



Photos courtesy Mahina Expeditions

# Staying Shipshape

## Maintaining and refitting a coastal or offshore cruising boat

By John Neal

Since 1974, I've spent the majority of my life living on and maintaining a series of cruising boats. My first love was an Albin Vega 27—a simple and affordable boat due to its size. After four years and 17,000 miles, I moved up to a Hallberg-Rassy Monsun 31, which I sailed 11 years and 44,000 miles, eventually selling it in Australia. My third love was a 1983 Hallberg-Rassy 42, on which I led sail-training expeditions for seven years, logging

70,000 miles throughout the South Pacific, Patagonia, Cape Horn and Antarctica.

In 1997, Amanda Swan Neal and I ordered *Mahina Tiare III*, a Hallberg-Rassy 46 designed by German Frers and built in Sweden. We've now sailed *MT* 145,000 miles, using her as a platform to conduct sail-training expeditions, including two 50,000-mile round trips from New Zealand to Spitsbergen, above Russia and Norway. As I write this, we are mid-passage between Fiji and Vanu-

atu. We will end our 21st expedition season in New Zealand, leaving *MT* hauled out in a secure boatyard snugly protected by her full boat cover while we return to our winter job of conducting cruising seminars and speaking at boat shows.

I'm consulting daily with clients worldwide, and depending on the age and condition of the yacht they're considering, they may spend as much on repairs and refitting as the purchase price. A vigilant check of all systems and components is essential, but doing your homework first and having an understanding of what needs upgrading or servicing can save you hours and dollars.

### SAILS

If your plans are for local or short-distance coastal cruising, consider having a sailmaker assess the condition of your sails, making repairs where needed. If you are planning ocean passages, you need to take a close look at how much life is left

in the sails; it may be prudent to replace them before departure. You must have the confidence that your mainsail isn't going to blow out the first time winds reach 35 knots.

If your furling genoa is larger than 135%, it may be too big for the average ocean wind speed. For tradewind ocean passages, a smaller, flatter sail with added foam luff padding strips to maintain shape once furled will be more versatile. Instead of ordering a new sail, it might be cost effective to have a larger sail recut smaller, with luff padding added. For UV covering on the foot and partial leech up from the clew, we have found that Top Gun fabric—a high count woven polyester duck—makes a sturdier UV covering than the acrylic fabric frequently used.

If possible, set up your mainsail with three permanently-rigged reef points. If you have a furling main and are planning extensive ocean voyaging, a storm trysail is an excellent heavy weather option. Carry spare battens and ask your sailmaker or Sailrite Kits ([www.sailrite.com](http://www.sailrite.com)) to assemble a sail repair kit that will include at least one square yard of fabric for each weight of sail plus sail repair thread, seam stick, sticky-back Dacron and spinnaker repair tape. If you like self-sufficiency, take a sail repair seminar and invest in a Sailrite Kits Ultrafeed LSZ-1 sewing machine. You can easily cover the cost of the machine by making an awning, covers and lee cloths. If you don't have a sewing machine, at least carry V-92 sail thread for repairs as you may find someone ashore with a zigzag machine, though not the appropriate UV-treated thread.

At sea, plan on checking your sails daily, paying attention to attachments, chafe at the seams and wear at the batten pockets, especially if you're sailing downwind. We have found that covering all seams that

contact the shrouds with sewn-on spinnaker repair tape has eliminated a common repair. Keep your mainsail covered whenever it's not hoisted to prolong its life. We consistently get 40,000 to 70,000 miles out of a suit of specially designed offshore sails from Port Townsend Sails ([www.porttownsendsails.com](http://www.porttownsendsails.com)).

If ocean voyaging is on your agenda, you will need at least one dedicated storm sail for when winds are above 40-45 knots; a storm jib or staysail to replace the furling genoa; and/or a trysail to replace the main. If you don't have a removable cutter or Solent stay for hoisting the storm sail, a passable option is the ATN Gale Sail ([www.atninc.com](http://www.atninc.com)), which utilizes a sleeve wrapped around a furled genoa.

## RIG

If you have offshore insurance, check the rigging replacement clause as many policies specify replacing standard rigging every 10 years. This is a prudent idea. In any case, if you haven't pulled your mast within six years and/or you're not familiar with

it, plan on having it removed in a boatyard and hire a rigger to look for stress fractures or cracks. Pay particular attention to the gooseneck and vang fittings as they take a tremendous amount of loading offshore and failure really impacts your ability to sail. Have the rigger help set up the mast tune when you re-step the rig.

It's an excellent idea to go aloft for a rig inspection before each major offshore passage. In 10 minutes, you'll be able to check each fitting,



sheaves, the masthead, furling swivel and lights. At sea, we make a deck-level rig inspection every morning and afternoon—checking cotter pins and split rings, furling drum, gooseneck, vang and backstay. In addition, we sight up the mainsail track, checking that the mast is in column and not flexing too much.

You may think that heavy weather puts the most stress on rigging, but we actually experience more wear and tear in light winds with crossed or confused seas due to sails slatting as the boat rolls.

For your running rigging, UV damage aside, particularly on colored lines, you should achieve 20,000 miles or nearly one circumnavigation including halyards and reef lines, and 30,000 miles out of main and genoa sheets. Be careful to avoid chafe.

## FURLER

Exposed to saltwater spray and dunking, and subjected to loading in many directions, furling units don't last forever as bearings can corrode or flatten. With many units, the forestay terminates inside the furler drum with a mechanical terminal fitting that includes a tapered stainless cone inserted into the forestay wire. The cone fitting is subject to crevice corrosion, so part of your rig check should be disassembling the drum and checking that the cone is intact. If your furler instructions call for annual lubrication, don't skip it, and remember to service the upper swivel.

## WINCHES

Maintain winches once a year or more often if your vessel is exposed to airborne dust or sand. Disassemble and clean components with diesel fuel to remove old grease and dirt. Grease the bearings and components with manufacturer-recommended waterproof grease



and oil the pawls with light oil. A professional rigger generally charges an hour's labor per winch.

## RUDDER

"Out of sight, out of mind" is often a sailor's attitude to the rudder and steering gear, but the only way to check the rudder stock for crevice corrosion is by dropping the rudder. With the boat hauled out, it's easy to check for excessive bearing wear by firmly grasping the bottom of the rudder and trying to rock it side to side and fore and aft. If it "clunks," you probably need to replace rudder bearings.

With traditional chain, cable and quadrant steering systems, check the cable closely for fraying or "meat hooks," as this is often a warning of chafe or simply wear and it may be

time to replace the wire. Add checking and lubricating turning blocks to your regular maintenance routine.

## ENGINE

If you can find a hands-on diesel maintenance and repair seminar, take it. Be meticulous about recording all maintenance, repairs and engine hours in an engine log. The goal is to establish the lifespan of components like water pump impellers and fresh water circulation pumps—this will remind you to replace them before they wear out, potentially causing additional problems. Keep the engine clean, and if possible, position OilSorb pads beneath the engine to assist you in spotting leaks.

Always check engine and transmission oil levels before starting the engine and try to look in on the engine every couple of hours when it's running. Check for coolant, oil, fuel or transmission leaks and look out for belt flutter. Note the charging rate of the batteries. After every long passage, I spend time in the engine room cleaning, checking belt and bolt tightness, and looking for leaks or problems.

Ensure that you have the knowledge and experience to change the raw water pump and impeller, oil and filters, fuel filters, belts and alternator(s). Annually, check all cooling and exhaust hoses for soft spots, chafe, bulging or cracking.

Installing a 12-volt oil change pump makes this necessary job

easier. Don't push the manufacturer's specified intervals for oil and filter changes; if 100 hours is the recommendation, do it then. If our engine hours are reasonably close to an oil change before the start of a long passage, I will always do it at anchor or in port, which is easier than at sea.

At the start of each cruising season, I hire a diesel mechanic to assist me in adjusting the valves and checking engine alignment. We have had 11,000 trouble-free hours of use out of our current engine and plan on rebuilding it in a few years at 15,000 hours.

Spare engine parts are expensive, but may save time scurrying about in search of components and/or waits in foreign ports for parts to arrive. One engine manufacturer is known for no longer supporting discontinued engines with spare parts; instead, their dealers encourage customers to buy a new engine. Spares aboard should include owner's, workshop and parts manuals; spare raw and possibly fresh water pumps; four raw water pump impellers; thermostat; water pump seal kit; fuel lift pump diaphragm; belts; oil, transmission and air filters; shaft seal or packing; zincs; OilSorb pads; and fuel biocide such as Biobor or Star Brite. Carrying identical replacement alternators and voltage regulators is an excellent idea, as it's generally more efficient to switch out failed units, having them repaired later when parts and service are available.

If you are really paranoid, carry a spare starter and solenoid.

Consider repowering or rebuilding if your engine is 20+ years old and your plans include extensive foreign cruising. An engine survey including compression test and oil analysis may help you decide whether or not to rebuild or repower. If you don't



repower, plan on servicing the injectors, replacing the engine mounts, and having the heat exchanger, transmission and oil cooler cleaned and tested. With smaller Yanmars, the exhaust elbow often needs to be removed and de-carboned.

### TANKS

With any tank, remove the inspection port (add one if there isn't one already) and check the bottom of the tank. It is normal to find black, tar-like residue in the bottom of fuel tanks and oxidation goo in the bottom of aluminum water tanks. If possible, install a fuel sump hose to the lowest corner of your fuel tank with a manual or electric fuel sump pump. Ten minutes after filling the tank, pump out whatever debris collects in the bottom to ensure your

tank and filter remain clean. Whenever we fill our tanks with questionable fuel, we use the small, portable West Marine Fuel Filter Funnel, which does an excellent job.

Unless your tanks are stainless, there is a good chance they will have to be replaced—frequently a difficult and expensive job. On older Taiwan-built boats with “black iron” steel fuel tanks, it's only a matter of time before they will develop leaks. Aluminum fuel or water tanks more than 20 years old are also prone to developing pinhole leaks, particularly if exposed to salt-water splashes (when installed above the bilge) or drips (if located below the shaft seal).

### PLUMBING

Head discharge hoses generally become permeated and smelly after three to five years. If smell isn't a problem, scale buildup on the inside of discharge hoses frequently is. Freshwater supply hoses often need to be replaced after six to eight years to keep drinking water tasting good. If your boat doesn't have a permanent domestic water filter, by all means install one. This can be something as simple as a Shurflo filter housing with a widely-available replaceable cartridge or the more sophisticated Seagull filter that comes with its own dedicated tap. If your boat has a pressurized freshwater system and you have space, consider carrying a spare electric pump.

According to a recent survey,



more boats sink from failed thru-hull fittings than any other cause, so it's prudent to check and generally replace thru-hulls every 10 years, particularly those for head and galley sink discharge and engine intake. Note that thru-hull fitting failure can be earlier than 10 years if a boat is in a "hot" (electrically) marina. Last week when I turned off the engine room raw water manifold intake ball valve so I could clean the raw water strainer basket, the handle snapped off in my hand. Five months ago I meant to replace the thru-hull and ball valve before relaunching *MT* in New Zealand, but I ran out of time. In order to save weight on the boat, I stored the fitting in a friend's basement, but fortunately it was easy to find a replacement in a store at Denarau Marina, Fiji.

Installing a watermaker really changes your style of cruising. Solely relying on onboard tank water can be a drag, particularly in areas where shore water is difficult to obtain, expensive or polluted. In speaking with watermaker repair technicians in Tahiti and Fiji this season, I was surprised at the high percentage of

yachts whose watermakers had stopped working and were stuck in port waiting on replacement parts. Two owners of expensive large yachts said they were replacing their single large watermakers with two identical smaller units

for redundancy. We've had 13 years of good service from the simplest of all watermakers—a 12-volt Katadyn PowerSurvivor 160 GPD unit. But we only run it offshore in clean water and pickle it after not running it for three days in the tropics or seven days in temperate climates.

## BILGE PUMPS

Three times a year, fill the bilge with fresh water to test bilge pumps and alarms. Two—ideally, three—bilge pump systems and alarms are essential. The first bilge pump should be a manual pump, easily accessible. The second, a de-watering sump pump of moderate capacity. The third, if space permits, the highest possible capacity submersible pump located above the sump pump. Install an audio alarm on the high capacity pump and a second independent high water bilge alarm.

## ELECTRICAL SYSTEM

Most electrical systems will need upgrading before taking even a coastal cruise. When there is no longer a place to plug into shore power, you'll have to plan on increasing battery storage and electrical generating

capacity. Install a digital battery-monitoring device to help you monitor power consumption, charging output and battery voltage. Look for ways to reduce consumption—use LED or compact fluorescent bulbs and add insulation to existing refrigerator and freezer boxes.

The most cost-effective way of upgrading your electrical system is to install the largest possible high output alternators and increase battery storage capacity. Frequently, this involves adding an additional double pulley on the front of the engine so there will be two matching dedicated belts driving a high output alternator. If you try to use the same single belt that currently drives a smaller alternator and the fresh water circ pump, you may quickly burn out the bearings and seals on the circ pump, as well as the high output alternator if the single belt slips. Generally the cables from the alternators to batteries and electrical panel will need to be upgraded at the same time. Nigel Calder's *Boatowner's Electrical and Mechanical Handbook* will be a good resource for correctly sizing the cables and installing fuses or breakers for this job.

Unless your current batteries are less than two years old, consider replacing them before an extended cruise. Be cautious about choosing unusual sized batteries as they may be impossible to find once you are cruising in foreign waters. Choosing standard, worldwide battery sizes such as Group 27, 31, 4D and 8D is the best option. If you are careful to use only the top 50% of the battery capacity, you should get three to five years of service life from most quality gel or AGM batteries. Traditional flooded lead-acid batteries give off highly corrosive gas when charging, need topping up and produce dangerous chlorine gas if flooded with seawater. We find that in many

harbors around the world, shore power is now available, frequently at no charge. Fully charging batteries greatly extends their life. Solar, wind and towing generators are also valuable options that can lead to energy independence, depending on your style of cruising.

## ELECTRONICS

Frequently, new electronics don't "talk" to older components even if they are from the same manufacturer. I'm not sure if this is planned obsolescence by the manufacturer, but it often means replacing an aging radar with a new radar-chart-plotter capable of supporting an important (for collision avoidance) AIS transceiver. The plus side to this equation is that the new electronics frequently use less power and are far more versatile. Review the energy consumption of any electrical device before purchasing.

## HULL

If you have a fiberglass boat, an epoxy barrier coat like International Interprotect 2000 or 3000 applied over a clean, dry hull will prevent water absorption into the laminate. If your boat has a buildup of bottom paint that occasionally flakes off in places, it is probably time for a yucky job—scraping the old paint down and starting over. After many years of having good service with Pettit Trinidad (a semi-hard high copper anti-foul paint), I was forced to switch to a different brand this year as Pettit is no longer distributed in New Zealand. After researching and emailing paint reps in Australia and a boatyard owner/cruiser, I ended up with International Micron 66 ablative paint. After five months and 6,000 miles in the South Pacific, results have been excellent with almost no sponging required and no grass attaching.

To maintain the topsides, we have the fiberglass compounded during our annual boatyard visit. We then wax it by hand with Collinite #885 Fleetwax paste wax. This wax is always at the top of *Practical Sailor's* tests and I've found it will last three months in the tropics. I've kept the cabin sides waxed by hand every couple months. This only takes half an hour and keeps oxidation from occurring. Collinite #920 Liquid Fiberglass Boat Cleaner is used on smudges and stains. On an older boat with a porous gel coat, an LPU paint job is frequently the only solution that will achieve the "shiny boat" look. Amanda cleans the plastic dorades with acetone.

## ANCHORS, WINDLASS AND CHAIN

Most windlasses are not sized for 150- to 250-foot all chain rodes and storm size anchors, so it isn't unusual for them to break down. It is often a good idea to upgrade an undersized windlass before departing on an extended offshore cruise. Chain can last for many years until it comes in contact with coral, which can quickly abrade the galvanizing,



thus allowing the chain to start rusting. It may be difficult to find a galvanizing shop that can handle chain. If replacing chain, carefully check the country of origin as Chinese chain has a very poor reputation. ~

*John Neal sailed to the South Pacific in 1974 at age 22 on a 27-foot sloop, wrote the bestseller Log of Mahina and has logged 284,000 miles. Since 1976, John's passion has been sharing his knowledge of ocean cruising. He has conducted 142 sail-training expeditions in the South Pacific, Patagonia, Antarctica, Atlantic, Scandinavia and the Arctic aboard Mahina Tiare II & III.*



Mahina Tiare III