Mauricetown Marine

# Safety Tune-Up

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- At Mauricetown Marine, LLC, we believe that it is appropriate to highlight some very important maintenance and safety issues for all boaters. Our goal is to have all boaters 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. Boat owners should familiarize themselves with their boat owner's manual and all individual equipment manuals. You are also encouraged to refer to the current edition of Chapman's *Piloting, Seamanship and Small Boat Handling (available in our web store)* and to take the U.S.C.G. Power Squadron Boating Safety course followed by a complimentary boat inspection before leaving the dock. To locate a Power Squadron in your area please visit http://www.usps.org

## Contents

# Boating Safety Links

### Boat Owners Association of The United States (BOAT U.S.)
http://www.boatus.com
This organization provides a multitude of services for the recreational boater, including towing packages, insurance, and tips on boat buying. Check out their resources and references as well as their member benefits.

### Boat U.S. Foundation
http://www.boatus.org
This organization sponsors an on-line boating course and PWC course.

### BoatSafe.com
http://www.boatsafe.com
This website features information on boating courses, safety tips and contests for children.

### CommanderBob.com
http://www.commanderbob.com
This website hosts a wealth of information and is a must visit for every boater.

### National Marine Manufacturers' Association
http://www.nmma.org
This website provides the consumer with a listing of all boat shows and information on NMMA's Discover Boating and Take Me Fishing Tour.

### NMMA Certification Program
http://www.discoverboating.com/certification
This website describes the National Marine Manufacturers Association (NMMA) Certification Program.

### The National Safe Boating Council
http://www.safeboatingcouncil.org
The Council consists of 325 U.S. and Canadian organizations with an interest in boating safety.

### The National Transportation Safety Board
http://www.ntsb.gov/surface/marine/marine.htm
This organization investigates major marine accidents on navigable waters of the U.S.

### United States Coast Guard Office of Boating Safety
http://www.uscgboating.org
This site features volumes of information under Boating Safety including safety brochures, recall notices, port closures, boating safety courses and how to have your vessel checked.

### United States Coast Guard Boating Safety Circular
http://www.safetycenter.navy.mil/ashore/recreation/uscgboating.htm
This is a valuable source of information on established or proposed regulations and standards and other boating safety topics.

### United States Coast Guard Navigation Center
http://www.navcen.uscg.gov
This site primarily contains navigational information but also includes the Navigation Rules for downloading.

# CarbonMonoxideSafety

## 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 (depending on relative temperature and humidity) 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

## 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

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 gasoline 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 flying bridges. 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. Inefficient trim angles also can cause the station wagon effect.

- 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 engines 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 can affect the accumulation of carbon monoxide, the boat operator must remain aware at all times of the possibility of CO accumulation.

The following illustrations show some of the ways that carbon monoxide gas 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.



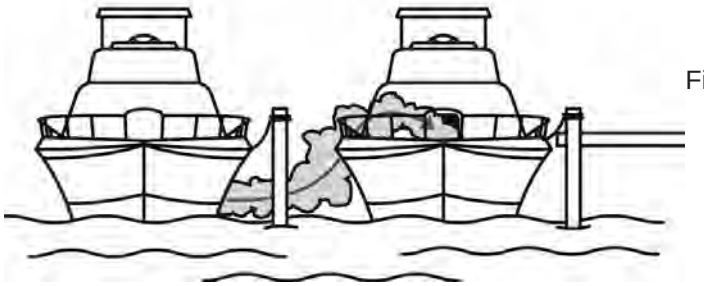


Figure 2. Engine and generator exhaust from other vessels alongside your yacht, while docked or anchored, can cause excessive accumulation of Carbon Monoxide gas within the cabin and cockpit areas of your yacht. Be alert for exhaust from other vessels.

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 and operating with a high bow angle can cause excessive accumulation of Carbon Monoxide gas within the cabin and cockpit areas of your yacht. Always provide adequate ventilation and redistribute the load to lower the bow angle.

Figure 5. 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



### Swimming

On many boats, carbon monoxide from your main engines 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 below 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.

### Teak Surfing

Another danger in the water is a recent activity known as "Teak Surfing" or "Platform Dragging". Not to be confused with the legitimate sport of wake surfing, this activity requires an individual, while in the water, hold onto the swim platform of a boat while underway. As a stern-wake builds the individual can let go of the platform and body surf on the wake. This activity presents several dangers. The area just behind a boat as it moves forward is the most likely place for CO to accumulate. Along with the risk of exposure to CO, one could be slammed into the transom and propellers if the boat suddenly decelerates. Finally, this activity cannot be done wearing a life jacket so the possibility of drowning is increased, especially if CO concentrations are high. NEVER participate or allow others to participate in this extremely dangerous activity.

## 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 engines or generator is running.
- Do not run with a high bow angle. Use trim tabs or redistribute the load to maintain a low bow angle.
- 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 engines 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 engines or generator.



Next, start each 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 assure 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 engines and generator are tuned up. They should run smoothly and not produce black smoke. The spark plugs and ignition systems should be maintained regularly, and 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.

# Boating Under the Influence

## 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.



## 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)

# Miscel aneous
# General Maintenance and Tips

## Fuel Maintenance

Diesel fuel is especially prone to having slime and other matter in it, even when freshly pumped from a trusted fuel source. Periodic inspection of a fuel sample indicates the condition of the fuel in your tanks. Regularly check primary and secondary fuel filters to optimize fuel flow and condition.

## Sight fuel Gauges

Certain models use sight fuel gauges, which require monitoring of the fittings prior to each trip. Change your fuel filters regularly and verify fuel fittings are in proper condition.

## Electronic Controls

Certain models use electronic controls, which should be checked for proper settings of the "shift delay" and the "feel" of engagement to ensure comfortable action to place vessel in forward or reverse gear. This can be changed as per the control manufacturer owner's manuals. Contact your dealer or Customer Service for assistance.

## Outriggers

Proper stowage of outriggers in the up position while running is key to ease of use while setting and storing the outrigger system. Stowing your outriggers with proper support, and also periodic cleaning/lubrication of joints will greatly ease operation of your riggers. Consider using silicone spray, instead of other spray lubricants, to lessen dust and dirt sticking into the moving parts.



## Weld and Fastener Inspection and Maintenance

Both of these subjects are important as a part of your regular maintenance. Owners should do a monthly visual inspection of welded components and tightness check of all fasteners in their boat. These processes pertain to both supplier and boat builder manufacturer items.

**WELDS** should be visually inspected after wiping off with a cleaning solution and rag.

**FASTENERS** should be checked with a manual screw driver and/or proper wrench.

## Cracks and Crevice Corrosion

Periodic inspection of shafts, especially near key-ways, should be done twice a year with a haul-out. Each time a diver is used to perform maintenance is another good time to check the integrity of your shafts, and to also verify that there are no other obvious issues with your shafts and underwater gear. On land, a good type of test is to either use a crayon, smeared over the areas to inspect. Otherwise, use of a metal "bluing dye" is beneficial.

## Stuffing Box and Dripless Seal Maintenance

Both of these types of shaft sealing assemblies require regular maintenance. Every 100 hours should be the timeframe for inspection of seals (DRIPLESS) and annually for packing material (STUFFING BOXES). Both types should be visually inspected before each trip.

**Dripless type** is primarily affected in a negative way if you tighten the O-rings too much or the cooling hoses are not functioning properly.

**Stuffing Box** type require more maintenance and attention. INSPECT to achieve the proper packing compression, and cooling, of the shaft while underway. Too loose, the packing nuts allow too much water to enter, too tight, can damage the shaft. REPACK the stuffing box once the packing material no longer seals properly. Special kits for stuffing boxes are available at most marine supply stores. PACKING CHOICES must be proper size. Many new types are available, check with your local marine supply stores.

## Swim Platforms and Ladders

Your swim platform is the closest accessory to the water, without being constantly immersed. That type of exposure could possibly create loose fasteners, premature fatigue, or other issues that could weaken the attachment. Every few months, you should visually inspect and check for tightness. Periodic checks of the sealants are a good idea as well.

## Sunroofs

Just as with your car, this accessory is one that should be looked at periodically for proper operation and sealing. Follow the instructions as to the types, and frequency, of maintenance related to this item.

## Backing Down

We are sure you have probably seen a dozen photographs of boats backing down on a fish where the stern is almost buried and the cockpit and anglers are awash. This maneuver is one of the most dangerous and should be avoided. The design of your boat, and most others, has the shafts pointed in a down angle of usually 7 to 10 degrees, depending on the model. When you are backing down, you have reversed the lifting direction and now the props are pulling the stern down and lifting the bow. In many cases, a hard and prolonged back down will fill the cockpit and position the cockpit floor lower than the sea level and making recovery very difficult. The additional water pressure on the hatches in the cockpit and the engine room access may cause leaks and water intrusion into the bilges. All hatches should be secure and gasketed correctly. A good way to inspect your cockpit seal is to have someone close the hatch while you are below and look for sunlight coming through any gaps. The hatches should be sealed all the way around.



## Bilge Pumps

These are your primary defenses against water intrusion and they should be checked often and replaced if questionable at all. Testing should include the automatic float switch, manual override switch, the pump and hose plus the wiring harness. All components should be free of corrosion, dirt and debris. Even the best equipment can be rendered useless by an errant piece of debris being caught in the pump. Be sure to keep your bilges clean.

# TrimTab Operation

**Getting and Staying Trimmed**

Most boats “break over” (get on plane) at a particular speed. This speed is determined by many factors, including weight distribution, water conditions, etc. Trim tabs enable your boat to plane at speeds lower than its natural plaining speed. By pressing the control to the “Bow Down” position, your trim tabs move down. This raises your stern and lowers your bow, getting you up on plane faster and increasing your speed and efficiency.

**Your Boat’s Optimum Running Attitude**

A good way to find your boat’s optimum running attitude is to conduct the following test. Lightly load your boat and run it at full speed on flat water. Notice the position of the bow in relation to the horizon. This should be your boat’s optimum running attitude. You can then use your trim tabs to recreate this” perfect attitude” regardless of weight distribution, speed or water conditions.

**Getting Used to the “Feel” of Your Trim Tabs**

When learning to use your trim tabs, begin by pressing the helm control in half-second bursts for gradual trimming. You will notice that a momentary delay occurs from the time you press the control to the time the boat reacts. This is normal and varies with boat speed. Be careful not to over-trim your boat. An over-trimmed boat will “plow” or “bow-steer”. If you over-trim the boat, simply press “Bow Up” and the bow of the boat will rise.



**Trimming From the Flybridge or a Tower**

When steering from a flybridge or tower, a good trimming method is to watch the bow spray, stern wake, or the rooster tail. An untrimmed boat will produce more spray aft of the bow and will produce a larger wake. When trimmed, the bow spray is farther forward, the wake is reduced, and the rooster tail is smaller and farther behind the boat. You will also notice that the engine RPMs will increase when the boat is properly trimmed.

**Running in Rough Water**

When running in a chop or in heavier seas, press “Bow Down”. This will bring the V of the hull into contact with the waves rather than having the waves pounding the hull and your passengers. In a following sea or when running an inlet, the trim tabs should be fully retracted for maximum rudder response.

**Correcting for a List**

Trim tabs are operated individually so that you can correct for listing. The trim tab controls are designed so you can use them intuitively. Do not think about what the trim tabs are doing, just concentrate on the bow of the boat. If the port bow is high, push the port side “Bow Down” direction. If the starboard bow is high, push the starboard side “Bow Down” direction until the bow is level.

**Trim Tabs with Power Trim**

Using your trim tabs in conjunction with your power trim will give you increased speed and power.

1. Adjust the trim tabs to achieve a plaining attitude.
2. Use the power trim to position the prop path parallel to the water flow.
3. If necessary, readjust the trim tabs to “fine tune” your tabs to trim the boat and your power trim to trim your prop.

**Correcting for Porpoising**

Porpoising is a condition more common in faster performance boats, although it may occur in any boat. As speed increases, the bow repeatedly rises out of the water until gravity overcomes lift and the bow bounces down. To correct for this condition, press “Bow Down” in half second bursts. As the trim tabs deflect, the porpoising will subside and your speed should either remain the same or increase. Only a slight amount of trim tab deflection should be necessary.

**SAFETY PRECAUTIONS**

- Do not over-trim, particularly at high speeds, as the bow will dig in and wave action may cause the boat to veer.
- While underway, do not move one trim tab significantly farther down than the other, as undesirable listing could occur.
- Use the trim tab helm control with caution.
- For best maneuverability, trim tabs should be fully retracted in a following sea or when running an inlet.
- To avoid potential damage to the trim tabs, always ensure that they are fully retracted before putting your boat in reverse
- Improper use of trim tabs can result in accident or injury.



Trim tabs have a very significant effect on the operation and versatility of your boat. No one knows your boat better than you, and one of the best learning methods is to spend time getting familiar with your boat’s reaction to the use of your trim tabs. As your experience with your trim tabs increases, so will your enjoyment. Above all, always operate your boat with safety first in mind.

# FuelSafety

## Fire And Explosions on Your Boat Are Real Risks

Over a period of time, it is easy to become complacent about your boat. The fuel system is an area where complacency should not exist. The following checklist should be followed every time you board your boat.

- Before approaching your boat, extinguish all smoking materials and make certain there are no other devices on or near your boat that could create a spark and start a fire or cause an explosion.
- Approach your boat alone to make the initial inspection. Have your guests and crew stand by at a safe distance away from your boat.
- Visually inspect your boat from the dock for any fuel leaks from the deck fills or hull vents and take notice if there is any odor of fuel. Also, check the water surface around your boat for signs of fuel.
- Once on board, open the cabin door and sniff at the doorway and then inside the cabin for fuel odor.
- Open the engine compartment hatch and sniff for fuel odor.
- Inspect the engine compartment and all bilge compartments for fuel leaks and sniff for fuel odor.
- If there are any signs of fuel leakage, either visually or by odor, open doors, hatches and windows and most importantly, DO NOT start the engines, generator or any other device that could create a spark. Evacuate the boat and inform the Dock Master. Have a qualified technician determine the source of the leak. NEVER operate your boat if a fuel leak is suspected or present!
- If no signs of a fuel leak are present, board your guests and crew.
- Run exhaust blowers for five minutes before starting engines or generator.
- Always be aware of the hazards associated with fuel and follow all safety and maintenance procedures in this publication, the owner's manual and Chapman's.



## Fueling Your Boat

Improper fueling procedures can cause boat fires and explosions. It is imperative that the following procedures be followed every time you fuel your boat.

- Before fueling, check the fuel system for leaks and repair or replace any components prior to fueling or starting your engines, generator or any electrical device.
- If possible, fuel your vessel during daylight hours. Check fuel vents to assure the fuel tanks are not over-filled. Fuel spills are easier to spot when visibility is good.
- In very warm weather, do not top off your tanks, as the fuel will expand as it heats up and spill out of the vents.
- Make sure you are using the correct fuel type required by the engine manufacturer.
- Be sure to turn off all engines, the generator and all devices that could create a spark prior to fueling. Battery switches should also be shut off to prevent sparks from any electrical devices.

## Fueling Your Boat – Continued

- Disconnect shore power.
- Extinguish all smoking materials and any other items that can create a spark.
- Completely close all doors, ports, hatches and windows and ask guests to leave the boat during fueling.
- Before fueling, touch the fuel nozzle to the fuel fill cap to discharge any static electricity. Open the designated fill pipe and insert the nozzle while maintaining contact with the side of the fill pipe.
- After pumping several gallons, **STOP**. Inspect engine and tank compartments for any signs of leakage.
- **DO NOT** continue fueling if leaks or the smell of fuel are present. Contact a qualified technician to inspect your boat and repair it before continuing to fuel.
- If no leaks are present, continue fueling, allowing for expansion in warmer weather. Slow the flow as you approach full to avoid overflow.
- Once full, remove nozzle, replace fill cover tightly and clean up any spills.
- After fueling has been completed, open all hatches, doors and compartments. Visually check all fuel fittings, lines and tanks for leakage, including engine and generator fuel lines. Immediately notify a qualified technician of any problems and correct them before proceeding.
- Turn main battery switches on to operate bilge blower. Ventilate all bilges for at least five minutes.
- Make a final inspection of the engine and/or generator space and smell for fumes. If they are present, open all doors and ports and evacuate the boat. Notify the dock master and request a qualified technician to correct the problem. If all is clear, follow the recommended engine starting procedure.
- When storing your boat for extended periods, it is preferable to top off the tanks and add a fuel conditioner and or stabilizer (See page 5 for more information concerning alcohol in fuel). Please refer to the engine owner's manual for recommendations.



## Fuel System Maintenance

Maintenance of your fuel system must also be a high priority. As boats get older, maintenance may be done by people with varying degrees of expertise. Materials and methods previously used can also change.

## Fuel Tanks

All aluminum fuel tanks are susceptible to developing leaks as the result of corrosion and they should be inspected for signs of leaks, corrosion, and pitting each time you board your boat. Corrosion can occur on the external and the internal surfaces of fuel tanks. On the external surfaces of fuel tanks corrosion normally appears as a white chalky, discolored or flaky appearance on the surface of the tank. Sometimes it also appears as pitting or small pockets of missing aluminum. Another indication of external corrosion could be bubbles on the paint that coats the tank (if painted). Corrosion occurring on the internal surfaces of the tank is almost impossible to see during a visual inspection. This type of corrosion typically won't reveal itself until a fuel leak actually occurs. It is important to remember that fuel, especially gasoline, is extremely flammable. Even the smallest spark or flame can cause a fire or explosion that could result in severe injury or even death. It is of the utmost importance that you be certain, especially before you use the boat, that there is no leaking fuel in your boat. This should be your standard procedure. One way to check for a fuel leak is to lift all of the floor and engine compartment hatches and sniff the lowest

areas of the bilge for the odor of fuel. If a fuel odor is present, leave the hatches open and open all doors, deck hatches, and portholes. Do not turn on any electrical or mechanical systems, immediately vacate the boat and have a qualified marine technician inspect your tanks and the entire fuel system.

**NEVER operate your boat if a fuel leak is present!**

Obviously, it is a good practice to sniff the bilges for the odor of fuel prior to starting the engines each time you use your boat. We urge you to follow our suggested procedures and precautions and always be aware of the dangers that are associated with gasoline. There is no substitute for being an educated boater and using good common sense to prevent an accident.

## Fuel Hoses and Fittings

You should also inspect all fuel hoses and fittings for wear and deterioration and assure that the proper materials were used. Fuel hoses must have the USCG type approved markings on them. If they do not, they are not suitable for use with any type of fuel. Additionally, brass fittings must not be connected directly to an aluminum tank. Brass and aluminum are not galvanically compatible and direct contact will result in corrosion. Usually, you will find stainless steel fittings used in front of the attachment of brass fittings and valves. If any of these conditions is present, have a qualified technician immediately correct it.
The fuel distribution supply and return hoses, fittings, and connections should be inspected often for leaks and signs of wear, dry rot, cracking, chafing or swelling. A good way to examine the fuel hoses is to run your hand along the length of the hose including the fittings. Small leaks will be revealed as wet spots on your hand. If any evidence of hose deterioration is present, have a qualified technician replace all of the hoses with USCG TYPE A1 hoses immediately. If a leak is found, turn off battery switches, disconnect shore power and disable any possible source of ignition. Do not start your engines, the generator or any other devices that could create a spark. Contact your Dealer or Customer Service Department immediately. If hoses need to be replaced, make sure that only USCG TYPE A1 are used. TYPE A2 is not acceptable for fuel distribution.



The fuel fill and fuel vent hoses, fittings, and connections should be inspected often for leaks and signs of wear, dry rot, cracking, chafing or swelling. If any of these conditions are present, have a qualified technician immediately inspect the entire fuel system. If a leak is found, turn off battery switches, disconnect shore power and disable any possible source of ignition. Do not start your engines, the generator or any other devices that could create a spark. Contact your Dealer or Customer Service Department immediately. If hoses need to be replaced, make sure that only USCG TYPE A1 or A2 are used.

## Fuel System Grounding

Without a proper ground, static electricity can create a spark resulting in a fire or explosion. Check fuel tanks and fuel fills for proper grounding. Wires are generally easy to replace when necessary.

**Proper grounding (bonding) is critical in maintaining a safe fuel system.**

## Fuel Filtration

Your fuel filters are your primary defense against contamination and water in the fuel. They need to be changed at least as often as the operator's engine manual specifies. The fuel filters should be checked for leaks each time they are changed and as part of the inspections listed above.

## Fuel Gauge

Your fuel gauge is read from a sensor in the tank. If the boat is up and running, an accurate reading is not always possible. Be sure to check the level at rest and inspect the sender for proper electrical connections and leaks at the fuel tank.

## Internal Fuel Tank Corrosion

Many times, fuel tank leaks are the result of galvanic corrosion of the tanks, pitting from the inside out. For galvanic corrosion to begin or continue, the corrosion site must be in contact with a liquid that conducts electricity. Generally, water is required to sustain galvanic corrosion. However, alcohol additives in gasoline, particularly methanol and ethanol, in the presence of very small quantities of water, transform the gasoline into a blended solution of gasoline and water. This solution sometimes becomes a conductive liquid that can promote galvanic corrosion. In the last eighteen years due to changes in gasoline formulations, fuel has become potentially more corrosive. New formulations can contain up to 10 or even 20 percent alcohol, primarily ethanol, and oxidizers such as MTBE and others. These formulations vary widely from brand to brand, region to region, and season to season. Consumer products sold as fuel additives, such as "Sta-Bil" and others added regularly, are the best defense to prevent corrosion as long as they contain no alcohol. With either methanol or ethanol in fuel, water contamination may result in creating a conductive liquid.

Once a conductive liquid is present in the tank, galvanic corrosion is possible. To compound this, the introduction of miniscule particles of certain metals lying on the surface of the tank bottom can increase the risk of corrosion even further. Metal particles may enter the tank at any time from contaminated gasoline. Gasoline delivered to your boat may carry metal contaminants. The metal fittings in the fuel delivery system of your boat, or contact with metal components during gasoline transport, storage, or delivery may result in metal contaminants being introduced to the fuel tanks. In addition, water and other contamination may enter the tanks through the fuel fills if they are not tightened properly. Water and cleaning compounds can introduce enough elements into the tanks to promote galvanic corrosion. Moist air entering the tank through the vents introduces moisture, which can condense and collect inside. Tanks that are empty are more likely to collect water through condensation.



A 1992 Underwriters Laboratory study on aluminum fuel tank corrosion found the average service life for aluminum tanks is only 6.5 years. We are not aware of any single solution to this potential problem. However, it is a good practice to always keep your fuel tanks full, especially during long periods of non-use. When doing so, remember that fuel does expand as the temperature rises and if the tanks are too full fuel may spill from the vent fittings on the hull side. Another good practice is to check the fuel filters frequently for the presence of water. If water is present, the tanks have collected water. It was once believed that the use of fuel stabilizers and inhibitors would reduce water in your tanks. We now know that while stabilizers can be helpful, they can also work with water to increase the possibility of corrosion if the additives contain alcohol. Be careful not to use stabilizers and inhibiters that contain any form of alcohol. Alcohol allows your engine to operate with water contamination, but may contribute to longer-term harm to your tanks. Keep the tanks full of pure gasoline.

# 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.
- 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 (discussed in the fuel safety section of this publication).
- Never smoke while handling fuel.
- Keep machinery and bilge areas clean and free of debris.
- Always sniff for fuel vapors before starting engines or generator.
- 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 $CO_2$ 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's 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 in a doorframe 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 is 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.

# Electrical Safety

## Shore Power Cords – Proper Use and Maintenance

- All shore power cords should be rated suitable for Marine Use, or better still, "UL-Marine" listed for marine shore power applications.
- CAUTION -- Never use ordinary "outdoor use" extension cords to provide electrical shore power to the boat or any equipment, such as a battery charger on board the boat. These cords are not rated for and are not suitable for the severity of a marine environment. They can deteriorate and/or overheat causing electrical shock, a short circuit or a fire.
- All shore power cords should have male (plug) and female (connector) ends of the locking type. Make sure that plugs and connector are turned to the full locked position by pulling on them. If they are properly locked, they will not pull out. A plug or connector not properly locked will become loose, causing arcing (sparks) on the contacts, resulting in a failure, and possibly a fire.
- All male (plug) ends must be molded on or have weather-proof boots in order to provide a weatherproof seal when plugged into a receptacle.
- All female connector ends must have a locking ring to secure the power cord to the inlet on the boat and provide a weatherproof seal.
- Adapters should always be used at the shore end of a power cord.
- Always make sure that the "Main" circuit breaker on the boat is turned "OFF" before connecting or disconnecting the shore power cord.
- Always connect the female end of the cord to the boat before plugging the male end into shore power receptacle. Always disconnect the male end from the shore power receptacle before disconnecting the female end from the boat.
- Never leave a shore power cord on the dock with only the plug end connected. A live cord end is dangerous, especially if it accidentally falls into the water.
- Periodically check shore power cords for the following:

  Cuts, cracks or severe abrasions on the yellow cord covering

  Bent, broken or loose plug blades

  Plug blades or connector slots that show signs of overheating or arcing, such as:

  — Brown or black discoloration on insulation around blades or slots

  — Discoloration and/or erosion of blade material

  Faulty locking rings due to cracking or damaged threads.
- Do not allow cords to be pinched by a closed door or hatch. Pinch points create resistance and generate heat that can result in a fire.
- Never coil a cord tightly on the dock. Such a coil acts as a heat generator and can cause a fire. Hang the cord loosely on a hook or support or lay it out in a loose coil of only a few turns.
- Spray all contacts monthly with an electrical contact cleaner, corrosion inhibitor and lubricant, such as LPS-1 made by Holt Lloyd Corp. Please note that "WD-40" or silicone sprays are not appropriate because the film they leave increases contact resistance. The proper spray types can be found at electrical supply houses or stores such as Radio Shack.
- If a shore power cord should become immersed in water, it should be immediately sprayed with fresh water, THOROUGHLY dried, and blades and contact slots sprayed with a moisture displacement before re-using.

(Source: *USCG Boating Safety Circular*)

## 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 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 marina. Even if you do everything right, you can't be sure that others have, and it's better to be safe than sorry.

# 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 Required Safety Equipment

- Required lifesaving equipment, including personal floatation and throwing devices
- Required fire-extinguishing equipment
- Required visual distress signal devices
- Whistle
- Fog bell (boats over 39.4 feet)

## Minimum Recommended Safety Equipment

- First aid kit
- Emergency position indicating radio beam (EPIRB)
- Manual bailing device
- Anchor with sufficient line/chain
- Flashlight with fully charged batteries
- Binoculars
- VHF radio
- Navigational charts for your cruising area



## Personal Flotation Devices

Hundreds of people drown every year while boating in the United States alone. Statistics show that four out of five drowning victims were not wearing a PFD (life vest or life jacket). In fact, during the year 2000 in the US 519 boaters lost their lives due to drowning. Of which, 445 were not wearing a PFD. The US Coast Guard requires that one approved PFD be provided for each person onboard and strongly recommends that they be worn at all times. Also, most states require that children wear a PFD at all times when on or near the water. You are encouraged to refer to Chapman Piloting, Seamanship and Small Boat Handling or http://www.uscgboating.org for more information about Personal Floatation Devices and other important lifesaving equipment.

# 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.

- 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 assure 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.
- 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 assure that the water traps are full of water. This should also be done periodically throughout the boating season.



# Thru-Huls and Ball-Valves

Everyone takes these important pieces of equipment for granted until they break! Preventative maintenance is very important on all these areas. The easiest procedure is to routinely inspect and tighten all hose clamps. Vibration and wear can loosen them, and corrosion can allow them to fail. Replace any questionable clamps and keep a supply of spares in different sizes aboard. Hoses should be inspected and replaced as needed. Although hoses may look good on the outside, the inside may be deteriorated or may have dry rot. All through hulls should be inspected on a regular basis and all ball or gate valves should be free to open or close. A valve that cannot be closed is inviting a disaster. A good time to grease the ball valves is when your boat is hauled for the season or for bottom paint. You should also carry a supply of "bungs", tapered wood plugs, for emergency use on a through hull. These are usually available at better marine supply stores.

# 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 aids 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 watch and heed posted speeds; do you slowdown in anchorages?
- 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 overboard, 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*)

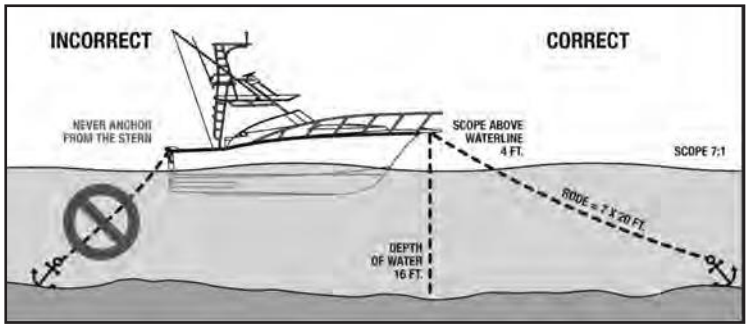
## Man Overboard

One of the most frightening emergencies that may occur aboard a boat is a crewmember or other person falling overboard. Although man-overboard drills have been a routine element of boating safety courses for many decades, they have been largely overlooked by many otherwise responsible boat operators. We encourage you to refer to Chapman's *Piloting & Seamanship* for detailed information and procedures about this important topic.

## Anchoring

Anchoring is done for two principal reasons: first, to stop for fishing, swimming, lunch, or an overnight stay and secondly, to keep you from running aground in bad weather or as a result of engine failure. Anchoring can be a simple task if you follow these guidelines:

- Make sure you have the proper type of anchor — Danforth, plow or mushroom.
- A three-to-six-foot length of galvanized chain should be attached to the anchor. The chain will stand up to the abrasion of sand, rock or mud on the bottom much better than a fiber line.
- A suitable length of nylon anchor line should be attached to the end of the chain (this combination is called the "Rode"). The nylon will stretch under heavy strain cushioning the impact of the waves or wind on the boat and the anchor.
- Select an area that offers maximum shelter from wind, current and boat traffic.
- Determine depth of water and type of bottom (preferably sand or mud).
- Calculate the amount of anchor line you will need. General rule: 5 to 7 times as much anchor line as the depth of water plus the distance from the water to where the anchor will attach to the bow. For example, if the water depth is 8 feet and it is 2 feet from the top of water to your bow cleat, you would multiply 10 feet by 5 to 7 to get the amount of anchor line to put out (See diagram below).




- Secure the anchor line to the bow cleat at the point you want it to stop.
- Bring the bow of the vessel into the wind or current.
- When you get to the spot you want to anchor, place the engine in neutral.
- When the boat comes to a stop, slowly lower the anchor. Do not throw the anchor over, as it will tend to entangle the anchor.
- When all anchor line has been let out, back down on the anchor with engine in idle reverse to help set the anchor.
- When anchor is firmly set, use reference points (landmarks) in relation to the boat to make sure you are not drifting. Check these points frequently.

## Do Not Anchor by The Stern!

Anchoring a small boat by the stern has caused many to capsize and sink. The transom is usually squared off and has less freeboard than the bow. In a current, the force of the water can pull the stern under. The boat is also vulnerable to swamping by wave action. The weight of a motor, fuel tank, or other gear in the stern increases the risk.

(Source: *USCG Boating Safety Circular*)