



# Safety TuneUp

- At Hunter Marine, we believe that it is appropriate to highlight some very important maintenance and safety issues to all of our boat owners. Our goal is to have all owners enjoy safe and trouble-free boating at all times.
- Although this publication is not all-inclusive, it does cover some very important responsibilities of boat maintenance and ownership. We ask that you insert this into your owner's manual or boat log for quick and easy reference when using your boat. In addition, please go to <http://www.huntermarine.com> for archived issues of this publication. You are also encouraged to refer to the current edition of Chapman's *Piloting, Seamanship and Small Boat Handling*, or U.S. Sailing's *Keel Boat Manual*.

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PLEASE PRINT AND RETAIN FOR YOUR RECORDS

# Preliminary Care and Inspection List

The following pages feature a list of items and recommendations that we believe should be incorporated into your own ongoing list of preventative maintenance items and safety check points.

**THIS LIST SHOULD NOT BE CONSIDERED A COMPLETE SERVICE MANUAL OR THE ONLY ITEMS ON YOUR BOAT IN NEED OF ROUTINE MAINTENANCE, INSPECTION OR ATTENTION.**

You will find that we address commonly found optional equipment items installed on Hunter boats, as well as most standard equipment from Hunter Marine. Owners need to familiarize themselves with individual equipment manuals on all such items, especially aftermarket purchases or optional equipment installed by your dealer or Hunter Marine. This should ensure that you are following the manufacturer's recommendations for proper maintenance and upkeep.

We strongly recommend that all owners complete a Power Squadron course followed with a complementary boat inspection before leaving the dock. To locate a Power Squadron in your area please visit <http://www.usps.org> . Reviewing and familiarizing yourself with the Chapman's Piloting Manual is also highly recommended for every boat owner. This manual contains demonstrations for safety drills which should be practiced routinely, dealing with adverse conditions, general boat handling and recommended safety equipment. Our opinion is that no boat owner should operate a boat without first reviewing this manual and without having ready access to it while sailing.

We hope that this list will be beneficial to you in your ongoing maintenance and upkeep. Safe boating!

## Preliminary Care and Maintenance Checklist

A qualified Technician should be used if you are not completely confident in your ability to make repairs or inspections.

### OUT OF WATER INSPECTION

#### Pre-Launch Inspection

- Sacrificial zinc anodes installed
- Propeller installed with keyway, nuts and cotter pin
- Propeller shaft turns freely and without excess wobble
- Struts and shaft log free of corrosion
- Rudder swings easily & correct with wheel direction
- Rudder and post inspected for cracks and/or concealed damage (may require removing rudder)
- Auxiliary tiller handle properly aligned, fits securely and operational
- Backup rudder system complete and operational
- All thru-hulls and valves below water line inspected for corrosion, labeled and closed until after launch
- Bottom paint in satisfactory condition
- Hull freshly cleaned and waxed (free of gelcoat damage)
- Mooring, safety lines and fenders onboard and in good condition
- House & engine start batteries installed and filled with correct electrolyte levels
- House & engine start battery boxes secured
- All battery terminals clean and wires secured
- Engine block & transmission drains closed
- Speed / Depth transducers in place. Speed paddle wheel rotates smoothly
- Hose clamps on all systems below water line tight
- Keel bolts tight and clean
- Exhaust hose attached and secured
- Boat is free of internal and external water leaks above water line (Failure to stop water intrusion could result in permanent damage or deterioration of structural coring materials, internal wiring and cause mildew and molding)

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#### Mast Assembly

- Review manufacturers manual for maintenance and up-keep
- Spreaders securely fastened
- Mast and spreaders free of corrosion and stress cracks
- Standing rigging and pins inspected for wear, tear, corrosion and cracking
- External wiring secured for anchor, steaming and deck lights
- Electronic wind indicator installed per manufacturers recommendation
- Manual wind indicator installed on masthead
- VHF antenna installed and connected
- Headsail furling system installed inspected per manufacturers recommendation
- Running rigging inspected for wear and tear
- Mast step stand-up blocks secured and operational
- Main Sail, jib sail and flaking system inspected for wear and tear (non-furling mast). In-mast system checked for smooth operation and overall condition of sails
- Specified pre-bend and diagonal tensions attained in mast. See owners manual
- Mast to deck wiring properly sealed with drip loop

## Preliminary Care and Maintenance Checklist – Continued

### Anchor System and Ground Tackle

- Anchor windlass inspected per manufacturers recommendation
- Anchor secured in bow roller assembly
- Spare anchor onboard and accessible. See Chapman's Manual for recommendations on anchors, anchor lines and drogues
- Anchor line pays out and retrieves into anchor locker without difficulty
- Bitter end of anchor line secured
- Anchor rode inspected and free of abrasions
- Anchor chain shackle lock-wired at pin after secured to anchor and corrosion free
- Anchor locker hatch secures properly with anchor and line in place
- Anchor locker free of debris inside
- Anchor locker drains open

### Fuel System

- Tank fuel level indicator functioning properly
- Fuel clean and treated with engine manufacturers recommended additives
- Primary and secondary filters cleaned or replaced
- Fuel tank supply valves open
- Fuel tank vent clear from tank to atmosphere  
(hose has anti-siphoned loop in place at hull or deck side)

### Steering System

- Inspect and service steering system according to manufacturer's recommendation
- Clean and grease autopilot drive chains
- Ensure compass light is operational

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### Primary Pumps Functional

- Manual bilge pumps
- Electric bilge pumps and float switches (discharge hose has anti-siphon loop in place to prevent back flow under sail)
- Macerator pumps
- Fresh water pumps
- Toilet flush pumps
- Shower sump pumps
- High water bilge alarm pump

### Illumination and Small Electrical Components Check

- Bow light
- Cabin lights
- Stern light
- Deck light
- Instrument lamps
- Masthead light
- Chart light
- Anchor light
- Courtesy lights
- Reading lights

## Preliminary Care and Maintenance Checklist – Continued

### Illumination and Small Electrical Components Check – Continued

- Distribution panel lights
- Smoke detectors operational
- CO detectors operational (one per cabin recommended)
- Engine & generator room blower operational
- Auto fire suppression system operational (engine compartment)
- Shore power cord and adapter plug operational. See manufacturer's manual for complete details
- 110 or 220 VAC outlets operational – Ground fault circuits functioning
- 110 or 220 VAC inverter/battery charging systems functioning properly
- Cockpit control systems operational

### Fresh Water Systems

- Hot water heater drains shut
- All spigots and hose bibs shut
- All tanks flushed clean and free of debris and antifreeze
- Water heater tank and lines flushed of antifreeze
- All water lines and components purged of air and checked for leaks
- Sinks and drains checked for leaks and adequate flow
- Cockpit shower operational
- Fresh water filters clean
- Tank water level indicator systems operating – labeling and tank valve selection correspond

### Head and Holding Tank Systems

- Vent clear from tank to atmosphere
- Filled with fresh water and test pumped with macerator
- Toilets flush to holding tanks properly
- Waste level indicating system properly functioning
- No leaks at any hose fitting within the system

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### Galley Systems

- Gas bottle filled installed and connected to regulator. Inspect Gas system for leaks after 3 minutes. Should a leak be detected, immediately close the main valve exit boat and seek professional assistance for a thorough inspection.
- Stove and oven operational. Refer to manufacturer's manual for proper operation and troubleshooting.
- Gimbal latch secure and operational
- LPG stowage locker drain open and tank storage area free of debris.
- Microwave operational
- Refrigerator operational and proper temperature attained
- Freezer operational and proper temperature attained
- USCG waste disposal-warning poster onboard or in owner's package
- Icebox drains to sump or bilge properly
- Icebox drain plugs installed

## Preliminary Care and Maintenance Checklist – Continued

### Topside Inspection

- \_\_\_ Swim seats/ladders/gates operational
- \_\_\_ Swim seat latch operating correctly
- \_\_\_ Cockpit hatches operate properly (adjustments should be made with boat in water)
- \_\_\_ Canvas properly cleaned and installed
- \_\_\_ Cockpit cushions cleaned and installed
- \_\_\_ Lifeline fittings tight and secure
- \_\_\_ Rubrail sealed secured to hull
- \_\_\_ Sliding hatches drains free of debris
- \_\_\_ Companionway drop-ins fit properly in companionway and stowage rack
- \_\_\_ Load bearing hardware sealed and securely fastened. This includes but is not limited to chainplates, winches and handrails
- \_\_\_ Traveler arch sealed and securely fastened. Stainless Steel models should be properly grounded, see owners manual for details
- \_\_\_ Plexiglas hatches, ports, windscreens and windows adjusted and cleaned. Cleaners and polishers specifically for Plexiglas can be purchased from most marine supply stores
- \_\_\_ External teak cleaned and oiled (Teak decking cleaned with mild soap and water)
- \_\_\_ External railings cleaned with soap and water then hand polished using automotive wax
- \_\_\_ All deck fill caps seal properly and have retainer chains intact (except Waste Pump-out)
- \_\_\_ Dorade vents or sealing caps installed
- \_\_\_ Topside surface clean and free of gelcoat damage

### Interior Inspection

- \_\_\_ Drop-in hatches for bunks and floors in place and fit securely
- \_\_\_ Interior steps and grab rails secured
- \_\_\_ Bilges clean and free of debris
- \_\_\_ Opening port and hatch screens in place
- \_\_\_ Blinds/privacy curtains, shades and interior cushions cleaned, installed and secured
- \_\_\_ All doors open/shut/latch properly
- \_\_\_ Insure all wires and connection on distribution panels are tight (should be professionally inspected)
- \_\_\_ Television/VCR operational
- \_\_\_ Stereo/Tape/CD operational
- \_\_\_ Chapman's Manual onboard and readily available
- \_\_\_ Safety gear onboard readily available and up to date. See Chapman's Manual and US Coast Guard website at <http://www.uscg.mil> for details.
- \_\_\_ Boat owner's manual onboard

## Preliminary Care and Maintenance Checklist – Continued

### IN-WATER INSPECTION

#### Dockside Inspection of Engine, Pre-Start Sequence and Operating System

- \_\_\_ Review engine manual for maintenance requirements and proper starting procedure
- \_\_\_ Propeller shaft properly aligned (per engine manual)
- \_\_\_ Shaft to engine coupling bolted and properly torque (per engine manual)
- \_\_\_ All engine mounting bolts in place and properly torque (per engine manual)
- \_\_\_ Crankcase oil at full mark (per engine manual)
- \_\_\_ Transmission fluid / oil at full mark (per engine manual)
- \_\_\_ Coolant mix ratio proper – heat exchanger and expansion tanks full (per engine manual)
- \_\_\_ Seawater intake valve open and no leaks
- \_\_\_ Air bled from fuel lines and system
- \_\_\_ No fuel leaks at any fittings
- \_\_\_ Throttle linkages smooth and operational
- \_\_\_ Shutdown system operational
- \_\_\_ USCG Oil Discharge warning poster in place
- \_\_\_ Exhaust elbows and hoses tight
- \_\_\_ Starting sequence and alarms correct
- \_\_\_ Oil pressure acceptable (per engine manual)
- \_\_\_ Coolant temperature acceptable (per engine manual)
- \_\_\_ Alternator DC output at rated rpm (per engine manual)
- \_\_\_ Correct Idle rpm (per engine manual)
- \_\_\_ Water discharged with exhaust
- \_\_\_ Hour meter operational
- \_\_\_ Fuel level indicators operational
- \_\_\_ Throttle cable tension set properly
- \_\_\_ Shifter operation correct
- \_\_\_ Neutral safety start switch operational
- \_\_\_ No inboard exhaust gas leaks
- \_\_\_ No fuel / oil / water leaks on engine
- \_\_\_ Shaft packing / Drip free Seal adjusted and locknuts tight. One to three drips per minute with shaft turning on traditional packing assembly
- \_\_\_ Engine box installed and secured

#### Dockside Inspection of Generator, Pre-Start Sequence and Operating System

- \_\_\_ Review and follow manufacturer's manual for maintenance and up-keep
- \_\_\_ Seawater strainer water-tight and clean
- \_\_\_ No leaks in fuel system - Fuel filters clean
- \_\_\_ Lube oil at full mark
- \_\_\_ Coolant level full – proper mix ratio with water (per generator manual)
- \_\_\_ Seawater discharge overboard with exhaust gas
- \_\_\_ No inboard water or exhaust gas leaks
- \_\_\_ Proper voltage output to distribution panel (per generator manual)
- \_\_\_ Ship / Shore power transfer panel function properly
- \_\_\_ Starter battery box secured
- \_\_\_ Starter battery cable connections clean and tight
- \_\_\_ Starting battery electrolyte level proper

## Preliminary Care and Maintenance Checklist – Continued

### Climate Control System

- \_\_\_ Review and follow manufacturers manual for maintenance and up-keep
- \_\_\_ Seawater strainer water tight and clean
- \_\_\_ Seawater pump air purged and operational
- \_\_\_ Seawater flow adequate fwd and aft
- \_\_\_ Fwd system functions properly in all modes of operation
- \_\_\_ Aft system functions properly in all modes of operation
- \_\_\_ No seawater leaks in system components and lines
- \_\_\_ No condensation leaks to deck or liner
- \_\_\_ Air return/intake filters clean and clear
- \_\_\_ 110 or 220 VAC 30 amp shore power wired correctly at dock
- \_\_\_ Remote control units and display features operate correctly
- \_\_\_ Condensation drains open

### Dockside Pre-sail inspection

- \_\_\_ Standing rigging tuned statically – all fittings pinned and secured (re-check after sailing)
- \_\_\_ Genoa installed and furling system operational
- \_\_\_ Main sail installed and operates smoothly
- \_\_\_ Main sail flaking system properly adjusted
- \_\_\_ All reefing points attained properly
- \_\_\_ Topping lift and outhaul operational
- \_\_\_ Sheets / Blocks / Winches operate correctly and easily under load
- \_\_\_ Genoa Car travels freely full length on tracks port and starboard
- \_\_\_ All line stoppers operational and labeled
- \_\_\_ Calibrate all electronic equipment and compass to geographical area.
- \_\_\_ VHF operational
- \_\_\_ Dockside water connection operable and free of leaks
- \_\_\_ Complete safety package onboard and up-to date (see Chapman's manual and US Coast Guard rules and regulations)
- \_\_\_ Secure and evenly distribute all loose equipment and weight
- \_\_\_ Complementary onboard inspection made by local Power Squadron











# Carbon Monoxide Safety

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## Carbon Monoxide Can Kill

This section is intended to provide educational information about carbon monoxide relative to boats and boating. Carbon monoxide accumulation is affected by boat geometry, hatch, window and door openings, ventilation openings, proximity to other structures and boats, wind direction, boat speed, boat maintenance and a multitude of other variables. This section discusses many of these and enables the boat owner to better understand some of the more predictable effects. However, this information is limited in that it cannot cover all conceivable variables. Therefore, the boat owner is cautioned not to exclusively rely on it to prevent the accumulation of carbon monoxide.

## What Is Carbon Monoxide?

Carbon monoxide is a highly poisonous gas formed by the combination of carbon and oxygen. Commonly referred to as CO, its chemical formula, "C" for carbon and "O" for oxygen. CO is a colorless, odorless, and tasteless gas that by itself cannot be detected by human senses. CO diffuses in the air much more rapidly than other gases that are detectable by the human senses. The weight of CO is about the same as air so it does not rise or fall like other gases but will distribute itself throughout the boat. CO is produced any time a material containing carbon is burned. In boating, these materials include, but are not limited to, gasoline, diesel fuel and propane. All carbon based fuels produce varying amounts of CO, depending on their carbon content. Gasoline is high in carbon and therefore produces high levels of CO. Diesel fuel is low in carbon and therefore produces lower levels of CO. However, the exhaust of all engines and generators as well as any open flame device produce CO and the same precautions should be taken regardless of the type of fuel.

## How A Person Is Affected By Carbon Monoxide

When breathed, carbon monoxide is absorbed by the lungs and reacts with the blood hemoglobin to form carboxyhemoglobin, which reduces the oxygen carrying capacity of the blood. The result is a lack of oxygen for the tissues with the subsequent tissue death and, if prolonged, death of the individual. Carbon monoxide in high concentrations can be fatal in a matter of minutes. Even lower concentrations must not be ignored because the effects of exposure to CO are cumulative and can be just as lethal. Certain health related problems and age increase the effects of CO. People, who smoke or are exposed to high concentrations of cigarette smoke, consume alcohol or have lung or heart disorders are particularly susceptible to an increase in the effects from CO. However, the health of all of the boat's occupants should be considered. Physical exertion accelerates the rate at which the blood absorbs CO. The early effects of CO poisoning are easy to overlook because they are similar to the effects of other boating related stresses such as eye strain, fatigue, sun exposure, seasickness, or alcohol consumption. But as the concentration of CO in the air increases, it has increasingly adverse effects on your health.

## Symptoms Of Carbon Monoxide Poisoning

One or more of the following symptoms can signal the adverse effects of carbon monoxide accumulation. The order of this list is generally the sequence of symptoms. However, the number of symptoms and the order of appearance may change for different people:

Watering And Itching Eyes  
Flushed Appearance  
Throbbing Temples  
Inattentiveness  
Inability To Think Coherently  
Ringing In The Ears  
Tightness Across The Chest  
Headache  
Drowsiness  
Incoherence  
Nausea  
Dizziness  
Fatigue  
Vomiting  
Collapse  
Convulsions

**If you need assistance, please feel free to contact our Customer Service Hotline at 1-800-771-5556.**

## What To Do When Someone Is Overcome By Carbon Monoxide

When someone falls victim to carbon monoxide poisoning, fast and responsive action is crucial. Know the symptoms. The earlier the effects of CO are detected the better the chances for recovery. The following list shows the sequence of events that must be done in an effort to revive a CO victim:

**Evacuate, Ventilate, Investigate and  
Take Corrective Action:  
Carbon Monoxide Poisoning Action Sequence**

- Move the person to fresh air.
- Administer oxygen if available.
- Contact medical help.
- If the victim is not breathing, perform artificial respiration per approved CPR procedures until medical help arrives and takes over. Prompt action can make the difference between life and death.
- Ventilate area.
- Investigate the source of CO and take corrective actions.

## How Carbon Monoxide Can Enter Your Boat

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Any device that burns fuel creates carbon monoxide. For example, a propane cook-top or a space heater are both potential sources for CO. But the most serious danger comes from the engines and generators aboard your own and neighboring boats. There are four basic ways that CO from a running engine or generator can enter your boat:

- The “Station Wagon Effect” results from the aerodynamics of deck cabins and transoms. With the boat under way, the air flow over the top forms a low pressure area behind the cabin or transom which can suck exhaust gasses into the cockpit and the cabin.
- Obstructions are principally a problem when boats are rafted together or tied to a dock or seawall. Against an obstruction, exhaust gasses which normally dissipate may instead be directed back to your boat. Beware of open windows, hatches, doors and the location of the engine air intake. Exhaust contains particularly high concentrations of CO when an engine is cold; so to protect yourself and your neighbors, minimize the time spent getting underway. Pay particular attention to potential obstructions when running a generator for long periods.
- Infiltration of CO from a neighbor's exhaust can be a problem aboard any boat at any time. Infiltration can happen any time your neighbors are running a generator or engine, even when they are many slips away.

- Leaks in your own exhaust system from the engine or generator can allow harmful levels of CO to accumulate at a surprising rate. Good maintenance practices are critical to avoid this.

There are many variables that can combine to affect the accumulation of carbon monoxide. Some of these variables are: the presence of weather enclosures and covers, boat layout and configuration, location of ports, hatches, windows, doors, and vents, proximity and types of structures and other boats, wind speed and direction, speed of the boat, etc. Although it would be impossible to identify every variable or combination of variables that may affect the accumulation of carbon monoxide, the boat operator must remain aware at all times of the possibility of CO accumulation. The following additional illustrations show how Carbon Monoxide Gas (CO) can accumulate in your boat while you are at the dock or underway. Become familiar with these examples to prevent exposure to this poisonous gas.

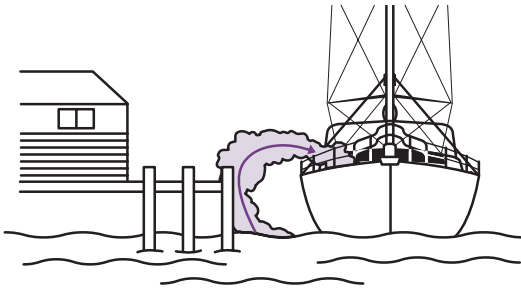


Figure 1. Blocked hull exhaust outlets near a pier, dock, seawall, bulkhead or any other structure can cause excessive accumulation of Carbon Monoxide gas with the cabin areas of your yacht. Be certain hull exhaust outlets are not blocked in any way.

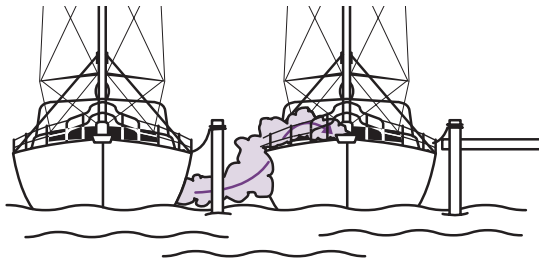


Figure 2. Engine and generator exhaust from other vessels alongside your yacht, while docked or anchored, can cause excessive accumulation of Carbon Monoxide gas within the cabin and cockpit areas of your yacht. Be alert for exhaust from other vessels.

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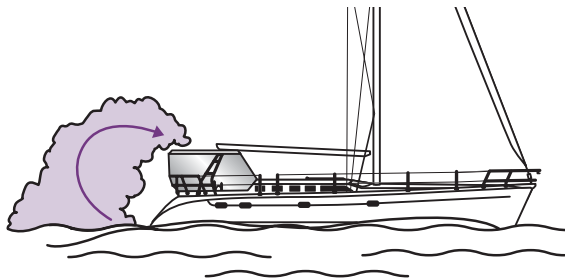


Figure 3. When protective weather coverings are in place, engine or generator exhaust from your yacht, while docked and/or running, can cause excessive accumulation of Carbon Monoxide gas within the cabin and cockpit areas of your yacht. Always provide adequate ventilation when the weather coverings are in place and either the engine or generator are running.

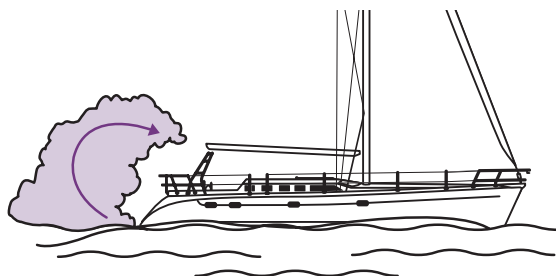


Figure 4. Engine or generator exhaust from your yacht while underway at a slow speed can cause excessive accumulation of Carbon Monoxide gas within the cabin and cockpit areas of your yacht. A tail wind can increase the accumulation. This is often referred to as the “station wagon effect”. Always provide adequate ventilation or increase your speed if possible.

## Dangers Of Carbon Monoxide In The Water

On many boats, carbon monoxide from your main engine or generator or those of another boat can accumulate in high concentrations beneath the swim-platform. Carbon monoxide can also accumulate between boats, boats and docks, and below docks and other structures. Accumulations of carbon monoxide at or near the surface of the water can present the risk of carbon monoxide poisoning to anyone swimming in or otherwise near the water surface. Children are especially vulnerable, as they tend to playfully swim near swim-platforms and docks where accumulations of carbon monoxide may be present. NEVER swim or allow others to swim if a generator or engine is running. Never swim or allow others to swim while in a marina or where other boats or structures are present.

## How To Minimize The Accumulation Of Carbon Monoxide

- Practice good inspection and maintenance habits.
- Be certain hull exhaust outlets are not blocked or restricted in any way.
- Be alert for exhaust gasses from other boats.
- Always provide adequate ventilation when weather enclosures are in place and engine or generator is running.
- Orient your boat to maximize the dispersion of CO.
- Be aware of the effects of your actions on other boats.
- Be aware of the effects of the actions of others on your boat.
- Provide adequate ventilation when open flame appliances are used in the cabin.

## Preventative Maintenance

Frequent inspections and proper maintenance of the engine, generator, and exhaust systems as well as other various areas of your boat are critical in preventing the accumulation of carbon monoxide. It is the owner's responsibility to make sure that the entire boat is inspected and maintained against CO.

The exhaust systems of your engine and generator are under constant attack from salt water, gasses, vibration and normal wear. Inspect every exhaust system component often. Start with a visual inspection. Check each joint for discoloration, carbon buildup, stains, water leaks or other signs of damage. Inspect all metal parts for corrosion, discoloration or flaking. Check that all hose clamps are in good condition and properly tightened. Carefully inspect all exhaust and cooling hoses for signs of wear, dry rot, cracking, discoloration, chafing or swelling. If any of these conditions exist, have the entire system inspected and corrected by a qualified technician before starting the engine or generator.

Next, start the engine and generator one at a time. Follow the full run of the exhaust system, listening and looking for leaks. While doing this, make sure there is adequate ventilation and that your CO detector is on.

Other items to inspect are as follows: If your boat has access panels, check that the access panels around the engine and exhaust are in place and fit snugly to minimize the opportunity for CO to enter the cabin. There should be no large openings where CO could enter the cabin. Ensure that all ventilation systems are in good working order, and not blocked or punctured. Check all sink drains to ensure that they have a good water trap to prevent CO from coming in from the outside.

Finally, because poorly running engines produce excessive CO, make sure engine and generator are tuned up. They should run smoothly and not produce black smoke. The fuel system and air filters should be in good order.

## Carbon Monoxide Detectors

If you carefully avoid potential CO accumulation and maintain your systems properly, you have made great strides towards protecting yourself and others from the dangers of carbon monoxide. Another important line of defense is a CO detector, used whenever you're aboard your boat. A detector is the only way to properly detect the presence of CO. There should be a CO detector located in each living area of your boat. Use only those CO detectors that are UL approved for marine use. RV and residential models won't withstand the elements of the boating environment. Most CO detectors require specific maintenance procedures to remain accurate and functional. Follow the manufacturer's instructions for the installation, use and maintenance of the CO detectors. Carbon Monoxide Detectors should be installed in all boats and the operation of them should be known to all aboard.

**If you would like to purchase a CO detector and receive a special purchase price, please contact the Hunter Marine Customer Service Hotline at 800-771-5556.**

**If you need assistance, please feel free to contact our Customer Service Hotline at 1-800-771-5556.**

# Boating Under The Influence

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## BUI is just as deadly as drinking and driving!

Did you know:

- A boat operator is likely to become impaired more quickly than a driver, drink for drink?
- The penalties for BUI can include large fines, revocation of operator privileges and serious jail terms?
- The use of alcohol is involved in about a third of all recreational boating fatalities?

Every boater needs to understand the risks of boating under the influence of alcohol or drugs (BUI). It is illegal to operate a boat while under the influence of alcohol or drugs in every state. The Coast Guard also enforces a federal law that prohibits BUI. This law pertains to ALL boats (from canoes and rowboats to the largest ships) — and includes foreign vessels that operate in U.S. waters, as well as U.S. vessels on the high seas.

## Dangers of BUI

Alcohol affects judgment, vision, balance and coordination. These impairments increase the likelihood of accidents afloat – for both passengers and boat operators. U.S. Coast Guard data shows that in boating deaths involving alcohol use, over half the victims capsized their boats and/or fell overboard.

Alcohol is even more hazardous on the water than on land. The marine environment – motion, vibration, engine noise, sun, wind and spray – accelerates a drinker's impairment. These stressors cause fatigue that makes a boat operator's coordination, judgment and reaction time decline even faster when using alcohol.

Alcohol can also be more dangerous to boaters because boat operators are often less experienced and less confident on the water than on the highway. Recreational boaters don't have the benefit of experiencing daily boat operation. In fact, boaters average only 110 hours on the water per year.

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## Alcohol Effects

- Alcohol has many physical effects that directly threaten safety and well-being on the water.
- When a boater or passenger drinks, the following occur:
- Cognitive abilities and judgment deteriorate, making it harder to process information, assess situations, and make good choices.
- Physical performance is impaired - evidenced by balance problems, lack of coordination, and increased reaction time.
- Vision is affected, including decreased peripheral vision, reduced depth perception, decreased night vision, poor focus, and difficulty in distinguishing colors (particularly red and green).
- Inner ear disturbances can make it impossible for a person who falls into the water to distinguish up from down.
- Alcohol creates a physical sensation of warmth - which may prevent a person in cold water from getting out before hypothermia sets in.

As a result of these factors, a boat operator with a blood alcohol concentration above .10 percent is estimated to be more than 10 times as likely to die in a boating accident than an operator with zero blood alcohol concentration. Passengers are also at greatly increased risk for injury and death - especially if they are also using alcohol.

## Estimating Impairment

This table gives a guide to average impacts of alcohol consumption. However, many factors, including prescription medications and fatigue, can affect an individual's response to alcohol, and impairment can occur much more quickly as a result. There is NO safe threshold for drinking and operating a boat, so do not assume you are safe just because you fall into the "rarely" or "possibly" influenced categories.

APPROXIMATE BLOOD ALCOHOL PERCENTAGE									
Drinks	Body Weight in Pounds								Influenced
	100	120	140	160	180	200	220	240	
1	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	RARELY
2	0.09*	0.07*	0.06*	0.06*	0.05*	0.04	0.04	0.04	
3	0.13	0.11	0.09*	0.08*	0.07*	0.07*	0.06*	0.06*	
4	0.18	0.15	0.13	0.11	0.1	0.09*	0.08*	0.07*	POSSIBLY*
5	0.22	0.18	0.16	0.14	0.12	0.11	0.1	0.09*	
6	0.26	0.22	0.19	0.17	0.15	0.13	0.12	0.11	
7	0.31	0.26	0.22	0.19	0.17	0.15	0.14	0.13	DEFINITELY
8	0.35	0.29	0.25	0.22	0.2	0.18	0.16	0.15	
9	0.4	0.33	0.28	0.25	0.22	0.2	0.18	0.17	
10	0.44	0.37	0.31	0.28	0.24	0.22	0.2	0.18	

The asterisk ( \* ) indicates estimated levels of impairment that could mean the individual is possibly influenced.

## Enforcement and Penalties

The Coast Guard and every state have stringent penalties for violating BUI laws. Penalties can include large fines, suspension or revocation of boat operator privileges, and jail terms. The Coast Guard and the states cooperate fully in enforcement in order to remove impaired boat operators from the waters.

In waters that are overseen solely by the states, the states have the authority to enforce their own BUI statutes. In state waters that are also subject to U.S. jurisdiction, there is concurrent jurisdiction. That means if a boater is apprehended under Federal law in these waters, the Coast Guard will (unless precluded by state law) request that state law enforcement officers take the intoxicated boater into custody.

When the Coast Guard determines that an operator is impaired, the voyage may be terminated. The vessel will be brought to mooring by the Coast Guard or a competent and un-intoxicated person on board the recreational vessel. Depending on the circumstances, the Coast Guard may arrest the operator, detain the operator until sober, or turn the operator over to state or local authorities.

## Tips For Avoiding BUI

Boating, fishing and other water sports are fun in their own right. Alcohol can turn a great day on the water into the tragedy of a lifetime.

Consider these alternatives to using alcohol while afloat:

Take along a variety of cool drinks, such as sodas, water, iced tea, lemonade or non-alcoholic beer.

Bring plenty of food and snacks.

Wear clothes that will help keep you and your passengers cool.

Plan to limit your trip to a reasonable time to avoid fatigue. Remember that it's common to become tired more quickly on the water.

If you want to make alcohol part of your day's entertainment, plan to have a party ashore at the dock, in a picnic area, at a boating club, or in your backyard.... Choose a location where you'll have time between the fun and getting back into your car or boat.

If you dock somewhere for lunch or dinner and drink alcohol with your meal, wait a reasonable time (estimated at a minimum of an hour per drink) before operating your boat.

Having no alcohol while aboard is the safest way to enjoy the water — intoxicated passengers are also at risk of injury and falls overboard.

Spread the word on the dangers of BUI. Many recreational boaters forget that a boat is a vehicle - and that safe operation is a legal and personal responsibility.

(Source: [uscgboating.org](http://uscgboating.org))

**If you need assistance, please feel free to contact  
our Customer Service Hotline at 1-800-771-5556.**

# RiggingMaintenance

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As a sailing yacht owner the list of responsibilities that ensure the enjoyment and safety of you and your family and friends may feel overwhelming at times. It may seem that you are expected to be "the expert" at every turn in an arena where all you were looking for was some fun and relaxation.

One of the most important systems to get to know on your sailboat is the primary function of Sail power. It involves five subsystems, which include: Sails, the spars (mast and boom), standing rigging (furling systems included), running rigging and deck hardware.

When you purchase your sailboat, it is usually the case where all of these systems are intact and ready to operate. This is a good thing, as your responsibility as an expert doesn't seem so demanding after all. You have hoisted and furled sails before and you understand the concept of having to reef or "shorten" sail when conditions merit. So what else do I need to know about my primary power supply while I am out on the water?

As with any power system there is going to be that vital concept of diligence, known as maintenance. After owning your boat for a season or two, you may be asking yourself am I doing what I should to keep my sail power system operating safely and at its optimum. The key to answering this question is one simple word: Awareness!

The four subsystems which I'll discuss (sails excluded) that help make up your sail-power system are quite simple and logical in their design and the key to you maintaining them is being aware of what they are and how they function.

Maintenance awareness should start with an overview of your mast and standing rigging and its proper relation to your boat. This includes a proper rig tune and knowing the rigging pieces involved. This overview can be best introduced by reading your Selden Mast "Hints and Advice" Rigging guide for the Hunter keel boats which gives you a thorough background of how your rig was stepped and tuned in relation to your boat. The guide should give you a vivid mental picture of how your boat was set up originally by your dealer and presented to you in its current state. A photo log or notebook that would record the current settings would be a good idea to add to your rigging guide.

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Now that you have an overview or general picture of your mast and standing rigging, it is important for you to become aware of the general conditions of these systems by conducting regular inspections. At least once or twice a year, your personal inspections should help satisfy any safety or performance issues that may have arisen during your sailing season. These inspections will also provide you with more awareness of the systems and their function as well.

General items to look for during our inspection are signs of accelerated corrosion. It can usually appear as excessive rust discoloration or oxidation, which can appear as a powder or flaking of a metallic part. Routinely cleaning the deck level areas of your mast and rigging with fresh water will help in preventing the corrosion problems you are looking for. Another item of inspection are your fasteners and rigging screws which are threaded items that should still be intact and matching their original condition. (It would be a good time to review your photo or notes log.) Also check that all cotter pins, locking nuts and locking pins are still in place. It is a good practice during this inspection to coat any threaded items or moving parts with a light lubricant to ensure that they will properly function when you want them to.

A third inspection area related to your mast and rigging are your furling systems. It is best to become aware of your furling systems by reviewing the particular manuals provided with the boat. Then you will get to know the concept of its function and the vital points of inspection and lubrication before you remove your sails. After removing your sails you will see that Selden furling systems for the Hunter keel boats have several lubrication points that are described in your manuals and are easily accessible during your inspection.

Your boat's running rigging (halyards, sheets and control lines) and deck hardware are the remaining areas to address during your maintenance awareness program. The same rule applies with first a general overview of their function which is actually quite simple and logical, will make you the expert in no time. Then a closer inspection several times a year would be prudent. Since these subsystems are more dynamic than the mast and standing rigging, you should pay close attention to wear and chafe of these materials. Any particular area that seems to be more worn than the remainder of the piece being inspected should be addressed by replacement or a recommendation by a professional. Part of your mast and rigging awareness, of course, involves everything aloft as well. If you are not comfortable in going aloft to perform a routine inspection then hiring a professional using the same timetable is the prudent thing to do. It would be advisable to at least perform an overview of going aloft in case of an emergency where it would necessitate you having the awareness of you being able to use a bosun's chair and safely perform the task at hand. Then if the situation arose you would at least have a comfort factor of what needed to be done.

So while you are out sailing, providing the enjoyment and relaxation which makes it such a great sport, just remember to keep your eyes open and watch things work as this awareness will make you the expert in no time.

HUNTER MARINE CORPORATION would like to thank Mr. Tom Sharkey, General Manager, Selden Mast, Inc. for this article and his contribution to this edition of the Hunter Safety TuneUp.

# Rudder Information

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Dear Valued Hunter 450/456/460/466/46 Owner:

Seasoned offshore sailors understand and appreciate the fact that rudders are designed and manufactured to protect the hull of the boat from serious under-water damage. Over the past several years, we have received reports from some owners who have inadvertently lost their fiberglass composite post rudders during boating activity. Our goal with this communication is to explain how this loss might occur and to provide you with recommendations for enhanced maintenance options, plus encourage ongoing safety education for captain and crew alike in the case of rudder loss.

By virtue of its design, whenever a boat runs aground, or when the rudder strikes or is struck by an object, there is always a chance that the rudder post has been compromised or weakened to some extent. This weakening may go undetected, and may only become evident after continued or extensive use, possibly in adverse conditions.

While Hunter Marine's limited warranty specifically does not warrant the rudder because of the significant linkage to boat operation, it has always been Hunter Marine's policy to examine rudder stocks where there has been a rudder loss, whenever possible. Our goal in analyzing rudder loss is to determine cause and continually seek methods of improvement in our approach to design and manufacturing.

Specifically, Hunter Marine is aware of 16 rudders which have been lost on boats within your size range, most of which had been in use for more than two years. We were able to review 13 of the 16 reported. Our research indicates that 11 were well within the design and manufacturing tolerances. One rudder post may have had a manufacturing problem, while another was within the design tolerance but did not meet Hunter's internal tolerance specifications.

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Another area in which we seek to assist our owners involves ongoing education. One of our key goals is to continually educate owners about preparation for offshore sailing, including our strong safety recommendation that the captain should learn how to sail without a rudder. We regularly publish articles in our corporate publications, including Safety Tune Up and KnotLine about this topic, and other safety issues. We highly recommend that our offshore owners in particular be appropriately prepared for offshore sailing activities by bringing along appropriate equipment, including anchor lines and anchors as well as other needed supplies. You should be well aware of equipment requirements which allow you to recover in the case of unexpected rudder loss. Coast Guard recommendations and Chapman's Piloting are both excellent resources all captains should be familiar with and thoroughly review in regards to this topic. We also highly encourage your participation in professional sailing schools where safety techniques can be taught and mastered by captain and crew. Here's a great source for more information:

[http://www.offshore-sailing.com/courses\\_content/learn\\_to\\_sail.htm](http://www.offshore-sailing.com/courses_content/learn_to_sail.htm)

In an effort to better support our owners and to make routine maintenance inspections easier to spot rudder problems, Hunter is now offering to replace our former composite rudder posts with stainless steel rudder posts on boats in your size range. While both composite and stainless steel rudder posts have their distinct advantages, we believe that stainless posts provide more obvious visibility of damage and will thereby assist our owners in the troubleshooting process. This direct inspection will allow you to replace a damaged post prior to your next use, versus not being able to readily note the problem with the composite design. In a goodwill effort, we are making a retrofit stainless steel rudder post available to you at a significantly reduced cost. If you are interested in purchasing such a rudder, please inquire through our Customer Service Department by calling (800)771-5556. We will be pleased to make arrangements to have the stainless steel option delivered to you for your installation.

We are also in the process of researching an affordably priced pre-manufactured emergency rudder system and will advise you when this becomes available. In the meantime, there are some aftermarket versions available at a reasonable cost. For information, visit: <http://www.selfsteer.com/products/sos/index.php>

Our research has shown that the SOS rudder system can be purchased for about half the cost of an emergency life raft.

In closing, we want you to know that Hunter Marine remains committed to your total satisfaction, boating safety and excellent sailing experience. We hope that this safety alert and precaution encourages you to take the proper steps to be fully prepared to sail without a rudder in the case of a loss, to anchor appropriately in adverse conditions, to have all required emergency equipment and supplies, and to consider making the switch to a stainless post to enhance your inspection capability.

Have a great – and safe – sailing season!

# Rudderless Sailing

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The rudder on a sailboat is extremely vulnerable to damage and is under extreme pressure at all times when being used, including motor sailing. It also is exposed to any hazard that exists in the sea and can be damaged by grounding or receive shock loads by hitting flotsam and debris in the water. Whales and other sea life have been known to destroy rudder blades. It is not uncommon for an anchor line to wrap around the rudder, and for the shock load from wave action to apply enough pressure to overload the rudderstock. There are many ways a rudder can become damaged or inoperable.

The operator of a sailing vessel should be able to diagnose the cause of steering loss, assess the damage, and determine which course of action is appropriate in order to regain control of his boat. The source of failure may not be obvious, and a systematic inspection of relevant components may be necessary. Start by examining the wheel or tiller system that connects to the rudderpost. In most instances, the problem is here because this area is subject to high pressure and is normally mechanically fastened to the rudderpost. Check for cables that have slipped off the sheaves, or pins that have dropped out of the link between the wheel and rudderpost. It is good policy to always insert clevis pins "aircraft style", with the end of the pin that the cotter pin fits into aiming down. This is so that if the cotter pin falls out, the clevis pin still has a chance of not dropping out. In the case of a tiller boat, inspect the bracket that connects the tiller to the rudderpost. This can work itself loose or become unbolted. If all the mechanical parts seem to be functioning properly, one can assume that the problem lies in the rudder blade or rudderpost. This situation is more difficult to repair. If this is the case, it will likely be necessary to either sail as best as possible away from danger or, if in shoal conditions, anchor until you have a chance to implement a jury rig.

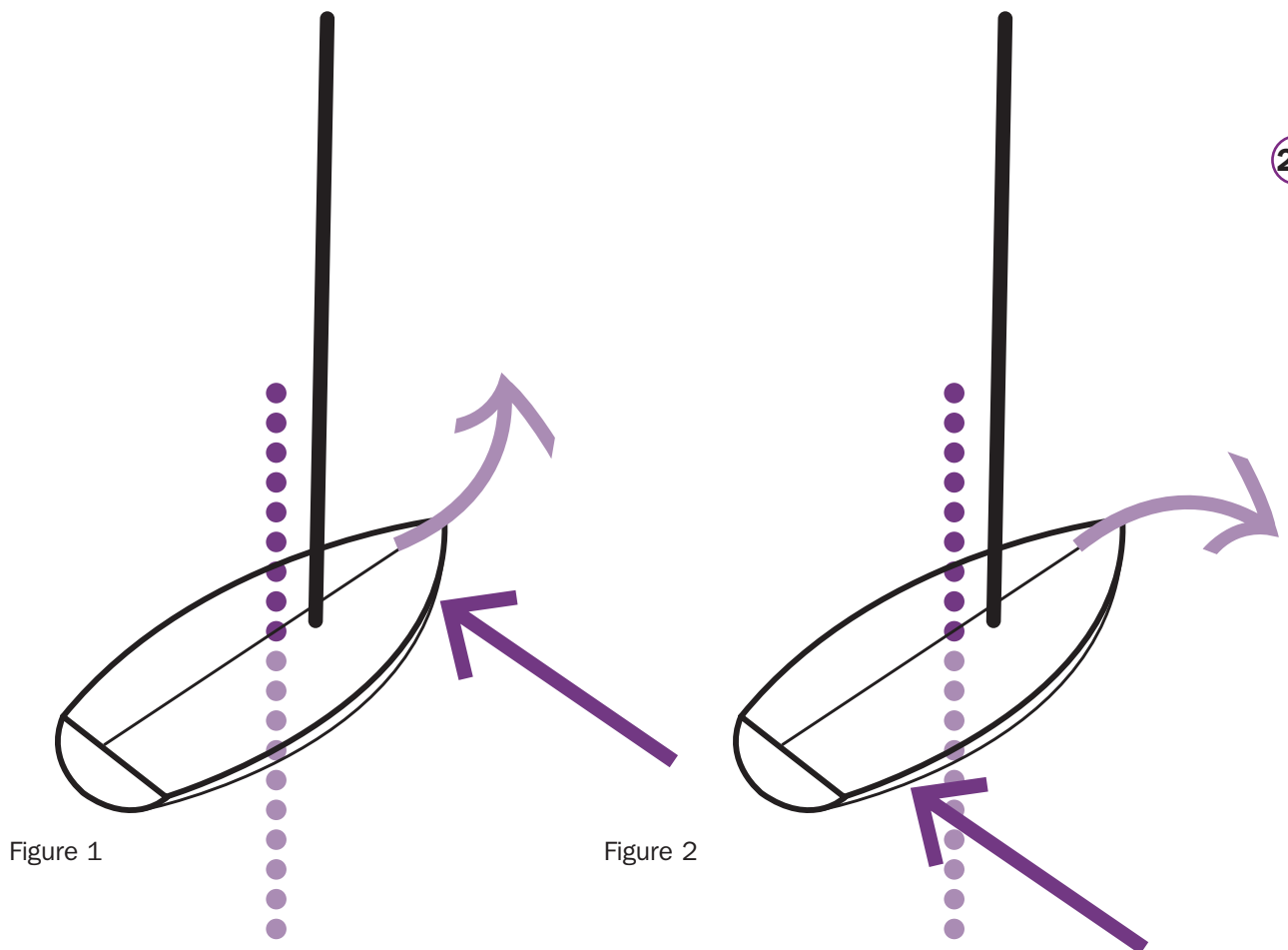
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However, the rudder is not the only factor involved in steering a boat, and there are several alternate methods for controlling the trajectory of a vessel in the event of rudder dysfunction. Knowledge of alternate steering methods is an important component of thorough sailing knowledge, and should be part of any beginner's training. Rudderless sailing is indeed possible; in fact, many junior sailing programs devote a portion of their instruction to sailing the boat without a rudder. This is learned through the study of the boat's dynamic reaction to sail trim. It is important to understand how a sailboat reacts to sail trim, as this is how you will guide the boat. Not only can learning these skills help you out of a difficult situation, they will advance your knowledge of sail trim and your ability as a sailor.

**If you need assistance, please feel free to contact our Customer Service Hotline at 1-800-771-5556.**

Imagine a boat resting in the water with no sails rigged. Underwater, the keel or centerboard acts as a fulcrum, called the Center of Lateral Resistance (CLR, indicated by dotted line in illustrations on the top of the next page) somewhere near the center of the boat. If you were to push against the bow from the starboard side, the boat would turn toward the port, rotating on that fulcrum (figure 1). Conversely, if you push on the stern from the starboard side the boat will turn toward the starboard side (figure 2).

These forces can be duplicated using the sails. With only the mainsail rigged, and the wind blowing across the starboard side, the boat will turn toward the starboard side (figure 3). This is because the position of the mainsail is generally aft of the CLR, and the wind causes the mainsail to apply force behind that axis. With only the jib rigged and sheeted in, the same force is applied forward of the axis, and the force of the sail will push the bow away, as if you were pushing the bow with your hand (figure 4).



If both sails are up, sheeting out all the way on one or the other sail can provide the same effect as if the other were the only sail. When the jib is sheeted out, it does not exert any force, so it is as if it were not even there. Similarly, if the jib is sheeted in and the mainsail let loose, the boat will behave as if force were being applied to the bow. Keeping these principles in mind, it becomes evident that changing the trim of the sails can influence the trajectory of the boat. In fact, this should be practiced.

Go sailing and lock off the rudder. Try making the boat go in the direction you want by applying the sail trim as we described. If the bow needs to go downwind, trim it in and ease the main. If the bow needs to go upwind, ease the jib and trim in the main. As you become accustomed to how much trim is required (and this will vary from boat to boat), you should be able to steer a course by making minor adjustments once you have the basic trim set up. It will take some practice but it will make you a much better sailor.

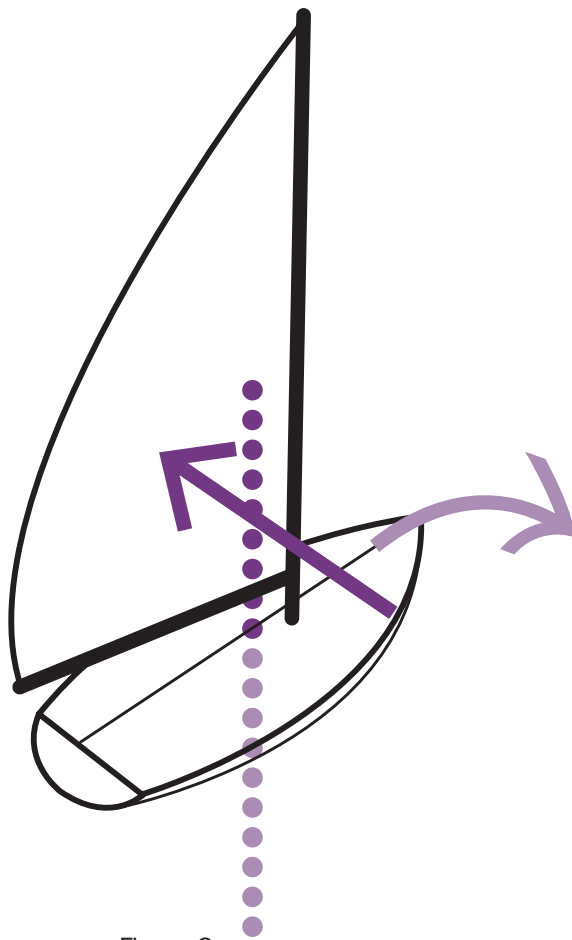


Figure 3

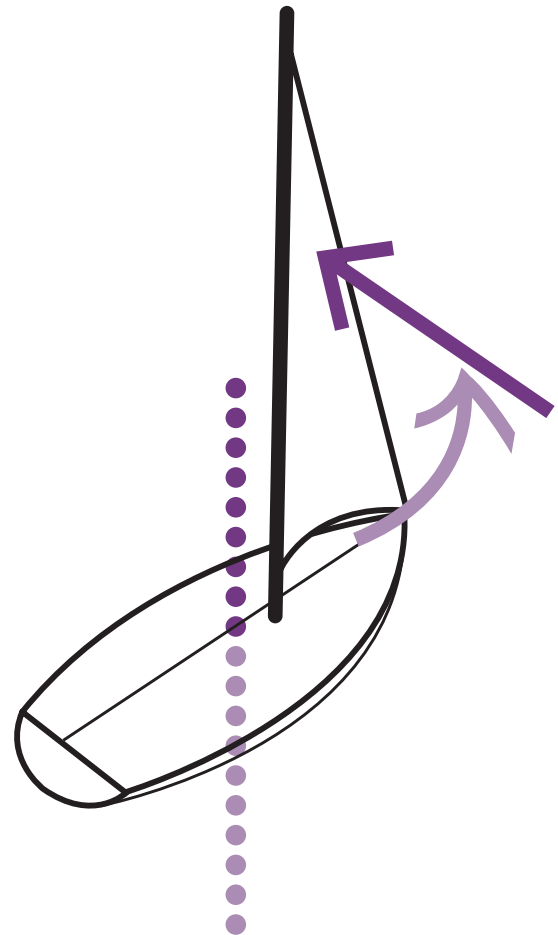
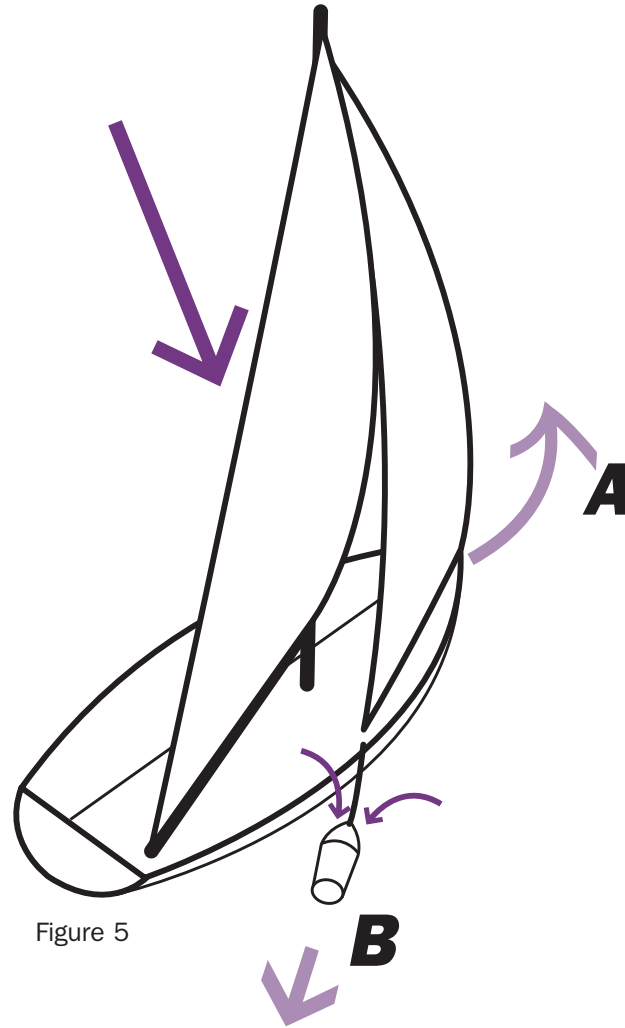


Figure 4

To refine this method, we need to understand that a boat is designed so it will slowly head into the wind if the helm is let go (A, fig 5). Accordingly, the mainsail should be eased so that the jib can "blow" the bow back down to compensate. Also, a drag device can be easily improvised to reduce the boat's tendency to head-up into the wind. For example, a bucket can be tied off the leeward side of the boat, creating a drag (B, fig 5), which reduces the boat's tendency to turn into the wind.



By adjusting the amount of drag (i.e. adding or removing buckets), an optimum combination can be reached. Also, most sailboats when under power will automatically tend either to the port or starboard when the engine is engaged, depending on many different variables from boat to boat. Determine which way the boat turns with just the engine on, and this force can be used to help steer the boat. The idea is to balance all the forces to keep the boat going straight ahead. If you are able to practice and become comfortable with the necessary procedures involved to successfully sail without a rudder, it should greatly boost your confidence in your ability to handle unexpected situations. That is the essence of seamanship.

# TrailerTuneUp

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One of the most overlooked investments many boat owners have is their boats trailer. While most owners only take a quick glance at the owner's manual after taking delivery of their boat they do not realize that trailer maintenance and setup is a crucial part of having a fun day on the water or in some cases not making it to the boat ramp at all.

Within the trailers owners manual there is an inspection list with many items that will need to be greased, inspected or tighten on a regular basis. In most cases the unseen items are what can turn out to be the most troublesome. Rather than quote the owners manual word for word lets review the most common maintenance items on your trailer and see how they could affect your weekend outing if not properly attended to.

1. Wash your trailer: When washing the trailer do it systematically and take your time doing so. This is an excellent time to visually inspect the under carriage, brake line fittings and brake drums, if equipped on your trailer. As you work your way around the trailer use your free hand to lightly push or pull on items such as trailer uprights, fenders or winch stands to check for tightness. Always be on the lookout for loose fitting hardware. Remember a lot of bouncing and vibration takes place as your trailer moves down the highway and this can loosen most types of fastening devises.

2. Tire pressure and tire wear: Just like your automobile tire pressure can be the difference between a smooth or unpleasant ride to the boat ramp. The difference in a few pounds of air from one tire to the next or from side to side can make a large difference in fuel economy and tire wear. If you have ever wondered why your trailer seems to bounce down the road, chances are one or all of the tires are not properly inflated. By checking the air pressure on a routine basis (monthly) you are one step closer to a safe and worry free trip to the local boat ramp or the long awaited vacation resort a few hundred miles away.

3. Proper lighting: This is one of the most important safety inspections you can make on your trailer. How many times have you been motoring down the highway after sunset and notice just in front of you a boat and trailer with the running lights flashing and flickering? And, this is just the ones that are working. It is often taken for granted that if one taillight is working properly then the boat can be seen by the driver following behind. The type of lighting failure described above is not only dangerous it is easily and inexpensively resolved. To replace the running/brake light bulbs on your trailer probably cost the average owner less that five-dollars to complete. To clean the light bulb sockets install the new bulbs and clean the trailer light connector at the hitch probably takes less than thirty minutes to complete from start to finish. The point being, it only takes a few minutes of preparation to travel safely during the nighttime hours so why take the chance.

4. Tie down straps: A good start to any weekend outing is when a boat owner, his vehicle, boat and its trailer all arrive at the same location and at the same time. One of the largest misconceptions in boat towing that a boat by itself weighs enough to hold it securely on the trailer while riding down the highway. Part of this assumption is true or that is until it becomes necessary to set the brakes in an emergency situation and this is when the trailer becomes a launching pad for the boat rather than a means of transporting it. Don't be convinced that a boat tie down strap is only used to prevent a boat from sliding backwards or from bouncing around on the trailer because this is far from the case. Check your owner's manuals (boat and trailer) for the correct tie-down locations on your boat and trailer.

5. Safety chains: Very few owners are aware that not only are safety chains required in most states they should also be crossed under the trailer coupler for maximum performance. Safety chains and the use of an emergency brake cable (supplied on most trailers with brakes) are the only means of controlling and stopping your boat/trailer should it become detached from the vehicle while it is moving down the highway.

6. Trailer weight: One of the biggest misunderstandings most owners have is load capacity. For the most part a boat's trailer is only designed, specified and manufactured to carry your boat and a reasonable amount of loose gear. They are not designed or intended to transport excess cargo such as, but not limited to, gas grills, small fishing boats with outboard or an assortment of windsurfers. These are just a few examples that come to mind. Trailers for the most part are built for a specific brand and model of boat. If ever in doubt about your trailers carrying capacity a quick review of the manufacturers capacity label located on the forward portion of the trailer will relieve any concerns you may have.

7. Tongue weight: I am sure at some point we have all seen a vehicle slowly and carefully moving down the highway in an odd manner. In this particular case what you quickly begin to notice about this bizarre driving style is that as the operator begins to accelerate the rear of the vehicle begins to sway back and forth. When he slows down the rear of the vehicle settles down and the driver continues on at a slow pace. This, not so uncommon event, is known to most Trailer Sailors as fish tailing. What most drivers don't understand is that this nerve-wrenching and dangerous means of transporting a boat is normally caused by improper tongue weight. In most cases the type of swaying just described takes place when the boat or its cargo has been set too far aft on the trailer therefore as it moves down the road it is attempting to lift the rear of the vehicle off the ground. It is not set in stone for every boat trailer but the average tongue weight for a Hunter boat should be at or close to seven percent of the total boat weight. This can be accomplished by moving the winch stand forward or aft on the trailer tongue to achieve the desired weight.

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8. Wheel bearings: If there was ever an item that needed to be maintained to the letter it is the greasing and annual maintenance of your trailers wheel bearings. For the Trailer Sailor, more weekends have been spoiled by that unpleasant grinding sound coming from the center of the wheel hub on a trailer. Why? Because it can only mean one thing and that is the bearings are dry of grease, over heating and about to stop turning. What is even worse is this only happens at night on a lonely highway and during a holiday weekend. The good news is it can be partially avoided by installing and using bearing buddies, if you do not already have them, and following a diligent maintenance schedule. One of the few down falls with bearing buddies is the inner/rear bearing may not receive the proper amount of lubrication if the bearings are not packed properly in the beginning. This is why it is recommended that all bearing be removed, cleaned and repacked (including the hub) on an annual basis. By following these simple suggestions you will greatly improve your chances of trouble free travel and increased fuel mileage.

By following these simple recommendations we feel that your time spent traveling to and from your favorite boating site or taking that annual family vacation can be made more pleasant and enjoyable for the entire family.

# Windlass Fact And Fiction

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Windlasses are often times viewed as the culprit whenever there has been a problem with the anchoring system. All vertical and horizontal windlasses must have the same installation opportunity to function as the manufacturer has intended for it to work. Unfortunately vessel manufacturers and designers have space constraints that may cut into the perception that the consumer has regarding the level of performance that is delivered from the system. The following information will answer some of the myths and facts regarding anchoring systems.

All windlasses, no matter the manufacturer, must have a minimum amount of fall directly under the windlass to accept the anchor rode paying off the gypsy, down into the anchor locker. The windlass does not "stow" the rode into the anchor locker. Gravity and locker capacity play the major role in capturing the rode and "stowing" the rode until it is needed to hold the boat during the anchoring process. The conventional windlass installation/operation will work best when the windlass is sitting over the widest and deepest portion of the locker. This will help gravity to stow the rode evenly as it pays off the windlass. The locker layout does play a part in how well the rode will pay off the windlass, as well.

The anchor rode must have available space in the locker. The incoming rode must leave the area where the rode pays off the windlasses gypsy free and clear to keep it from piling up in front of the windlass. Should there not be sufficient free space, the operator will have to "tend" the rode so that there is space for the rode as it pays off the gypsy. If the rode is not tended to it will "pile up" on itself directly in front of the windlass or underneath the mounting platform. Creating a "bottle neck", jamming the rode as it is trying to pay off the gypsy. This will, of course, "trip" the circuit breaker and damage the stripper. No matter what the rode length is, there must be free space for the rode paying off the gypsy into the locker or in front of the windlass to allow for the oncoming rode, the windlass cannot detect that the locker is full.

Whenever you alter your anchor rode, adding a longer tail scope of chain or ALL chain rode you must be sure the extra length or size change will be adequate for the windlass that is installed. Just because you can physically put a given length of rode into a locker does not mean that the windlass will do the same. The trade off point is the windlass will do all of the "back breaking" work for you.

Simple rules to cross check your rode choice is to find the total weight of your rope, chain and anchor. Multiply the total rode weight by 3. If your findings are less than the maximum pulling power of the windlass you then have selected a rode that is matched to the capacity of the windlass. Should you find that the total rode weight multiplied by 3 is greater than the maximum pulling power of the windlass, you will have to replace the windlass as it will not provide you with the service you are looking for. This method is telling you that the system is now mismatched. (You will find the max pulling power information listed in your owner's manual.)

A common problem discussed alot is rode jamming. Some of the reports refer to a "looping" in the line that creates a jamming of the rode from underneath as the rode pays out. It is believed that a common anchor swivel may prevent the "looping" of the anchor rode. Looping is a common action that is part of the line falling over on itself as the line pays into the anchor locker. The line will rotate clockwise during the recovery process, hesitate and then fall over itself and continue to rotate counter clockwise until the rope repeats the hesitation; at which time the rope falls again over itself as it lays in the locker. The "loops" are created when the rope changes direction as it pays into the locker. The anchor swivel will not stop this action. The "looping" is increased when the lay of the 3-strand nylon rope becomes tighter, or after it has been used in salt water over a period of time. Saline builds up in the rope fibers over time and causes the rope to stiffen. However, a good fabric softener rinse has been found to be very effective in lessening this problem. Depending on where you cruise will determine the effect the salt water has on your rope. It has been found that some fresh water lakes will "soften" the rope and cause it to jam.

Another cause for jamming is when the rode has been dumped into the locker. The "loops" appear as part of the rode from the start. For example the "looping" found with a common garden hose. If the rode was originally stowed removing the tangles and loops as the rode pays off into the locker, as apposed to just dumping the rode into the locker. 3-Strand nylon has a bit of memory and will want to retain the loops. This is brought on because during the twisting of the yarns to form the rope creates the 3-strand construction. By loading the rode initially using the windlass, and working the 'loops' and 'twists' out as the rode is installed, will certainly lend to reducing added woes of the rode fouling itself at the start. The addition of the anchor swivel will not completely rid you of you 3-strands woes, but it does help and is worth the investment.

To dispel the "loops" the rode needs to be periodically taken completely out of the locker and manually remove the twists and "loops". Again, an anchor swivel will not be a total "end all" to removing loops. The "old salt's tail" of dragging the anchor behind the boat or letting the anchor hang straight down at a 90 degree angle to the vessel in deep water just does not get the problem solved, in fact it delays and wastes time and it is not safe.

The other issue to be aware of is that the 3-strand can be just too tight of a lay to properly perform in a windlass installation and may have to be replaced. The rope will appear to be hard and stiff. Even going to an all chain rode; you can find the exact same problem. The chain will twist and fall over itself. The main cause is the point of contact where the rode crosses over the bow roller, and when the rode changes direction as it travels around the windlasses gypsy. Yes, even chain will develop twists and will periodically have to be laid out to manually remove the twist (It's the best method, although not well liked and it is the safest way).

We do not know why some vessels have more problems than others. It is reasonable to have 6 vessels all-operating out of the same marina and one will have problems and the others will not. And yes the bow roller wheel design will pay a big part in this process.

Summary:

The incoming rode must have somewhere to go. Clearing itself and making more room for the rode entering behind it. The volume of the locker must match the length of rode being used.

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Windlasses with control arms can require up to 12 or more inches of fall when being used with 3-strand ropes. 8-Plaited rope is much more forgiving. With the entire rode in the locker, 8-plait rope requires as little as 8 inches of fall.

Use the "Cross Check" method mentioned above to make sure your rode matches your windlasses performance rating.

Always tie off to a strong point while at anchor. The windlass uses a clutch drive system and it could creep out the anchor rode.

Always tie off the rode while the vessel is under way. You would not want to run over your anchor.

A windlass is a retrieval device. It is designed to recovery your anchor and rode. It is not a winch that is manufactured to pull sustained high loads.

Damaged strippers are caused by:

- Using a rope that is too soft
- Too small of a diameter of rope.
- Too long of an anchor rode fills the locker and as the windlass continues to operate jams the rope into the stripper.
- Too stiff of rope.
- The rope passing through the deck can get hung up on the deck. In other words the passage is not clean or smooth.
- Not tying off while at anchor. The rope stretches wedges itself down in the bottom of the gypsy and cannot strip itself out fast enough when the up button is pushed.

These are sound helpful hints to keep your anchoring experience a pleasant one, not a hateful one.

# General Safety

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## Safety Equipment

Federal law requires that you provide and maintain certain safety equipment on your boat. As the boat owner, you are responsible for providing all required safety equipment. Consult the United States Coast Guard and your state and local regulations to ensure your boat is in complete compliance with all requirements concerning safety equipment on board. Additional safety equipment may be recommended for your safety and the safety of your passengers. You and your passengers should be aware of the availability and specific use of each piece of safety equipment.

## Minimum Recommended Safety Equipment

- Required life saving equipment, including personal floatation and throwing devices
- Required fire-extinguishing equipment
- Required visual distress signal devices
- First aid kit
- Emergency position indicating radio beam (EPIRB)
- Manual bailing device
- Anchor with sufficient line/chain
- Flashlight with fully charged batteries
- Binoculars
- Whistle
- VHF radio
- Navigational charts for your cruising area
- Fog bell (boats over 39.4 feet)

## Fire Safety

Fire safety is something that everyone who owns or operates a boat should practice. Each year, boating fires and explosions kill and injure hundreds of boaters and cause millions of dollars in property damage. While there is a greater chance of a fire or explosion on a boat than on land, most of these accidents can be prevented. With a little effort on your part, fire prevention and fire safety are very attainable goals.

As the owner of your boat, it is your responsibility to:

- Have fire-fighting equipment inspected at regular intervals.
- Replace fire-fighting equipment, if expired or discharged, with devices of equal or greater fire-fighting capacity.
- Inform members of the crew about the location and operation of all fire-fighting equipment.
- Inform members of the crew and guests about the location and operation of all escape hatches.
- Ensure that fire-fighting equipment is readily accessible.
- Keep passageways to exits and escape hatches clear of obstructions.
- Never allow the use of gas lights on board.
- Never leave the boat unattended when cooking or heating appliances are in use.

## Fire Safety — Continued

- Never modify any of the boat's systems (especially electrical, exhaust, fuel, and ventilation).
- Never handle fuel of any type when machinery is running or when cooking or heating appliances are in use.
- Follow proper fueling procedures.
- Never smoke while handling fuel.
- Keep machinery and bilge areas clean and free of debris.
- Perform fire drills on a regular basis.

## Fire Drills

Your strategy for fighting a boat fire will depend on many variables. Therefore, you should perform fire drills under several different circumstances.

Discuss with your regular complement of crew, family and friends exactly how to fight a fire in the engine room, the galley, the berthing area, and the helm station; then decide who should do which jobs – and when.

Each person should know how the installed fire extinguisher system works and how to operate it. Walk through the boat noting all the potential fire locations, and point out all the hand-portable extinguishers.

Practice dismounting the extinguishers and then aiming for the base of the imaginary flames – sweeping the jet from side to side. (However, if you actually squirt a CO<sub>2</sub> extinguisher during this "test run", it won't reseal properly and will leak.) Check to see if any of the extinguishers weighs less than it is supposed to, and have any light ones refilled or replaced. Focus on all of your boat's potential fire locations.

Periodically, call a fire drill and time everyone with a stopwatch. The first drill will probably help you identify weak links. Discuss them and practice again right away, until you've improved your response time. After everyone is comfortable in his or her role, change roles and practice again – or practice with one less person to simulate an injury situation.

Generally, everyone on board who is physically able to grab an extinguisher and douse the fire should be ready to do so. However, if the fire is inside a crowded space (such as the engine room), perhaps only one person may be able to stand and aim an extinguisher at the fire. The other person could stand nearby, holding backup extinguishers, ready to hand them to the primary firefighter – or ready to take over the fight if the first person is exhausted or inhales smoke.

If you're offshore, anyone not fighting a fire should (a) shut down the fuel and air supply at the helm station, (b) make the Mayday call on VHF or SSB radio, and (c) don PFDs as if abandoning ship. If you're drifting in the harbor, a non-firefighter could also turn up the loudhailer and notify everyone nearby that the boat's on fire.

If your boat is on fire in a marina slip, you might be able to put the fire out more safely while standing on any of the docks surrounding it. If it is not an electrical fire, using multiple water hoses from neighboring slips may help you put out the fire faster. Most marinas have a high-volume fire pump and hose mounted on the docks. During your fire drill, locate that hose and learn how to operate it.

We hope that you'll never have to confront an onboard fire – but if you do, follow these steps and you'll be prepared to deal with it swiftly, safely and successfully.

## Danger in the Water

What could be more refreshing than a swim? The fact is, especially in a freshwater marina, a swim could be deadly. Electric shock drowning is a real concern in freshwater marinas. This invisible danger is not a new phenomenon but it has only in recent years been recognized and fully understood. Cases of electric shock drowning may be incorrectly reported because, unlike traditional electrocution, there are no burn marks on the body in an electric shock drowning. Many cases are reported as drownings because autopsy results are not able to pinpoint the cause.

Faulty wiring or equipment either from the marina or a boat can be the cause of stray current entering the water. When this happens, potentially lethal electric fields are established near and around the affected source. Add a human body to the mix and the results are too frequently deadly. Electric shock drownings may occur when even a small stray current enters the water because minimal AC current levels sometimes cause paralysis and loss of muscle control. Even good swimmers are at a loss to save themselves or others. At slightly higher current levels the victim could suffer ventricular fibrillation leading to cardiac arrest. Fresh water is not a good conductor of electricity so if there is a stray current in the water, a person's body provides a path of lesser resistance in its search for ground. This is typically not the case in salt water since its high conductivity allows the majority of ground fault currents to pass quickly to the earth's ground.

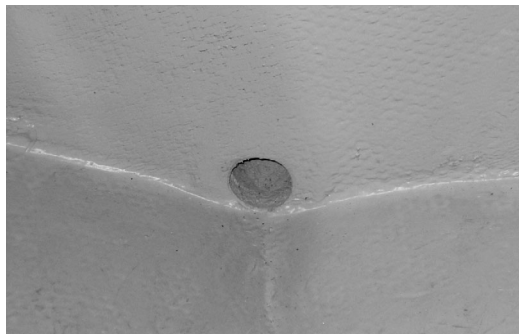
These stray currents, commonly referred to as "ground faults," occur when current-carrying wires come in direct contact with water, any portion of a faulty power conductor makes contact with the water, or neutral wires are connected to grounding wires anywhere on the dock or on a boat. Stray currents are also possible when equipment is faulty or when a boat is powered from a generator. A properly wired boat that meets ABYC (American Boat & Yacht Council) standards require the green grounding wire connected to the battery negative and the underwater gear bonding system. When connected to shore power, all boats in a marina are tied to the marina's grounding system. In addition, all boats are grounded at a second source – the water. If any connection is faulty, whether from the boat, the marina, or equipment there is a definite risk.

What can you do to protect yourself, your family and friends? First of all, never swim in a freshwater marina. Your marina should post "no swimming" signs. Electrical wiring on boats should meet ABYC standards and electrical work on boats and in marinas should only be performed by certified marine electricians. Boats and marinas should be inspected regularly for faulty wiring or open circuits. In addition, marinas should have equipment in place to monitor and protect against ground faults. By making sure all electrical systems are in good working condition and properly installed and inspected, as well as installing ground fault equipment, marinas and boat owners will help prevent electric shock accidents from occurring. One of the best rules of thumb is never to swim at a freshwater marina. Even if you do everything right, you can't be sure that others have, and it's better to be safe than sorry.

## Maintenance For Safety

Maintaining the critical equipment and systems of your boat is essential to safety. The following is a guideline for maintaining some of these systems.

- The condition of your rigging, both standing and running, is paramount to your safety and the performance of your vessel. It is imperative that all rigging be inspected and checked by a qualified professional on a regular basis. Acid rain, airborne dirt and salt spray can cause serious corrosion to your rig. It should be cleaned where possible on a regular basis and all swages and fittings should be checked for cracks and deterioration. Many insurance companies demand periodic checks by a reputable rigging company. Be sure to check with your company or agent to make sure you are covered in the event of a failure.
- Running rigging should also be inspected and replaced on a schedule. To have a line part under stress is dangerous to the crew and could jeopardize the integrity of the entire rig.
- Chainplates are under considerable loads and need to be checked regularly for any separation, delamination or loosening during the season. If you suspect any problems, contact your Hunter dealer or qualified technician immediately. Do not use your boat, if there is a problem present. If a visual inspection is not easily done, call Hunter Marine Customer Service at 800-771-5556 or 386-462-3077 for instructions.
- Keep your bilge absolutely free of dirt and trash. Check frequently and clean out as often as needed. Accumulations of dirt and debris can absorb oil and fuel. In addition to creating a fire hazard, this may also clog limber holes and bilge pumps. Clogged limber holes could result in water damage to equipment and corrosion of fuel tanks.



Limber hole

- Inspect lifesaving equipment frequently. At least at the beginning and midway through the boating season, check the condition of all lifesaving equipment. Replace any equipment that is dated or questionable.
- Check fire-extinguishing equipment regularly as recommended by the manufacturer. Weigh the engine room fire extinguishers yearly to ensure that they are fully charged.
- Have the entire fuel system inspected for signs of damage and wear. Visually inspect the fuel lines inch by inch. Look for signs of corrosion of the fuel tanks. If any deterioration is noticed have a qualified marine technician repair or replace immediately.
- Have a qualified marine electrician inspect your entire electrical system annually. This should include the AC, DC, and bonding systems. Replace zinc anodes and damaged wiring and equipment as needed.

## Maintenance For Safety — Continued

- Maintaining your engine and generator exhaust systems is critical to prevent flooding and the infiltration of deadly carbon monoxide gases. Inspect your entire exhaust system regularly for signs of leaking, breakage, cracking, and dry rotting of hoses. Have a qualified marine technician inspect and repair the exhaust systems annually.
- Each sink drain in your boat includes a water trap within the drain hose. The purpose of the trap is to prevent deadly carbon monoxide gases from entering your boat through the drain. Before you use your boat at the beginning of each season, run an ample amount of water through your sink drains to ensure that the water traps are full of water. This should also be done periodically throughout the boating season.
- Check all keelbolts for rust or water intrusion. They should be tight and show no signs of movement. The keel sump should also be kept clean and free of debris.
- Check rudder bearings for signs of wear or leaks. Please refer to the owner's manual for the specific maintenance schedule.
- Check all through hull seacocks for proper operation. All should be able to be opened and closed easily. If any are difficult to operate, they should be disassembled, greased and reassembled.
- Check all stanchions and pulpits for cracks and integrity.

## Is Your Boat As Safe As It Can Be?

If you can answer YES to the following questions, chances are that your boat is safely equipped and that you operate it safely.

- Do you carry legally required and other safety equipment aboard and do you know how to use it?
- Before getting underway, do you review, with everyone on board, emergency procedures and identify all safety equipment and exits?
- If you carry a life raft aboard your boat, have you included its proper deployment as part of your routine safety training?  
Has at least one other crew member been trained?
- Are you aware that it is illegal and dangerous to operate a boat while intoxicated?
- Do you check local weather reports before departure, and keep a weather eye open during your voyage?
- Are your lifesaving equipment and fire extinguishers readily accessible at all times?
- Do you avoid overloading your boat with people or gear?
- Do you make sure you have good non-skid surfaces on deck and on the soles of shoes of everyone on board?
- Do you keep bilges clean and electrical contacts tight?
- Do you guard rigidly against any fuel system leakage?
- Have you requested a Coast Guard Auxiliary Courtesy Examination for the current year?
- Have you taken any safe boating or first-aid courses?
- Before departing, do you leave a Float Plan so someone knows where you are boating and when you are expected to return?
- Are you familiar with the waters that you will be using: tides, currents, sand bars, navigation aides and any hazards you may encounter?
- Do you know your personal limitations and responsibilities?
- If you are a non-swimmer, are you learning to swim?
- Are you and your crew prepared for any emergency that could occur?
- Do you know and obey the Rules Of The Road?
- Do you know your fuel tank capacity and fuel consumption at various RPMs, and the cruising range this gives?
- Do you take maximum precautions when taking on fuel? Do you practice the “one-third rule” by using one-third of the fuel going out and one-third to get back, keeping one-third in reserve?
- When anchoring, do you allow adequate scope on your anchor line? Are you far enough away from your neighboring boats?
- If someone falls into the water do you know what to do?
- Do you avoid relieving yourself over the side of the boat in a standing position? This is a common cause of accidents resulting in drowning.
- Whenever possible, do you, and those aboard your boat remain seated while underway?

(Source: Chapman *Piloting, Seamanship & Small Boat Handling*)

# Product **Recalls** and **Notifications** \_\_\_\_\_

This publication is distributed annually to all known Hunter owners. In it, many important product recalls and notifications are highlighted from the past year. These recalls and notifications are generally safety related and contain information that you need to be aware of. We also mail all recalls and notifications to our dealers, customers, or both as they are released. Even though we make every effort to notify everyone of these issues, it is strongly recommended that you visit our web site <http://www.huntermarine.com/prodNot/index.html> frequently and check the "Product Safety Notifications" section for current recalls and notifications that may pertain to your boat.

## **Hunter Recalls and Notifications**

HUNTER 33 FUEL VENT NOTIFICATION	01/05
HUNTER 33 BOW ROLLER NOTIFICATION	02/05
TRAILER TUNE-UP	02/05
SPARE RUDDER SYSTEM	11/05

**If you no longer own your boat, please give this memorandum to the purchaser and advise Hunter Marine of the name and address of the purchaser. Call 1-800-771-5556.**



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