

Good boat keeping start by developing a maintenance mindset, a willingness to go looking for trouble and see things that are not quite right in order to uncover and correct problems before they become serious. This can be divided daily, monthly, quarterly and annual checks.

You need to be able to maintain the yacht as you go on an ocean voyage. The constant motion on board will mean that things wear out much quicker than you're used to due to small movements that add up to cause damage if not noticed.

Daily proactive maintenance (inspection & remediation)

System	Look / Listen for	To fix it
Hull	Water in bilge, if so check if this is salt or fresh water	Inspect stuffing box, hawsepipe plug, seacocks, hose connections to locate and correct the problem
	Water anywhere else down below	Inspect hatches, ports, and other likely sources
	Encrusted decks and brightwork	Clean with fresh water as often as practical
	Damp, moldy-smelling lockers	Ventilate as needed
Running rigging	Chafe of running rigging	Find and eliminate source of chafe or replace line if needed. Make sure no lines are wrapped up the mast (e.g. halyard wrapped around the stay)
	Loose shackle pin	Tighten or wire-tie closed
	Squeaky blocks / sheaves	Lubricate with soapy water or dry lubricant
	Control line inside jib furling drum twisted	Unfurl and furl the jib. If stuck, drop the jib "traditionally" and fix the line
Standing rigging	Bent or damaged cotter or clevis pins	Find and fix cause; replace pin if needed
	Cracks in welds around gooseneck or vang	Reduce load on any fitting showing cracks and mark crack ends to see if they are growing
	Loose stay	Inspect stay and chainplate; fix if possible; reinforce with halyard
	Jib furling drum not turning smoothly	Lubricate with soapy water or dry lubricant
	Mainsail not working smooth in the mast track	Lubricate with soapy water
	Mast not straight when standing at the foot and looking upwards	Tune the standing rigging
	Fracture / fatigue around fittings	Replace broken fittings and tune the rig
Sails	Chafe on any sail	Repair damaged area and cover with chafe patch: find and eliminate source of chafe
	Broken or loose battens	Replace batten, repair sail, reinforce stitching and chafe protection on batten pocket
Steering	Autopilot squeaking / groaning	Inspect for leaking fluid; top up fluid and rebuild autopilot at first opportunity
	Rudder bearings squeaking / groaning	Inspect for damage; if none, lubricate

	Any other unusual steering noises	Locate and eliminate source
Safety and communication gear	Loose or damaged jackstays / lifelines	Tighten and repair
	Chafed, stretched, or frayed jackstays	Replace jackstays
	Anchor tie loose or chafed	Tighten or replace tie lines
	Guardrails loose	Tighten if possible
	Safety equipment in place (horse shoe, life ring etc.)	Tighten or replace tie lines
	VHF/MF/HF radios cannot be turned on or display is not working	Check battery voltage and charge as required, check cables behind the panel
	DSC equipment test without radiation failed, i.e. internal loop test	Service or replace the radio
	DSC test call to a Coast Station on MF failed when station in range (weekly)	Verify with your portable unit; check batteries are charged; visual check of aerial system for signs of corrosion or damage
Engine	Low fluid levels	Top up fluids; inspect for leaks
	Hard starting	Check is starting battery is charged enough; inspect Racor filter for water; check starter motor
	High engine temperature	Check that water is coming out of exhaust; check seawater intake for clogs and clear; check and tighten fan belt; change impeller; check coolant level; inspect if no debris fouled propeller
Plumbing	“Rotten egg” odor in head	Clean out head with marine cleaner or baking soda solution; remove hoses and clean or replace at first opportunity
	Leaking head pump	Replace stuffing; rebuild pump
	Pressure pump running	Check if there is enough water in the tanks look for loose hose clamps; rebuild / replace accumulator; rebuild pump
	LPG gas smell in the bilge	Inspect all gas hoses, connections and cooker
Electrical	Poor charging of batteries	Inspect and tighten alternator belt; inspect battery terminals for corrosion or loose connections and clean thoroughly; check regulator function
	Burned-out bulbs	Replace bulbs
	Intermittent electrical problems in fixtures or equipment	Inspect wiring for corrosion or loose connections

Engine and Generator preventive maintenance schedule

Engine hours	Look / Listen for
Every 50 hours or monthly whichever comes first	Tighten/check belts and check pulleys
	Clean raw-water strainer
	Check electrical connections and terminals for corrosion and fray
	Check antisiphon loops and make sure vents are clean of salt and debris
	Drain fuel/water separator (Racor filter)
Every 100 hours or 6 months whichever comes first	Check electrolyte level in the battery
	Check all hoses and tighten hose clamps
Every 250 hours or 1 year whichever comes first	Clean air filter
	Change oil and oil filter (including oil filter on turbocharger)
	Change fuel filters
	Change transmission oil (engine only)
	Check or replace cooling-water impeller
	Replace cooling-system anode
	Touch up paint
	Clean intake silencer (air cleaner) element and exhaust/water mixing elbow
Sails Every 500 hours or 2 years whichever comes first	Tighten all major nuts and bolts
	Drain water and sediment from fuel tank
	Check engine alignment and replace engine bolts if necessary (engine only)
	Replace coolant system hoses if they show signs of softening or cracking
	Replace raw-water injection elbow on the exhaust if it shows signs of corrosion
Every 1000 hours or 4 years whichever comes first	Repack stuffing box (engine only)
	Replace rubberized hoses (fuel and water) every 2 years
	Replace the seawater pump impeller
	Replace alternator V belts
	Adjust intake/exhaust valve clearance
	Adjust propeller shaft alignment

Preventive maintenance schedules

System	Monthly	Quarterly	Annually	Every 5 years or as needed
Hull	Inspect zincs, prop, through-hulls, and bottom paint	Inspect and rebed deck fittings on a regular rotation	Polish and wax hull	Replace hull zincs
	Use mild liquid abrasive to polish stainless	Inspect prop for corrosion; replace prop zinc as needed	Paint folding prop	Varnish cabin sole and interior teak
	Touch up any exterior varnish		Clean and grease winches	Clean fuel tanks
			Inspect rudder	
			Inspect keel bolts	
			Inspect and service through-hulls and rebed if necessary	
			Inspect propeller to make sure it runs freely, replace zinc if needed	
Ground tackle			End-for-end chain and rope inspection	Re-galvanize anchors and chain
			Service windlass	
			Replace marks on chain and rode	
Rigging		Check rig fittings, welds and terminal ends	Complete mast and rig inspection, retune rig	Unstep the mast for full inspection. Replace corroded wiring, fix any cracked terminals
		Clean and lubricate mast track	Clean foil on furler with lots of fresh water to stop salt and dirt deposits building up inside	Remove mast base, inspect mast partners, clean and reseal mast base
			Inspect every halyard and sheet over its entire length for wear and chafe	Replace the entire rig every 10 years or every 40,000 miles whatever comes first
			Inspected swivel, furler drum, and joins, screws and rivets on foil	
Sails		Inspect every sail for chafe and pulled		Replace sail covers

		stitches; repair as needed		
		Fix any chafe on sail covers		
Plumbing		Inspect, open and close all seacocks to be sure they are not frozen	Inspect all through-hull above and below waterline; polish and lubricate as needed	Steam-clean water tanks
		Inspect all hose clamps; replace or lubricate as needed	Check head and hand/foot pumps, electric pumps for bilge, fresh water, and deck wash	
Steering and self-steering	Inspect wind vane	Tighten wind vane control lines	Inspect rudder bearings for leaking, binding	Repack or replace rudder bearings
	Tighten bolts	Inspect steering and lubricate if needed	Inspect steering system and replace any worn wire rope, sheaves, or other components	
		Inspect below-deck autopilot and top-up oil if needed		
Electrical	Check battery fluid (flooded batteries only)	Equalize flooded batteries and make a battery drop test individually		
	Clean battery terminals and make sure they are tight and can't be moved around	Check all navigation and deck lightbulbs and connections		
	Check all major charging system connections, terminals and bus bars (eg. alternator, starter motor) for fray corrosion or loose wires	Check condition of electrical cabling coming down from the mast into the boat for sign of deterioration or fractures		
	Rinse anchor windlass with fresh, clean water	Check condition of alternator and starter motor terminals for fray and corrosion		

Refrigeration / air-conditioning		Check belt tension and alignment on belt-driven compressor	Inspect brushes and commutator in DC motor	Replace brushes
		Clean air filters on AC unit	Top up refrigerant in compressor	
			If condenser uses seawater, flush with muriatic acid in the tropics, replace zinc anode	
Watermaker	Clean raw-water strainer	Clean / replace prefilters and charcoal filter as necessary	Clean membrane	Replace membrane
			Change oil on high-pressure pump (oil-filled crankcase type only)	Rebuild high-pressure pump
Propane	Leak test on all connections every time you change the bottle. Use soapy water or commercial leak spray or detector.	Check all connections. All copper piping should be well supported by brackets every 150-300mm.	Clean connections and refit if needed aluminum tape	Soft LPG hoses should be replaced every seven years or as instructed
Safety and communication gear	Test EPIRB, PLBs and SART using build in procedure	Check EPIRB, PLBs and SART batteries	Have life raft inspected and serviced	Replace battery in: EPIRB, PLBs, MOB AIS equipment
	Navtex internal test (done automatically when started)	Replace materials in ditch kit and make sure everything works properly	Have fire extinguishers serviced	Replace cartridges on self-inflating life vests
	Distress Alert Test on Sat-C, life tests of SART	Visual check of aerial	Inspect jackstays and replace if frayed or worn, or if made from non-UV resistant webbing	
	Visual inspection of EPIRB, SART and HH VHF (Ch 15/17), batteries in date	Performance Verification (PV) Test on Sat-C	Check first aid kit and make any necessary updates or replacements	
Dinghy and outboard	Clean dinghy of sand, barnacles and dirt	Inspect dinghy painter for chafe	Replace dinghy painter	
			Service outboard	

Hand tools for the self-sufficient voyager

Tool	Description / Type
Screwdrivers	Small and medium, small jewelry, large Philips-head
Spanners (wrenches)	different sizes, adjustable, torque, socked
Monkey (pipe) wrench	
Filter wrench	For the oil filter on the engine
Pliers	Needle-nose, wire cutters, slip-joint
Mole grips	Locking pliers or vice grips
Allen keys (hex wrenches)	Metric and imperial
Pain and polish tools	Putty knife, paintbrushes of various sizes, scrapers, brass brush, stainless steel wire brush
Metal files	Set of metal files (flat, half-round, round)
Hammer and mallet	Small and medium, rubber mallet, pry bar
Tapes	Various types, e.g. electric, 3-M
Digital multimeter	
Acid tester	For cell flooded batteries
Cables to jump-start a boat	Also useful for making a battery bridge
Sharp knives	Rigging knife or Leatherman
Hacksaw	With fine grade spare bi-metal blades
Angle grinder or hydraulic cutter	Very effective in cutting wire but expensive
Spanners	
Sawing threads and sailmaker's palm	
Vacuum cleaner	Small 12V wet-dry, handheld
Grease and caulk gun	
Small hand or drill-driven siphon pumps	For draining oil
Soldering iron	
Fids for splicing lines	
Metalwork tools	
Lever	Something that can be used as a lever to tighten V-belt on engine
Box of open wrench	Large enough to service though-hulls
Extensions	Long enough for hard-to-teach engine bolts
Rivet gun and rivets	
Gas lighters	To seal cut-off twine or rope
Strip and crimping tools	
Soldering iron and solder	
Pair of scissors	Repairing sails, splicing lines

Tools should be specific to the equipment on board so the number you have carry is reduced.

Spares and maintenance supplies for the self-sufficient voyager

System	Recommended spares	Supplies	Other
Engine	Several oil and fuel filters sufficient for five services	Enough engine oil for three oil changes	Empty container to drain the old oil into
	Cooling-water pump impeller and rebuild kit with bearings and seals. Ideally, a complete spare raw water pump	Enough transmission oil for one oil change	Engine cooling hose
	Starter solenoid	Engine coolant	High pressure fuel line
	Several belts of each type		Gasket material and gasket solenoid
	Full manufacturer's replacement gasket set		Sealants
	Regulator		
	Thermostat and gasket		
	Alternator bearings. Ideally, a complete spare alternator		
	Brushes and diodes		
	Starter motor bearings and brushes. Ideally, a complete spare starter motor – reconditioned or new		
	Set of injectors		
	Diaphragm for lift pump		
	Cutless bearing		
	Stern gland packing and grease		
Hull	Spare zinc anodes for hull, prop and engine	White gelcoat and hardener	Fiberglass rubbing compound
	Winch repair / rebuild kits	Gelcoat color additive if needed	Fiberglass polish and wax
	Winch pawl and springs (min 6)	Fiberglass cloth, mat, and disposable brushes	Plastic brushes for use with an electric drill
		Epoxy putty and filler	
		Underwater epoxy	
Rig	Assorted shackles and blocks	Teflon spray	Several snatch blocks
	Spare block and tackle that can be used as a vang	Water dispersing spray	Small diameter messenger/mousing line twice the height of the mast
	Spare low stretch line (Spectra or Vectran) - long enough to replace longest stay	Whipping twine and vinyl rope dip	
	Same sized wire as your shrouds – equal to the length of longest stay		Extra 1m length of wire

			Corresponding bulldog clips / cable clamps
	Spare halyard and set of sheets	Cotter and clevis pins	
	Spare turnbuckles and swageless terminals (Norseman or Sta-Lok)	At least, one but preferably three Norseman fittings	T-terminal (or equivalent)
	Hose clamps	Larger-diameter high-quality	Duct tape, ratchet straps
	Bottle screws		
	Mast slides		
	Splicing fids		
Sails	Two spare battens of longest length	Sail tape, seam tape	Sailmaker's palm and needles, seam ripper, 96% alcohol (ethanol), double sided tape, 3M 5200 Sikaflex
	Spare hands and slides or two spare batten cars and hardware	Sail twine, plain and waxed	
	Webbing of various weights	Heavy-duty thread	Pair of scissors
	Sticky back sailcloth	Many heavy-duty needles	Leather punch or spike
Furling gear	Handles for manual back-up to electric furlers		
Steering and self-steering	Steering cables with appropriate size and length	Hydraulic fluid for auto-pilot	Emergency tiller Clamps
	Spare wind vane wind blade and control lines		Spare for mounting a jury rudder
	Spare wind vane crash tube and oar		
	Spare kit for electric autopilot (belt, shear, pins, or sealed motor for wheel-mounted pilot)		Complete spare autopilot or tiller pilot
Plumbing	Rebuild kits for all pumps and the head including diaphragms and impellers for manual and electric pumps	Teflon tape or plumber's tape	Spare hoses of various sizes Valves and seals
	Float switch for electric bilge pump	Stainless hose clamps of all sizes	Assortment of hose and pipe fittings
	Spare bilge and head pumps		
	Spare handle for manual bilge pump		
Electrical	Bulb of all types for interior and navigational lights	Assorted crimp-on terminals	Assortment of fuses
	Flashlight bulbs	Coaxial end fittings and connections	Wire ties of various sizes

	Batteries of all types	Insulating electrician's tape	Multistrand tinned wire of various sizes
		Heat-shrink tape and tubing	
		Vaseline and anticorrosive	
Refrigeration / air-conditioning	Spare electrical control panel for refrigerator	Gauges, refrigerant and recharge kit	
	Spare drive belts	Pencil zincs for condenser	
Watermaker	O-ring seals	2-3 prefilters	
	Rebuild kit for high-pressure pump	2-3 charcoal filters if necessary	Pickling chemicals for preserving for longer period of no use
	Low-pressure pump	Pressure pump oil	
Other	Light household oil	Box of wooden tongue depressors	
	Screws, bolts, nuts and washers		
	Burners and jets for cooker		
	VHF aerial		
	Selection of marine grade electrical wire		
	Lengths of hose and clamps		
	Lines and webbing		
	Pieces of marine plywood – large enough to cover largest hatch or window		
	Loctite and never-seize products	Box of surgical gloves	
	Teak oil, varnish, paint	Monel seizing wire	
	Lubricating sprays	Wet and dry sandpapers	
	Lithium grease	Assortment of stainless bolts, locking nuts, and screws	
	Silicone-based sealants		
	Duralac or Teflon spray to prevent galvanic corrosion		
	Silicon or Teflon spray for mainsail sliders and other uses to prevent resistance		
Solvents including acetone, alcohol and mineral spirits	Assorted small pieces of teak, stainless, and aluminum		

	Variety of bedding compounds	2-3 large medical syringes	
	Superglue, rubber cement, wood glue	Duct tape, masking tape, aluminum tape	
	Propylene glycol antifreeze or coolant if there is fresh-water cooling	Shock cord in several sizes	
	Anti-rust paint		
	Anti-foul paint		
	Gas connectors and safety regulators (e.g. <u>GasBOAT</u> kit)		

Source: *The Voyager's Handbook*, Beth A. Leonard