knots.

A colorful sunset capped off a rewarding day at St. Andrews.

We found ourselves in the middle of tide rips, whirlpools, and eddies, and our over-the-ground speed was nearly 10 knots! In the middle of this wild ride, the Deer Island ferry came steaming through the narrows. Luckily, there was enough sea room for both vessels and we waved at the tourists, who probably wondered what we were doing there. After about a half hour, we washed out into the bay and found ourselves on a glassy calm with the hot sun beating down. After an hour or so of steaming, we arrived in St. Andrews and tied up to the town wharf.

St. Andrews was a contrast to the other harbors we'd visited. Here we were surrounded by yachts, and the wharf was bustling with people. St. Andrews is a quaint little town established in 1783 by American Loyalists from Castine, Maine, some of whom brought their houses with them in pieces. In summertime, the place is thronged with tourists, but we found it a good place to have a shower and stock up with food and drink. It was also a good place to rendezvous with our wives, Barbara and Lauren. They drove down from Saint John that evening, and we enjoyed a meal together at The Gables restaurant on a tree-shaded terrace overlooking the harbor.

My brother, Roger, joined us as crew about noon the next day, and the three of us set off across the bay. The weather was cool and overcast. A light wind and a close reach meant that progress was slow, but in due course we came up to the eastern shore, where my friend Harry Bryan, a wooden-boat builder of some repute, has his home. He sailed out to meet us in his beautiful gaff sloop, *Katie*, and we sailed in company for a while.

Later in the afternoon, at the turn of the tide, we sailed out of Passamaquoddy Bay in a light breeze. This time we took Big Letete Passage and it was less exciting, but we still had a 2- to 3-knot tidal current pushing us. Then we ran into the great nemesis of sailing in the Bay of Fundy — fog! Navigating with both GPS and radar, we were comfortable and confident.

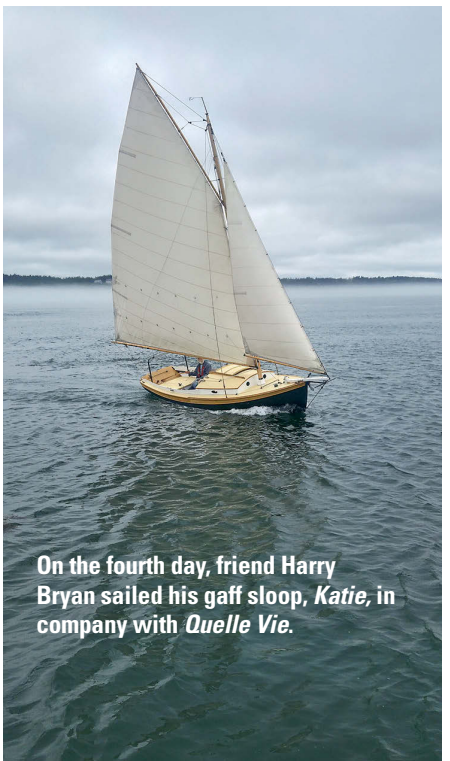
We sailed into Blacks Harbour, where Roger's wife was waiting to meet him. We tied up to an old barge behind the Grand Manan ferry terminal and rowed him ashore. Since we couldn't see across the harbor, we decided to stay where we were and have supper and pop a cork.

My old friend Gordon Dugas lives nearby and agreed to join us. It was dark when he rolled onto the wharf in his Jeep, and we could just make him out through the fog. It had been a while since we'd seen each other and we had a pleasant evening catching up.

The next morning, the thick fog persisted, but the wind was fair and the tide was right, so we decided to head toward home. We left the harbor and headed for the Blacks Harbour fairway buoy, and it was the last thing we saw for more than four hours. Sailing through thick fog is a strange experience; we felt as though we were in a small bubble of reality disconnected from the rest of the world.

Later in the afternoon, we came right up on the Dipper Harbour fairway buoy. From there we steered for the wharf, which we didn't see until we were about 100 yards from it, and tied up for the night.

The next day dawned calm and clear. We motorsailed in light air up to the eastern boundary of Saint John Harbour.



On the fourth day, friend Harry Bryan sailed his gaff sloop, *Katie,* in company with *Quelle Vie*.

Fog enveloped Blacks Harbour on day four, above top, and Dipper Harbour's fishing fleet provided company on the fifth, above.

The last day of the cruise brought *Quelle Vie* back to Saint John.

Saint John is an important and busy commercial port.

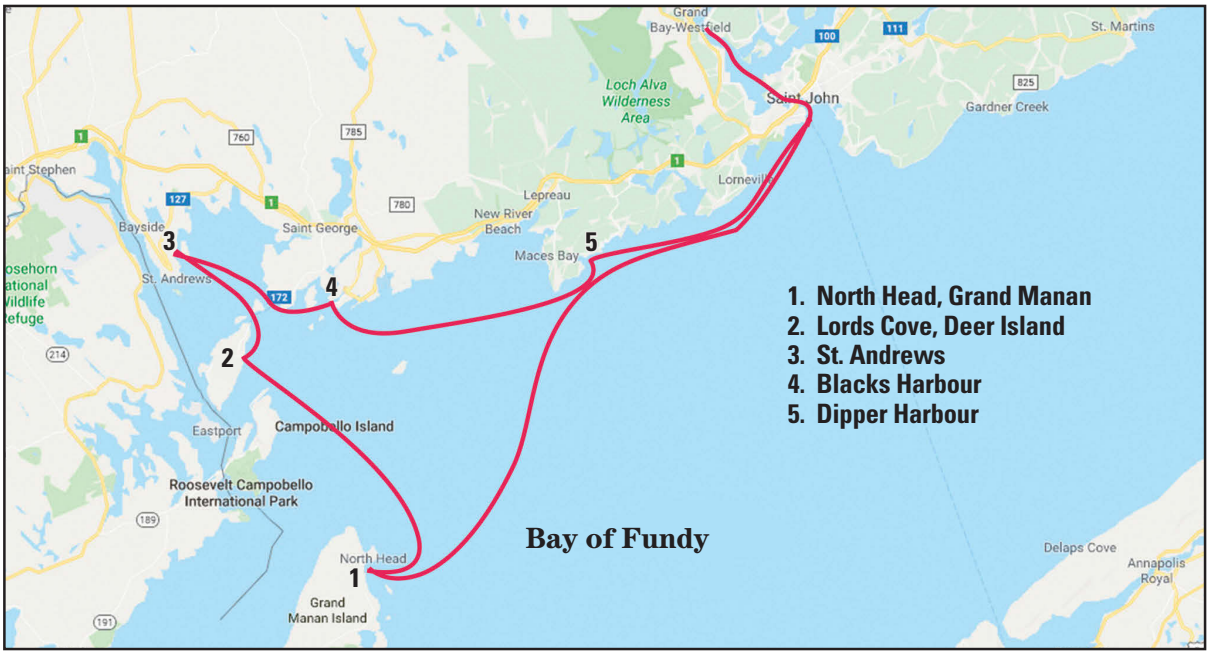
Home again

Saint John is a large commercial harbor with a supertanker terminal and facilities for containers and bulk cargoes, such as potash and petroleum products. Unfortunately, the harbor lacks good facilities for small boats. There is a dock adjacent to a large shopping complex in the center of town, but it's rarely a good place to lie as it's open to the swell that often rolls into the harbor. So, as we usually do, we timed our arrival to coincide with slack water at the Reversing Falls, which allowed us to continue on toward our home berth.

Above the falls is a narrow gorge, a near-pristine natural area that passes through the center of the city. I am always struck by the contrast between the Bay of Fundy and the Saint John River. In the Bay of Fundy, the water temperature was 60°F. In the Saint John River, it was 75°F. Crossing Grand Bay near the mouth of the river, we stopped and jumped off the boat for a welcome swim. Refreshed, we motored into the marina for an anti-climactic end to a memorable cruise.

The gorge above the Reversing Falls is within the city of Saint John.

Peter McKelvey is a retired engineer who has been sailing the Saint John River and the Bay of Fundy since he was a child. He spends the Canadian winter in his shop making gifts, doing projects for Quelle Vie, *and in community volunteering. He has also built a couple of small wooden boats. He and his son John plan further ventures on salt water.*



MAP BASE COURTESY OF GOOGLE MAPS

Living with Ethanol

E10 gasoline is now a fact of life, but its devils don't have to be

BY DREW FRYE

Why is ethanol problematic for marine engines but not for cars? The only noticeable difference for the family car is reduced gas mileage, the result of ethanol-blended fuel containing less energy per gallon. The marine problems are different and far more severe, and stem from moisture, irregular usage, and smaller scale.

Small engines have always been a tribulation. The high surface-to-volume ratios of their small tanks accelerate oxidation and gum formation and evaporate the volatile components that give gasoline its starting ginger. Smaller carburetor passages are more clog-prone, and simple engines lack the sensors and computers car engines use to optimize the mixture. Many small engines aboard boats are used only sporadically, further increasing the potential for corrosion and stale fuel.

More than 90 percent of the fuel market is now 10 percent ethanol, or E10. We worry that E15 is knocking on the door, likely to become a pervasive reality in the next decade. It's no longer an issue of lobbying for this scourge to go away, it's a matter of learning to live well with the fuel we have.

Moisture seldom finds its way into the automotive tank because the tank is sealed. Venting, when it occurs, is through a carbon canister, which removes most of the water. The canister is then purged clean when the car runs. Per US Coast Guard regulations, boat tanks cannot be sealed in any way that might increase pressure. Even slight pressurization increases the risk of leakage and subsequent explosion. If a car develops a minor leak, the fuel will probably just drip on the ground, and at the very worst, you can get out and walk away. A dripping tank aboard a boat can lead to gasoline fumes in the bilge, and the results can be catastrophic.

Cars are used daily, while a boat that is used 20 to 30 weekends each year is considered very busy indeed. And while gasoline will seldom stay in the family car for more than two weeks, it might sit in an outboard-motor tank for months at a time. Indeed, as sailors, we take pride in running the engine for as few minutes as it takes to clear the jetty, which is one of the worst things we can do for the engine. Any gas that remains in the tank will sit through the winter, evaporating, drawing moisture, and polymerizing.

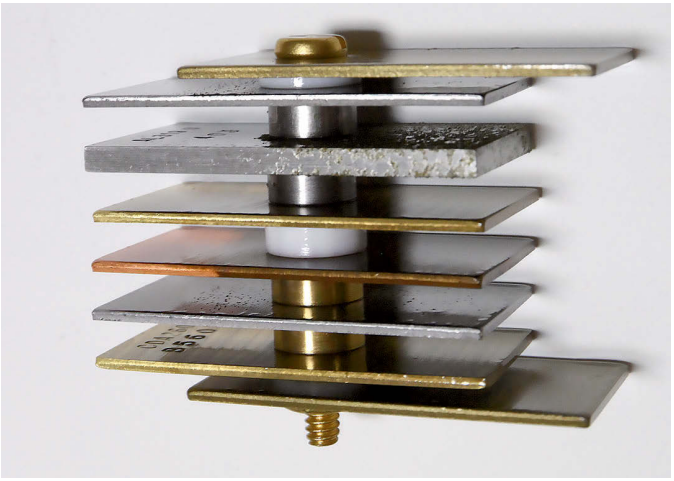
Finally, there is the matter of size. The fuel passages in the kicker on your dinghy, or even an Atomic 4, are logically 5 to 30 times smaller in cross-sectional area than in the first car you drove, back when cars had floats and jets rather than fuel injection. It does not take much to plug these passages enough to restrict the flow, throw off the mixture, and strand you somewhere.

All of these problems with E10 are quite solvable through better practices, additives, and minor equipment modifications. I have fought with these problems, but perhaps being a chemical engineer in the refining business gave me a leg up. It is often said about diesel engines that the key to reliable operation is clean fuel. The same is true for gasoline, although the path is different.

Keeping the fuel dry

Gasoline and water don't mix. Traditional gasoline would not draw water from the air. If a few drops of water found their way into the gas tank, they would sink to the bottom and do no harm other than eventually rusting a hole in a steel tank. E10 is different.

Ethanol is soluble in gasoline, but add just 0.5 percent water and all that water will be drawn to the alcohol, and a phase containing the water and all of the ethanol will fall to the bottom. Because the solubility of water in E10 changes with temperature, fuel that was stable during the summer, collecting a few drips and drawing



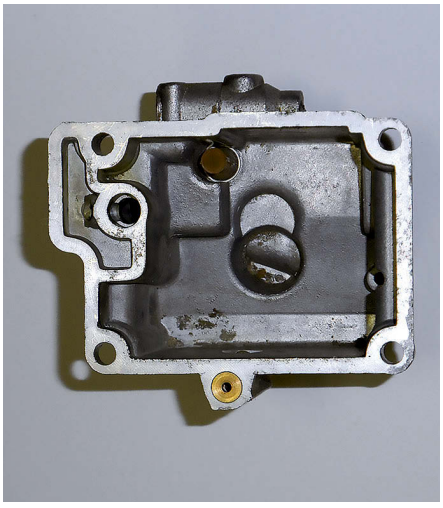
Drew tested evaporation water absorption by filling 1-liter jars with 500 ml of E10 and allowing them to breathe for 2 months, either freely or through a scale-size silica-gel or carbon filter. The silica-gel filter consistently showed the lowest evaporation rates because it was less affected by moisture, above left. The coupons he used in his corrosion tests included aluminum, brass, copper, and steel in galvanically coupled groups, above right. The corrosion on the aluminum one is similar to that in the carburetor bowl.

water from the air, can suddenly become unstable when the temperature drops from the 80s and 90s of summer to the 40s and 50s of fall with the first cold snap. This is more of a problem with smaller tanks because they cool more quickly.

There are additives whose makers claim will prevent phase separation. Don't use them. Testing shows this is not generally true, and on the balance, that is a good thing. Do you want to run water, perhaps including seawater, through the engine? A few additives are able to accomplish this trick, but it is, in the end, a dirty trick. They can keep the water dissolved only by means of high levels of co-solvents like butyl cellosolve or with high levels of surfactants. These are not harmless and the engine manufacturers have been working on standards that would ban this approach due to problems with intake-valve deposits.

The primary water source will always be a leaky filler cap. The cap on my first boat was located right in a drainage path, and I was constantly battling water leakage. It was only a few drops, so I installed a small separating filter (Raycor 110 series) and drew off a few teaspoons per year. That lasted until E10 arrived, after which that tiny amount of water would trigger the separation of gallons of ethanol/water mixture seemingly overnight. To get to the root of the problem, I moved the filler to a more elevated position in a location that would not allow vapors to enter the cabin or belowdeck areas. I kept the O-ring fresh and lubed it with a smear of waterproof grease a few times a year.

Another potential water source is the tank's vent. Portable tanks and integral tanks have a poor record of keeping out rain and heavy spray when the vents are open, as they must be during operation. More than once, an overnight rain (it doesn't take much) has found me pulling lines, replacing the filter, and draining a bit from the tank. Cover the tank to prevent rain or spray from hitting the vent when it's in use and close it when it's not in use. Driving rain can enter a stanchion vent. Transom vents can be slapped and water driven into the tank; the best protection is a high loop in the vent hose, at least 6 inches higher than the inlet. Another solution is a P-trap vent, available from Attwood and others.



Pitting in this carburetor bowl, at left, was the result of mixing ethanol, brass, and aluminum.

Even a few humid evenings can introduce enough water to cause trouble in the 1-liter tank of a dinghy outboard. In the case of portable tanks and integral tanks, the vent should be closed anytime the engine is not operating. If you don't close it every time, night will come, you will forget, and it will probably rain.

Fixed tanks can benefit from adsorbent vent dryers. The EPA tested this in the process of developing evaporative emissions standards for boats (primarily, these apply only to power boats, due to tank size and production-volume limits). The unfortunate error was that the test lab used automotive test conditions, not the heavy-dew situation encountered 18 inches off the water, thus missing key design variables entirely. I set about testing tank vents, both in the lab and in the field, under more realistic high-humidity conditions.

When field testing on a number of boats in the water, we saw that the carbon in the vent filter would often be soaking wet with dew. Remember how gasoline and water don't mix? Carbon that is wet can't absorb gasoline fumes, because it is as though each granule is sealed in a plastic bag. Silica gel, on the other hand, while not as effective an adsorbent for hydrocarbon vapors, is

After 2 months, the best-performing anti-corrosion additive left the gasoline clear and the test coupons corrosion-free.

In another sample, there was corrosion on the coupons and the gasoline was visibly darkened by oxidation and sludge formation.

not adversely affected by water vapor or fog and performs more consistently. At both laboratory-scale and in on-boat testing, silica gel outperforms carbon in keeping water out of a tank and in reducing evaporation.

I also learned that the daily out-breathing of E10 has an interesting self-regeneration effect on silica gel: Each time the ethanol breathes out, it displaces some of the water, regenerating the filter for the next cycle. As a result, the silica gel remains effective for up to 5 years, rather than the 6 months to a year manufacturers may suggest. Even spent media traps dew until it can evaporate in the morning, and it reduces oxidation and evaporation by reducing air exchange in the tank due to convection (air currents). Gas in a portable tank or an integral tank will evaporate less and absorb less water when the vent is kept closed.

I installed a vent filter on my PDQ 32 catamaran and those of several friends 8 years ago, in climates as varied as Chesapeake Bay, South Florida, and Seattle. Typically, after 5 years they required regeneration. All of the testers regenerated the gel by heating it in a pan, and none reported any difficulty. As the gel dried, it returned to its original blue color, and after cooling was ready for another 5 years of service. In my case, during those 5 years, it kept several pounds of water out of my fuel, which is important far beyond the problem of phase separation. As scary as it sounds, phase separation is not the main problem with water.

Anti-corrosion additives

Corrosion is the real problem. Additive makers claim improved stability and reduced gum formation. However, during several rounds of extended aging testing, the only thing that correlated strongly to gum formation was corrosion of copper and zinc alloys. These metal ions, once dissolved in gasoline, serve as aggressive catalysts for oxidation and polymerization. Before ethanol, corrosion rates were low, because water is insoluble in gasoline, gasoline doesn't conduct electricity, and the ions were not mobile. But the addition of ethanol changed all that. E10 gasoline absorbs water, water supports galvanic corrosion within the fuel system (carbs contain brass jets in an aluminum body — an excellent recipe for aluminum pitting), and copper and zinc ions are now mobile and aggressive.

To test the anti-corrosion properties of the additives, I placed standard ASTM corrosion coupons in vented bottles for 2 months, along with 150 PPM (parts per million) of seawater, because a wee splash into the vent is not unheard of, to compress years of corrosion into a reasonable testing period. They were galvanically coupled in groups as they might be in a fuel system; copper and brass to aluminum, steel to brass, and so forth. The bottles were fitted with a hose

With no anti-corrosion additive present, venting the tank allows in moisture, which leads to corrosion, at left. Sealing the tank to keep moisture out helps prevent corrosion, at right.

sized to simulate normal venting of a 10- to 20-gallon tank without allowing excessive evaporation or oxidation. They were stored in the dark, and at the end of the period, observed for relative corrosion.

Of the top performers, Biobor EB is my personal favorite — it stopped corrosion dead in its tracks. Mercury Quickstor, SeaFoam Motor Treatment, and ValvTect Ethanol Gasoline Treatment are also excellent. Beware of the rest; some do little to arrest corrosion, and a few can actually make it worse.

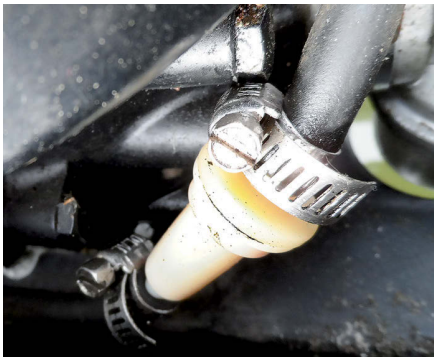
Filtration

A little supplemental filtration can go a long way toward reducing on-engine filter plugging and carburetor problems. The micron rating is probably not that critical. Particles smaller than 10 microns might cause wear in a diesel injection pump, but they won't be noticed in a carburetor. Most water-blocking elements are rated at 10 microns and I've had good experience with these. I have also used 2-micron elements and didn't notice any real difference.

Is a filter with a water drain required, such as used for diesel fuel? I've had both, and absent a chronic leakage problem (like my first boat — fix the problem), water will never accumulate in the drain, not in 10 years, because unless the gasoline phase separates in a major way, fresh E10 gas will continuously dissolve all traces of water. Should a droplet somehow condense in the tank and find its way to the filter, it might settle to the bottom, but it will quickly redissolve.

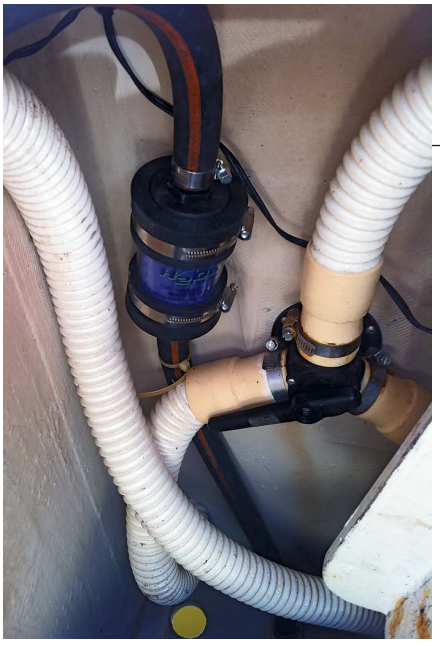
Another problem is that the separated phase formed in E10 is not water but actually 90 to 95 percent ethanol. It does not bead up readily on the surface of the filter because its surface tension is much lower than that of water and not so different from gasoline's. It does not readily run off the filter surface and down to the bowl because it is not as heavy as water and not much heavier than gasoline. As a result, separating filters just don't work as well with E10 as they do with conventional gasoline or diesel. There is no harm in using a filter with a drain, just don't be disappointed if there is nothing to drain in the normal course of sailing, and don't expect it to help that much if the gas separates; it might help, but it might not. I've had both experiences.

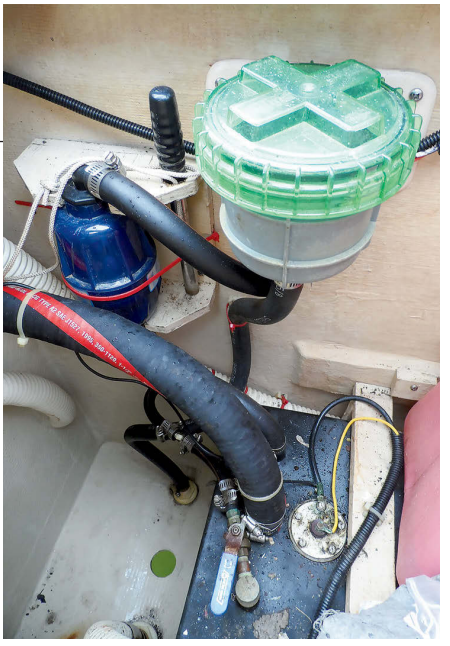
This is not to say a few water droplets aren't a problem and that a sufficiently large filter can't help. Phase separation takes time, and often just a tiny bit of emulsion forms at the bottom of the tank. The tiny in-line filter under the outboard engine cowl is easily blocked by just a few drops of water or a little bit of this emulsion. The filter won't look plugged and you can even blow through it, but the medium is designed to repel water. With even the thinnest coating, it becomes gasoline-repellent, much as water-repellent treatment can make canvas water-resistant. The canvas is not truly sealed, just coated with enough hydrocarbon to make the water bead up. Apply the slightest pressure — often just the touch of a finger — and the fabric will begin to leak. But this thin coating of water on a tiny factory filter can be enough to starve the engine.



A lawnmower fuel filter fitted to a 3.5-horsepower Mercury outboard reduced carburetor clogging significantly.

I recommend a filter rated for 35 to 90 gallons per hour, even for an engine that can only burn a gallon or less. This gives the water the time it needs to either flow off or redissolve. If dirt is present, the filter will take more than 5 years to become fouled instead of once or twice each season, because the larger filter has far more capacity to hold dirt, and because the greater surface area allows it to function while partially blocked. Should you encounter a small slug of dirt from a dirty jerrycan or a few drops of water from a splash, the larger filter can handle this without stranding you. My favorites? I like the Raycor Snap, the Raycor 110 series, the Raycor 320 series, and the Sierra spin-on kits. Some small outboards





Drew installed an H2Out AVD-2 silica-gel vent filter in a high loop, at left. He also modified a Vetus no-smell vent filter to hold silica gel, at right.

— my old 3.5-horsepower Mercury two-stroke comes to mind — might have only a fine strainer in the tank. Add a lawn-mower filter under the cowl for just a few dollars and enjoy the reduction in carburetor clogging. It may clog if you leave the vent open through an overnight rain, but changing it is the work of a few minutes.

Enleanment

There is one more problem we can't do much about: enleanment.

Gasoline with ethanol requires a slightly richer mix, but simple carburetors cannot compensate. What this means is that the carburetor will be running a little on the lean side and will be more sensitive to clogging, as it's already getting less gas than it was designed for. This will get worse with E15, which is also thought to be damaging to seals and intake valves of engines not designed for it. The EPA does not appear to be widening approvals, and no marine engine manufacturer approves E15, so don't use it in your boat.

Living Ethanol-Free

—Cliff Moore

A few years ago, I replaced the two-stroke outboard motor on my dinghy with a 2.3-horsepower four-stroke Honda, which behaved flawlessly for a very long time. Each fall, I changed the oil in the head and lower unit and, knowing that fuel goes bad over time, I drained the fuel tank.

Then something happened. Three years ago, the engine ran rough all summer. It would start, then run for a minute, then quit. Even with new fuel it misbehaved. The next summer it worked perfectly well. Then, last summer, it was back to its old tricks again, running rough and quitting. It always restarted, but it was a nuisance.

I finally figured out the problem — and the solution. The problem is the ethanol contained in gasoline sold at highway gas stations, where many trailer-boaters fill up. Ethanol readily absorbs moisture — a couple of drops through the cap vent and the engine's not happy. While there are fuel-treatment products that are promoted as mitigating the negative effects of ethanol in gasoline, I've found the best solution is to simply burn only ethanol-free gas. How? The website pure-gas.org lists every service station (including marinas) in the US and Canada that sells ethanol-free gas.

I was not surprised to find that in New Jersey, where I lived until February of last year, only 10 gas stations in the entire state sold ethanol-free gas. But here in North Carolina, where I now live, hundreds are listed by town. At least three are within a mile of my home, and another couple are on the way to the marina I now sail out of.

Cliff Moore is a Good Old Boat *contributing editor.*

Portable-Tank Advice –DF

Most of the time, a portable tank works just fine left in the cockpit and exposed to the elements. But you can do a little better.

Keep it out of the sun. E10 has considerably higher vapor pressure than conventional gasoline, resulting in tanks that bulge alarmingly in the sun. Sometimes fittings leak. Sometimes gas is forced past the needle valve into the engine (consider installing an in-line cutoff valve). The UV is not good for the tank and it isn't good for the gasoline inside the tank.

Close the vent when the tank is not actively in use. I've had both integral tanks and portable tanks phase separate as a result of water that splashed in during heavy downpours in a matter of an hour. They also draw water vapor from the air and evaporate valuable volatiles into the air.

Use caution when venting. A significant puff of vapor can be released when a bloated tank is vented. Make sure to open the vent only when in a safe area away from ignition sources and located such that the fumes cannot get belowdecks.

If filling a portable tank at a fuel dock, remove it from the boat and fill it on the dock. Static and fumes are your concerns.

As the US fuel pool moves slowly, inexorably, to all ethanol-blended fuels, newer engines have been rejetted to compensate. But expect older motors to run a little lean on E15. Because small engines are not subject to quite the same emission standards as their computerized counterparts in cars, they are designed to run the mixture a little richer than strictly required, and so far, this has been enough. Let's hope that another 5 percent won't be fatal.

I can proudly say I've learned to live in harmony with E10. I check my filler O-rings. Where I have a fixed tank, I use a silica-gel vent dryer to keep the fuel bone-dry. If the tank is portable or integral to the motor, I close it faithfully after use. I add Biobor EB as directed to prevent carburetor corrosion and gum formation. I add supplemental filters to catch anything the engine filter missed and to deal with the few drops of water that might fight their way through on occasion. The result is super-clean fuel, and the motors like that. Years ago, I learned to clean a carb under way with one eye closed and the boat bouncing enthusiastically, knowing I needed to get this sorted out before I reached the marina. Now the engines start on the first or second pull, every time, for many years at a time. That's nice.

Drew Frye draws on his training as a chemical engineer and pastimes of climbing and sailing when solving boating problems. He cruises Chesapeake Bay and the mid-Atlantic coast in his Corsair F 24 trimaran, Fast and Furry-ous, *taking advantage of its shoal draft to venture into shallow and less-explored waters. His book,* Rigging Modern Anchors, *was recently published by Seaworthy Publications.*

Mid-Cruise A4 Crisis

Rebuilding an Atomic 4 on a mooring far from home

BY BOB BAKER

Although I lived in Michigan, I bought my 1967 Morgan 34 with a trip south in mind. I thought she would be a good boat for the shallow waters of Florida and the Bahamas, as she drew only 3 feet 4 inches with the centerboard raised and, weighing a respectable 13,000 pounds, was stable enough to cope with modest saltwater crossings.

Her name then was *Nereus*. That seemed a good name to me in 2004, when I was 52, and she is still *Nereus*. She was essentially factory; she had the original Atomic 4 engine and there were no signs anyone had tinkered with her, not even to install roller furling or wheel steering. Neither had she received much TLC. Her previous owner had painted over her deteriorating teak appointments with, I swear, house paint. "It's what I call a good 100-foot paint job," he told me. More like 100 yards, I thought.

The Bahamas were a long time coming.

I finally left the Great Lakes in the spring of 2014, via the Saint Lawrence Seaway. I bounced down the East Coast to mid-Florida, then took the Okeechobee Waterway to Fort Myers Beach, where I prepared for a simple day/night jaunt to the Dry Tortugas.

I took off across the Gulf of Mexico in the late afternoon with a good weather window, planning to arrive at the Dry Tortugas around noon the next day. As the shoreline disappeared, the daylight faded, and so did the wind. I cranked up the engine and puttered off into the night, mindful that crab pots were everywhere. But with *Nereus*' centerboard retracted, her full keel would present nothing to hook a crab-pot line, or so I thought.

Deep into the night, I heard a noise coming from under the cockpit. It began as a light pounding, almost like the engine timing was off, then became a resounding *thunk-thunk-thunk* followed by a *wackaty-wakaty-wakaty*. After a loud punctuating *bam*, I shut off the ignition, then tentatively tried to restart the engine. It was seized. I sat in silence.

Continuing to the Dry Tortugas made no sense. The National Monument offers few resources, not even fresh water. There was still no wind and *Nereus* rolled uncomfortably in the swell. I lashed the inflatable dinghy to the side and started the 5-horsepower outboard. We headed back to Fort Myers at a blazing one and a half knots, and I eventually pushed the boat back to the mooring sometime after a long night and day.

The engine

Going through some of my old scribblings recently, I ran across a note to myself that read, "Someday I wouldn't mind the opportunity to dig into the workings of this old engine." I'm certain I had not imagined that opportunity arising when I was bobbing on a mooring a thousand miles from home. Be careful what you wish for.

My first analysis of the problem revealed no probable cause for the seizure. The engine's temperature had never spiked, the oil-pressure warning alarm never sounded, and the oil level was OK. Strangely, after jostling the flywheel, I could sometimes get the engine to crank and even start and run for a bit. Then it would seize again.

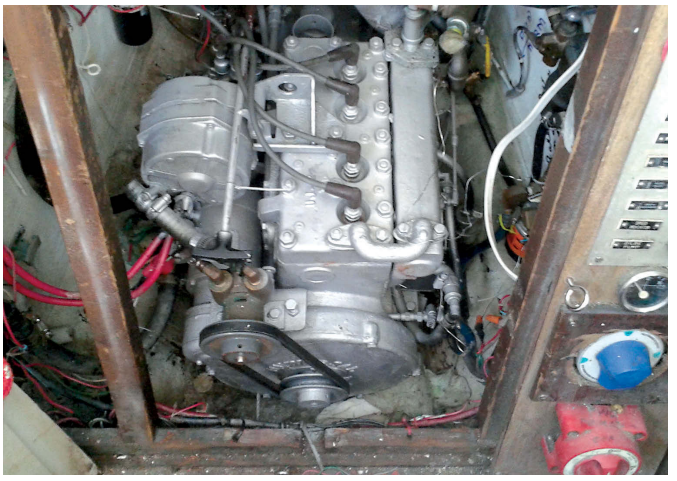
A principal resource A4 owners have in keeping their old engines running is Moyer Marine, which maintains a comprehensive parts supply and hosts an active community of dedicated A4 owners on its website. Despite spotty

Bob bought *Nereus*, his Morgan 34, in 2004 with the idea of sailing her south from the Great Lakes. Ten years later, he fulfilled that goal, and learned a lot about Atomic 4 engines along the way.

internet access in the harbor, I was able to post my problem to the community, prompting lively speculation around my A4's distress but no consensus as to a possible cause. I now had no choice but to fulfill that wish I'd expressed all those years ago.

I pulled the head and placed it on the spare pilot berth. Nothing was out of place. Rats. The next step would entail removing the engine from under the cockpit. A tow to a proper marine repair facility was beyond the means of this low-budget venture; the gauntlet had been thrown. I was going to rebuild or replace the engine myself while *Nereus* was afloat in Matanzas Harbor.

By moving the mainsheet and blocks halfway along the boom and doubling up the topping lift for strength, I was able to raise the 300-pound engine through the companionway to the level of the spare pilot berth where, after getting a little swinging action on it, I was able to drop it. In that cramped and not-quite-pristine operating theater, I began the next surgical procedure. The engine, cheaply built by 1940s standards, was like an iron bomb. The cast-iron oil pan alone is hard to manhandle, and a glancing blow from it cost me a big toenail.



When he was rebuilding his Atomic 4, above, Bob was working under duress and his photos didn't come out well. The broken crankshaft has since done good service as an anchor kellet, at top.

Diagnosis and restoration

Looking into the crankcase, expecting to see a jumble of broken stuff, I saw nothing, even after I'd cleaned out the accumulated gook. I stared at it a long, long time, thinking, "Oh, no, the problem is in the transmission" before finally spotting the culprit. The crankshaft had broken neatly between the first and second cylinders. When jostled around, sometimes the crankshaft ends must have realigned and, held by the bearings, allowed the engine to turn and start. But its heart was broken. At a minimum, it would need a new crankshaft.

Moyer Marine supplied a rebuilt crankshaft and all the necessary gaskets, rings, and bearings for a complete rebuild, together with a comprehensive guide to the process. I had not done engine work since working on my Honda 125 in the 1970s, but the Moyer folks have done rebuilds for decades and their patient advice was instrumental. I took my pistons and connecting rods on a bus to a remote Fort Myers neighborhood that had an ancient machine shop, where the equally ancient machinist remembered working on Atomic 4s "in the day." He gauged the straightness of the rods and roundness of the pistons, revealing no issues there, and also pressed in the new piston-rod bearings. I had to order some tools from Amazon, like the piston ring compressor and micrometer, but by following the instructions and advice from Moyer Marine over the phone (from Ken, specifically), I was able to successfully reassemble the engine. That no other engine part was affected in this disaster is testimony to the ruggedness of the A4 beast.

Reversing the extraction procedure, I placed the engine back on the stringers. Not without trepidation, I cranked it up for the first time. I followed a break-in procedure supplied by Moyer and the engine passed all the tests!

So, about a month after my first attempt, I left the harbor for version 2.0 of my voyage to the Dry Tortugas, and arrived there just days before Christmas. I went on to complete the trip to the Bahamas and then back home to Lake Michigan. To date, I've put about 600 hours on the engine and it purrs as it should — like a Singer sewing machine. Do I have to say that I'm planning another venture?

Why did the crankshaft break?

The Moyer parts guy told me he had seen fewer than 10 crankshaft failures in his decades in the business. As to the cause: Had I been revving the engine out? No. Did it run low on oil? No. Did it overheat? No. Had an oil passage clogged? No. That I knew because when I showed the main bearings to the Fort Myers machinist, he said they had not burnt out, that the damage to them was due to the crankshaft failure, not the other way around.

Resources

Moyer Marine
moyermarine.com

Bob's conversation is on the Moyer Marine forum:
moyermarineforum.com
Search "titles only" with "mostly siezed" (yes, it's misspelled).

Only after he returned to Muskegon and had *Nereus* hauled did Bob discover a clue to his A4's seizure — a mess of deep grooves in the hull in the region of the propeller aperture.

But what was the noise? There were no broken parts rattling around in the crankcase, and the couple of times it started immediately after it first seized did not produce the same cacophony, in forward or reverse.

This remains speculation, but when I had *Nereus* hauled after we were back in Muskegon, Michigan, a clue was revealed. Above the prop, where the keel meets the hull, there were deep grooves in the fiberglass both port and starboard. This is not an area that would be involved in a grounding, or even a collision. Had I wrapped something around the shaft that subsequently unwound or fell off?

One of the virtues of a full keel that I was keenly aware of is its relative immunity to that bane of boaters, crab and lobster pot lines and buoys. My trial by fire was a night arrival in Bar Harbor, Maine, during lobster season. Although they are supposed to leave a passage for boats, lobster fishermen simply do not. That night, without incident, I bumped through dozens if not hundreds of pot buoys.

In the Gulf, there was an evil twist to this minefield of floats. Each pot had two floats connected to each other by 3 to 4 feet of line, and I think my boat ran across one of these getups. One on each side of the keel, unable to float up and away from the prop, the twin floats were sucked into the prop and spun around in a merry tangle that beat them and their hardware against the hull and finally, suddenly, locked the prop. Subsequently, did the buoys drop off when the line was cut by the prop or unwound in the couple of times the engine restarted? It is well documented that such a jolt has snapped driveshafts. Of course, 50 years of use could cause metal fatigue. I don't have a conclusive conclusion. I do have half of a crankshaft that makes a nice catenary weight on my anchor rode.

None of this has shaken my confidence in the ole girl, but if she breaks again in another 50 years, when I'm 115 . . . I'll fix her.

Bob Baker is semi-retired with an accounting background and an interest in hiking and sailing. He got his first sailboat, a 24-foot Hunter, in 1994 and currently sails his Morgan 34, Nereus*, which he's owned since 2004. He's sailed the Great Lakes in her and recently returned from a round trip to the Bahamas, via the Trent Severn, the Saint Lawrence Seaway, and the Okeechobee Waterway on the way down and the Erie Canal on the return.*

A4 Lore —BB

Quite often, when I pull up next to the gas pump on a fuel dock in *Nereus*, with her 1967 Atomic 4, the attendant will ask, "Are you *sure* you want to put gas into a sailboat?" Gas attendants are a captive audience to a solo sailor, and 15 gallons gives me time to tell my Atomic 4 story I've cobbled together from bits and pieces of lore I've read over the years.

It starts with the buildup to D-Day, when the US government asked for bids for a 20- to 30-horse-power engine that would power 1,000 landing craft *once*. (Well, if it worked, we wouldn't need to invade again, and if it failed, it was unlikely that Hitler would return the craft). The Universal Motor Company delivered a four-cylinder engine with, among other cost-cutting measures, no center crankshaft bearing. After the war, thousands of these "frail" engines were available as war surplus, and became very popular with sailors, who up to this time had not used auxiliary engines very widely. Thought good enough for going in and out of harbor, they turned out to be good enough to power boats for miles and miles and years and years.

When the supply of surplus engines expired, demand was great enough for the Universal Motor Company to begin producing them again. The production run ran through 1984, and an estimated 20,000 engines remain in use today, most of them in good old boats.

Mantus and Mustang recently released their latest waterproof packs for boaters and we've spent time with both . . .

Mantus

This pack represents Mantus' return to the waterproof backpack market (a 2.0, if you will) and it is stellar. (Last year, we tested Mantus' first version of this versatile pack and found it sub-par; we didn't publish a review.) The pack is a relatively simple affair: a large roll-top dry bag with a mesh pocket and two large waterproof zippered pockets (one inside, one outside). The fit and finish is excellent and the material is heavy. The back is padded for wearing comfort and the straps are wide enough and well-positioned. It has an adjustable chest strap, a wide, heavy waist belt, a heavy-duty carry handle, and an outer bungee system for securing miscellaneous gear. I used this backpack daily for 3 weeks while traveling and sailing (and it rained for about half that time). I didn't take it easy on the pack. I didn't find anything to complain about; it does everything promised without compromise.

For more information: mantusmarine.com

— **Michael Robertson,** Editor

Mustang

Over the course of five years of living on our boat and cruising, my partner and I have "tested" (destroyed) half a dozen dry-bag backpacks. "Waterproof" seams often leaked, flimsy straps sometimes broke, and comfort was usually lacking. Lack of interior padding usually meant I added a sheet of foam to protect our devices. Oh, and why is there no way to make a giant rubberized backpack look cool? Well, I've finally found the ultimate dry-bag backpack, one that stands up to boat life and looks sleek too. It has a waterproof roll-top compartment at the back (in which I can easily fit both my iPad and my 14-inch laptop), front compartments with urethane-coated zippers, and a large pouch on the front for wet gear. It feels tough and has a padded back that protects electronics within. The chest and hip straps and the foam back stiffener make it comfortable when carrying heavy loads long distances. And I love the many pockets and compartments that mean I don't have to grope around for my phone or keys that have fallen to the bottom of the bag.

For more information: mustangsurvival.com

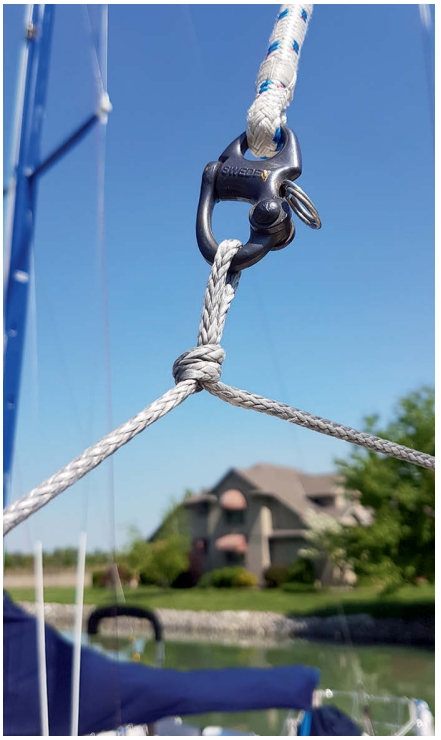
— **Fiona McGlynn,** *Good Old Boat* contributing editor

A summary comparison	Mantus Backpack	Mustang 30L Bluewater Gear Hauler
Size: both packs are within airline carry-on size limits, but the smaller Mustang pack will fit underneath the "seat in front of you." The larger Mantus is sized to carry SCUBA gear (and even includes a closable drain at the base).	50 liters	30 liters
Versatility: the Mustang is more versatile in terms of having a wide selection of pockets and pouches. The Mantus is limited in this regard, a simpler design.	2 waterproof zippered pockets, 1 mesh pouch, exterior wet storage, clip points	2 zippered compartments, internal organization system, configurable exterior wet storage, clip points
Material: the Mantus pack is made of a heavier nylon than the Mustang pack, but this makes sense. A pack intended to carry SCUBA gear and even be used as a bucket to rinse that gear requires a heavier material, whereas a smaller, more versatile pack with numerous compartments requires a lighter, less-stiff material.	840 denier TPU-coated ripstop nylon TPU (thermoplastic polyurethane) is a waterproof coating.	210 denier TPU-coated ripstop nylon
Color Options & MSRP	Gray, $90	Black or Blue, $159

We present these profiles as a service, as firsthand accounts from fellow boaters. Neither *Good Old Boat* magazine nor the folks who profiled the products on this page were paid for these profiles. Most products were sent to *Good Old Boat* for review consideration by the manufacturers. We profile only a small percentage of the products that marketers contact us about, choosing only those we're interested in, in the hope you're interested too. A few products we pick up on our own, because we want to share.

Refurbishing a Spinnaker Pole

BY ROBB LOVELL



It gets a new look and loses its fishhooks

We were in the middle of a race and Sam was up front, jibing the spinnaker pole over to the other side of the boat. "Ouch! Dammit!" She drew back her hand from the pole. A moment later, drops of blood hit the deck. Poor Sam had laid the pad of her thumb wide open. Fortunately, it was nothing a couple of Band-Aids and some Polysporin couldn't fix.

We finished the race without further incident, and back at the dock, Sam and I went up to the foredeck to examine the spinnaker pole. The wire bridle on the pole lift was badly frayed, and she had caught her thumb on one of the fishhooks. I felt terrible, and promised her I'd fix the problem.

The pole itself was straight and free of dents, but the anodizing had worn off in large sections. The trip lines, also made of wire, were loose and frayed as well. It happened that this was the last race of the season, so I carried the pole down the dock, strapped it to the roof of my Jeep, and added it to my winter list of things to fix.

My plan was to simply replace the wire bridle and trip wires with new wire, but when poking around online, I learned that many racers are replacing wire bridles with Dyneema and trip lines with thin Spectra cord.

Dyneema rope is approximately 15 times stronger than steel wire of the same weight, and it is easy to splice. It worked well as a replacement for the bridle. I tied simple loops in the Dyneema to replace the stainless steel rings that had served as attachment points for the topping lift and downhaul shackles. I was pleased to see them gone, as the old rings were forever banging on the deck and gelcoat.

I considered coating the pole with self-etching primer and then sanding and spray-painting it, but I figured that if the anodizing had worn off the pole, then spray paint wasn't likely to hold up either. After a bit of research, I concluded that powder coating would be the way to go.

In the powder-coating process, a positively charged powder is sprayed onto a clean grounded metal surface, to which it sticks electrostatically. The metal surface is then baked at a high temperature, at which the powder melts into a uniform film that cools to a hard coating that is more durable than paint.

The spinnaker-pole topping lift attaches to a loop made with an overhand knot in the gray Dyneema bridle, top left. The bridle is attached at each end of the pole with eye splices, top right. For the trip line that opens the pole-end jaws, Robb used brightly colored Spectra cord.

To make it easier for the crew to handle the newly red spinnaker pole in strong winds, Robb rerigged the downhaul, with a 2:1 tackle, below.

I found a local company willing to powder coat my spinnaker pole for the very reasonable sum of $75. After they had media-blasted the pole to clean it, then powder coated it, I was left with a durable and beautiful finish on my very red spinnaker pole.

I followed this up with a bit of splicing work, and installed the new Dyneema bridle and a set of brightly colored Spectra trip lines.

In the spring, I completed the project by finally addressing the fact that hauling in on the downhaul had always been difficult in a strong wind. I dead-ended the downhaul at the deck and attached a block-and-tackle combination to the pole to give the crew a 2:1 mechanical advantage.

The new setup is a vast improvement, both in form and in function. From here on, we will let the red spinnaker pole be the eye-catching item on the boat (and skip the bloody thumbs).

Robb Lovell grew up sailing on Lake Huron aboard his family's Endeavor 40, where he caught the sailing bug. That was about 20 boats ago. Rob enjoys buying and restoring boats, and is an avid racer and cruiser based out of Lasalle Mariner's Yacht Club (LMYC) in Ontario. He currently races on a Cal 9.2 named Jade *but owns three other sailboats and a tugboat . . . yes, he has a problem!*

Terminology -Editors

While America and Canada share a common language, their vocabularies differ, and that shows in nautical terms. When Robb (Canadian) writes "topping lift," Americans would say "pole lift." And where he writes "downhaul," Americans would use "foreguy."

continued from page 7

Famous neighbors

I was catching up on my *Good Old Boat* reading and saw the Southerly 115 review in the March issue. We store our boat, *Her Diamond*, on the hard at Safe Cove Boat Storage in Port Charlotte, Florida, over the summer and we met the Southerly's owners, Chris and Laura Mlynarczyk, last November during commissioning. We then enjoyed some time with them at nearby Burnt Store Marina before we headed south. What a small world!

–Bob Allenick, *Her Diamond*

Intrigued by composting

Writer Jon Keller mentioned a homemade composting toilet in his article "A Tartan 34 with PTSD" (September 2018). Is it possible to have more info on this subject? What kind of container does he use? Did he install ventilation? Is odor a problem? I would also like to see a separate article on the subject.

–Bruno Joly, Contrecœur, Quebec

We asked Jon and he offered the following: "Well, by that I meant I have a bucket and either peat moss or sawdust. I typically overboard it when sailing offshore. I'd planned to upgrade, but I found I like the bucket option. I did frame it and put a seat on it. There is no odor and it's very simple, but the downside is that it's not suited for women to urinate in, because there's no separator, and the urine (and associated moisture) is where the odor comes from. Also, my solution doesn't work so well handling the volume generated if there are more than two people aboard. But I'm usually alone."

In her article "Zero-Discharge Solution" in the September 2011 issue, Connie McBride described how she and her husband, Dave, installed an Air Head composting toilet after the kids left their liveaboard home. And we'll add that we might have a composting-head article on tap.

—Editors

The Dogwatch from Good Old Boat

We want to hear from you!

Send letters to the editor to michael_r@goodoldboat.com. We publish more letters in our monthly digital supplement, *The Dogwatch*. In fact, all *The Dogwatch* content is unique — and free! — so don't miss it. If *The Dogwatch* isn't landing in your email inbox each month, email brenda@goodoldboat.com.

"It was a Saturday in July, 2013. The Santana 22 Nationals were held on San Francisco Bay. The wind started at 20 knots and went up from there. They canceled the America's Cup race scheduled for the same day; I guess those fragile craft just weren't designed for those conditions," wrote Stefan and Mary Berlinski. That's *Hamachi*, their 1967 Santana, headed for Erik Simonson's camera. A 50-year-old boat, perfectly content.

Boats for Sale

Cape Dory 330
1986. Alberg's redesign: cutter rig, taller 35' mast, roomier interior and cockpit. *Annie Laurie* is jewel of the fleet, loaded with upgrades: new Yanmar engine in '08, new yankee and Schaefer RF, new main in '12, new Bierig self-tending jib in '16, Hood in-mast RF, new rigging '14, 4 Awlgrip jobs since '00. Solid, safe, a joy to cruise, gorgeous. Perfect boat for couple with occasional guests. Mount Desert Island, ME. $55,000.
Contact the broker:
Newman Marine
207-244-5560
yachtworld.com/boats/1986/Cape-Dory-330-3220159

Yankee Yachts 38
1974. Sparkman & Stephens IOR design. Hull #24 of 24. Above average condition. Complete refit '09: rigging, sails, deck hardware. Hull and topside repaint by Epifanes '18. Engine rebuild '16. Equipped for coastal and offshore. Excellent '18 survey available. Eliot, ME. $49,750.
Howard Green
603-498-1067
Howard.h.green@raymondjames.com

Pearson 26 Weekender
1976. Great daysailer, excellent PHRF racer, heavy-duty gear, spinnaker-rigged. Lots of accessories. Includes long-shaft OB, car trailer, steel cradle. Plymouth, MN. $8,000.
Michael Barnes
763-557-2962
granite55446@gmail.com

Cape Dory 28
1977. Yanmar 2GM20F 16-hp diesel, RF 135 jib, reefed mainsail, new bimini, Garmin GPS Map 441s, Raymarine ST 2000 AP, solar-charged batteries, new Jabsco head. Origo 2-burner stove, Magma propane grill, standing headroom. Engine serviced recently. Many accessories. *Vasa* is a veteran of several East Coast voyages. Owner ready to retire. Galesville, MD. Reduced to $8,950.
Dixon Hemphill
703-250-9277
dixonh999@gmail.com

Marieholm 26
1973. Folkboat hull. Full-keel bay or bluewater cruiser (sisterships have crossed Atlantic). 18-hp Yanmar 2GM20 diesel. Custom hard dodger, chart plotter, radios, AP, Max-Prop, Doyle Stackpack main, jib, genoa, spinnaker. Head and galley w/standing headroom. New bottom paint and prop coating '18. USCG documented. Annapolis, MD. Asking $15,000.
Terry Otis
571-332-4473
terry.otis@verizon.net

C&C 35 Mk I
1973. Rare classic racer/cruiser. Draws 5'3"; fast, nimble, fun to sail. All lines led to cockpit. Solid hull/no blisters. Many upgrades, incl. 30-hp diesel, folding prop, FB main w/Dutchman, RF, 4 headsails, new halyards, bimini. Compass, GPS/Chartplotter D/S/W, VHF. Shorepower, regulated battery charger, dripless stuffing box. H&C water, microwave, propane cooktop. AM/FM/CD, electric bilge pump. Spinnaker/whisker poles, swim ladder, anchor. MD. $14,500.
John Filippini
703-409-9187
johncfilippini@gmail.com

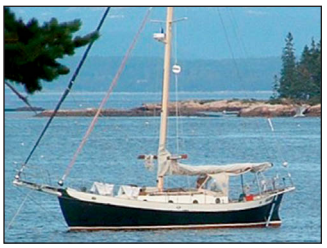
Irwin 37
1973. Center-cockpit sloop w/ custom Talbert trailer. All rigging, sails, gear included. Great project boat ready to transport. Dock and storage fees paid to date. Aqualand Marina, MD. $8,500.
Anthony Rifino
703-967-9140
anthonyrifino@icloud.com

Hinterhoeller 28
1966. Freshwater boat. Tiller steering. Sle[illegible] North main new '17, RF [illegible] ner 9.9 elec-s[illegible] in well[illegible] 1000 [illegible] marine la[illegible] Ele[illegible] Pl[illegible] ja[illegible] MOB r[illegible] cu[illegible] ockpit awn[illegible] Danfo[illegible] nylon rode. Cust[illegible] axle trailer. Clayton, NY. Price reduced $7,500.
Mark Fontaine
410-956-5841
mrflady@hotmail.com

Islander 32 Mk II
1978. Almost new sails and furler. Folding prop, diesel, keel-stepped mast. LED lights below. Retiring and health issues. Nice boat! Caseville, MI. $18,500.
James Leonard
989-550-2722
jamesgleon@hotmail.com

Grampian 26
1970. A fine-sailing, spacious sloop w/many owner enhancements. 9.9-hp Yamaha elec. start OB, UK sails, RF jib, Hood MPS, internal halyards, ST winches, rigid boom vang, D&S meters, VHF, bow anchor roller, teak-and-holly cabin sole, enclosed head, superb cabin cushions, sleeps 4 comfortably. Pelham Manor, NY. $2,900.
Malcolm Hartman
718-885-1381
maljh@verizon.net

Southern Cross 35
1983-1988. Airex cored. 40-hp Yanmar new '04. 5/16" wire, Sta-Lok terminals, Merriman ½" turnbuckles (like new), bronze Bomar ports and Barient ST winches. Force 10 propane stove. Strong, great-sailing bluewater boat, freshwater daysailed all its life. Lovely wooden interior needs some finishing. North sails: main, staysail, Yankee, all original, in OK cond., 135 genoa (like new). Running rigging, original, in OK cond. Marlboro, NY. $34,000.
John Milici
845-417-6044 or 845-255-8123
clairemilici@yahoo.com



Steel Cutter 32
1986. Merritt Walter design. *Gypsy Rover* has a custom-built mahogany interior. Insulated cabin. Fresh water 55 gal. 140 genoa, mainsail, staysail, storm sail. LWL 28'10", LOA 40'5", Beam 10', draft 4'10", disp. 19,000 lb. 28-hp Volvo diesel, 24 gal. fuel. Recent survey. Boothbay, ME. $69,500.

Alan Boyes
207-633-5341
alan@winterisland.com

Vancouver 36
1978. Fully equipped bluewater cutter in sound cond. Designed by Robert Harris and built by Durbeck in FL. Many miles in her wake including two transatlantics. Ready for new owners with dreams of distant shores. See website for detailed description, equipment list, many pictures. Potomac River, VA. $32,500.

George Hunt
434-591-4599
george@w4avo.org
w4avo.org/promise.html

Westsail 32
1973. New 38-hp Yanmar w/0 hrs. New engine-room wiring, hoses, lifter, fuel tanks, shaft, prop. New 12/110V fridge, new stove w/ oven. New Air Head toilet. Elec. windlass, 7 sails, hard dinghy, no blisters. 4 anchors, 300' 5/16" HT chain, 19,000 lb offshore cruiser: 800 built, 600 still sailing around globe. Needs finishing touches. FL. $39,000.

Andre
239-215-0005

Cheoy Lee 36 Yawl
1976. I am in the last stage of restoring my Cheoy Lee Luders 36 and I have all the receipts from the Flag Harbor Boat Yard. Needs varnishing and some wiring. Alwgrip painted top and bottom. Rebuilt Perkins 4-108 and transmission. All tanks flushed. Spars varnished. All new rigging. Sails in fair cond. St. Leonard, MD. $18,500.

Robert J Kraczek
772-249-4349
captainbob45@peoplepc.com

Newport 27S
1982. Great Lakes boat. Sailed North Channel '18. Flush deck, standing headroom, roomy cockpit. Bimini, tiller, 2 sets ground tackle, whisker pole. Roller reefer refurbed '18. Atomic 4 vgc. Interior well kept. Head, no galley. Icebox. Lots of storage. 5 sails, newer main. New running rigging '18. Lines led to cockpit. VHF/CD, Garmin. Zodiac and 3.5 Mercury 4-stroke. Steel cradle. Fast, stable, a joy to sail. Cheboygan, MI. $7,385.

Hall Derkin
419-509-7063
hsderkin@yahoo.com

Nor'west 33
1978. *Aria* is a robust version of this well-built Chuck Burns design ready for cruising. Upgrades in '05/'06 include standing rigging w/ new chainplates, 3YM30 Yanmar w/600+ hrs, all new canvas. '15/'16: VHF, Garmin GPS, 8 opening ports, Profurl RF w/130 genoa. Recent back surgery forces sale. Gulfport, FL. $15,000.

James Marron
941-228-7269
marronorama@gmail.com

Pearson Vanguard 32
1965. Beautiful classic Phil Rhodes design. *Merlin* has been extensively upgraded over 38 years of family cruising from Rhode Island to Maine. 3YM30 Yanmar diesel w/feathering 4-blade VariProp. Schaeffer RF/reefing. Andersen 2-speed ST winches. Cape Horn steering vane. Autohelm tiller pilot, JRC radar, rigid boom vang. Dinette layout, Force 10 range w/oven/broiler, Tiny Tot heating stove. Composting head. Barrington, RI. $27,000.

Richard Green
401-245-5508
cell: 401-339-6993
rgreen@fullchannel.net

C&C 25 Mk II
1986. *North Country Lady* is well maintained — perfect lifelong freshwater sailboat for any sailor. Smallest, most successful design made by C&C. Superb build quality! You won't be disappointed. All new: mast wiring in riveted conduit, LED lighting/anchor light, Dometic head, sea foam green boot stripe, forward berth portlights added, mahogany tiller. Gray bottom paint in '18. Custom steel cradle. 3 jibs/blue spi, recently tuned by Bill Fastiggi. Shelburne, VT. $5,500.

Rob Snyder
802-295-4040
bobbino@myfairpoint.net

Islander 29
1967.Well maintained in good cond. Bristol brightwork. Raised dinette saloon w/ample storage throughout. New interior and cockpit cushions. New holding tank system. Well-running Atomic 4 engine, FW-cooled w/ electronic ignition. Vapor and high-water alarms. Profurl RF, 3 anchors, 3 bilge pumps, 2 Plastimo cockpit compasses. Datamarine S/D, 2 VHF radios, new stereo, Raymarine GPS. Many extras! $7,000.

Dean Gibbons
978-688-6360
deangibbons67@gmail.com
islander29.tumblr.com

Chrysler C-22
1975. Second owner since 1978. Freshwater only. Well equipped. Full flotation. Main, 110, and 150. Fair cond. Custom trailer w/long extendable tongue and spare tire. Atlanta, GA, area. $3,500.

Bill Marish
678-446-0852

Seafarer 31
1968. Bill Tripp design. Cruise ready. *Trilogy* is a master cabinetmaker's boat, classic inside and out. Solent-type rig, furler and headstay, inner cutter sail, spi in sock, red canvas dodger/awning. 200W solar, 400AH batt, inverter, hot showers, microwave, fridge, AP, cabin heater, Corian counters. 15-hp OB in lazarette. Rockland, ME. $16,000.

DT Lewis
603-669-7937
dtlewistrilogy@gmail.com

Boats for Sale: cont.

Chris-Craft 35
1964. Sail a classic! Well maintained Olin Stephens-designed fiberglass center-cockpit sloop built by Chris-Craft in Algonac, MI. One of only 62 built. LOA 35', draft 4.5'. 60-hp diesel, 100 gal fuel and water. Full electronics suite including AIS, radar, autopilot new in '16. Jamestown, RI. $24,500.
Tom Gonsiorowski
617-877-3276
tgonsio@comcast.net

Ericson 32
1970. Ready to sail and in good cond. 24-hp Universal model 5424, solar panels (2 x 90W), Lewmar 700 elec. windlass, Raymarine ST40 Bidata. Waeco fridge, 2-burner alcohol stove. Interior redone, full enclosure with new cushions. Email for more information or pictures. On the hard at Iroquois Marine, Ontario. $15,000 US or $19,500 CAD.
Yves Asselin
819-770-3910
yasselin43@gmail.com

Rhodes Custom 43
1967. CB yawl, custom design, launched 1976. Beam 12', draft 4.5'/8', 65-hp Volvo diesel (low hours). Spare set of rigging, RF headsail, 4 sails. Annapolis, MD. $35,000.
Barry Gruber
gruberbarry2@gmail.com

Products - Electrical

Products - General

Sails/Canvas

Boat Deliveries

Restoration

Services

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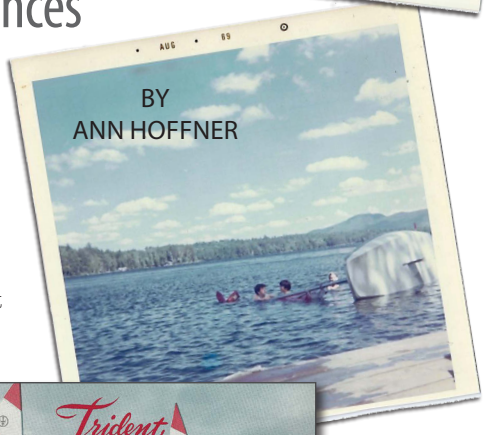
Books & Videos

Rediscovering a Childhood Inspiration

Sailing an obscure board boat had big-boat consequences



When writer Nathaniel Philbrick felt stranded in mid-life, he dug out the hull of his old Sunfish, the boat on which he won the North American championship 15 years earlier, and embarked on an odyssey that took him across most of the ponds of Nantucket.

At the same age, I responded to wanderlust by going cruising on a big boat. But my humble sailing beginnings were as a small-boat sailor, and Philbrick's story, told in his memoir, *Second Wind*, sent me on an odyssey of memory.

My time spent at the Eagle Island Girl Scout Camp on Saranac Lake in upstate New York looms large in my formative sailing years. The Girl Scouts did such a good job enticing me to sail that by the age of 12 I was seriously hooked on boats. When I was still too young to sail the Blue Jays alone, I'd volunteer to scrape dry rot out of their wooden hulls just so I could spend time in them on their moorings.

The Eagle Island fleet also included knock-around board sailboats that I could take out on my own. These craft represented freedom. While our camp counselors sat on the dock, we campers would mess around on the board boats in packs, spreading our sailing wings.

The wind could really blow on Saranac, so we used the boats to learn skills like capsize procedures; on hot days we'd slip off the overturning boat like frogs, shove foam cushions under the masthead and gather up the sail and boom, giggling and hanging our puny weight on the centerboard to right the boat.

In a moment of nostalgia, I tried to remember the make of those board boats, but couldn't. I unearthed an old album with fading snapshots from my camp days. Some of them showed the boats, but no identifiable markings were visible. I did notice they had a distinct blunt bow with a concave underbody, almost like a catamaran. Searching online, I found the "Board Boat Shorty Pen Sailboat Guide," which lists dozens of board boats, and matched the blunt catamaran bow and "wing sprit Marconi rig" with something called a Trident. There were a few grainy pictures of the Trident hull, sketchy dimensions, and a listed manufacturing run in the late 1950s.

My further research followed a bunch of twisted paths before I found in *Popular Boating* magazine a Trident advertisement and a reference to a fleet of Tridents at Cape Cod Sailing Center in the 1960s. I might not have found anything except that the Trident occupied a unique turning point in boat design and construction.

The Trident's designer, Dick Fisher, went into business with Merriman Brothers, longtime makers of yacht hardware (hence the trident symbol on the sail) to produce the boat. Whereas Alcort's Sunfish and Sailfish were wooden, Fisher used a new product, polyurethane foam, and treated it as a synthetic balsa that could be sandwiched between layers of laminate and gelcoat to make a lightweight boat that was also strong and rigid. By then, Alcort had filled the niche market for board boats, and Fisher soon moved on, using his new production concept to help create the Boston Whaler.

Tridents were phased out of Eagle Island Girl Scout Camp's fleet not long after I aged out of camp. I imagine at least several are still around, moldering in garages or under backyard tarps. As a hull sailor, I harbor a lingering distrust of board boats, but I think I've rekindled a childhood fondness for the unconventional Trident.

Ann Hoffner and her husband, photographer Tom Bailey, spent 10 years cruising on their Peterson 44, Oddly Enough. *They sold the boat in Borneo, returned to the US, and bought a Cape Dory 25 in Maine. Ann is a longtime contributor to sailing magazines, most often writing articles about weather events on passage and places she's been.*

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