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MANAGING MAINTENANCE

Would You Fly With An Airline If You Knew It Didn't Have A Preventive Maintenance Program?

By Sue Canfield and Quent Kinderman

Although we all recognize the role preventive maintenance plays in the safe operation of aircraft, ships, trains, and cars, few of us follow a comprehensive program of preventive maintenance for our own boats. Yes, most of us do change engine oil, filters and zincs. We scrub and polish. We haul out, scrape and paint. But other than that, we mostly fix things when they break or fail to operate.

It's not really surprising. Unlike new cars, boats rarely come with a preventive maintenance program. Developing a comprehensive maintenance program for your boat isn't difficult, but it does require organization and some effort. The benefits of having one are significant: fewer breakdowns, less lost time, damage prevention, the avoidance of costly repairs, and higher resale value. In developing a maintenance management program, you will also learn a lot about your boat, its construction, systems and equipment. Your confidence when operating your boat will grow accordingly. It's a project most family members can contribute to, regardless of their initial knowledge level, and a good opportunity to learn new skills. And, last but not least, a well-documented maintenance program will add value when you eventually sell your boat.

The first maintenance management hurdle for most boat owners is getting organized. Recently, we offered to set up a maintenance management program for a friend in return for the use of his 47-foot pilothouse motor yacht as an example. Our approach, loosely based on the U.S. Navy's preventive maintenance program, is tailored to the needs of the recreational boat owner regardless of who actually does the maintenance: owners, a hired captain, boatyard personnel, or independent marine contractors.

Building a maintenance program takes time. Don't be discouraged by the complexity of your boat. Maintenance management is a continuing process that's best addressed in an organized way. We began by recording basic information about our friend's boat for future reference, e.g., make and model, hull identification number, dimensions, etc. Next, we decided on the basic organizational structure we wanted to use to categorize the boat's systems, equipment and structural components for maintenance purposes, e.g., hull, deck, steering, machinery, electrical, electronics, etc.

Starting on deck at the bow and working aft, we began to list the boat's equipment or components – everything that might need maintenance - under the appropriate category: navigation lights, spotlight, anchors and rode, windlass, etc. At the same time, we noted the equipment manufacturer, model, and serial numbers as applicable. This list will serve as our preventive maintenance Master Index. From this index we'll develop three other program management tools including Maintenance Index Pages (one for each individual system, piece of equipment, or structural component we want to manage), an annual Preventive Maintenance Schedule, and a Maintenance Guide for each task to be performed. Let's look at a specific example so you can see how our maintenance management program actually works.

Our boat is equipped with an Australian-built Muir model H1200 Cougar 12-volt reversing windlass. Fortunately, we found the manufacturer's instruction manual on board. The owner or dealer had done a good job of filing all the manuals in binders. We also visited Muir's website for additional information on windlasses and accessories. And we called Muir's U.S. distributor, Imtra, to obtain a copy of the Cougar manual in PDF format. Many marine manufacturers make their installation guides and owner's manuals

available online. This makes it possible to create a CD with your boat's equipment manuals for ready reference at home or onboard.

After reading Muir's installation instructions, we checked to ensure that our boat's installation complied, both mechanically and electrically. Next, we reviewed Muir's maintenance recommendations and created a Maintenance Index Page (MIP) for the windlass (Figure 1). The Cougar's gearbox is pre-oiled. It needs no further lubrication unless dismantled. We assigned each of the recommended windlass maintenance tasks a periodicity code (per the list at the bottom of the MIP) and an identifying number for scheduling purposes. Then we added these tasks to our annual Preventive Maintenance Schedule. It lists, by category, each piece of equipment or component and the preventive maintenance tasks to be accomplished in any given month. The Maintenance Guide we subsequently developed for cleaning and greasing the windlass' clutch cones appears as Figure 2.

Keep moving through your boat, adding equipment to your master index, reading owner's manuals, developing MIPS and maintenance guides, scheduling maintenance tasks, and ensuring that the scheduled work gets done. It may take several years to build a comprehensive program. But don't worry; half a preventive maintenance program is much better than none at all. If you were boat shopping and considering several boats, would you be more likely to buy the one that had a documented preventive maintenance program? Would you pay a premium for it?

About the authors: Sue Canfield is a marine surveyor in Annapolis, Maryland; she also teaches "Surveying Fiberglass Boats" at WoodenBoat School in Brooklin, Maine. Quent Kinderman is a serial boat owner with extensive experience in boat restoration and maintenance.

Figure 1 – The first two maintenance tasks listed (R-1 and A-1) are the windlass manufacturer’s recommended service. Task A-2 is based on the authors’ own boating and marine survey experience. A list of consumable spares is a useful addition where applicable.

Maintenance Index Page	Deck	Windlass
Reference: Muir H-1200 Cougar Installation Instructions Manual (H04)		
Periodicity	Maintenance Task	
R-1	After each excursion, rinse the windlass thoroughly with fresh water to keep salt deposits and galvanic corrosion to a minimum.	
A-1	Clean the clutch cones and reapply a thin film of waterproof grease to the surfaces. This facilitates smooth running of the gypsy and chain when the windlass is operated in manual freefall mode. Inspect the windlass for evidence of galvanic corrosion.	
A-2	Check windlass and footswitch electrical connections (in chain locker) for tightness and corrosion. Inspect chain locker for water leaks, e.g., at footswitches, windlass and bow platform bolts, etc. Monitor bow platform moisture levels.	
Spare Parts - Location		
Part #	Description	

Periodicity Codes

- | | | |
|--------------|---------------------------|-----------------|
| A – Annually | Q – Quarterly | U – Unscheduled |
| D – Daily | R – Situation Requirement | W – Weekly |
| M - Monthly | S – Semiannually | |

Note: When used as a prefix, the number 2 indicates “every 2nd day, week, or year” as appropriate. The situation code “R” may be used alone or with a calendar code, i.e., R-1 or M-1R. The situational periodicity requirement must then be clearly specified on both the MIP and MG.

Figure 2 – A maintenance guide’s level of detail can be tailored to the needs of the expected maintainer. If you want to get really elaborate, you can include equipment diagrams and/or photographs.

Maintenance Guide	Deck	Windlass
Reference: Muir H-1200 Cougar Installation Instructions Manual (H04)		
Periodicity	Maintenance Task	
A-1	Clean the clutch cones and reapply a thin film of waterproof grease to the surfaces. This facilitates smooth running of the gypsy and chain when the windlass is operated in manual freefall mode. Inspect the windlass for evidence of galvanic corrosion.	
Safety Precautions		
<ol style="list-style-type: none"> 1. Ensure windlass breaker (located to the left of the master panel) is turned off. 2. Depress footswitches to verify the windlass will not operate. 3. Ensure the anchor is secured to prevent accidental free fall during maintenance. 		
Tools, Supplies and Test Equipment		
Windlass extension handle		Paper towels
Standard screwdriver (large)		Work towel
Wrench, 9/16"		Waterproof grease
Hex wrench, 1/4"		PB Blaster or WD-40 w/straw
Kneepads		Tef-Gel
Procedure		
<ol style="list-style-type: none"> 1. Lock the deckpipe cover in the open position. 2. Pull sufficient chain from the locker so it can be lifted from the gypsy and laid on deck clockwise around the windlass. 3. Disengage the clutch and pawls. If necessary, the extension handle may be used to loosen the 3-prong clutch nut. 4. Remove the hex screw, washer, clutch nut, and outer cone. Lay parts on work towel in order of disassembly. 5. Remove the forward bolt at the chain stripper located under the gypsy. Rotate the chain stripper aft on the aft bolt to clear the gypsy. 6. Remove the gypsy. Clean and grease the clutch cones. 7. Inspect the windlass for evidence of galvanic corrosion due to the use of mixed metals in a saltwater environment, e.g. bubbling or flaking paint on the aluminum housing, the de-zincification of bronze components, etc. 8. Replace the gypsy. Apply Tef-Gel to the chain stripper bolt prior to reassembly to minimize galvanic corrosion. (Note: Remove and lubricate the aft bolt too if indicated.) Replace the outer cone, clutch nut, washer and screw. 9. Engage the clutch and pawls. Align the chain with the gypsy; lower excess chain into the chain locker. 		