

ACEBOATER.COM



Study guide

USA

Boating Safety Course

California Boater Card





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CHAPTER 1 – The Boat

Welcome to our online boating safety course!

NASBLA requires 3 hours of online study to access the online exam. You **must** study all seven chapters.

- Each page has a timer showing the study time left for that page.
- Once the time has elapsed, you may go to the next page.
- After each chapter you must take the quick ten-question quiz.
- The passing score is 70%.
- When you have successfully completed all seven chapters, you may take a practice exam or the final exam.
- Passing score to get your Certificate of Completion is 80%.
- Retries are free.
- Study at your own pace.

Mandatory Boater Education

Who needs the card in the State of _____.

Age Restrictions

Age and Education Requirements in the State of _____.

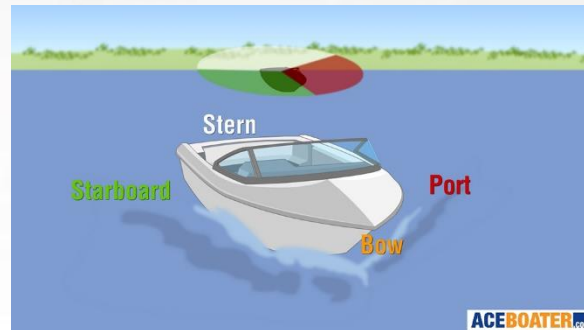


Boating Terminology

https://www.youtube.com/watch?time_continue=4&v=6mM8-33bscM

Boating is growing in popularity across the country as people discover the joy of the water. Boating provides hours of enjoyment but can be very dangerous if you don't take safety precautions. This course presents the basics to make sure you can enjoy the water safely.

Here are some important boating terms you should know.

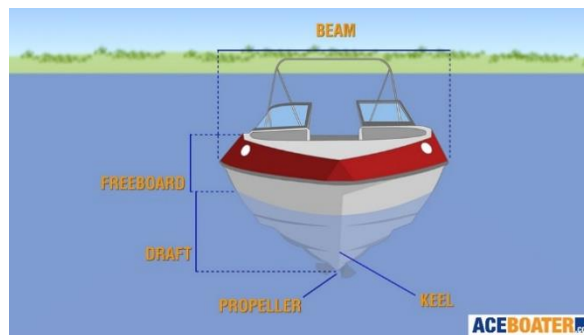


PORT - The left side of a boat looking forward.

STARBOARD - The right side of a boat when looking forward.

BOW - The forward part of a boat.

STERN - The back part of the boat.



BEAM - The width of the boat at its widest point.

FREEBOARD - The minimum vertical distance from the surface of the water to the gunwale.

DRAFT - The depth of water required for a boat to float freely.

KEEL - The centerline of a boat running fore and aft (front to back); the backbone of a vessel.

PROPELLER - A type of fan that transmits power by converting rotational motion into thrust.

WATERLINE - The line marked on the hull of the boat that separates the submerged part of the boat from the part above the water level.

CLEAT - A fitting on ships, boats, and docks to which ropes are tied.

GUNWALE - The top edges of the sides of your boat.

Boat type

Choosing the right boat for your activity is the first step to safe watercraft operation. You would not expect a small runabout to cross the Atlantic, likewise, a large motor yacht would not be suitable to pull water skiers. Boats come in many sizes, configurations and designs, each with a particular use in mind. All boats driven by propulsion machinery are motorboats.



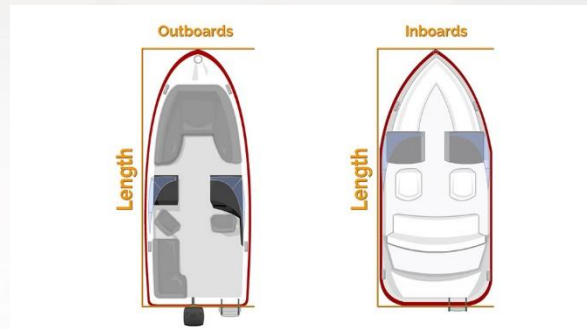
A personal watercraft (PWC), such as a jet ski, is considered a motorboat. PWC must follow the same laws and regulations as a boat with the same length and horsepower. In many states, there are additional regulations for PWC.

The length of your boat and its type of engine determine the safety equipment that you must carry.

Length of a Boat

<https://www.youtube.com/watch?v=iDk3dd7tIJM>

A motor boat is measured from the tip of the bow in a straight line to the stern. This measurement does not include any attachments such as swim platforms, outboard motors, bow sprits, etc. This measurement is the "length overall" (LOA).



Hull Designs

https://www.youtube.com/watch?time_continue=1&v=fg7-7gkPr08

There is a vast range of boat designs, depending on the intended use of the boat. Boats are usually designed to be either **displacement** or **planing** vessels.

Displacement vessels

Displacement vessels are designed to move through the water with minimum propulsion. They have a large underwater profile and ride comfortably but slowly. Trawlers and large sailing boats are displacement vessels.



Planing vessels

Planing vessels are designed to rise up and ride on top of the water when powered. They need much more horsepower to get the boat up but they can reach much higher speeds than displacement vessels. This is because moving on top of the water creates less friction than moving through the water.



Hull types

<https://www.youtube.com/watch?v=WjoxRkaK1m4>

Flat bottom boat

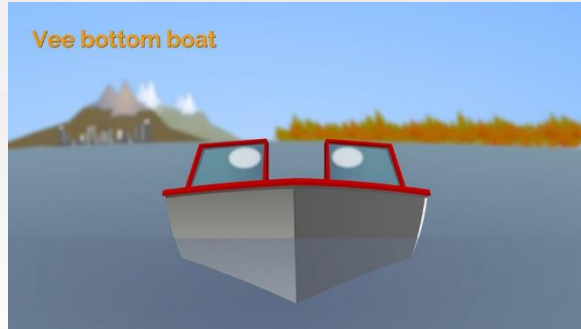
These boats are generally less expensive to build and have a shallow draft. They can get up on plane easily but tend to give a bumpy ride, unless the water is completely calm. This is because the flat bottom pounds each wave. Flat bottom boats are also less stable and need careful balancing of the cargo and crew.



Jon boats, small utility boats, and some high-speed runabouts, are examples of flat bottom boats.

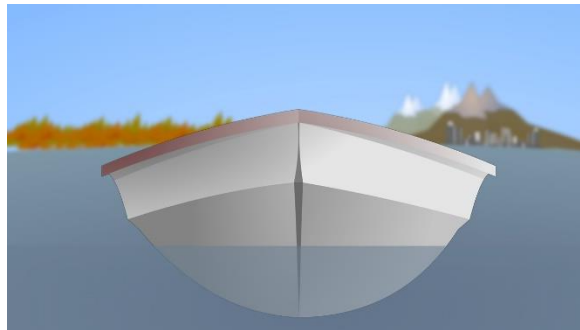
Vee bottom boat

The vee bottom has a sharper entry into the water that provides a smoother ride in rough water. But they need more power to achieve the same speed. Many runabouts use the vee bottom design.



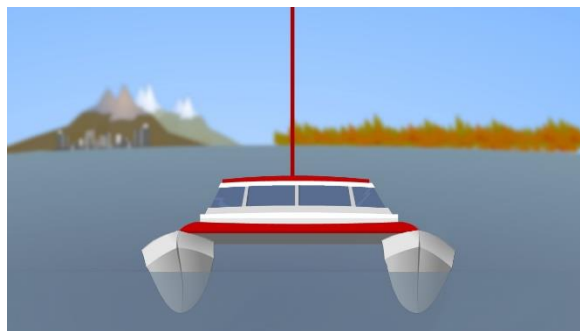
Round bottom boat

These move easily through the water, especially at slow speeds. But they need a deep keel or stabilizers to stop them rolling. Many trawlers, canoes and sailboats have round bottoms.



Multi-hull boat

Catamarans, trimarans, pontoon boats and some houseboats use the multi-hull design. The wide stance provides greater stability. Each of the hulls can use any of the bottom designs described above.



Propulsion Requirements

https://www.youtube.com/watch?v=YF7gU_XtZ4U

Each boat may need a different type of propulsion, depending on its design and intended use. **Most recreational boats in the United States use outboard engines and are less than twenty feet in length.**

Outboard



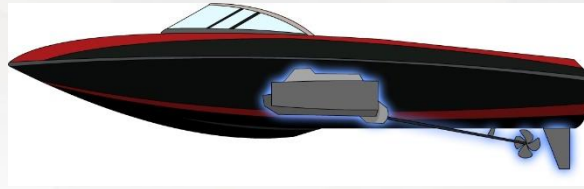
Outboard motors are popular and quite useful on smaller boats. They are light, powerful, and modern outboards are extremely quiet. The outboard is a self-contained propulsion system. It includes the engine, transmission, shaft and propeller. Outboards are usually mounted directly on the transom of the boat. But some boat designs use a motor well or bracket to mount the motor. The whole motor swivels to provide easy steering as the turning propeller pushes the stern. Outboard motors come in a wide range of sizes, horsepower, and power sources. These include: electric or trolling motors, gasoline-and-oil mixture two stroke engines, gasoline-only four stroke engines, and diesel engines.

Stern drive



A sterndrive combines an inboard engine and a lower outboard drive unit attached near the base of the transom. They are generally heavier than outboards. This lower unit resembles the bottom part or lower unit of an outboard motor. The outdrive or lower unit part swivels from side to side to provide for the steering of the boat. It can also be tilted up and down to provide boat trim while underway. I/Os come in both gasoline and diesel models and larger ones tend to have more power than outboards. Stern drives are often favored over outboards especially on larger motorboats. This is because the main power supply is like a small automobile engine, easily accessible and more powerful.

Inboards



The engine is mounted inside the watercraft. It is placed near the center for good weight distribution. They are most popular on motorboats over twenty-six feet in length. The engine connects directly to the transmission, from which a shaft goes through the hull of the boat, passing through the stuffing box. The shaft is then attached to a propeller that turns to drive the boat. The shaft is fixed (does not swivel from side to side), so a rudder behind the shaft and propeller deflects the flow of water and provides steering.

Jet Drive



Jet drives are usually inboard engines that take in water flowing through an impeller-powered pump. The water is then discharged through a nozzle at high pressure. This propels the boat forward. **The nozzle swivels to provide steering to the boat.** PWCs are usually equipped with a jet drive unit. These systems do not have propellers that can be dangerous to people in the water and marine life

Note: Without power, a jet driven watercraft loses steering because the stream of water steers the boat. Keep hands, feet and hair away from the pump intake. Do not operate a jet-driven watercraft in shallow water.



Choosing the right type of propulsion system for your boat is very important. Both its weight and horsepower will have an effect on the performance of your boat. If your boat is underpowered, the engine will work hard and provide poor performance. If your boat is overpowered, it may exceed the safe operating speed for the watercraft.

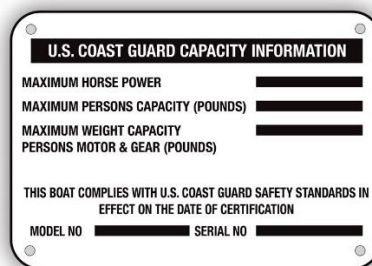
Capacity Plate

<https://www.youtube.com/watch?v=A2W21PBhNPo>

Federal law requires that boat builders put a capacity plate on monohull motorboats less than 20 feet in length. The capacity plate must be permanently displayed in the steering area, in clear view for the operator.

This plate displays three important items:

- **The maximum persons capacity** (number of people or number of pounds).
- **The maximum carrying weight** - persons, motor & gear (pounds).
- **The maximum horsepower recommended for the boat.**



Boats without a capacity plate

Owners of PWCs or other boats without capacity plates should refer to the owner's manual and/or state laws.

Determine safe loading capacity

If you own a boat that was built prior to the federal law mandating capacity plates or you have a homemade boat, you can use the following formulas to determine safe loading capacity.

Determine the maximum number of people for the boat

Boat length (ft.) x boat width (ft.) / 15 = number of people

Determine the maximum horsepower for the boat

Boat length (ft.) x boat width (ft.) = compare the answer to this chart

If answer is:	Maximum HP is:
35 or less	3
36-39	5
40-42	7.5
43-45	10
46-52	15

Boat Capacity

https://www.youtube.com/watch?time_continue=1&v=PBYypCJeSc

Always check the capacity plate to make sure you are not overloading or overpowering the boat. A larger motor than recommended will make the stern too heavy and can cause the boat to flip. The transom will ride too low in the water and you could be swamped by your own wake or a passing boat's wake. Your boat will not sit properly in the water and will be difficult to handle. **If your boat is loaded beyond its capacity, it will be difficult to control.**

Too many people (and/or gear) will also cause the boat to become unstable. **Always balance the load** so that your boat maintains proper trim. **Keep the weight low in the boat.** Too much weight to one side or the other will cause the boat to list and increase the chance of taking on water. Too much weight in the bow causes the boat to plow through the water, and too much weight in the stern will create a large wake. All of these situations make the boat difficult to handle and susceptible to swamping.

Remember that the capacity plate limits are suitable for normal operating conditions. **In rough seas, bad weather or when operating in congested areas, you will should carry a lighter load.**



Registration & Titling

All motorized vessels must be registered and (depending on state requirements) titled when operating on state waters. If a boat does not have a motor it may still have to be registered depending on the state. Each state or territory's registration and titling requirements may differ. Penalties for failing to register a vessel may involve paying a fine as well as the possibility of serving jail time.

Registering your boat means applying for and getting a **Registration Certificate** and a **registration number** that must be displayed on the outside of your boat.

The registration number is actually a combination of letters and numbers normally beginning with the abbreviation of the State in which the boat is registered.

The Registration Certificate is a wallet-sized card and must be on the boat whenever it is being used.

In many states you also have to display a validation decal on your boat.



Display Registration Number and Decals

How to display Registration Number and Decals in the State of _____

Hull Identification Number

The hull identification number (HIN) is the boat's serial number. Boats built after 1972 must have a Hull Identification Number (HIN) permanently attached to the transom on the starboard side above the waterline.

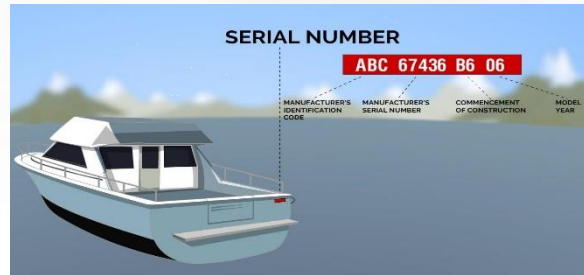
The HIN helps to find lost or stolen boats and boats that are subject to a recall. It's 12 digits long, beginning with the Manufacturer's Identification Code.

This number is necessary to title and register the boat.

You should record this number in a safe place. In case of theft it may help identify your boat.

The HIN must also be permanently attached in a second unexposed (hidden) location.

It is forbidden to alter, deface or remove a hull serial number. If a boat is not marked with a hull serial number, the owner of the boat must make a request for such a number to the builder, manufacturer, rebuilder or importer of the boat.



Cooling System

Boat motors are not equipped with radiators like cars are, but still must somehow get rid of the heat generated by the friction of the moving parts.

The water system simply takes water from the body surrounding the boat, pumps it through the engine to draw out the generated heat and discharges the heated water through the exhaust system. This discharge has two benefits. It cools the exhaust and also muffles the sound of the exhaust.

When you start your boat, make sure that water is being discharged from the exhaust system. This indicates that the cooling system is operational. DO NOT START THE ENGINE WITHOUT WATER BEING SUPPLIED TO THE COOLING SYSTEM. The impeller will burn out quickly without water to cool and lubricate it, and the engine could seize because of overheating.

Marine Environment

Everyone knows that water pollution ruins the beauty of an area but it also harms human life, marine life and damages boating equipment. We will now discuss a number of Environmental Laws and Regulations that are there to protect the environment.

Polluting may result in substantial civil penalties, including fines and imprisonment.

Littering

The Refuse Act prohibits the dumping of plastic refuse, and garbage mixed with plastic, into any waters. Plastic is a big threat to marine life as many species mistake it for food. Birds can get tangled in plastic rings, fishing lines, or nets. Litter can also injure swimmers. Remember, it is ALWAYS illegal to dump plastic into any state or federal waters.

Your distance from the shore determines what you can and cannot throw overboard. The diagram below shows what must **not** be dumped as waste, depending on where you are.



State and local regulations may further restrict the disposal of garbage. Make sure you know the regulations covering the waters upon which you will be boating.

Disposal of Toxic Substances

Regulations issued under the Federal Water Pollution Control Act require all vessels with propulsion machinery to be able to retain oily mixtures on board. A fixed or portable means to discharge oily waste to a reception facility is required. A bucket or bailer is suitable as a portable means of discharging oily waste on recreational vessels. No one may drain oil or oily waste from any source into the bilge of any vessel on purpose.

Cleaning and maintenance products on your boat might include cleaners, paints, solvents, varnishes, fuel, antifreeze and phosphate detergents. You might be surprised by the warning labels and restrictions on the uses of the products and how to dispose of them. You can reduce your impact on the environment by using non-phosphate biodegradable products.

You must immediately notify the National Response Center if your vessel discharges oil or hazardous substances in the water. Call toll-free 800-424-8802 and report the following information:

- Location
- Size
- Substances
- Source
- Color
- Time observed



Display of Information Placards and Waste Management Plans

Oil Placard

The Federal Water Pollution Control Act prohibits the discharge of oil or hazardous substances that may be harmful into U.S. navigable waters. Boats 26 feet in length and over must display a placard at least 5X8 inches, made of durable material, fixed in a conspicuous place in the machinery spaces or at the bilge pump control station, stating the following:



Garbage Disposal Placard

Boats 26 feet and longer must display a "Save Our Seas" Garbage Disposal Placard that outlines the rules of dumping waste offshore. These placards can be bought from local marinas, boat dealers, and marine equipment suppliers.

Waste Management Plans

U.S. recreational boats 40 feet or longer and equipped with a galley and berthing are required to carry a Waste Management Plan if the watercraft operates, or is certified to operate, more than 3 nautical miles from shore.

The Waste Management Plan, identifying the boat's name and homeport, should be posted and include directives to all passengers and/or crew about:

- Discharge of sewage and hazardous substances.
- Discharge of garbage and other food waste.
- Disposal of plastics, bottles, and cans.
- Applicable placards for additional information.
- Advising the captain in case of oily discharges or diesel spills.

Human Waste Disposal



Recreational boats do not have to be equipped with a toilet. **However, the “Clean Water Act” means that if a toilet is installed, it must be equipped with a US Coast Guard-approved Marine Sanitation Device (MSD) to treat, process and store raw sewage.** Installed toilets that are not equipped with an MSD, and that discharge raw sewage directly over the side, are illegal.

Types of MSD

MSD Type I	Flow-through treatment devices that commonly use maceration and disinfection for the treatment of sewage.
MSD Type II	Flow-through treatment devices that may employ biological treatment and disinfection (some Type II MSDs may use maceration and disinfection).
MSD Type III	Typically a holding tank where sewage is stored until it can be discharged shore-side or at sea (beyond three miles from shore).

Portable toilets are not considered installed toilets and are not subject to the MSD regulations. But they are subject to disposal regulations that prohibit the disposal of raw sewage within territorial waters (3 miles limit), the Great Lakes, or navigable rivers.

No Discharge Zones

No Discharge Zones are areas of water that require greater environmental protection and where even the discharge of treated sewage could be harmful. A boat may be equipped with any type of MSD permitted under the regulations. When operating in a No Discharge Zone, a Type I or Type II MSD (these types discharge treated sewage) must be secured in some way to prevent discharge. Closing the seacock and padlocking, using a non-releasable wire-tie, or removing the seacock handle would be sufficient.

Generally, all inland waters, freshwater lakes, and rivers are considered No Discharge Zones, and discharge of human waste is prohibited.

Pump-out Station

This symbol is used to show boaters where you can find onshore pump out services. You will need to locate a marina displaying this symbol if you use a portable toilet or Type III MSD holding tank on your boat.



Aquatic Nuisance Species

<https://www.youtube.com/watch?v=H7EWWISXzrE>

Aquatic nuisance species are non-indigenous species that threaten the diversity or abundance of native aquatic species. Two such ANS are the Zebra mussel and the Quagga mussel. Aquatic nuisance plants, such as loosestrife, water milfoil and hydrilla quickly establish themselves, replacing native plants.

On behalf of water users, states spend tens of millions of dollars attempting to control these species every year. The dense growth of these weeds cause environmental and economic problems including difficulties for water-based recreation, navigation, flood control, water quality and fish and wildlife habitats.

Boaters should take care when pulling their boats from recreational waters. You should inspect the boat and trailer, before you leave the ramp area, and remove any suspected aquatic nuisance species and mud in order to stop their spread to other waters that may be visited.

Stop Aquatic Invasive Species

CHECK

Remove Mud, Weeds and all aquatic life.



DRAIN

Water from pumps, coolers and buckets.



CLEAN

Boat and all gear by drying, power washing or freezing.



Please consult with your state marine patrol and local marinas to identify non-indigenous species in your area.



CHAPTER 2 – Boating Equipment

Personal Flotation Devices

https://www.youtube.com/watch?v=C_rwEm97C5U

PFDs/Life Jackets are important life saving devices and are required onboard. Make sure **when selecting a PFD that it is USCG (United State Coast Guard) approved, is of the Type that is recommended for its intended use** and is designed for a person of your size and weight.

One wearable PFD/life jacket for each person aboard is required and they should be stowed where readily accessible and correctly sized for the persons using them. It is a good idea to place a PFD next to each seat before getting underway.

In addition to a wearable PFD for each person, one Type IV throwable device, which should be immediately available, is also required on each boat 16 feet or larger.

PFD's Labels

Manufacturers include valuable information about each PFD on the product label. The label provides information about the PFDs intended use, along with information about the size of person it will fit, care instructions, and how to wear or don the jacket. Keep in mind that using the PFD outside of its listed restrictions and intended use is illegal and can result in receiving a ticket or, more significantly, the loss of a loved one.



Operator's Responsibility

It is the responsibility of the owner/operator of the vessel to inform passengers of the location of PFDs and life jackets onboard, the importance of wearing them, how to make sure they fit correctly and under what conditions that they are absolutely necessary to be worn. Emphasis should be put on the fact that a life jacket is much harder to put on in the water and passengers should be encouraged to wear them at all times while underway.

If you wait until you are in the water it may be too late!

It's on Board... It's on Me!

Every boater should wear a PFD especially when in dangerous conditions, whether or not required by law. Dangerous conditions include high boat traffic, severe weather, dangerous water conditions, dangerous local hazards, distance from shore, operations at night, and boating alone. Any time you feel in danger or simply apprehensive about a situation remember the following: when in doubt, get it out, and put it on. According to USCG recreational boating statistics, drowning is the cause of approximately 70% of all fatal boating accidents. Of those that drowned, around 90% were not wearing a life jacket.

Remember, conditions on the water can change rapidly. Be prepared by wearing your PFD. If a storm is near, make sure everyone aboard is wearing USCG approved PFDs and head for the nearest shore that is safe.

To minimize the risk of drowning, the safest life jacket is the one you're willing to wear! **It is recommended you wear your life jacket at all times when aboard.**



Putting on a PFD while on land or in a stable boat can be a simple task. However, donning a PFD while in the water can be very difficult. You don't have the same leverage or balance you would normally have. Although you should be wearing a PFD before entering the water, you should practice putting on a PFD while in a pool or in shallow water to experience first hand what it would be like.

The technique for putting on a PFD while in the water:

- Spread the device open with the inside facing up out of the water;
- Rotate the device so as to look at the neck opening;
- Extend both arms through arm openings;
- Lift arms over the head;
- Position the device around the upper body;
- Fasten the device to fit snugly.



PFD Types

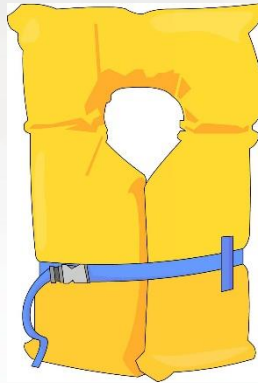
https://www.youtube.com/watch?v=YNj_qKK0wxc

TYPE I PFD



A TYPE I PFD, or OFFSHORE LIFE JACKET, provides the most buoyancy. It is effective for all waters, especially open, rough, or remote waters where rescue may be delayed. It is designed to turn most unconscious wearers in the water to a face-up position. The TYPE I comes in two sizes: adult size (provides at least 22 pounds of buoyancy) and child size (provides at least 11 pounds of buoyancy).

TYPE II PFD



A **TYPE II PFD, NEAR-SHORE BUOYANT VEST** is intended for calm, inland water or where there is a good chance of quick rescue. **This type will turn some unconscious wearers to a face-up position.** The turning action is not as strong nor as effective as a TYPE I. An adult size provides at least 15.5 pounds buoyancy, a medium child size provides 11 pounds. Infant and small child sizes each provide at least 7 pounds buoyancy.

TYPE III PFD



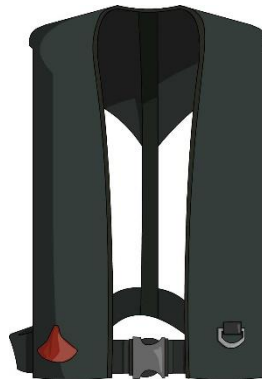
A **TYPE III PFD, or FLOTATION AID**, is good for calm, inland water, or where there is a good chance of quick rescue. **This PFD type will not turn unconscious wearers to a face-up position.** The wearer may have to tilt their head back to avoid turning face down. TYPE III has the same minimum buoyancy as a TYPE II PFD. Examples of Type II PDF include float coats, fishing vests, and vests designed for various water sports. Some Type III PFDs are designed to be inflated upon entering the water.

TYPE IV PFD



A TYPE IV PFD, or THROWABLE DEVICE, is intended for calm, inland water with heavy boat traffic, where help is always present but can be used in open water as well. **It is designed to be thrown to a person in the water** and grasped and held by the user until rescued. It is not designed to be worn. Type IV devices include buoyant cushions, ring buoys, and horseshoe buoys.

TYPE V PFD



TYPE V, Special Use Devices, are intended for use during special activities (such as windsurfing, kayaking, or waterskiing) or in specific conditions. Type V PFDs have different designs depending on their intended use. For example, type V PFDs for cooler climates (such as deck suits, or work vests) may provide hypothermia protection. Type V Special Use Devices must be worn when underway to meet minimum US Coast Guard requirements.

Many Type V inflatable vests are designed to automatically inflate when entering the water. They are the least bulky. They are not guaranteed to turn an unconscious wearer face-up.

USCG-approved inflatable PFDs must be functional and armed. Check and replace used cartridges in inflatable PFDs.

Inflatable PFDs

<https://www.youtube.com/watch?v=voui43i7Jv0>

Inflatable PFDs only count towards the PFD/life jacket requirements if they are worn. However, they are **not for use when water impact is expected, such as when waterskiing, riding personal watercraft, or whitewater paddling**. It is against the law for a person under 16 to meet the carriage requirements by wearing an inflatable PFD.

Inflatable PFDs are now available in types III and V. However, the characteristics of inflatable PFDs are different than inherently buoyant PFDs. Inflatable PFDs are not inherently buoyant and will not float without inflation.

Although an inflatable PFD is considered one of the most comfortable PFDs to wear when it's hot, it requires regular maintenance — the owner's manual should be read and kept as reference. **After you have activated your inflatable PFD, replace the CO2 cartridge and re-arm.**

To insure proper operation make sure that:

- The armed indicator is showing green.
- The inflation cartridge is not cross-threaded (make sure it is screwed in properly to avoid leaks).
- Check for punctures and wear.
- Manually inflate the air bladder periodically to ensure it is in good condition.

Lack of proper maintenance will render the inflatable PFD useless.

PFDs Serviceability

https://www.youtube.com/watch?time_continue=8&v=zwIonLgjPTo

Make sure all your PFDs are in good condition

Ultraviolet sunlight, rough handling and improper storage make it necessary to check your PFD is in serviceable condition. Check for rips, tears, and holes. Make sure seams, straps, zippers and hardware are okay. Make sure there is no sign of waterlogging, mildew odor, or shrinkage of the buoyant materials. **If your PFD is discolored, torn or has torn straps, discard and replace it.** A PFD and/or lifejacket become void if it has been repaired or altered. This means it is no longer usable and must be thrown away and replaced as the floatability may be compromised.

Exposure to sunlight and moisture can deteriorate PFDs rapidly. Let your PFD drip dry thoroughly before putting it away. If your PFD has been in salt water, rinse it thoroughly

with fresh water. On board, place your PFDs and life jackets that are not being used in a dry, well-ventilated and accessible area.

PFDs Proper Fit

<https://www.youtube.com/watch?v=KorvNCuz6TI>

Specific PFDs exist for many different sports such as kayaking, canoeing, fishing, sailing, etc. Any person being towed on water skis, other towed devices, or operating or riding on a personal watercraft (PWC) must wear a properly fitted USCG-approved PFD. When you buy a PFD, choose the model that is the most suitable for the activity you will be doing. It should be snug fitting, yet allow your arms and legs to move freely.

There's no question that life jackets save lives. However, a life jacket that does not fit properly can put a person at risk of drowning. Proper fit is vital for safety on the water.



To ensure the proper fit of a PFD, have the wearer put on a PFD and adjust the straps as necessary to ensure a snug fit. Have the wearer raise his or her arms above their head. With his or her arms raised above their head, pull-up firmly on the upper straps of the PFD. **A properly fitted PFD will not ride higher than the ears or mouth of the wearer and will keep the head and chin out of the water.** Follow the tips below to insure that the PFD you will be wearing is effective.

- **Always choose a USCG-approved life jacket that is the correct size for the weight of the person.** The USCG stamp of approval, size, whether it is for a child or an adult, and appropriate weight of the wearer should be listed inside the jacket on the label. A person's chest and/or stomach size may come into play when selecting the right life jacket.
- Use the "touchdown" test to see if your life jacket fits properly. Lift your arms above your head as if calling a "touchdown." The chest portion of the jacket should not touch your chin when you look left, right or over your shoulder. If the jacket passes this test, it most likely fits. If possible try it out in shallow water.

The life jacket should not ride up on your body. However, ride-up may happen if your stomach is larger than your chest.

- Weigh a child and measure for chest size under the arms before shopping for a child's life jacket. A properly fitting jacket should be snug but not tight.
- Check for proper fit of a life jacket on a child. Wearing the jacket, the child should stand normally with arms at his or her sides. Grab the jacket at the shoulders and firmly lift up. The jacket does not fit if it moves more than three inches up and down the child's body during the test.
- Ensure a life jacket for an infant or child has a crotch strap to help keep the life jacket on. A good choice for the smaller boaters has an oversized float collar to help keep the head out of the water and a grab loop for easier water rescue. **All straps should be intact and fastened at all times.**

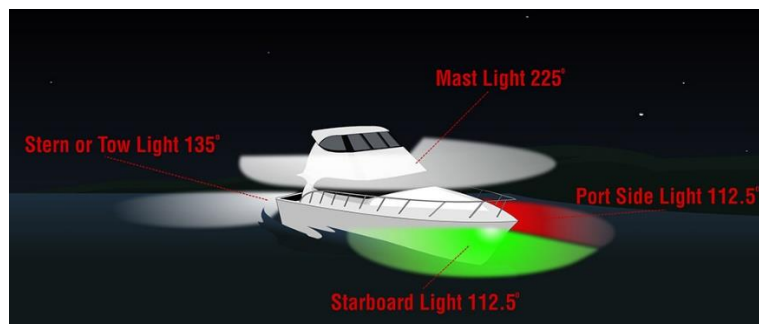
Note – The fitting procedure above does not apply to inflatable PFDs. For inflatable PFDs, the retaining strap should be adjusted loosely to allow for the inflation of the device.

PFDs - State Specifics

State laws for PFD wearing requirements for children and for certain water craft and sports.

Navigation Light Equipment

Recreational boats must display navigation lights between sunset and sunrise and during periods of reduced visibility. Many boat collisions happen at night, according to boating accident statistics. Boat operators can help reduce nighttime collisions by following navigation and anchorage light requirements.



Sidelights

A red light on the port side and a green light on the starboard side, each displaying a constant beam and affixed in a manner that the light is projected to the front and sides allow you to determine if the oncoming craft is heading towards you or from one side or another.

Sternlight

A white light placed as closely as practical at the stern shining constantly, affixed in a manner so that the light will shine out at 135 degrees from the back of the boat and affixed to show the light from aft on each side of a pleasure craft.

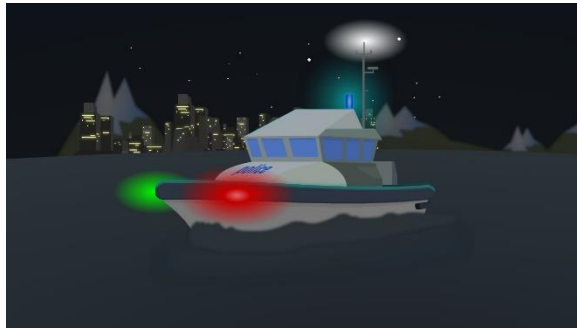
Masthead light

A white light placed over the fore and aft centreline of a pleasure craft shining constantly and affixed to show the light from straight ahead to either side of a pleasure craft.

All-round light

A white light shining constantly over the horizon at **an arc of 360 degrees**.

Blue flashing light



Restricted to all **law enforcement agencies and some government agencies**, emitting an all-around blue-flashing beam indicated the boat is engaged in official duties in US waters.

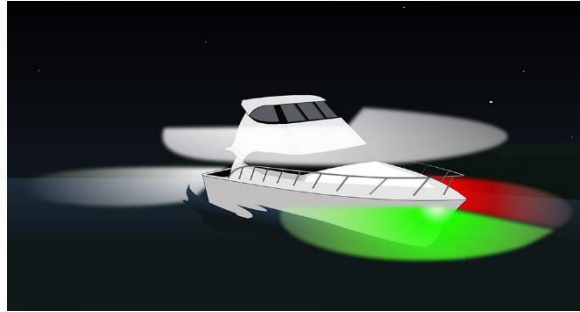
Recognizing Boats by their Lights

<https://www.youtube.com/watch?v=W29P8odYZDw>

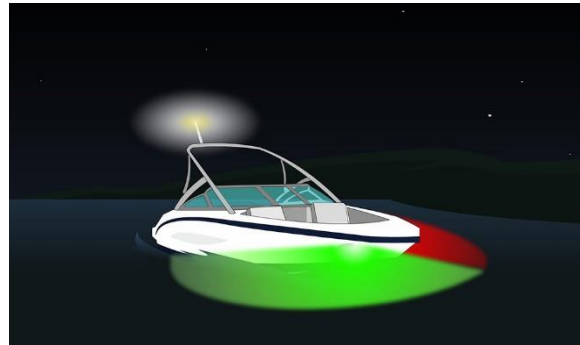
While boating at night you must display the appropriate lights to let other vessels know if your craft is under sail, power-driven, or at anchor. Large ships, vessels with fishing nets,

and tugboats pulling barges will display additional lights so that they can be identified. Also, **by looking at the colour of the other craft's navigation lights, you can tell who has the right-of-way when two crafts meet during nighttime navigation.**

Power-driven vessels (less than 65.6 feet long)



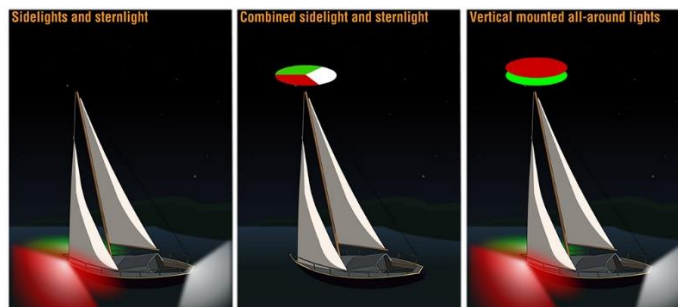
Power-driven vessels (less than 39.4 feet long)



Power-driven vessels (less than 23 feet long)

Vessels whose maximum speed cannot exceed 7 knots may exhibit an all-around white light (360 degrees) and, if practicable, sidelights instead of the lights prescribed above, **in international waters only.**

Sailing Vessels (less than 23 feet long)



Sailing vessels less than 7 meters may carry an electric torch or lighted lantern showing a white light to be displayed in sufficient time to prevent collision. If practicable, the lights required for sailing vessels less than 20 meters should be displayed.

Vessels under oars (kayaks & canoes)

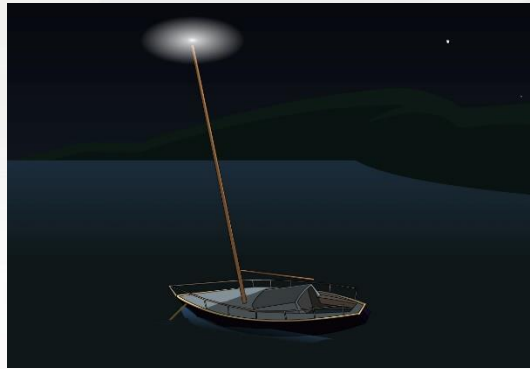


A canoe or kayak may display the lights required for sailing vessels. Otherwise, you must have an electric torch or lighted lantern (flashlight) showing a white light to hand and to be displayed in enough time to prevent a collision.

Anchored Vessels



Power-driven vessels and sailing vessels at anchor must display anchor lights. An anchor light for a vessel less than 50 meters in length is an all-around white light visible for 2 miles and exhibited where it can best be seen.

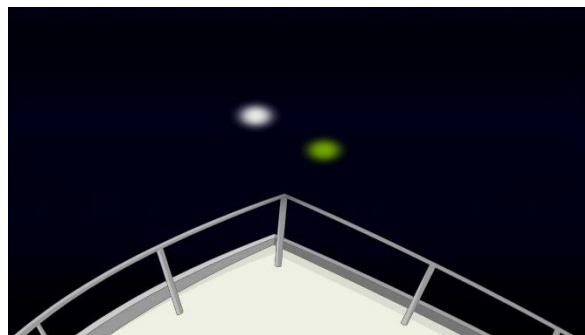


Vessels less than 7 meters are not required to display anchor lights or day shapes unless anchored in or near a narrow channel, fairway or anchorage, or where other vessels normally navigate. Anchor lights are not required on vessels less than 20 meters, anchored in special anchorages in inland waters designated by the Secretary of Transportation.

Boat Navigation at Night

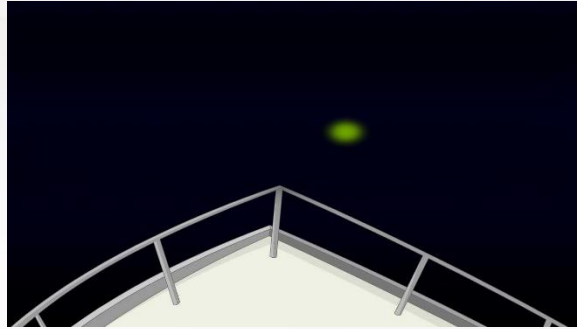
Below are examples of situations you may come across when navigating at night. They show the necessity for navigation lights as well as how to recognize the type and path of the approaching vessel.

If you see a **green light and a white light**:



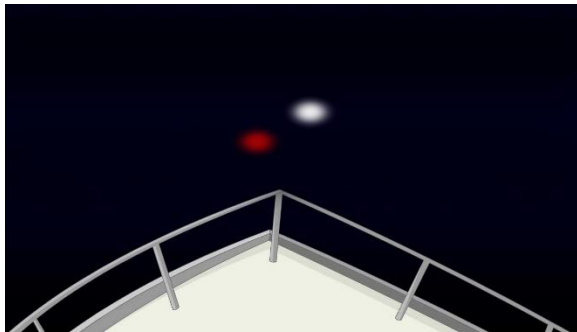
It means that you are approaching the starboard side of a power-driven vessel.

If you see a **green light only**:



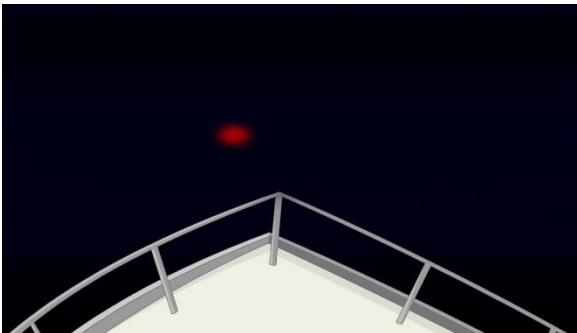
It means that you are approaching the starboard side of a sailing vessel.

If you see a **red light and a white light**:



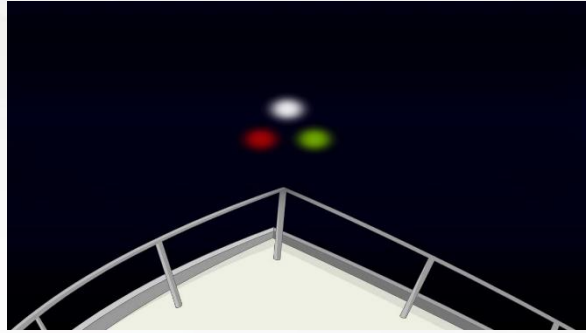
It means that you are approaching the port side of a power-driven vessel.

If you see a **red light only**:



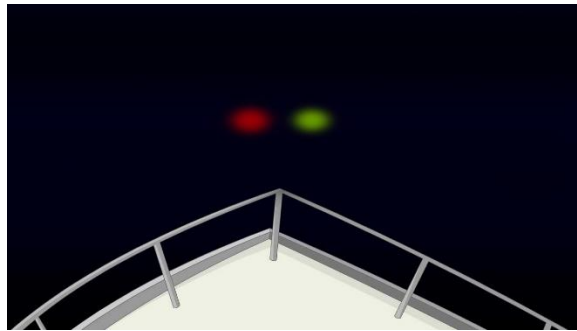
It means that you are approaching the port side of a sailing vessel.

If you see a **red light, a green light, and a white light**:



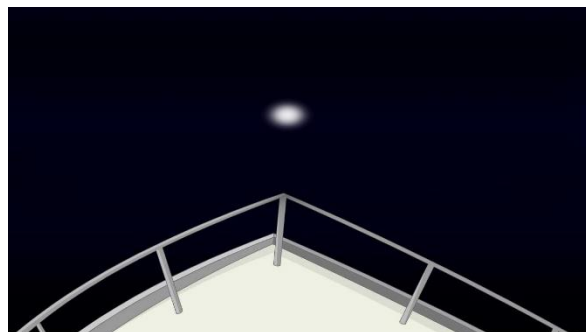
It means that you are approaching another power-driven vessel head-on.

If you see a **red light and a green light**, but there is **no white light**:



It means that you are approaching a sailing vessel head-on. Sailing vessels only have a stern light that illuminates just the back of the boat.

If you see a **white light only**:



It could indicate that:

- you are approaching an anchored craft; or
- you are overtaking a power-driven vessel or a sailing vessel (you see the stern); or
- you are approaching a vessel under oars or a sailing vessel of less than 7 meters.

Navigation lights should be checked before leaving the dock and you should always carry spare bulbs. The USCG does not care if they were working when you left, only that they work when needed.

For the most up-to-date lighting requirements for recreational boaters, visit the US Coast Guard's website at www.uscgboating.org.

Fire Extinguishers

<https://www.youtube.com/watch?v=9kH-xMOCrWE>

Fire extinguishers are a very important safety item. Although not all motorboats are required to carry a fire extinguisher, it is highly recommended that you do. There are many types and sizes of extinguishers but each one has to be U. S. Coast Guard-approved.

Fire Extinguishers are classified by letters and numbers according to the class and size fire they can put out. **The letter on the extinguisher (A, B, C, or D) indicates the class of fire. The number is a measure of the capacity of the extinguisher** - the larger the number, the greater the capacity of extinguishing material to put out a fire.

"A" is for combustible solids like wood



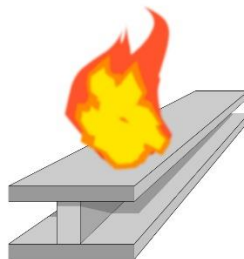
"B" is for flammable liquids such as gasoline





"C" is for electrical fires



"D" is for combustible metals like magnesium



Some boat fires involve burning wood and paper (Class A), but these fires can be put out with water. Do not use water on gasoline, oil, or electrical fires. Water causes gasoline and oil fires to spread and electrical current is conducted through the water.

Fire Extinguisher Classification				
		Foam (gal.)	CO2(lb.)	Dry Chem(lb.)
B-I		1.25	4	5
B-II		2.5	15	10

Extinguisher Requirement						
Boat Length	Less than 26 ft.	26 ft. to less than 40 ft.	40 ft. to less than 65 ft.	Greater than 65 ft.	Inboard Engines	
B-I			 OR	 OR	Must meet federal requirements.	When the engine compartment is equipped with a fixed (built-in) extinguishing system, 1 less B-I extinguisher is required.
B-II						

Fire Extinguishers – Inspection

<https://www.youtube.com/watch?v=kYMYSeToi7w>

Inspect your fire extinguishers monthly to make sure they are properly stored, charged and undamaged. Provide maintenance according to the manufacturer's recommendations.

- Portable extinguishers should be mounted where they are readily accessible.
- **Check the gauge on your fire extinguisher regularly to ensure that it is charged properly.**
- Check the seals to make sure they have not been tampered with.
- Replace cracked or broken hoses and keep nozzles free from obstruction.
- Weigh extinguishers to assure that they meet the minimum weight stated on the label.

- Before each voyage, turn your dry chemical extinguisher upside down and give it a few taps with a rubber mallet. This will loosen the powder inside the extinguisher if it has caked up. Loose powder is much more effective for putting out a fire.

Once you use a fire extinguisher, you should either have it recharged, if it is rechargeable, or replaced if it is a disposable type. In any event, always make sure that your extinguisher label indicates that it is a U.S. Coast Guard-approved marine-type device.

Ventilation Systems

The ventilation system removes fuel vapors from the bilge by circulating air through the engine and fuel tank compartments, which will help prevent a fire or explosion from occurring.

All boats built after April 25, 1940 that use gasoline to generate electricity, for mechanical power or for propulsion must be equipped with a ventilation system.

There are two types ventilation system that may be used:

- Natural ventilation system
- Powered ventilation system

Natural ventilation system

A natural ventilation system consists of at least two ventilator ducts, fitted with cowls or their equivalent:

- A minimum of one intake duct installed to extend at least midway to the bilge or at least below the level of the carburetor air intake.
- A minimum of one exhaust duct installed to extend from the open atmosphere to the lower portion of the bilge.



Powered ventilation system

All boats built after July 31st, 1982, that have an inboard engine or installed fuel tanks are required to have a powered ventilation system. A powered ventilation system consists of one or more exhaust blowers. Each intake duct for an exhaust blower should be in the lower one-third of the compartment and above the normal accumulation of bilge water.

You, the owner of the boat, are responsible for keeping your boat's ventilation systems in operating condition.

Make sure:

- Openings are free of obstructions.
- Ducts are not blocked or torn,
- Blowers are operating properly,
- Worn out parts are replaced with equivalent marine type equipment.

Remember: the USCG recommends turning on the powered ventilation system for four minutes before you start the boat's engine, and for at least four minutes after fueling to remove any fumes that may have settled.

Back-fire Flame Control Device



Internal combustion engines can back-fire. In order to prevent flames from the back-fire causing a fire onboard, an approved Back-Fire Flame Control Device must be attached to the air intake with a flame-tight connection. **Flame arrestors must be in good and serviceable condition.**

They must be approved by one of the following organizations:

- **U.S. Coast Guard**
- Underwriters Laboratories
- Society of Automotive Engineers Standard

This is required for all motorboats except outboards and diesels.

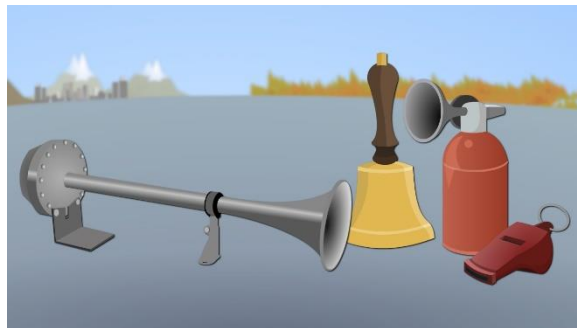
It is very important to ensure your flame arrestor is clean and undamaged. If there is a hole in the grid, or oil or gasoline in the grid, or if it is not properly attached, it will not work correctly. To clean the flame arrestor, remove it and wash the heat dissipation grid with soap and water. Let dry thoroughly and reinstall. Make sure that the arrestor has a flame-tight connection.

Sound Signaling Equipment



Navigation rules require sound signals under certain circumstances. Meeting, crossing and overtaking situations described in the Navigation Rules section are examples of when sound signals are required. Recreational boats are also required to use sound signals during periods of reduced visibility.

- **Vessels less than 39.4 feet long:** An efficient sound-producing device, such as a horn or whistle is required. The required device for boats of this size must be audible for ½ mile.
- **Vessels greater than 39.4 feet long:** A bell is required in addition to a horn or whistle. The required device for boats of this size must be audible for ½ mile.



VDS - Pyrotechnic Devices Type

<https://www.youtube.com/watch?v=rIEq9HwQILE>

USCG regulations make it illegal to display distress signals unless a distress situation actually exists. You should only use visual distress signals (VDS) when help is close enough to see the signal. The USCG recognizes both pyrotechnic and non-pyrotechnic devices

Pyrotechnic devices

Red flare (hand-held)



Orange smoke (hand-held or floating) - Day use only



Red meteor flare (launcher)



Parachute flare (launcher)



Information about the use of flares

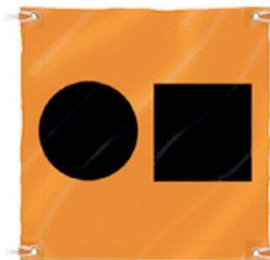
<https://www.youtube.com/watch?v=GEgMG8Yoe6w>

- **Read and understand the instructions.**
- **Note the expiration date and replace as necessary.**
- **Hold lighted flares downwind and over the side of the boat.**
- **Do not point them at anyone and hold them away from your body.**
- Store in a watertight container such as a Ziploc bag.
- Store where readily accessible and ready to use.
- Use only in case of an emergency.

VDS - Non-Pyrotechnic Devices Type

<https://www.youtube.com/watch?v=UGOPBwDb6RQ>

Orange distress cloth or flag



The Orange distress flag is required only on recreational boats of 16 feet or greater. Day use only.



Another option is to display an orange flag with a black ball (above or below the flag).

Electric distress signal



For night use only. The electric distress light must automatically flash the international distress signal (S.O.S.). It must be a U.S. Coast Guard approved device, indicated by the U.S. Coast Guard approval sticker.

Arm signal



Or, within sight of another person, you can **signal distress by extending both arms out and raising them up and down**. Arm signal does not meet equipment requirements but if you do not have any other distress signals, wave your arms to summon HELP.

VDS – Uses

All vessels used on coastal waters, the Great Lakes, territorial seas, and waters connected directly to these waters, up to a point where a body of water is less than two miles wide, must be equipped with USCG-approved visual distress signals (VDS). Vessels owned in the United States operating on the high seas must be equipped with USCG-approved visual distress signals.



These vessels are not required to carry day signals but must carry night signals when operating from sunset to sunrise:

- Recreational boats less than 16 feet in length.
- Boats participating in organized events such as races, regattas, or marine parades.
- Open sailboats less than 26 feet in length not equipped with propulsion machinery.
- Manually propelled boats.

A minimum of three visual distress signals must be carried. Visual distress signals must be USCG-approved, in serviceable condition, and readily accessible.



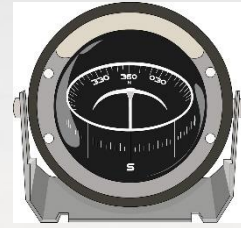
The following combinations of signals are examples of Pyrotechnic VDSs that could be carried onboard to satisfy USCG requirements:

- Three hand-held red flares (day and night).
- One hand-held red flare and two red meteors (day and night).
- One hand-held orange smoke signal (day), two floating orange smoke signals (day) and one electric light (night only).

Other Recommended Equipment

As well as all the equipment the USCG requires, it is just good common sense to have some other equipment and supplies on board. The following items should be carried aboard:

- VHF Radio
- Anchor and ground tackle
- Bilge pump and or bailer
- Boat hook
- Charts and navigation publications
- Compass
- Detectors and alarms
- Fenders
- Lines
- First aid kit
- Flashlight and searchlight
- Spare parts and tools



VHF Radio

<https://www.youtube.com/watch?v=XU1Iq5sQDWo>

Communications

Although marine VHF radios are currently not a requirement for small recreational boats, this should be high on your list of equipment to carry. You should learn to properly use the radio and, during your passenger orientation, make sure at least one of your guests can also use the radio in case of emergency.

Distress Vs Non-Distress

Distress is defined as a situation where **you or your boat are threatened by grave danger** with loss of life or loss of the watercraft being imminent. Running out of fuel, a dead battery or other mechanical problems **are not distress situations**.

The Coast Guard serves as Search and Rescue (SAR) coordinator for all maritime emergencies and is the appropriate point of contact whenever you are concerned for your safety. If you are in distress, the Coast Guard will take immediate steps to help you. Normally Coast Guard rescue boats and/or aircraft will be sent, but assistance from any available source will be arranged to expedite your rescue.

How To Signal For Help

First you need to be familiar with just a few of the many radio channels available to you. **Channel 16 is the hailing and emergency channel**. This means that this channel is used to hail (call) another boat, marina, the U.S. Coast Guard, etc. You should not hold conversation on this channel. In non-emergencies use it only to contact another party and then switch to a "working channel" to carry on your conversation. There are many working channels to choose from. Just pick one, say Channel 68, and use it regularly.

Another channel to remember is Channel 22A. This is the U.S. Coast Guard's channel. Although you can contact them directly from Channel 16, you can also contact them on 22A. If you have a VHF radio, keep it tuned to channel 16. Know where you are at all times and be prepared to describe your specific location.

Use a maritime VHF radio to signal distress:

- If you are in extreme danger (for example, your boat is taking on water and you are in danger of sinking or capsizing), use your VHF radio channel 16 and say "Mayday, Mayday, Mayday."
- If you need help but are not in immediate danger (for example, your motor has died and you cannot reach shore), use channel 16 and say "PanPan, PanPan, PanPan".
- If you find yourself in a difficult situation, to keep up-to-date about the changing weather and the most recent navigation security alerts put out by the authorities (such as a cargo boat navigating in narrow waters that could put your safety at risk) simply call "Coast Guard, Coast Guard, Coast Guard"

Which channels or frequencies are **used for emergency calling purposes only**?

- **Channel 16** on a VHF (Very High Frequency) radio.
- **2182khz HF/SSB** on a Medium Frequency radio.

What To Tell The Coast Guard

- Your location or position (make sure you know where you are at all times).
- Exact nature of the problem (special problems).
- Number of people on board.
- Your boat name, registration and description.
- Safety equipment on board.

If you are buying a new VHF radio, make sure it has the new Digital Selective Calling (DSC) feature on channel 70. This provides automatic digital distress alerts. VHF channel 70 is only used for DSC (digital) communication.

Radio vs. Cellular

VHF Radio vs. Cellular Telephones

The Coast Guard does not recommend using cellular phones as a substitute for the regular maritime radio distress and safety systems. However, cellular phones can have a place on board as an added measure of safety.

There is no comparison between cellular phones and VHF marine radio. They provide different services. Cell phones are best used as an onboard telephone—a link with shore-based telephones. A VHF marine radio is intended for communication with other ships or marine installations—and is a powerful ally in emergencies.


While you may be able to get search and rescue assistance from the nearest Coast Guard Marine Communications and Traffic Service centre by **dialling *16 on a cell phone, it is no substitute for a marine radio.** Using a cell phone is not the best way to issue a distress call, because:

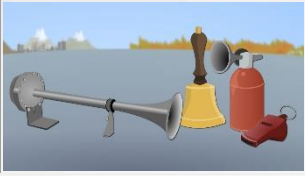

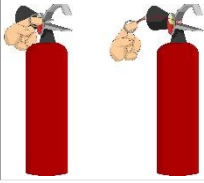
- Cell phones can lose their signal or get wet or damaged.
- Calling from your cell phone does not alert nearby vessels that you are in distress—they could help you if they hear you.
- Some cell phone signals cannot be traced to your location by rescuers.
- Not all cell phone providers offer the *16 service. Find out if this service is available for your phone.

If you have a portable or handheld cellular telephone, by all means take it aboard. If you are boating off shore, a cellular phone is no substitute for a VHF radio. But, if you are within cellular range, it may provide an additional means of communication.

Boat Safety Equipment Required

All boats are required to carry certain equipment. Most items must be approved by the U. S. Coast Guard, kept in good condition, and used only for their designated purpose.

U.S. COAST GUARD MINIMUM REQUIREMENTS FOR RECREATIONAL BOATS				
EQUIPMENT	Boats less than 16ft/4.9m	16 to less than 26 ft/7.9m	26 to less than 40 ft/12.2m	40 to not more than 65 ft/19.8m
Personal Flotation Devices (PFDs) 	One approved Type I, II, III or V (must be worn) PFD for each person on board or being towed on water skis, tubes, etc. <i>Check state laws for PFD wearing requirements for children and for certain water craft and sports.</i>	One approved Type I, II or III PFD for each person on board or being towed on water skis, etc.; and one throwable Type IV device. (A type V PFD may be used in lieu of any wearable PFD if approved for the activity in which the boat is being used. A TYPE V HYBRID MUST be worn to be legal.)		
Bell, Whistle	Every vessel less than 65.6 ft. (20 meters) in length must carry		On Federally controlled waters, every vessel 65.6 ft. (20 meters) or more in length must carry a whistle and a bell.	

	<p>an efficient sound producing device.</p> <p>Check state regulations that may vary.</p>	<p>They must be audible for 1 nautical mile.</p>	
<p>Visual Distress Signals (Coastal Waters, the Great Lakes & U.S. owned boats on the high seas)</p> 	<p>Required to carry approved visual distress signals for night-time use.</p>	<p>Must carry approved visual distress signals for both daytime and night-time use.</p>	
<p>Fire Extinguisher (Must be Coast Guard approved)</p> 	<p>One B-I type approved hand portable fire extinguisher. (Not required on outboard motorboats less than 26 ft in length if the construction of the motorboat means explosive or flammable gases or vapors cannot get trapped, and if fuel tanks are not permanently installed.)</p>	<p>Two B-I type OR one B-II type approved portable fire extinguishers.</p>	<p>Three B-I type OR one B-I type PLUS one B-II type approved portable fire extinguishers.</p>
<p>When a fixed fire extinguishing system is installed in machinery spaces it will replace one B-I portable fire extinguisher.</p>			
<p>Ventilation (Boats built on or after 8/1/80)</p>	<p>At least two ventilation ducts capable of efficiently ventilating every closed compartment that contains a gasoline engine and/or tank, except those with permanently installed tanks that vent outside of the boat and that contain no unprotected electrical devices. Engine compartments containing a gasoline engine with a cranking motor are additionally required to contain power operated exhaust blowers that can be controlled from the instrument panel.</p>		
<p>Ventilation (Boats built before 8/1/80)</p>	<p>At least two ventilation ducts fitted with cowls (or their equivalent) to efficiently and properly ventilating the bilges of every closed engine and fuel tank compartment using gasoline as fuel or other fuels having a flashpoint of 110 degrees or less. Applies to boats constructed or decked over after April 25, 1940.</p>		
<p>Back-fire Flame Arrestor</p>	<p>One approved device on each carburetor of all gasoline engines installed after April 25, 1940, except outboard motors.</p>		

CHAPTER 3 – Trip planning and Preparation

Pre-Departure Checklist



In the previous section we discussed all of the required equipment for a safe outing. In addition to the minimum requirements, common sense tells us we should check everything about our boat before leaving the dock to prevent an unpleasant situation.

Pre-Departure Checklist	
<i>PFDs</i>	
<input type="checkbox"/>	At least one Coast Guard-approved device per passenger and a minimum of two on board.
<input type="checkbox"/>	An additional throwable device is required if the vessel is 16 feet or longer.
<input type="checkbox"/>	Explain the location and use of all PFDs to passengers and crew that may be new to the vessel.
<i>Sound Signaling Devices</i>	
<input type="checkbox"/>	Must have a horn capable of producing a four-second blast audible for at least 1/2 mile.
<input type="checkbox"/>	If a portable air horn, have a spare can of air or an alternate device (Whistle).
<i>Navigation Lights</i>	
<input type="checkbox"/>	All navigation lights as required.
<input type="checkbox"/>	Instrumental lights working.
<input type="checkbox"/>	If you intend to engage in an activity that requires a day shape, have the required shapes.
<input type="checkbox"/>	Flashlight on-board.

Visual Distress Signals

- Accessible flares, day signals, etc., stored in a dry location.
- Carry signals at all times even if not required by the Coast Guard.
- Inform the crew and passengers of their location and their use.

Tools and Spares

- Basic tool box on-board.
- Box of spares aboard, e.g., fuel filter, light bulbs, head parts, through hull plugs, etc.

Ventilation

- On any powered vessel or auxiliary powered sailboat, or vessels using LPG for cooking or heat, check that all interior spaces are well ventilated before departure.
- If fuel smells are detected before ventilating, check after running the blowers for several minutes before starting.
- If odor persists, stop and look for the source of the leak.

Fire Extinguishers

- Accessible fire extinguisher. Do you have at least those required by the U.S.C.G.?
- Check to be sure mounts are secure and functional before departure.
- Take the time to point out locations to passengers and crew.

Fuel and Oil

- Are your tanks topped-off?
- If not, have enough fuel to provide a reasonable margin of safety for your return.
- Check the engine oil and coolant level.

Bilges

- Check to be sure bilges are reasonably dry and that pumps are not running excessively.
- Clean up any spilled oil or waste in bilges so as to prevent overboard discharge.

Battery

- If you have a dual charging system, is the selector switch in the proper position?
- Is the power on to the entire vessel?
- Spare batteries for accessories such as a handheld radio, flashlight, portable navigational aid, etc.
- If they are rechargeable, are they charged?

<i>Weather Forecast</i>	
<input type="checkbox"/>	Did you check the weather forecast?
<input type="checkbox"/>	Radio on board to receive weather updates.
<i>Docking and Anchoring</i>	
<input type="checkbox"/>	At least one anchor set up and bent-on to your anchor line.
<input type="checkbox"/>	Two or three extra docklines in case of unusual conditions dockside.
<input type="checkbox"/>	Visually inspect the lines you use for chafe or wear.
<input type="checkbox"/>	At least two fenders on-board for docking or towing if required.
<i>Documentation</i>	
<input type="checkbox"/>	Have the ship's papers, radio license, fishing permit, etc. on board.
<input type="checkbox"/>	Have the chart or charts for the area you intend to cruise in, regardless of your level of local knowledge.
<input type="checkbox"/>	

Passenger Communication

Before departure, the boat operator should conduct an onboard safety discussion and review the following emergency equipment with everyone on board:

- Locate PFDs, explain when to put them on, demonstrate how, and emphasize the importance of proper fit.
- Locate fire extinguishers and explain their use if there is a fire emergency.
- Locate required flares (VDS) and explain why, when and how they are used.
- Point out the location of the first aid kit.
- Point out location of anchor and explain briefly how to use and deploy it.
- Explain operation of the Marine Radio (if equipped) and explain its use during an emergency.
- Have a discussion of weather watching and explain passenger/crew duties and responsibilities in the case you encounter heavy weather.
- Prior to docking or undocking, explain fully the procedures for line handling. Use terms describing lines that the passengers/crew can understand or explain the terms you use.
- Explain what to do in case of operations emergencies such as losing steering, losing an engine, etc.
- Explain procedures and responsibilities of passengers and crew in case of a crew overboard situation.
- Appoint others on board to serve as lookouts for people in the water, marine life, and submerged obstructions (including coral reefs, where applicable).

Trailer - Capacity Plate

https://www.youtube.com/watch?time_continue=34&v=itJTlovlbJE

The majority of recreational boats in the United States are trailered to and from the water. Your boat trailer is only one part of the entire boating package, which includes the boat, trailer, hitch and towing vehicle. Neglecting the trailer's maintenance can result in damage to your boat, your towing vehicle, or both.



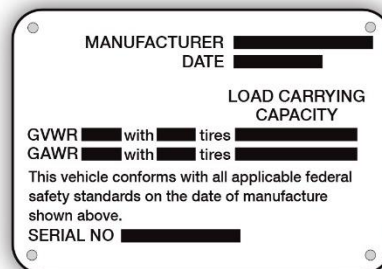
The trailer must have a load capacity adequate to carry the boat, motor, fuel and all equipment which may be carried in the boat as it is trailered. By law, trailers are classified by the maximum amount they may weigh when fully loaded. **It is strongly recommended that you never exceed 85% of a trailer's total capacity.**

Gross Vehicle Weight Rating (GVWR)

- Class 1 - GVWR to 2000 lbs. (suggest 1700)
- Class 2 - GVWR to 3500 lbs. (suggest 2975)
- Class 3 - GVWR to 5000 lbs. (suggest 4250)
- Class 4 - GVWR + 5000 lbs. (suggest 85%)

Your trailer will also have a Gross Axle Weight Rating (GAWR), which describes the minimum tire rating needed for that load. So a heavy-duty load will need heavy-duty tires! The tire rating must be at least equal to the GVWR.

All these numbers, plus trailer identification number, are on a capacity plate.

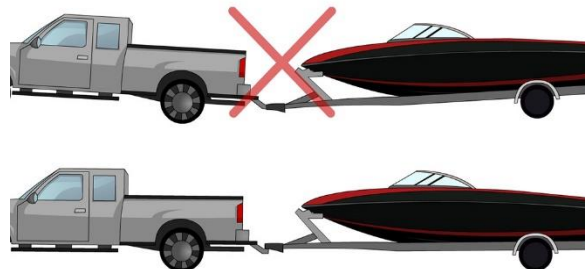


Another very important item to consider is the towing vehicle. It also must meet certain performance standards such as engine power, engine cooling, transmission cooling, wiring, brakes, battery, suspension, alternator, axle ratio, tires, and wheels in order to tow the boat and trailer. You should consult your dealer for advice. Each tow vehicle also has a maximum weight that it may pull by law. Again, you should not pull more than 85% of the vehicle's limit.

You may need a special permit from your state's Department of Transportation to transport a boat more than 8.5 feet wide on the highway.

The trailer is attached to the towing vehicle by a trailer hitch. A socket on the front of the trailer drops over a ball on the back of the hitch and then locks down. These two parts must match in size. The ball size is determined by the class of trailer. The hitch should be permanently attached to the towing vehicle and should handle the load you are attempting to pull. Bumper hitches (attached to bumper only) are illegal in some states and not recommended. **The chains for the trailer hitch should be crossed under the trailer tongue.**

In addition to the trailer's capacity weight, you must also consider "tongue weight." The weight of the trailer tongue that attaches to the towing vehicle should not be more than 7% to 10% of the total weight of the rig. Adjusting the tongue weight by moving the balance point of the trailer makes the tow more stable. If the tongue weight is too low, the trailer will fishtail at high speed. You should shift weight forward to increase the tongue weight. If the tongue weight is too high, it will drag down the rear of the tow vehicle and make steering difficult.



- Too much weight on the rear of the trailer will cause the trailer to fishtail and may reduce traction or lift the rear wheels of the tow vehicle off the ground.
- Too much weight on the hitch will cause the rear wheels of the tow vehicle to drag and may make steering more difficult.

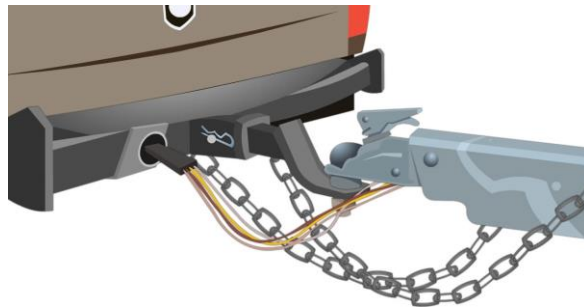
Rollers and/or pads are used to support the boat on the trailer. There should be sufficient support so as not to allow the boat to warp. You should make sure that all support surfaces are in contact with the boat at all times. Tie down straps should be used to secure the boat to the trailer both fore and aft. In addition, all fuel tanks and other equipment

inside the boat should be secured so that its weight does not shift during towing. Never carry gasoline tanks in the trunk of the tow vehicle.

Safe Towing Preparation

<https://www.youtube.com/watch?v=xaQu1JDfbRE>

- Drain accumulated water from the boat's bilge.
- Lower the tongue socket onto the ball on the trailer hitch and lock together securely.
- Connect trailer lights to towing vehicle and check turn signals, brake lights and backup lights.
- Attach safety chains from trailer to tow vehicle securely in a criss-cross fashion.
- Check tie-down straps and winch and cable.
- Make sure wheel bearings run free and are properly lubricated.
- Check tire pressure, lug nuts and test brakes.
- Make sure to stow drain plug in the boat so any remaining water can drain and it is there when you get to the ramp.
- Don't forget the keys to the boat.



Road Handling

The weight that you are trailing will make your towing vehicle less responsive in many respects. Speeding up, slowing down and all maneuvers will require more time to accomplish.

To tow a boat safely, you should:

- Drive more slowly than normal.
- Allow a greater distance to the vehicle in front to give you time to stop if they brake suddenly.
- Accelerate slowly.

- Remember that the turning radius is much greater. Curbs and barriers must be given a wide berth when you turn corners.
- Use extra caution driving in high wind, heavy rain, fog or icy conditions.
- Make sure your side view mirrors are large enough to provide an unobstructed rear view on both sides of the vehicle.
- Backing up a trailer can be quite tricky but with practice you should get the hang of it. The trailer will turn in the opposite direction to the car so take it slowly and try to avoid oversteering.
- Before driving on the open road, practice turning, backing up, etc. on a level, empty parking lot.

Launching a Boat from a Trailer



1. **Raise the outdrive or motor, remove the support bracket and install the drain plug.**
2. **Disconnect the trailer wiring. Remove tie down straps and again check the drain plug.**
3. Make any equipment adjustments necessary and check the drain plug.
4. Connect the fuel tank, check fluid levels and check the drain plug.
5. Drive to the ramp and back the boat and trailer down the ramp, keeping the tow vehicle's wheels out of the water.
6. Engage the emergency brake, shift into Park, and block the wheels.
7. Someone should get aboard the boat, turn on the blower, lower the motor, look for water entering the boat, sniff the bilge and start the motor.
8. Make sure you have attached a bow line to the boat, then release the winch and disconnect the winch line.
9. You should be able to launch the boat with a slight push or by backing the boat off the trailer under power.
10. **Move the boat to an area away from the ramp to load additional equipment and passengers.**
11. **Return the towing vehicle to the parking lot as soon as the boat is launched so the next person in line may proceed.**

Retrieving a Boat from the Water

The steps to retrieve the boat are essentially the reverse of launching. You always should be courteous to others launching and retrieving.

1. **Unload the boat away from the ramp if possible.**
2. **Get everyone off the boat except the operator.**
3. Back the trailer into the water, keeping the tires of the tow vehicle at water's edge, not in the water.
4. Turn off your vehicle's engine and engage the parking brake.
5. Maneuver the boat carefully onto the submerged trailer.
6. Attach the winch line to the bow-eye of your boat and shut off the engine prior to raising it.
7. Make sure the boat is correctly seated and properly balanced.
8. Winch the boat onto the trailer and secure it.
9. **Stay away from the direct line of the winch cable. It could break and cause injury.**
10. **Pull the trailer and boat well away from the ramp area for cleanup, reloading, securing equipment and safety check.**
11. Be sure to remove any remnants of nuisance species before leaving ramp area.
12. Connect the trailer lights and make sure they are working.
13. Remove the drain plug to allow water to drain from the bilge.
14. Use tie-down straps to secure the boat.

Checking Local Weather and Water Conditions

<https://www.youtube.com/watch?v=-NH2dAly7d8>

You should never leave the dock without first checking the local weather forecast and water conditions. Checking these conditions before leaving the dock is just as important in planning your trip as checking for fuel and required equipment. Special attention to weather and weather indicators can make the difference between a pleasant day on the water and potential disaster.

As the operator of the boat, it is your sole responsibility to determine, from the conditions, your skill level, and the vessel's capabilities, when to cancel or alter your trip. Most accidents occur on calm, clear days. However, poor weather combined with operator skill level and unexpected emergencies can increase the danger to operators and passengers.

You can get weather and water condition information from TV, radio or from one of the weather channels on your VHF radio.

NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information directly from your local National Weather Service Office. NOAA Weather Radio utilizes seven frequencies in the VHF band between 162.400 and 162.550 megahertz (MHz)

The NOAA provides a visual alert system to warn boaters when weather or water conditions are becoming dangerous.

Weather Warning Display Signals

There are eight weather warning signals: four flag signals are used during the day and four light signals are used at night:



Checking Dangerous Weather Signs

Certain signs you can look for indicate an approaching weather change:

- **Weather changes generally come from the west, so scan the sky with your weather eye, especially to the west.**
- **Watch for a buildup of dark clouds, vertically rising clouds.**
- **A sudden drop in temperature and change in the wind often mean that a storm is near.**
- If you have a barometer on your boat, check it every two to three hours. A rapid drop in pressure means a storm is approaching.
- Watch for lightning and rough water. Remember that boats, particularly sailboats, are vulnerable to lightning if not grounded.
- Watch the weather to the west, the direction from which most bad weather arrives. However, be observant of weather from all directions.
- Fog can create problems in inlets and bays or open water. Fog typically forms during temperature changes in early morning or evening hours and can persist for long periods.

- If your weather service has indicated that a hurricane is imminent you should not leave the dock - period. Approaching hurricanes can be identified by the "feeder bands" of rain that proceed them by 24-48 hours.

Checking Dangerous Weather Conditions

Stay alert to these dangerous water conditions:

- **High water** —after heavy rainfall, flooding, or tide changes— can hide obstacles in the water that would otherwise be visible.
- **Sand bars** are areas of shallow water that can damage your boat.
- **Strong currents** will make boat navigation difficult and can make swimming very dangerous.
- **Large waves** could swamp your boat. Look out for a heavy-looking sea as a sign of a storm coming.

If you get Caught in a Storm



- **First, make sure everyone aboard is wearing USCG-approved PFDs.**
- **Reduce speed and proceed with caution.**
- **Close all hatches and ports, so the water does not get into the boat.**
- **Head for the nearest shore that is safe.**
- **You should anchor the boat if you are caught in a storm and it is impossible to return to shore safely.**
- **Head into the waves at a 45° angle—this will reduce the chance of your boat being swamped.**
- Pump out bilges and keep them dry. This will help the boat stay higher in the water and reduce the possibility of the waves capsizing it.
- Secure loose items that could be tossed about.
- Keep everyone low in the boat and near the centerline to help stabilize the boat and keep the passengers from falling overboard.

- Minimize the danger of having your boat struck by lightning by seeking shelter in advance of a storm. If caught on open water during a thunderstorm, stay low in the middle of the boat.
- If there is lightning, disconnect all electrical equipment. Stay as far from metal objects as possible.
- If caught in fog, sound the appropriate sound signals.

Specific Local Hazards

https://www.youtube.com/watch?v=khG9N3rz_7c

You should be aware of any specific local hazards in the area where you will be boating.

You should have charts onboard for all areas where you boat.

If you are boating in an area for the first time, seek assistance from other boaters with local knowledge that can inform you of additional safety precautions that must be considered.

Make sure you check with state and/or local officials for requirements and specific conditions that may apply to a body of water on which you intend to boat. For example, some lakes prohibit any motorized vessels while others might prohibit personal watercraft or have specific hours of operation.



You should be aware of any and all of the following:

- **Hazardous inlets**
- **Shoaling areas or sand bars**
- **Whitewater areas**
- **Dams**
- **Locks**
- **Bridges**
- **Abnormal tides or currents**

Tides and Currents

Tide is the rise and fall of the water's surface. **Tides are predictable and you should always consult the tide tables when operating in shallow waters.**

Current is the flow of the water either from or to the sea as the tide rises and falls. You should be aware of the effects of current on your boat. Currents can flow as rapidly as five knots. If you lose an engine and are pushed along with current, you could be swept out to sea or pushed aground.

Dams

Dams are built to back up water in a reservoir for a variety of reasons. **Dams are hazardous both above and below the dam.** These wall-like structures pool the water as it flows over the crest and drops to the lower level.

From downstream, you may not realize the danger until it's too late. From upstream, low-head dams are difficult to detect. In most instances, a low-head dam does not look dangerous, yet can create a life-threatening situation. You should always pay attention to warning signs, markers or buoys and keep well clear of low-head dams.



Bridges

Traveling the inland waterways can be a pleasant experience but can also bring some special challenges especially for larger boats and sailboats. Dealing with drawbridges takes some knowledge of how the system works and knowing what you are looking for, especially at night.

Nautical charts tell you that there is a bridge and what the horizontal clearance (width) and vertical clearance (height) are. The vertical clearance is the one you are probably going to be most concerned with, i.e. will you fit under the bridge or will you have to open it?

Locks

When traversing connected navigational areas with considerable differences in water levels, you may encounter locks. These are used to move boats up or down from one level to another. Locks operate on a simple premise. You drive your boat into a chamber with gates at each end. To raise the boat, water is let into the chamber until it is even with the level of the water to be entered. When the water reaches that level the gates on the new elevation side are opened and you drive out. To go to a lower level, you enter the chamber and the gates are closed and water is let out until you are even with the lower level. The gates on that side are opened and again you drive away.

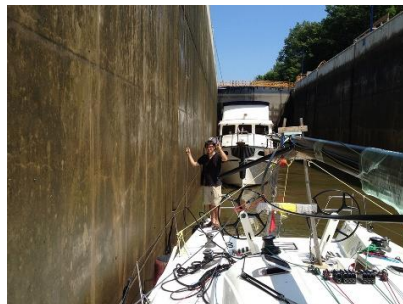
The lockmasters are responsible for the safety of vessels going through the locks. You normally will call the locks on your VHF radio and make arrangements to enter the lock.

You may, however, give two long and two short blasts from your horn and follow the light signals which are displayed at each entrance to the lock. Generally, they work similarly to a traffic light. A **red light means stop**, you cannot enter the lock and you must stay clear of any traffic about to exit the lock. A **yellow light** sometimes displayed means the lock is preparing for your entrance but still stay cautiously clear. A **green light means the boat may enter the lock** with caution and follow the instructions of the lockmaster.

Sound and light signals may be different in different parts of the country. Investigate beforehand.

Before entering the lock, you should have fenders rigged on both sides of the vessel. You and your crew should be wearing PFDs and be ready to handle lines and loop, not tie, them to the posts, bollards or lock wall ladder rungs on the side of the lock the lockmaster has indicated. Keep hands and feet clear of the boat and wall. Use a boat hook or paddle to fend off if necessary. Your crew handling the lines will have to adjust them as the water level rises or falls. Your lines should be at least twice the depth of the lock. Once secure in the lock, shut off your engine.

As soon as the water in the lock reaches the proper level, the gates are open and the lockmaster has indicated that you should do so, **you should cast off lines and exit with caution.**



Filing a Float Plan

Although the U. S. Coast Guard does not require one, **it's a good idea to prepare a float plan and give it to a responsible person before getting underway. This plan should outline your boating itinerary including your time of departure and arrival and a time to contact authorities** if you don't arrive at the time indicated. It should also give information including the description of your boat, the number of passengers aboard and instructions on what to do if you are overdue. *Float plans are a “rescue tool” used by authorities in the event of an accident.*

Please remember to communicate your float plan with a responsible person such as a family member or a friend.

As well, during the trip, update your float plan in order to prevent unnecessary emergency operations.

Important: Always let the person you entrusted with your float plan know of your return to avoid unnecessarily deploying a search.

A float plan can be filed in the form of a formal written document, emails, text messages, phone conversations or other forms of communication.

The image shows a screenshot of the ACEBOATER.com Float Plan form. The form is titled "FLOAT PLAN" and "ACEBOATER.com". It includes instructions: "Fill in this form before getting out. Leave it with someone who you can depend on to notify the Coast Guard if you have not returned as scheduled." The form is divided into several sections: "PERSONAL INFORMATION" (Name, Address, Phone, Email, etc.), "BOAT INFORMATION" (Boat Name, Make, Model, etc.), "TRIP INFORMATION" (Date, Time, etc.), and "CONTACT INFORMATION" (Name, Address, Phone, etc.). There are checkboxes for "EMERGENCY CONTACT" and "NOTIFY COAST GUARD".

Boat Preventive Maintenance

<https://www.youtube.com/watch?v=qqqd2etejY8>

Keeping your boat in good working order is just as much a part of the boating experience as the boating itself. When a pleasure craft functions properly, breakdown probabilities are minimized. In the last few years, 8% of reported boating

accidents and 4% of reported boating-related deaths in the USA involved factors linked to faulty boat equipment that had not been properly maintained.

Engine/Running Gear

You should get in the habit of not only inspecting and checking all the engine components and fluids each and every time you go boating, but also doing periodic maintenance.

Engine/Running Gear maintenance tips include:

- Change oil frequently - following manufacturer's minimum recommendations or once each season.
- Check and replace any belts or hoses that appear to be deteriorating.
- Check for oil and/or water leaks every time before leaving the dock.
- Flush your engine with fresh water after operating in salt water.
- Check impellers and pumps to anticipate a failure.
- Watch for the beginning of corrosion, especially on battery terminals, and take measures to stop it before it becomes a problem. Clean battery terminals and electrical connections by disconnecting them and removing corrosion with a wire brush.
- Check and service transmissions and lower units according to manufacturer's recommendations.
- Change fluids on a recommended schedule or at least once each season.
- Keep shafts and props in clean and good working order.
- Check all through-hull fittings for leakage and corrosion. Make sure that their valves are operational and can be opened and closed.
- Check the condition of the navigation lights.
- Check and clean the engine's back-fire flame arrestor.
- Clean and tighten any corroded or loose electrical connections.
- Check all water strainers to make sure that they are clean and free of debris.

Boat Preventive Maintenance (2)

Keep bilge areas clean and free of trash to reduce the risk of fire. Keep the hull and the boat clean and properly waxed. This protects the hull from deterioration from the sun, and a clean hull will give you better fuel efficiency. Fiberglass should be cleaned with fresh water and a non-abrasive soap. If necessary, a soft brush should be used to help remove debris caught in crevices. Patch any cracks that occur due to stress, age or accident.

Keep all aluminum and stainless parts clean and polished with a good metal wax. If not adequately maintained, metals on boats corrode quickly, especially in a salt water environment. Check all screws, bolts, and other fittings to keep secure. Protect the value of your boat. You may want to trade it in for another one some day.

Boat breakdowns are usually caused by faulty electrical systems. Keep all electrical fittings dry, free of corrosion, and coated with a water repelling, non-conductive grease or corrosion inhibitor such as Pertox.

If possible, **keep your boat under cover** in a garage, carport or boat storage unit. As a minimum, keep a cover on your boat to protect the topsides, floors, seats etc. from the effects of the sun and rain.

Fuel systems are comprised of one or more tanks, valves, lines, pumps and filters. Each of these elements, if left unserviced, can be potentially hazardous. Check your tank often for potential corrosion, which could cause leakage. Inspect the shutoff valves, lines, and pumps periodically for corrosion or wear. Check and change filters frequently to be assured of clean fuel entering your engine.

The most important tool you have to diagnose problems in the fuel system is your nose. **Do the "sniff test" each time you board your boat.** If you smell fuel, find the problem.

Fueling Procedures

https://www.youtube.com/watch?v=WWp3nv_KIw4

Proper fueling procedures are very important in preventing onboard fires. **Gasoline vapors are heavier than air and can spread rapidly into enclosed spaces and can cause explosions.** By following the safe fueling precautions below, the probability of explosion can be greatly reduced. **Gasoline fumes are most likely to collect in the bilge. The sniff test is the most effective method for detecting fuel leaks.**

Tip: Always use the 'one-third rule':

- One-third (1/3) of your fuel to get out,
- One-third (1/3) to get back,
- One-third (1/3) in reserve.

Safe Fueling Precautions

1. Secure boat to the dock.
2. Switch off engine(s).
3. Extinguish all open flames.
4. Do not use electrical switches.
5. No smoking.
6. Close ports, hatches, and doors.
7. Portable tanks should be refueled ashore.

8. Make certain all passengers are ashore.
9. Determine quantity of fuel required.
10. Hold hose nozzle firmly against fill pipe opening.
11. Do not overfill. Prevent fuel from falling into the water during fueling. This can harm the marine environment.
12. Ethanol fuel can cause your equipment to malfunction. If possible, avoid using it.
13. Wipe up all spillage.
14. **Open ports, hatches, and doors to ventilate.**
15. Turn blower on for four at least minutes.
16. **Do the sniff test. Check for fuel fumes in the engine and fuel tank compartment.**
17. Start engines(s).
18. Re-board passengers.
19. Untie from dock and cast off.

Protecting the environment

It is not uncommon to see a small fuel sheen on the water surface near boats. Although it may only be a tiny amount from some boats, the collective impact can be damaging to marine life. Once in the marine environment, oils and fuels have a tendency to accumulate in bottom sediments and concentrate in marine organisms. These harmful substances commonly enter the marine environment through bilge pumping or fueling. Don't add to the problem by overfilling your tanks.

CHAPTER 4 – Safe Boat Operation

Operator Responsibilities

<https://www.youtube.com/watch?v=ZY6t7OU-7T0>

The boat operator has primary responsibility for the safety of all persons aboard. You need to be aware of your own abilities when you go on the water. As the operator, you must rely on your experience and skills to determine if you are qualified to navigate the body of water safely. You must make sure that you are familiar with the craft's limitations and handling capabilities. You should also be constantly aware of weather, water and other environmental conditions to ensure the safety of your crew and passengers. **Remember: most fatal boating accidents involve boat operator error.**

Operators of recreational vessels should continue to invest in their own education beyond the boating basics. You should continue to learn to be a better boater - no matter how much boating experience you have, there's always more to learn.

Inform your crew and passengers of the rules of safe boating and try to ensure that at least one other person aboard is capable of operating the vessel in the event of an emergency.

As you are responsible for their safety, do not tolerate any behavior that could endanger the lives of anyone on board or nearby.

Courtesy

<https://www.youtube.com/watch?v=pgRyOBbTySo>

Everyone who uses or enjoys the waterways of our country, whether boating, walking along the shoreline or actually living on the water's edge has the same rights to enjoy the tranquillity of the water. Boaters should respect the rights of others who live or play on the shoreline. You should not disturb private property owners by docking at their docks or wharfs.

You should be careful about the amount of wake that you are leaving when operating close to shore. The wake is defined as the waves left behind as your boat moves through the water. **It may cause personal injury or damage. Control your speed and obey speed limit signs and no wake/limited wake restrictions.**

When operating around boaters who are fishing, take extra care to control your wake. People often stand up in their boat to cast or reel in a fish. Your wake could tip the boat and cause someone to fall overboard. **Remember that you are legally responsible for the wake and any damage that it may cause.**

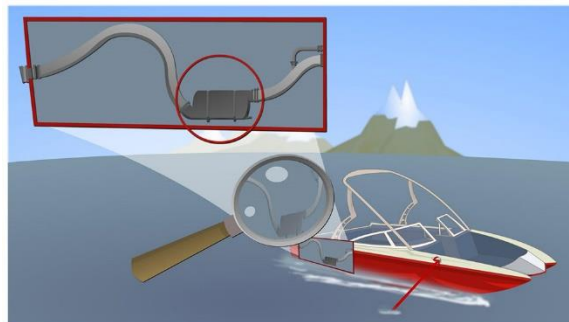
All boaters should use caution and operate within the posted speed limits. You should also be aware that under certain conditions, including heavy traffic, low visibility or extreme weather, you **must operate at a safe speed according to the conditions.**

Speed limit laws apply for boats in certain areas and in certain situations. Special buoys will mark the zones where these laws take effect. This includes areas where boating is restricted and in zones where no wake is tolerated.



Controlling boat noise

Part of being a **courteous boater includes controlling your boat's noise. All motorboats should be equipped with an efficient muffler, underwater exhaust or other device that adequately muffles or suppresses the engine's exhaust.** No motorboat should be allowed to produce excessive or unusual noise, and no motor should be equipped with any cutout.



Careless, Reckless or Negligent Operation



It is the responsibility of the operator to refrain from careless, reckless, or negligent operations on the water. **Failure to operate a boat in a safe manner could endanger the lives or property of other persons.** Again, be courteous and exercise caution.

Use common sense. If it doesn't make sense to do something on land, it probably doesn't make sense to do it on the water. Would you ride on the hood or hang out of the window of a moving car? Of course not, that wouldn't be safe. So don't allow passengers to ride or sit on the bow, stern or sides of the boat while underway.

Here are some examples of behaviors that could be considered negligent or reckless:

- Operating a vessel at high engine speed in circular or criss-cross patterns for extended periods of time in the same area.
- Operating under the influence of alcohol or drugs.
- Jumping waves or the wake of another vessel unreasonably close to that vessel, or so as to cause engine RPM to peak and make unusual or excessive noise.
- Weaving through congested traffic at more than slow speed.
- Swerving at the last possible moment to avoid collision (playing chicken).
- Operating a vessel at a speed higher than is necessary to maintain steerage way when near swimmers, or non-powered vessels.

State and local regulations determine how close to shore, a swimming area or other vessels you can operate. You should be aware of, and obey, speed limits and no-wake zones.

Homeland Security Measures

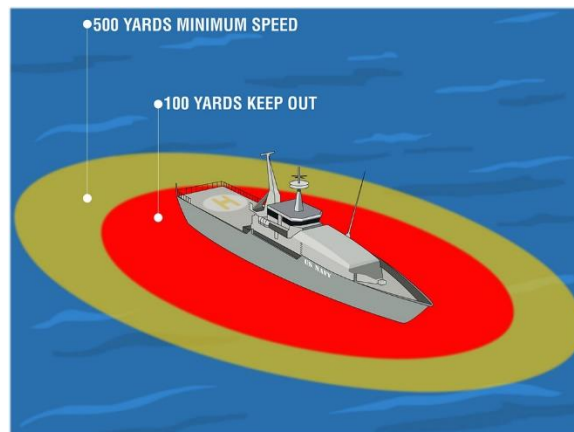
In light of security measures brought about by the events of September 11, 2001, it is critical that all boaters be aware of and comply with Homeland security measures set forth by federal, state and local governments. These include, but are not limited to:

- Keeping a safe prescribed distance from military and commercial ships.
- Avoiding commercial port operations areas.
- Observing all security zones.
- Following guidelines for appropriate conduct such as not stopping or anchoring beneath bridges or in a channel, and

100-Yard-Approach WARNING!

Do not approach within 100 yards of any U.S. naval vessel. If you need to pass within 100 yards of a U.S. naval vessel to ensure a safe passage in accordance with the Navigation Rules, you must contact the U.S. naval vessel or the Coast Guard escort vessel on VHF-FM channel 16.

You must operate at minimum speed within 500 yards of any U.S. naval vessel and proceed as directed by the Commanding Officer or the official patrol.



Boaters can help keep our waterways safe and secure

Keep your distance from all military, cruise line, or commercial shipping! Do not approach within 100-yards, and slow to minimum speed within 500-yards of any U.S. naval vessel. Violators of the Naval Vessel Protection Zone face 6 years in prison and a \$250,000 fine, not to mention a quick and severe response. Approaching certain other commercial vessels may result in an immediate boarding.

Observe and avoid all security zones. Avoid commercial port operation areas, especially those that involve military, cruise line or petroleum facilities. Observe and avoid other

restricted areas near dams, power plants, etc. Violators will be perceived as a threat, and will face a quick, determined and severe response.

Do not stop or anchor beneath bridges or in the channel. If you do, expect to be boarded by law enforcement officials.

Keep a sharp eye out for anything that looks peculiar or out of the ordinary. Report all activities that seem suspicious to the local authorities, the Coast Guard and the port or marina security. Do not approach or challenge anyone acting in a suspicious manner.

Influence of Drugs and Alcohol

<https://www.youtube.com/watch?v=tXOfj-qtCDc>

Most boating accidents involve the use of alcohol or drugs. One-third of all boating fatalities are alcohol-related. It is illegal to operate a boat while under the influence of alcohol or drugs. Penalties are severe and could include fines, imprisonment up to one year, unpaid community service, and mandatory substance abuse counseling. If an operator under the influence kills or seriously injures another person the penalty is up to five years in prison and a fine of up to \$5000.

Some states have additional penalties and the legal limit varies by state, so check your state laws for details.

Effects of Alcohol and Drugs while Boating



Alcohol and drugs can decrease a person's ability to handle a boat in many ways. As a depressant, alcohol goes straight to the nerves, blood stream, and the brain. As recreational boaters it is hard enough to remember all the rules, regulations, boat handling techniques, etc. while sober.

The negative effects of drinking alcohol while boating include:

Eroding sense of balance

Most boating deaths result from falling out of a small open boat, without a PFD, whether it capsizes or not.

Vision fades

Because of the sun and reflection of light, objects on the water can be hazy and difficult to see. Color perception and peripheral vision deteriorate and at night depth perception decreases. You can imagine what happens if you can't distinguish between the red and green markers or red and green lights of an oncoming vessel at night.

Physical reactions become slower

Should a person fall into the water they may have trouble just floating, let alone grasping onto a life ring or throwable device. Add the shock of the cold water, and the risk of cramping and drowning is much higher.

Surface blood vessels dilate

Blood vessels on the surface of the skin dilate to increase the rate of body heat loss while in the sun. If these vessels are dilated and you fall overboard into cold water, hypothermia will set in quickly and this further reduces your decision-making abilities.

Judgment and reasoning ability is impaired

One of the things that drinking tends to do is to make you begin to lose your judgment. **After a drink or two people tend to become relaxed and are more likely to perform dangerous acts** that they might not normally do if not under the influence. Because their judgment is impaired they may not even realize they are doing something dangerous. This, combined with the other debilitating symptoms previously covered, spells disaster.

Environmental stressors

Natural stressors such as exposure to sun, glare, wind, noise, vibration, and motion on the water produces fatigue. This in itself reduces reaction time almost as much as being under the influence. Adding alcohol to these environmental stressors intensifies their effects.

Passengers who are drinking should be encouraged to wear life jackets.

Navigation Rules

The "Navigation Rules" or Collision Avoidance Regulations were designed to give direction to vessels in order to set a standard that everyone could follow in order to prevent collisions between vessels. There are two sets of navigation rules: inland and international.

Disclaimer

The navigation rules contained in this course summarize basic navigation rules for which a boat operator is responsible on inland waterways. Additional and much more in-depth rules apply regarding various types of waterways, such as International Waters and Western Rivers, and operation in relation to commercial boats and other watercraft.

For a complete listing of the Navigation Rules, refer to the document 'Navigation Rules' published by the Coast Guard available online at: www.uscg.mil/vtm/navrules/navrules.pdf.

For state specific navigation requirements, always refer to the state laws where you'll be boating.

Navigation Rules – Terminology

Vessel - Every craft of any description used or capable of being used on the water.

Power Driven Vessel - Any vessel propelled by machinery.

Sailing Vessel - Any vessel under sail alone with no mechanical means of propulsion. (A sailboat propelled by machinery is a motorboat.)

Vessel engaged in fishing - Any vessel fishing with nets, lines, trawls or other fishing equipment that restricts maneuverability, but does not include a vessel fishing with trolling lines or other fishing equipment that does not restrict maneuverability.

Danger Zone - An arc of **112.5 degrees** measured from dead ahead to just aft of the starboard beam.

Stand-On Vessel - The vessel that should maintain course and speed.

Give-Way Vessel - The vessel that must take early and substantial action to keep clear of the stand-on vessel.

Vessel not under command - A vessel that due to some exceptional circumstance is unable to maneuver as required by the Rules and is therefore unable to keep out of the way of another vessel.

Vessel restricted in her ability to maneuver - A vessel that, from the nature of her work, is restricted in her ability to maneuver as required by the Rules and is therefore unable to keep out of the way of another vessel.

Vessel constrained by draft - A power-driven vessel that, because of her draft in relation to the available depth and width of navigable water, is severely restricted in her ability to deviate from the course she is following.

Practice Good Seamanship

It is important to always operate in a safe manner.

If something happens, such as a collision, everyone is at fault.

If you are in danger of colliding with another vessel, *both* boats are obligated to do everything possible to prevent the collision, even if doing so deviates from the rules.

You should use every means available to determine if there is risk of collision. This could be information from your lookout, radar, or other means. If there is any possibility of collision, you should act as if a collision is certain and take appropriate action to prevent it. **Do whatever is necessary to avoid the collision!**

It is your responsibility to avoid endangering the lives or safety of anyone involved in any activity in any waters.

USCG Statistics show that each year recreational boaters commit numerous violations of the navigation rules. The most common violations are because recreational operators are unfamiliar with and/or do not follow simple but important navigation rules.

Proper Lookout

<https://www.youtube.com/watch?v=8ahgsK9BizI>

The rules are very specific about maintaining a proper lookout at all times. In fact, the rules state that “Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.”



This means that we must keep our eyes and ears open to observe or hear something that may endanger someone or affect their safety. You must look up for bridge clearances and power lines, down for floats, swimmers, logs and divers flags and side to side for traffic before turning your boat. It is also important to look behind you to see if any traffic is going to overtake you. **A proper lookout can avoid a collision.**

As a recreational boater you should advise your crew and passengers that everyone is responsible for helping in these duties at all times. Although it is the skipper's responsibility, they should also be aware of and be looking out for changes in weather, other boats in the vicinity, dangerous and/or changing water conditions and the continued stability of the boat.

Safe Speed

Practicing the art of good seamanship is a talent that is developed over time by acquiring knowledge and skills. You must keep safety foremost in your mind when operating your boat. Do what you can to stay out of the way of other boats and always proceed at a safe speed.

The Rules of the Road provide consequences for any vessel owner, operator or crew who does not comply with the Rules. It is your responsibility to act in a reasonable and prudent manner consistent with the ordinary practices of recreational boating. **Safe speed means a speed less than the maximum at which the operator can take proper and effective action to avoid collision and stop within a distance appropriate to the prevailing circumstances and conditions.** Don't forget to also take into consideration your own level of skill and experience.



To determine safe speed consider all of the following factors:

- **Visibility: is it clear, overcast, foggy?**
- **The traffic density.**
- **The maneuverability of your vessel. Be sure to consider stopping distance and turning ability in the prevailing conditions.**
- **At night, does the presence of background light from shore affect your vision?**
- **The state of wind, sea and current, and the proximity of navigational hazards.**
- **Your draft in relation to the depth of water.**

Most specific speed regulations are local ordinances or state laws. Many states have speed and distance regulations that determine how close you can operate to other vessels, the shoreline or docking area, and swimming areas. For example, some state regulations require that you maintain a no-wake speed when within 250 feet of shore or when within 100 feet of another vessel. Be sure to check with state and local authorities to determine what regulations apply to you.

Sound Signals during Navigation

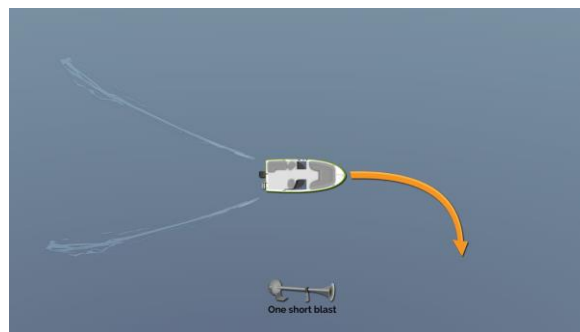
Every vessel is required to carry some kind of efficient sound producing device to signal their intentions.

Vessels are required to sound signals any time that they are in close quarters and risk of collision exists.

Use only the following signals to signal your vessel's intentions

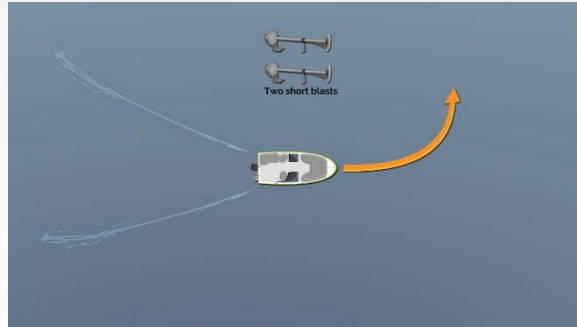
One short blast means:

I intend to change course to starboard.



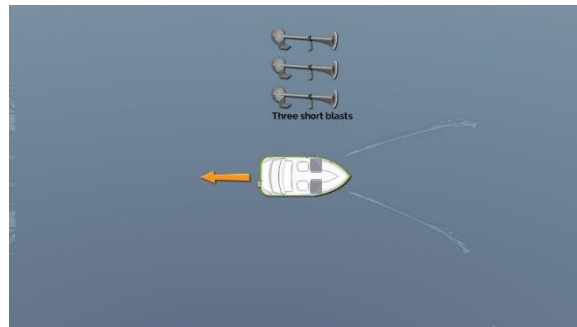
Two short blasts means:

I intend to change course to port.



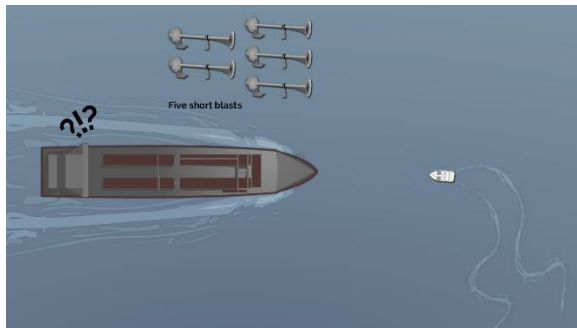
Three short blasts means:

I am operating astern propulsion (backing up).



Five or more short and rapid blasts means:

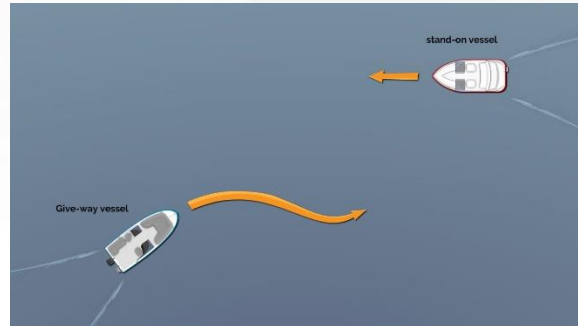
Danger or doubt signal (I don't understand your intent).



Determine the Right-of-Way

When two power driven vessels are in sight of one another and the possibility of collision exists, one vessel is designated by the rules as the stand-on vessel and the other is designated as the give-way vessel.

- **The stand-on vessel should maintain its course and speed.**
- **The give-way vessel must take early and substantial action to avoid collision.**



If it becomes apparent that the actions taken (or not taken) by the give-way vessel are dangerous or insufficient, **the stand-on vessel must act to avoid collision.**

Responsibilities Between Vessels

The Navigation Rules are written with the understanding that not all boats can maneuver with the same ease. Therefore, certain vessels must keep out of the way of other vessels due to their ability to maneuver.

A power driven vessel underway must keep out of the way of the following:

- **A sailing vessel**, under sail only, and vessels propelled by oars or paddles. (Note: when a sailboat has its motor running, it is considered a power driven vessel.)
- **A vessel engaged in fishing**, whose fishing equipment restricts its maneuverability. This does not include a sport fisher or party boat and generally means a commercial fishing vessel.
- **A vessel with restricted maneuverability** such as a dredge or tow boat, a boat engaged in work that restricts it to a certain area, or a vessel transferring supplies to another vessel.
- **A vessel not under command** – broken down.

A sailing vessel underway must keep out of the way of the following:

- **A vessel engaged in fishing**, whose fishing equipment restricts its maneuverability. This does not include a sport fisher or party boat and generally means a commercial fishing vessel.
- **A vessel with restricted maneuverability** such as a dredge or tow boat, a boat engaged in work that restricts it to a certain area, or a vessel transferring supplies to another vessel.
- **A vessel not under command** – broken down.

A vessel engaged in fishing underway must keep out of the way of the following:

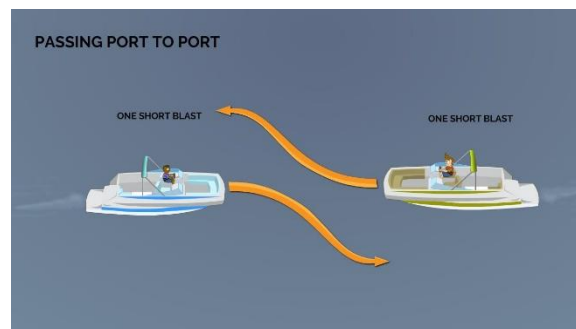
- **A vessel with restricted maneuverability** such as a dredge or tow boat, a boat engaged in work that restricts it to a certain area, or a vessel transferring supplies to another vessel.
- **A vessel not under command** – broken down.

Head-on Situations

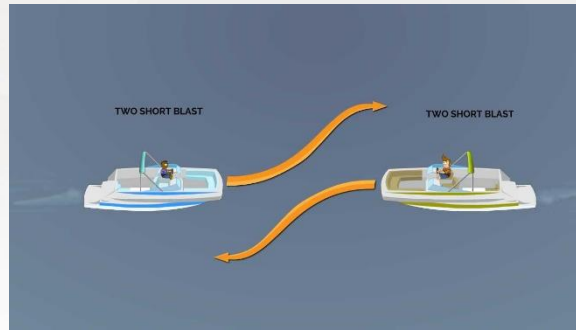
<https://www.youtube.com/watch?v=7SkWuXigGRE>

When two power-driven vessels are approaching head-on (or nearly so) either vessel can indicate its intent and the other vessel must answer promptly. In a meeting situation, neither vessel is the stand-on vessel.

It is generally accepted that you should alter course to starboard and pass port-to-port. The accompanying sound signal is one short blast.



If you cannot pass port-to-port due to an obstruction or other vessels, you should sound two short blasts to indicate your intention to pass starboard-to-starboard. Make sure the other vessel understands your intent before proceeding. The other vessel should return your two-short-blast signal.

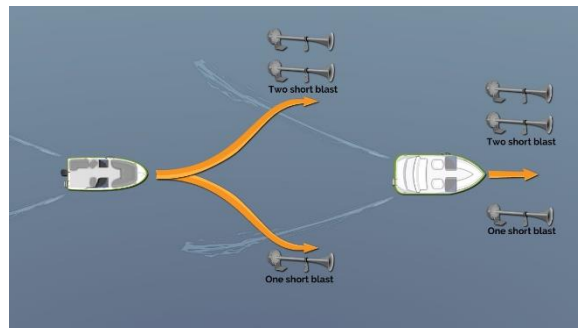


Overtaking Situations

<https://www.youtube.com/watch?v=yP4VIOa3AeE>

When two vessels are moving in the same direction, and the astern vessel wishes to pass, it must initiate the signal to pass as shown in the diagram. **Any vessel overtaking any other is the give-way vessel and should keep out of the way of the vessel being overtaken.** The vessel being passed is the stand-on vessel and must maintain its course and speed. If the stand-on vessel realizes that the course intended by the give-way vessel is not safe, it should sound the danger or doubt signal.

A vessel is deemed to be overtaking when the vessel is approaching the vessel ahead in a direction of 22.5 degrees abaft her beam. At night you would only be able to see the stern light of the vessel being overtaken. You would not be able to see either sidelight.



If you are overtaking a vessel, remember that you are the give-way vessel until well past, and safely clear of, the passed vessel. Do not cut in front of, impede or endanger another vessel.

"I intend to pass you on your port side" - 2 short blasts (1 sec.)

"Agreement" - 2 short blasts (1 sec.)

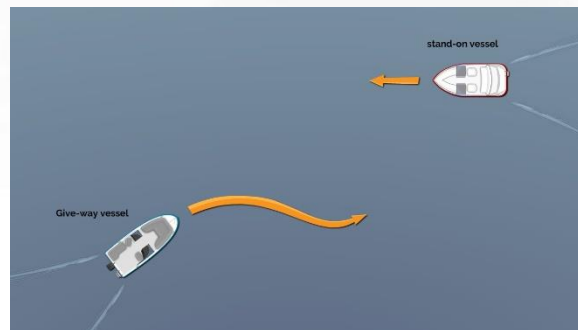
"I intend to pass you on your starboard side" - 1 short blast (1 sec.)

"Agreement" - 1 short blast (1 sec.)

Crossing Situations

https://www.youtube.com/watch?time_continue=2&v=QDSMic4_BaQ

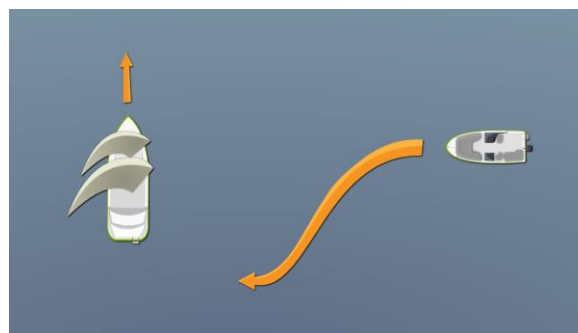
When two powerdriven boats are approaching at right angles or nearly so, and risk of collision exists, **the boat on the right is the stand-on vessel and must hold its course and speed.** The other boat, the **give-way vessel, shall maneuver to keep clear of the stand-on vessel and shall pass it by its stern.** If necessary, slow, stop or reverse until the stand-on vessel is clear.



In the example above, the blue vessel is the give-way vessel and should alter course and speed to pass behind the red vessel. If the skipper of the red vessel does not observe the blue vessel taking action to avoid collision, then the red vessel must take the required action to avoid a collision.

Sailing Craft and Vessels Propelled by Oars or Paddles

Sailing craft (not under power) and boats propelled by oars or paddles are stand-on vessels when approaching power driven vessels. In this situation, the power-driven vessel should alter course to pass behind the sailing vessel.



An exception to this is if the sailing craft or self-propelled vessel is passing a power driven vessel. In an overtaking situation, the overtaking vessel is the give-way vessel, even if an engine does not propel it.

Narrow Channels Situations

<https://www.youtube.com/watch?v=kDs-4ED4Zlk>

When operating in a narrow channel, the rules tell you to stay as close to the outer limit of the channel **as is practical on your starboard side**.

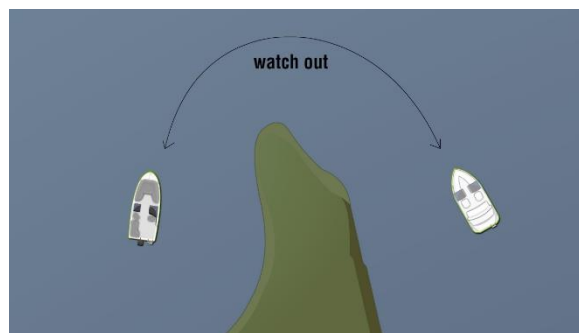
Vessels less than 65.6 feet or sailboats must not impede a boat that is constrained by draft, i.e. a large ship that must operate within the channel in order to make way safely. When crossing a channel, do so at a right angle and in such a way as to avoid causing the traffic in the channel to make course or speed changes.

Do not anchor in a narrow channel.

When operating on the Great Lakes, Western Rivers and other designated rivers, the down bound boat (going with the current) has the right of way over a boat going upstream. This is because a boat going upstream can maneuver better than a one going downstream.

Additionally, a boat crossing a designated river shall keep out of the way of boats ascending or descending the river.

If you approach a bend in a river around which you cannot see, sound one prolonged blast to alert boats approaching from the other side of the bend that you are there. If another boat is around the bend, it should answer with one prolonged blast. Similarly, if you hear a prolonged blast as you approach the bend, answer with a prolonged blast.



Commercial Vessel Situations

If at all possible, stay out of areas where there is commercial vessel traffic such as shipping lanes or traffic separation zones. Large ships and barges have special problems in maneuvering and cannot and will not get out of your way.



If you must operate around commercial vessels, be aware of the following:

- Avoid ship channels. If you must cross, do so at right angles and as quickly as possible.
- Be alert. Watch for traffic.
- Be seen, especially at night.
- Know the sound signals, especially the danger or doubt signal.
- Keep your VHF radio tuned to channel 16 and listen carefully.
- Order all aboard to wear PFDs.
- Be familiar with the area and have current navigation charts.
- Don't be a non-survivor of a collision with a large ship.

Operating during Reduced Visibility

When operating at night, or other times of restricted visibility, it is mandatory to display the correct navigation lights (explained in the required equipment section). The lights will let each boater know which is the stand-on or give-way vessel and each boater should react accordingly.



All vessels should proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility.

During times of restricted visibility such as smoke or fog, additional sound signals are required. Any boat underway in or near a restricted visibility area must sound a warning signal every two minutes.

- **Motorboats must sound one prolonged blast every two minutes.**
- **Sailing boats must sound one prolonged blast plus two short blasts every two minutes.**
- **Boats at anchor shall sound rapid strokes on the bell for 5 seconds at intervals not less than one minute.**

If you hear a fog signal of another boat you cannot see, slow to minimum speed and maintain a proper lookout!

Sailing - Rules of the Road

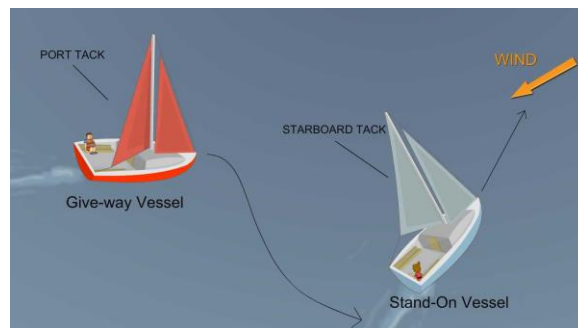
To understand the "rules of the road" for sailboats, you need to know a little more sailing terminology.

- **Port tack** - when the wind is coming over the port side of the boat.
- **Starboard tack** - when the wind is coming over the starboard side of the boat.
- **Windward** - in the direction from which the wind is coming (upwind).
- **Leeward** - in a direction away from which the wind is coming (downwind).

When sailboats approach one another under sail, the "give-way" boat must stay clear of the "stand-on" boat. The following rules determine which boat is the "give-way" and must yield the right-of-way in any situation where the danger of collision exists.

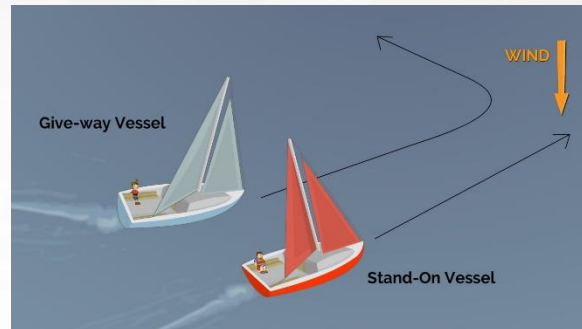
Starboard Tack vs. Port Tack

If the boats are on opposite tacks, the boat on the port tack (wind is coming over the port side of the boat) gives-way to the boat on the starboard tack (wind is coming over the starboard side).



Windward vs. Leeward

If the boats are on the same tack, the boat to windward must keep out of the way of the boat to leeward. In other words the boat farthest from the direction from which the wind is blowing has the right-of-way.



U.S. Aids To Navigation System (USATONS)

https://www.youtube.com/watch?time_continue=1&v=YYpOEwXcblY

To find our way safely from one place to another on the water, we depend on signs, just as we do on the road. The U.S. Aids to navigation are the road signs of the water. Learning to understand them requires experience and practice. But being able to navigate safely by using the system is well worth the effort.

Navigation beacons and buoys are installed as guides along coastal and navigable waters to help boat operators determine their position in relation to land, and to mark safe water and hidden dangers. The type of aid to navigation indicates the type of information it provides. Usually, several aids are used together to form a local navigation system that helps boat operators to follow channels.



Lateral Markers

<https://www.youtube.com/watch?v=gmplExMfGsc&feature=youtu.be>

The Lateral Navigation System uses a system of buoys or beacons that indicate the port and starboard sides of the preferred and safest routes.

U.S. Lateral Markers almost always follow the 3-R rule: "Red, Right, Returning". This means you should keep the red markers on the right (starboard) side of the vessel when you are returning from sea.

The port and starboard buoys and beacons come in a variety of forms:

Starboard buoy

Buoy that marks the starboard (right) side of a channel or where a danger is located. It must be kept on the starboard (right) side of a vessel when heading upstream. It is painted red. Its top is cone-shaped and if it is numbered, it bears an even number.



Starboard lighted buoy

If the buoy has a light, the light is red.



Starboard nun buoy

These cone-shaped buoys are always marked with red markings and even numbers. They mark the edge of the channel on your starboard (right) side when entering from open sea or heading upstream.



Starboard day beacon

Starboard day beacons are permanent red signs attached to structures, such as posts, in the water.



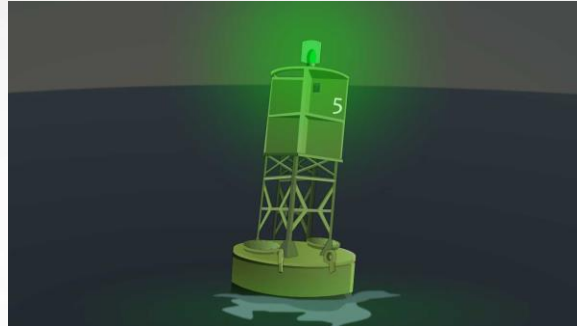
Port buoy

Buoy that marks the port (left) side of a channel, or where a danger is located. It must be kept on the port (left) side of a vessel when heading upstream. It is painted green. Its top is flat. If it is numbered, it bears an odd number.



Port lighted buoy

If the buoy has a light, the light is green.



Port can buoy

These cylindrical-shaped buoys are always marked with green markings and odd numbers. They mark the edge of the channel on your port (left) side when entering from open sea or heading upstream.



Port day beacon

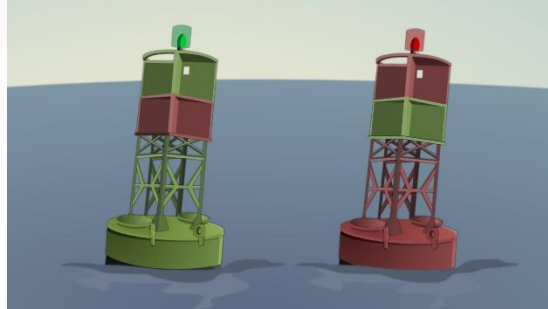
Port day beacon are permanent green signs attached to structures, such as posts, in the water.



Junction & Safe Water Markers

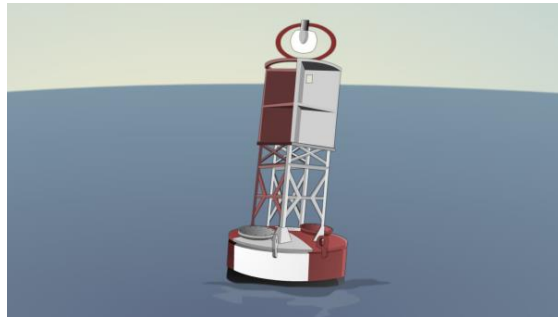
https://www.youtube.com/watch?time_continue=23&v=CVOU-qkOZDY

Junction markers indicate the preferred channel at points where the waterway splits or branches off in another direction. If you are returning from sea and see a junction marker that is red over green, to stay in the main channel you would consider the marker as if it were a red marker and keep it on your right.



Safe Water Marker

These are **white with red vertical stripes** and indicate **unobstructed water on all sides**. They mark mid-channels or fairways and may be passed on either side.



How to Read a Nautical Chart



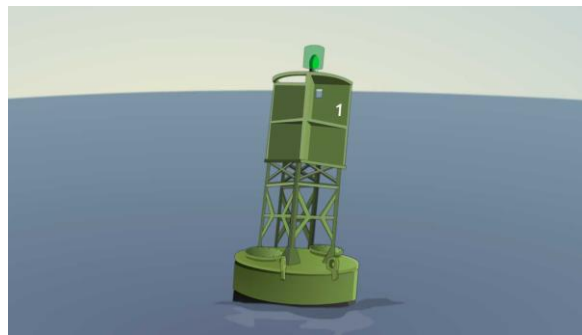
Safe water buoy

The first buoy you see when entering from sea is the open, or safe water, buoy. A lighted buoy flashes at night and during restricted visibility.



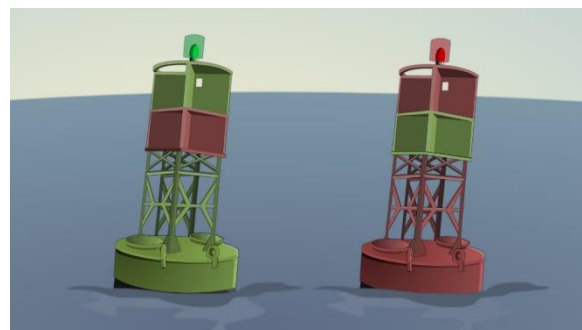
Port buoy

The next buoy you see as you enter this waterway is the port buoy. It is Green, has the number 1 on it, and it Flashes Green once each 4 seconds.



Junction buoy

When entering from seaward you may find two channels which separate and go in different directions. A junction buoy uses its top color to show you the primary channel. You use the top color and shape as if it were a stand alone buoy if you want to follow the primary channel. In this case keep the green junction buoy on your left.



Starboard nun buoy

The next buoy you see as you enter this waterway is the Red Nun buoy with an even number on it.



Green Can buoy

On your port side, you see a green can buoy with an odd number on it.



Non-Lateral Markers

<https://www.youtube.com/watch?v=zs-7Lfc0fLg>

Regulatory or informational markers are used to advise you of situations, dangers, or directions. They may indicate shoals, swim areas, speed zones, etc. **They can be easily identified by the white color with orange geometric shapes.**

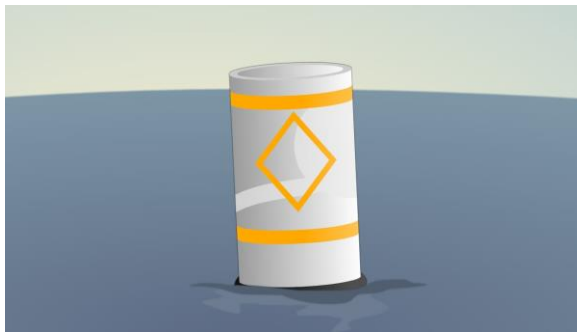
Exclusion buoy

Explanation may be placed outside the crossed diamond shape, such as dam, rapids, swim area, etc.



Danger buoy

The nature of danger may be indicated inside the diamond shape, such as rock, wreck, shoal, dam, etc.



Control buoy

Type of control is indicated in the circle, such as slow, no wake, anchoring, etc. May show white light and/or may be lettered.



Information buoy

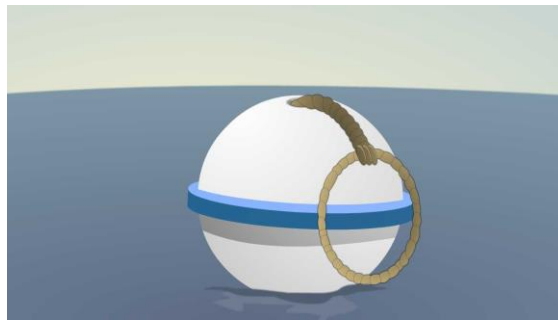
For displaying information such as directions, distances, locations, etc.



Other Markers

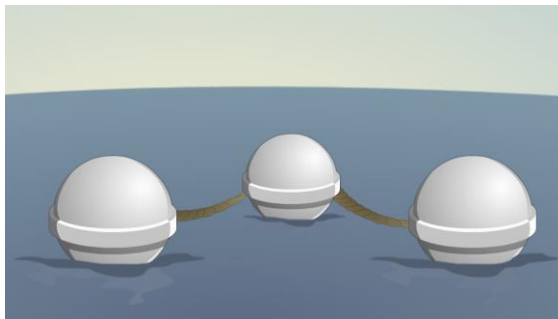
Mooring Buoys

These are **white with a blue horizontal band. They are usually placed in marinas and other areas where vessels are allowed to anchor.** These are the only buoys you may legally tie up to.



Swimming buoy

It marks the perimeter of a swimming area.



Intracoastal Waterway System

The Intracoastal Waterway System (ICW) runs parallel to the Atlantic and Gulf Coasts from New Jersey to Texas at the Mexican border.

Red, right, returning also applies to the ICW markers. But how do you know which way is returning? Generally, if you are travelling south, from New Jersey to Texas, you will have red markers on your right and green markers on your left.

Aids to navigation marking the Intracoastal Waterway (ICW) display unique yellow symbols to distinguish them from aids marking other waters. Yellow triangles indicate aids that should be passed by keeping them on the starboard side of the vessel. Yellow squares indicate aids that should be passed by keeping them on the port side of the vessel.

Intercoastal waterway (ICW)



Western Waterway Marking System

Found only on the Mississippi River and its tributaries, these aids to navigation are not numbered as in IALA-B system. Numbers indicate mileage from the river's mouth.

Western rivers system



CHAPTER 5 – Getting Underway

Getting Underway

<https://www.youtube.com/watch?v=kRoRqoORiPU>

Getting underway for the first time can be a stressful experience. However, with lots of pre-planning, passenger orientation and preparation, stress can be kept to a minimum and a safe voyage can be expected.

Once the boat has been checked out, passengers and equipment are aboard, and the engine has been started and has been allowed to run until it has come to operating temperature, you are ready to cast off. But before casting off let's take a look at how to tie and untie the boat properly.

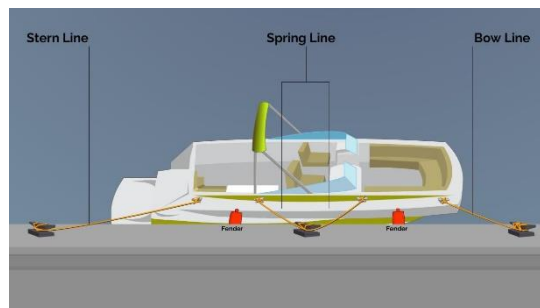
Mooring a Boat

https://www.youtube.com/watch?v=p2I7_0XEiAw

When aboard a boat, ropes are no longer called ropes, they are called lines. At least three, preferably four, lines should be carried aboard for docking:

- **A bow line to secure the bow.**
- **A stern line to secure the stern.**
- **At least one spring line to reduce fore-and-aft movement.**

The diagram below shows four lines used. Although the stern line will keep the boat from moving forward too much, to be safe a fourth spring line running from the dock cleat forward could be used.



Undocking Procedures

<https://www.youtube.com/watch?v=QCtMMhbOWTI>

Docking and undocking procedures are the most difficult boating maneuvers because you need to take all the following factors into account:

- **The direction of wind and current, which will dictate how you approach the dock.**
- **The traffic in the area, to avoid risking an accident with surrounding vessels.**
- **The size of your boat, as you will need to choose a dock with enough space for your vessel.**
- **The depth of the water, to make sure you do not hit the bottom.**

Before casting off:

- Keep your boat moored while you warm up the engine.
- If your boat has enclosed engine compartments, run the ventilation system for a minimum of four minutes before you start the engine.
- Ensure everyone on board is seated and that their hands and feet are inside the boat.
- Ensure everyone on board is wearing a life jacket.
- Go through your pre-departure check list, including checking the gas level and oil pressure.
- Ensure there is no traffic in the departure area.

Undocking - Wind or Current is Pushing

<https://www.youtube.com/watch?v=EwsWQj4-QLs>

Wind or current is pushing your boat away from the dock

1. **Cast off bow and stern lines and pull in fenders as the wind blows you away.**
2. When clear and safely away from the dock and other boats, shift to forward and gradually turn your boat away from the dock.
3. Make sure you are safely away and that the stern will not hit the dock as you motor forward and turn.
4. Move slowly away from the dock, continuing until you can safely increase your speed.
5. Once you are clear of the dock, stow lines and fenders so they will not get in the way.

Wind or current is pushing your boat toward the dock

1. **Cast off all lines except an after bow line. This line will keep you from moving forward and allow the stern to pivot away from the dock.**
2. You may want to use a fender forward to cushion the bow of the boat against the dock.

3. Turn the motor or rudder to the direction necessary to push the stern away from the dock.
4. Shift into forward at idle speed. Slowly, very slowly.
5. The stern will swing away from the dock. When it is clear of all obstacles and traffic, cast off the bow line and back away from the dock.
6. Move slowly away from the dock, continuing until you can safely increase your speed.
7. Once you are clear of the dock, stow lines and fenders so they will not get in the way.

Remember: A boat does not steer like a car. When moving forward, a boat pivots on its axis at a point roughly one-third back from the bow.

Docking Procedures

https://www.youtube.com/watch?time_continue=1&v=d7PhuTGr0Hc

Before docking:

- Make sure all passengers are safely and securely seated with their hands and feet inside the vessel.
- Bow and stern docking lines should be secured onboard.
- Fenders are ready.
- Slow down to the minimum speed needed to maintain steerage.
- **Determine the strength of the wind or current to plan your vessel's approach to the dock.**

Docking With No Wind or Current

1. Approach the dock slowly at a 30-degree angle.
2. Bring the boat parallel to the dock and within about two feet.
3. When close enough, a passenger should step onto the shore and secure the bow line.
4. Secure the stern line and the spring lines.

If the wind is onshore (blowing toward the dock)

1. Approach the dock slowly at an angle of about 15 degrees.
2. Bring the boat parallel to the dock and within about two feet.
3. Allow the wind to blow the boat in.
4. It can then be secured by bow line, then the stern line, and finally the spring lines.

If the wind is offshore (blowing away from the dock)

1. Approach the dock slowly at an angle of about 40 degrees.
2. Pass a bow line ashore and secure it.
3. Use the engine to bring the stern toward the dock.
4. The boat can then be secured with the stern line.

If the current is pushing you toward the dock

1. Approach the dock slowly at an angle of about 15 degrees.
2. Bring the boat parallel to the dock and within about two feet.
3. The current will push the boat in.
4. It can then be secured by bow line, then the stern line, and finally the spring lines.

If the current is pushing you away from the dock

1. Approach the dock slowly at an angle of about 40 degrees.
2. Pass a bow line ashore and secure it.
3. Use the engine to bring the stern toward the dock.
4. The boat can then be secured with the stern line.

Maneuvering Underway

Once underway, your duties as a skipper do not stop. You are still responsible for the safety of all on board, your boat and damage to other boats and personal property caused by collision or damage from your wake. As skipper you should:

- Be familiar with the safe handling characteristics of your boat. Know its cruising speed, idle speed, how it turns left and right and its stopping distance.
- Always choose a safe course. Do not take any risks that might endanger yourself or your passengers or crew.
- Know where you are at all times. Check around you and use landmarks, aids to navigation, charts or any other means possible to pinpoint your location as accurately as possible. If you have an emergency and have to call for help, the first question you will be asked is "Where are you?"
- Keep an eye on the wind, current and weather. Will any changes affect you and the course to your destination?
- Obey the rules of the road. In specially marked or crowded areas, control your speed.
- You should always help other boaters in danger or distress. This could be anything from a stalled engine to a life-threatening event.

Select an Anchor

https://www.youtube.com/watch?v=9B-w6whUP_o

At some point during your excursion, you will probably want to anchor. You may want to stop and fish, swim, have lunch, or stay overnight.

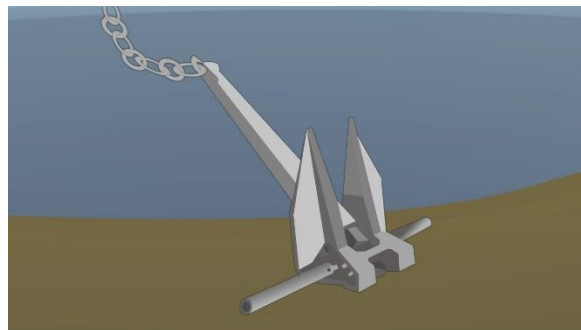
You may also need to drop anchor for safety reasons. Such as to control the boat if bad weather is blowing you ashore or if your engine has died and the wind and current are pushing you towards shallow water or other boats.

The first step in anchoring is to **select the proper anchor. When selecting an anchor, its holding power and the type of bottom in which it will be used must be considered.** As well, the anchor must be of proper size depending on the size and weight of your boat. It is best to have a heavier anchor than needed, because a lighter anchor will not keep your boat in place during bad weather conditions.

Having the right anchor and anchor rode for your boat is important. If you don't, rough winds and water can cause it to drag, leaving your boat to drift. Make sure that your boat is well anchored and that the swivel is properly locked, and keep watch to detect signs of dragging.

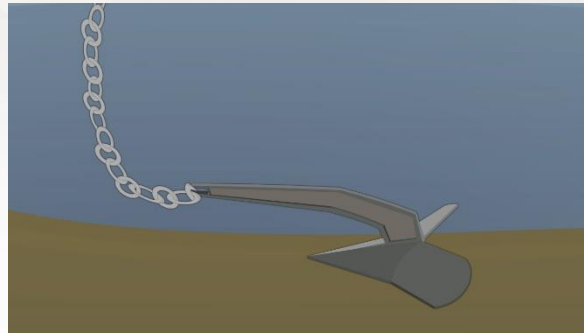
In spite of claims to the contrary, there is no single anchor design that is best in all conditions. On most pleasure boats, the **three anchors you will find most are:**

The fluke anchor



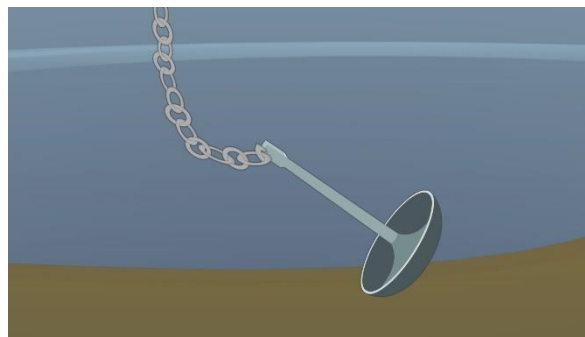
Best for clay, sand and mud. Fluke anchors, including Danforth, have difficulty penetrating kelp and weed-covered bottoms, as well as rocky and particularly hard bottoms.

The plow anchor



Plow anchors are popular with cruising sailors and other private boaters. They generally work well in all bottoms, but are not exceptional in any of them. It is more effective in harder ground than the Danforth type anchor. Good in sand and stiff mud, grass, and pebble bottoms. It can also hold in coral but is less effective in soft mud or clay. The plow anchor is easy to pull up with a vertical pull.

The mushroom anchor



Mushroom anchors are great at holding boats in place on muddy and weedy bottoms but do not work very well on rocky or sandy bottoms. Mushroom anchors do not have the holding power of a fluke or plow anchor and should only be used on small, lighter-weight boats. They need to be embedded in the bottom before they begin to work well. After embedding they can have a holding power of up to ten times its weight.

Procedures for Anchoring

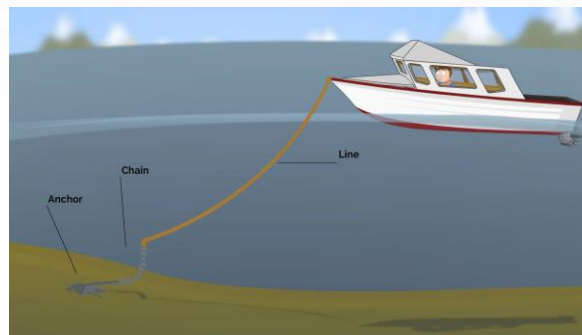
<https://www.youtube.com/watch?v=o9lelien1lk&feature=youtu.be>

Anchors must have something to attach them to the boat. **This is called the anchor rode and may consist of a line, a chain or a combination of both.** The whole system of gear including anchor, rode, shackles etc. **is called ground tackle.**

The amount of rode that you have out (scope) when at anchor depends on water depth and weather conditions. The deeper the water and the more severe the weather, the more rode you will put out.

As a general rule, recreational boaters should put out **7 to 10 times the depth of the water plus the distance from the water to where the anchor will attach to the bow.** The scope could be less for short stays in calm weather.

For example, if the water depth shows 10 feet and it is 3 feet from the top of the water to your bow cleat, you would multiply $(10+3=13)$ by $7 = 91$ to obtain the total of feet of rode to put out.



How to set the Anchor?

- Select an area that offers maximum shelter from wind, current, boat traffic etc.
- **Never anchor in a busy channel or traffic separation zone.**
- **A proper method for lowering an anchor is from the bow.** Never anchor the boat from the stern as waves crashing over the transom could cause the boat to swamp or capsize.
- Pick a spot with swinging room in all directions. Should the wind change, your boat will swing bow to the wind or current.
- **Determine depth and bottom conditions** and calculate the amount of rode you will put out.
- Anchor with the same method used by nearby boats. **Ask the boat adjacent** to the spot you select what scope they have out so that you can anchor in such a manner that you will not bump into the neighboring vessel.
- Rig the anchor and rode. Check shackles to make sure they are secured with wire tied to prevent the screw shaft from opening.
- Lay out the amount of rode you will need on deck in such a manner that it will follow the anchor into the water smoothly without tangling.
- **Cleat off the anchor line at the point you want it to stop.** (Don't forget or you'll be diving for your anchor.)

- **Stop your boat and lower your anchor until it lies on the bottom.** This should be done up-wind or up-current from the spot you have selected. Slowly start to motor back, letting out the anchor rode. Backing down slowly will assure that the chain will not foul the anchor and prevent it from digging into the bottom.
- When all the anchor line has been let out, **back down on the anchor with engine in idle reverse to help set the anchor.** (Be careful not to get the anchor line caught in your prop.)
- **While reversing on a set anchor, keep a hand on the anchor line.** A dragging anchor will telegraph itself as it bumps along the bottom. An anchor that is set will not shake the line.
- When the anchor is firmly set, look around for reference points in relation to the boat. You can sight over your compass to get the bearing of two different fixed points (house, rock, tower, etc.). Over the next hour or so, make sure those reference points are in the same place. If not you're probably dragging anchor.
- Begin anchor watch. Everyone should check occasionally to make sure you're not drifting.

How to retrieve the anchor?

- Retrieve the anchor by pulling or powering forward slowly until the anchor rode hangs vertically at the bow.
- Cleat the line as the boat moves slowly past the vertical. This will use the weight of the boat to free the anchor and protect you from being dragged over the bow.
- Once free, raise the anchor to the waterline.
- Clean if necessary and let the rode dry before stowing away.

Remember, boats don't have breaks and an anchor may be your only way to stop the boat's movement.

Make sure that the anchor and its lines are stored in a place that is easily accessible.

Use of anchor as safety device

The anchor may be used as a safety device if an emergency occurs. You may drop the anchor quickly to avoid running aground in the event that the engine breaks down. **The anchor may also be used to kedge off. It is a method of pulling a boat out of shallow water when it has run aground.** In small boats, the anchor may be thrown in the intended direction of progress and hauled in after it settles, thus pulling the boat in the direction of progress, while a larger boat can use a dinghy to carry the anchor ahead, then drop it and haul the boat.

Carbon Monoxide Poisoning

<https://www.youtube.com/watch?v=ESbph0aHQn8>

Carbon monoxide is a deadly gas produced when carbon-based fuels are burned. It can cause carbon monoxide poisoning. **Carbon monoxide is an odorless and tasteless gas.** It enters the bloodstream through the lungs, displaces the oxygen, and can kill a person in minutes.



Exposure can cause:

- Nausea
- Headache
- Dizziness
- Mental confusion
- Loss of consciousness

The symptoms can be mistaken for seasickness. If someone displays these symptoms, get them into fresh air immediately.

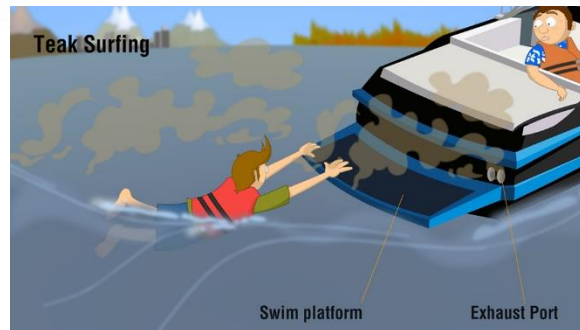


Possible sources of carbon monoxide on your boat include the engine, generators, cooking equipment, and heating appliances.

The most common causes of exposure include:

- **Teak surfing or platform dragging.**
- **Exhaust from other boats docked or anchored or tied to one another.**
- Repairing the boat's engine (working near the engine compartment or engine while it is running).
- Slow or idle speeds while traveling downwind, which allows exhaust fumes to accumulate in cabins, cockpits, or other enclosed areas.

A new and dangerous boating fad involves an individual holding on to the swim platform of a boat while a wake builds up, then letting go to surf the wave created by the boat. Known as "Teak Surfing", this practice is a sure way to get carbon monoxide poisoning. NEVER swim near the stern of your boat with the engine(s) running.



To protect yourself, **maintain and inspect the boat's engine and exhaust system. Keep forward hatches open to provide air flow.** Install a carbon monoxide detector. Be aware of other boats near you that may be running a generator or idling for long periods while docked. Their carbon monoxide can get into your boat too.

Propeller Intervention and Awareness

https://www.youtube.com/watch?v=HyaAiM0_Fy0

Out of sight, out of mind might best describe a very serious hidden danger in boating. Because of the speed and torque, this hidden danger has the potential to kill, mangle or permanently disfigure an unsuspecting person in the water. That hidden danger is the boat engine propeller ("propeller strike").

Propeller related accidents represent 4 percent of all boating fatalities, and a growing number of injuries.



Operating below the water line, the propeller is not readily visible to the operator, passengers, swimmers, skiers, etc. Common propeller strike events include “crew-overboard” and/or “circle of death” incidents. If you have a “crew overboard” event, you should immediately turn toward the person in the water in order to push the stern in the opposite direction. Simultaneously, you should shift to neutral to stop the propeller from spinning.

A “circle of death” event occurs when the operator goes overboard and/or loses control of the steering. Whether you have an outboard or inboard engine, more likely than not your propeller is designed to spin in a clockwise manner. This built in prop pitch introduces “prop walk”, which, depending on the amount of throttle still applied when steering is lost will cause the boat to circle. This circling action has the potential of creating a scenario where the operator, now in the water, is actually run over by the boat and potentially hit by the propeller.

To minimize the potential of someone being struck by the propeller take the following precautions:

- **Make sure everyone on board is seated properly before starting the engine.**
- **Never run the engine while people are boarding or unboarding.**
- Do not allow passengers to stand, sit on the transom, gunwales, seatbacks or bow while underway.
- Do not operate within close proximity to people in the water. This includes swimmers, skiers, divers, etc.
- Keep a sharp lookout.

There are devices designed to decrease the potential of “propeller strike”. These include:

- Propellers guards, which fully or partially surround the propeller.
- Interlocks which, if certain conditions exist, automatically shut off the engine.
- Sensors that can be worn by individuals and electronically stop the engine, sound alarms, etc., if they go overboard.

Prevent Boat Theft

Protect your boat against theft by securing it properly. The following suggestions should be followed:

- Never leave the keys in the boat when unattended.
- If you must leave your boat unattended in the water for an extended time period, consider taking the fuel line from the portable tank with you.
- Also consider removing the battery.
- If your boat is on a trailer, install a trailer hitch lock so the trailer can't be towed or take one wheel off the trailer and store it in your towing vehicle.
- Keep all equipment stored out of sight or take it with you.
- Paint the name on the transom of your boat.
- Make a record of your HIN and keep it in a safe place.

CHAPTER 6 – Emergency Preparedness

Boating Accidents

Believe it or not, most boating accidents occur when the weather is calm and clear and winds are light. In fact, the main cause of boating accidents is human error.

Most fatal accidents in small boats are drownings caused by people not wearing PFDs when they fall overboard or the boat capsizes. Even if you are a good swimmer, the urgency of going into the water unexpectedly, along with fatigue caused by stressors, could render you helpless.



Most non-fatal accidents are caused by collisions with other boats or objects in the water. Remember that the rules of the road require that a lookout be posted at all times. Make sure your lookout is doing his or her job.

Capsizing - The Prevention Response

<https://www.youtube.com/watch?v=VG5dWYbXqNs>

U.S. Coast Guard accident statistics show that capsizing and falls overboard are the leading causes of recreational boating fatalities.

Here are some tips to prevent capsizing:

- Small open boats can be unstable. Be sure that the boat is tied securely to the dock when boarding and step into the centerline of the boat running fore and aft.
- Maintain 3 points of contact with the boat at all times.
- With one hand on the pier and one on the boat, lower yourself down into the center.
- Although not required, you should wear a PFD.

- All other passengers should follow suit and keep low when moving around in the boat.
- **You should not attempt to carry items aboard the boat. You should board first and load them one at a time and, again, place them along the centerline of the boat.**
- **Read and take heed of the capacity plate information.**
- Make sure all passengers and carry-on items are secure and the weight evenly distributed.
- Once underway, **avoid standing up, riding on the bow or gunwale (side)** of the boat, trim the boat so it rides level and avoid making sudden sharp turns.

Capsizing - Responding procedures

<https://www.youtube.com/watch?v=0mpwm9JoueI>

The majority of small pleasure boats, and all built after 1978, have floatation to keep them from sinking even if they capsize.

- Capsizing is when a vessel is either on its side or turned completely over.
- Swamping is when the boat is upright but filled with water.

Capsizing causes

- **Overloading slows a boat down and reduces the amount of freeboard** (area above the waterline). A low freeboard increases the possibility of swamping the boat or taking on water, which will slow the boat even more.
- **Don't overload your boat** with passengers or equipment.
- Improper weight distribution can make the boat even more unstable. You must locate passengers and equipment in order to balance the boat and keep water out. Keep the weight as low in the boat as possible.
- Avoid boating in rough water. Waves can be a major factor in capsizing, especially if they are unexpected. Anticipate all waves and aim the bow into them.
- **Anchoring from the stern could also cause the boat to swamp or capsize.** A proper method for lowering an anchor is from the bow.

Responding procedures

- **Take a head count to make sure everyone is there, don life jackets and check for injuries.**
- If possible climb up on the overturned boat. It may be safer to stay with the floating boat than try to swim to shore. Staying with the boat also provides an easier object for rescuers to see.

- If your life jackets (PFDs) have floated out of range, you can use anything available to keep afloat until you can reach the boat. This might include ice chests, empty soda bottles, etc.
- You should conserve energy but **begin to signal for help** using available equipment such as visual distress signals, horn, hands, etc.
- If you can, turn the boat upright and bail it out. Once most of the water is out, climb back in. Or, if close to shore, just climb in the boat and paddle.



Crew Overboard - Recovering Procedures

<https://www.youtube.com/watch?v=qGYzqpb2sow>

Standing or riding on the gunwales or bow of a boat causes most crew-overboard situations. If you must move around in a **boat which is underway, stay centered and low, move along the centerline**, hold on to both sides and have at least three points of contact with the boat at all times.

Recovering Procedures

1. **Immediately throw a life-saving device** or a buoyant heaving line toward the person so they will have some assistance in keeping afloat. **Your type IV throwable flotation device should always be immediately accessible and within reach of the helm.**
2. Whoever first sees or hears someone go overboard should shout "crew overboard (port or starboard)." This **person should become the spotter and continually point to the person in the water** until the boat is safely alongside. Try not to lose sight of the crew overboard; it is extremely difficult to locate a person in the water.
3. Turn the bow of the boat quickly toward the side the person fell over and stop the boat. **Turning toward the person will push the stern and propeller away.**
4. Slowly turn the boat and make a gentle turn keeping the person in view.
5. **Approach the person slowly** into the wind or current.
6. **Move the boat alongside the person and stop the engine.**
7. Adjust the weight to keep the boat trimmed.
8. Help the person aboard. **Usually over the stern or the side of the boat.**

Do not go into the water to assist the person unless absolutely necessary. If the victim is unable to board or needs further assistance and someone must go into the water, make sure that person is wearing a PFD and is attached to the boat with a line.



In-Water Survival

<https://www.youtube.com/watch?v=usUWrtF5VmE>

Should you find yourself in the water, there are survival techniques you can use while waiting to be picked up. **Hopefully, you have been a safe boater and you have on your PFD. If not, you will have to float or tread water until rescued.**

One method of floating is the horizontal back float. This comfortable position keeps your face out of the water and allows you to conserve energy. You simply lie back motionless with your arms outstretched, arching your back slightly, allowing your legs to rise straight out.

Another method of floating is the vertical back float. This position does not float your entire body on the water's surface. Your body is still underwater except for your face and upper chest, with your arms extended out to each side.

If you cannot float in this manner, you can practice **survival floating**. Tilt your head back, slowly press down with your arms and legs to bring your mouth above the water, inhale, hold your breath and go limp for a few seconds. Your face will go underwater while you dangle your arms and legs. Exhale as you are tilting your head back and preparing to break the water's surface so that a minimum amount of energy and movement is required to keep your head out of the water long enough to inhale.

Treading water requires more energy than floating but keeps your head above water. Treading water is accomplished by doing a slow series of scissor kicks with your legs while slowly waving your outstretched arms back and forth on the water's surface.

Should you find yourself capsized or overboard in a swift river current, turn on your back and position your feet pointed downstream. This will help cushion blows from rocks and debris.

When you find yourself in the water, keep your clothes on to help prevent heat loss. Because they also trap air, your clothes can assist you in floating.

Four Stages of Cold Water Immersion

<https://www.youtube.com/watch?v=0lCvJtHIBOk>

Even when the weather is warm, do not forget that in many areas the water can be very, very cold. A sudden unexpected wake or other "unbalancing event" can land you in the frigid water. Your body can cool down 25 times faster in water than in air of the same temperature. (Not all bodies will cool down at that rate.) **Being immersed in cold water is the greatest danger of developing hypothermia.** But hypothermia does not only occur in extremely cold water. It can, and does, occur even in the warmer waters of Florida and the Bahamas.

Stage 1 - Initial Reaction - Cold Water Shock

A sudden, unexpected entry into cold water may cause a reflexive "gasp" (cold shock) allowing water to enter the lungs. Drowning can be almost instantaneous. When you realize you're about to fall into the water, cover your face with your hands. Covering your mouth is an attempt to avoid gulping water into your lungs.

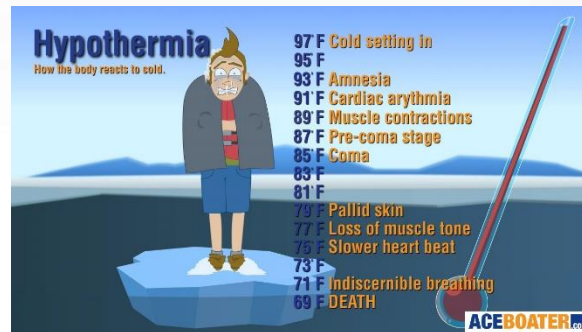
Stage 2 - Short-term immersion / swimming failure

- In the first 10 minutes, you will lose the effective use of your fingers, arms, and legs.
- Inability to match breathing rate to swimming stroke.
- Loss of coordination in the muscles in your arms and legs as they get cooler, increasing your swimming angle.
- Increased swimming angle, requiring more energy to keep your head above water.
- Possible drowning.

Stage 3 - Long-term immersion / immersion hypothermia

Immersion hypothermia begins to set in after 30 minutes in the water. Depending on the water temperature, what you're wearing, your body type and your behavior in the water, you can lose consciousness in as little as one hour. Once unconscious, if not immediately rescued and treated, the person overboard will very probably die due to hypothermia or drowning.

Hypothermia occurs when your body loses heat faster than it can produce heat. The internal organs cool and the body's core temperature drops. Cold water cools the body 25 times faster than cold air.



Stage 4: Post-immersion collapse

The effects on your body after you are pulled from the water can include the following:

- Loss of hydrostatic pressure from the water causes a sudden drop in blood pressure. This can cause heart or brain failure.
- Your heart is cold and cannot pump cold blood effectively to maintain blood pressure.
- Your lungs are damaged from the water you inhaled. This can cause a pneumonia-like illness.
- Fatal bleeding from injuries may occur as your body warms up and your blood flows more freely. You may have internal injuries or injuries to your head and neck that you and your rescuers are not aware of.
- Up to 20 percent of all survivors die during rescue or shortly after.

Treatment of Hypothermia

<https://www.youtube.com/watch?v=yW2xF8PgQjQ>

Treatment of hypothermia should be accomplished with medical treatment. If medical treatment is not immediately available, treatment can be accomplished by gradually raising the body temperature back to normal.

- **Remove the person from the source of cold and keep him/her warm and dry.**
- **Re-establishing body temperature can be as simple** as sharing a sleeping bag or blanket with another individual.
- Applying warm moist towels to the individual's neck, sides of chest and groin.
- **Remove wet clothes** as they inhibit heat retention.
- A warm bath could be used for mild to medium hypothermia, gradually increasing the temperature.
- Keep arms and legs out of the water and do not attempt to raise the body temperature too quickly.
- **Do not massage the victim's arms and legs.** Massage will cause the circulatory system to take cold blood from the surface into the body's core, resulting in further temperature drop.
- **Do not give alcohol**, which causes loss of body heat, or coffee and tea which are stimulants (and cause vasodilation) and may have the same effect as massage.

Surviving in Cold Water

<https://www.youtube.com/watch?v=V8WeOE40y9I>

Safe boating practices like checking the weather prior to departure, informing passengers about how to behave aboard, navigating at safe speed, and maintaining a proper lookout at all times, may help to prevent capsizing, swamping and falling overboard. If an accident does happen and you find yourself in cold water, **wearing a PFD or a life jacket in the water will improve your chances of survival.** You can float without using energy and PFDs cover part of your body, providing some protection from the cold water. When boating in cold water, you should consider using a flotation coat or deck-suit style PFD as they cover more of your body and provide even more protection. You should also consider carrying communication and signaling devices (e.g. a whistle) on you.

The foremost objective for a person in the water is getting control over breathing and getting out of the water. To accomplish this and to limit heat loss, **limit body movement.** Also, **keep your clothes on to retain heat.** Don't swim unless you can reach a nearby boat or floating object. Swimming lowers your body temperature and even good swimmers can drown in cold water.

If you can pull yourself partially out of the water - do so. The more of your body that is out of the water (on top of an over-turned boat or anything that floats), the less heat you will lose. This can also help rescuers to find you. You should conserve energy but also **signal for help** using equipment such as visual distress signals, horn, mirror, etc.

Stay calm, take the H.E.L.P. (Heat Escape Lessening Posture) position and be ready to signal rescuers at all times.

The HELP and Huddle Positions

H.E.L.P. position, commonly referred to as the fetal position, permits you to float effortlessly and protect those areas most susceptible to heat loss, including the armpits, sides of the chest, groin, and the back of the knees.



If you find yourself in the water with others, huddle together facing each other with their arms around each other's shoulders.



Fires On Board

https://www.youtube.com/watch?time_continue=3&v=fagwfAV8IHs

An onboard fire is a serious event. If the fire cannot be controlled where can you go except in the water? Fuels such as gasoline and propane can be particularly dangerous. **The fumes of these fuels are heavier than air** and tend to collect in the bilge and other lower areas of the boat. **It is essential that you keep these areas clean and free of trash and debris because they naturally are surrounded by oxygen, and all that is necessary to start a fire is heat.** All you did was turn the key to start the engine and boom. Most boat explosions and fires occur during or right after fueling.

The fire triangle consists of fuel, oxygen and heat. All three must be present to start a fire and the removal of any single one can extinguish a fire.

<https://www.youtube.com/watch?v=ebEILQ2Xj9E>

- **You should read and understand the instructions on your fire extinguisher. If a fire starts, you should be prepared and not hesitate.**
- **Grab the fire extinguisher, activate it, and direct it at the base of the flames using short bursts and sweeping it from side to side.**

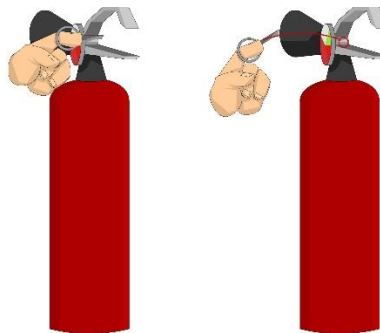
P. A. S. S.

Pull pin

Aim at base of flame

Squeeze handle

Sweep side to side



- **If underway and a fire starts, stop the boat and position it in such a manner that the fire is downwind. Order everyone to put on lifejackets. If possible try to turn off the fuel source to the fire. Grab the fire extinguisher and control the fire.**



Prevent Running Aground

<https://www.youtube.com/watch?v=xc0JHrFv76Y>

A "grounded boat" means a vessel that touches the bottom and gets stuck. According to U.S. Coast Guard (USCG) statistics, groundings have accounted for a number of fatalities, injuries, and millions in property damage every year.

Never *assume* the water is deep enough to avoid running aground, just because you are away from the shore.

The best way to prevent running aground is by knowing your environment.

Before you go out, make sure you are familiar with the locations of shallow water and submerged objects. Be aware that shallow hazards may move as the water level changes.

It is important to learn to read and use charts to determine your position and the water depth. **A good reason to carry and use local charts onboard is to avoid running aground**, which can cause injury to passengers as well as damage to your boat. Not all shallow areas or submerged hazards are marked by a danger buoy.



Respond to Running Aground

Assess the situation:

- **Check the people onboard to make sure no one is injured.**
- **Assess what damage that might have occurred.**
- **Is the boat taking on water? If so, find the source of the leak.**
- Set a kedge anchor to keep yourself from being pushed further aground.
- Use a lead line or boat hook to check the water depth around you.
- Check your chart for bottom characteristics.
- Check the tide tables and determine the next high tide.

Respond to Running Aground

When you run aground in an inboard/outboard vessel, you should shift the weight away from the grounded area of the hull, lift the outdrive part-way then shift into reverse.

A kedge anchor can be your working anchor. The kedge anchor should be attached and pulled in from the bow. To set it in deeper water, you can put the anchor in a dinghy and row or motor it out. If you don't have a dinghy, you may be able to walk or swim it out. Use two or more PFDs or throwables to float the anchor on while you walk or swim it out. Make sure the anchor line pays out smoothly. Be sure that you wear a PFD and have a line tied to you and the boat in case you get too exhausted to swim back.

If you were moving slowly when you grounded and hull damage looks to be minimal, **you may be able to simply back off by shifting the weight** farthest from the point of impact and using an oar or boat hook to push off. As you start to move, be sure to check once again to make sure you are not taking on water from a hole caused by the grounding.

If backing off is not a viable option or if it doesn't work, you could consider using a kedge anchor to kedge off. You do this by pulling or winching in on the anchor line attached to the kedge anchor you set as outlined above.

Should your hull be **severely damaged, stay put and call or signal for help** from another vessel or commercial marine towing company. You are not going to sink if you can step off the boat onto terra firma.

Your final option, short of waiting for the tide to come in, is arranging a tow. You should consider carefully whether to accept a tow from another boater who is inexperienced. Towing can be hazardous and can cause bodily harm and damage to one or both boats unless someone in the party is aware of the precautions that must be taken. If this is the case, call a commercial towing company. Do not call the U.S. Coast Guard unless you are in imminent danger.

PWCs going aground create different problems. In most cases, the operator can simply get off and push or pull the PWC into deep water, get onboard, connect the kill switch lanyard, and get back underway. You should not try using the engine to get off because of the possibility of introducing sand, mud or grass into the jet drive intake.

Be sure to immediately inspect the PWC hull both inside and out for cracks and leaks when you initially run aground. In addition, make sure that nothing has jarred loose and **do the "sniff" test to be sure no gasoline leaks have developed.**

First Aid Kit

Every boater should take an approved first aid course. It is not only important for your own personal safety but for your passengers and other boaters you may encounter who need first aid assistance. You should also equip your boat with a first aid kit. This kit should be sufficient to deal with common problems such as sunburn, scrapes, bruises, minor burns, seasickness and bug bites. The following is a minimum inventory of first aid supplies you should carry:



- Adhesive bandages in various sizes.
- Sterile pads.
- Rolled bandages.
- Scissors.
- Cotton balls.
- Antiseptic.
- Motion sickness pills or patches.
- Aspirin or substitutes.
- Latex gloves

Rendering Assistance - Accident Report

https://www.youtube.com/watch?v=ExS_oJ6hv4E

Federal law states that if you are involved in a boating accident that includes injury requiring medical treatment, death, disappearance of a person, or property damage, you are required to:

- Stop and give assistance to other persons involved to the extent you can do so without endangering yourself or your passengers.
- Give your name and address and identification of the vessel to the owner of any other vessel involved in the casualty, to any individual injured, and to the owner of any property damaged.
- File an accident report with the state boating authority and contact the responsible local law enforcement agency.

You should always render assistance to other boaters in danger or distress. Do not however put yourself or your boat in danger in rendering such assistance. Don't panic, have life saving equipment ready and approach the accident carefully. Watch for persons in the water and throw floatation devices to those who do not have one. Talk to the people and assess any injuries they may have. Administer first aid if necessary and get the people to shore as quickly and safely as possible. **Remember, don't overload your own boat with too many people.** If necessary, take victims requiring the most assistance into the boat and throw a line to the others and tow them slowly as you proceed.

Failure to provide assistance or identify yourself when involved in an accident is a serious offense and can carry a severe fine and/or imprisonment.

CHAPTER 7 – Other Water Activities

Hunting and Fishing

<https://www.youtube.com/watch?v=gpEdxFFebrk>

Many people who operate boats do not consider themselves "boaters" because boating is only incidental to their major activity. **In fact, everyone who is in a boat is a boater, whether the reason is to fish, hunt, or just drift around. As such, you should obey all U.S. Coast Guard and State Agency boating regulations.** Remember never to anchor in narrow channels or shipping lanes and do not tie up to aids to navigation. If in an area where you can anchor, do so from the bow.

Approximately one-third of all boating fatalities occurred while the victim was fishing. Likewise, more hunters die each year from drowning and the effects of hypothermia than from gunshot wounds. **The most likely cause of these accidents is capsizing or falling overboard.**

Many of the fatalities would **have been prevented if the victim had been wearing a PFD.**

A number of hunters and fishermen drown each year simply because they **do not act as responsible boaters.** They **overload the boat, stand up, don't wear PFDs** or fail to take other precautions required when boating. **Everyone should stay low in the boat and gear should be distributed evenly.** A person who stands in a boat does not have the same balance as someone sitting down. A person who fires a gun while standing could easily **lose balance and fall overboard.**

DO NOT operate around boaters who are hunting. Generally hunters don't want to be around other boaters any more than other boaters want to be around those hunting from boats. As a rule, if you see someone in a boat who appears to be hunting, just keep clear. When operating around boaters who are fishing, take extra care to control your wake. People often stand up in their boat to cast or reel in a fish. **Your wake could tip the boat and cause someone to fall overboard.** Remember that you are responsible for your wake.



Swimming

https://www.youtube.com/watch?v=l_9S9zfMI0k

Always swim close to shore and avoid areas where boating is heavy. Do not swim alone away from the boat. It might be a good idea to tie a line to the boat with a life ring or type four throwable device attached. A tired swimmer could reach this and he or she could pull himself or herself back to the boat. Be sure to get the line back on board prior to getting underway to avoid getting it fouled in your prop.

Boaters, be alert for swimmers in the water. Don't assume that they will always restrict themselves to designated swim areas. Be particularly careful when approaching an anchored or drifting boat. There may be swimmers in the area.



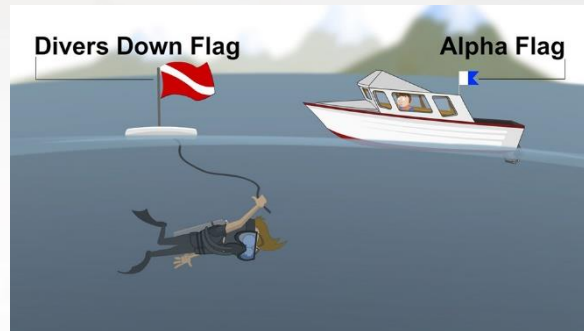
Diving & Snorkeling

You may come across boats engaged in diving operations almost anywhere, so keep a sharp lookout and scan the water ahead of you. Boats engaged in diving should show a rigid replica of the internationally recognized "**Alpha Flag**". This is a blue and white flag with a swallow tail. The alpha flag indicates that the vessel is restricted in ability to maneuver, in this case due to the nature of its work.

Additionally, the traditionally used "**Divers Down**" flag should be flown from the boat or from a float over the divers. This red flag with a diagonal white stripe should be easily seen on the water. **Stay well clear of this flag.** Many states have specific distance-away requirements from 100 to 300 feet. Check your state regulations.

Also watch carefully for bubbles breaking the surface. It could indicate that a diver has strayed from the area and may not be near the dive boat.

Snorkelers normally operate near shore in shallow water. Use extreme caution when approaching shorelines. Look for the backs of the snorkeler, the snorkel itself and swim fins flopping in the water.



Small Boats

<https://www.youtube.com/watch?v=sZSccKVJQ>

Paddle Sports are becoming more and more popular year after year. Whether canoeing, kayaking or rafting, a day on the water enjoying the thrill of the sport or leisurely enjoying the nature around you can be very satisfying.

Participants in Paddle Sports need to be especially vigilant in observing their surroundings, especially when operating around powerboats. A **wake from a powerboat can easily swamp** the paddle driven boat and leave the paddler in the water.

Power boaters should also be aware when operating around paddlers, other small boat operators and swimmers. They need to remember that they are legally responsible for their wake and any damage that it may cause.

There are certain Do's and Don'ts that should be observed to make your paddling adventure a safe one.

Do's:

- Take a hands-on lesson before attempting your first paddling experience. You will learn balance, safe exit and entry, stabilizing strokes, and rescue and recovery skills. You will also learn about special moving water conditions including unusually high water and operating around low head dams and strainers.
- Know how to swim and be able to perform a "self-rescue" in rivers or waters with strong currents.
- Wear a properly fitted lifejacket and keep it snug. Require that others onboard do the same.
- Pay attention to the boat's capacity plate and stay within the required limits.

Don'ts:

- **Never paddle alone.** There is safety in numbers.
- Avoid alcohol use. Far too many deaths are recorded each year when Paddle Sport enthusiasts are using alcohol prior to finding themselves in the water.
- Avoid paddling in extreme conditions that are beyond your skill level. If extreme weather or water conditions exist, stay off the water.
- **Do not overload your craft.**

Small Boats – Preparation

Like boating in general, preparation prior to getting underway is a necessity and could save your life.

- Check the weather conditions prior to getting on the water.
- File a float plan. Let someone know where you are going and when you expect to return.
- Put on a properly fitted lifejacket before entering the boat.
- Load all your gear into the boat properly. Make sure gear is secured and distributed evenly from side to side and bow to stern.
- Access your boat with 3 points of contact to stabilize it. Do not stand or move about excessively.
- **Keep passengers and equipment low and along the centerline.**
- Standing or moving about increases the chance of capsizing. Keep your center of gravity as low as possible. **The most stable position for a canoeist is kneeling.**
- Keep your shoulders within the gunwales of the boat. If you must retrieve something from the water, reach with your paddle or get close enough to retrieve the item without leaning over.
- Always dress for an unexpected flip, wear appropriate clothing.
- Carry required equipment and rescue gear.

The most obvious threat to life on the water is drowning. **Wearing a USCG approved and properly fitted life jacket** can prevent this in calm water but in swift or turbulent water even a life jacket may not keep your head above water at all times.

Small Boats - Special Dangers

Paddling presents some special dangers that every participant in the sport should be aware of. These include; entrapments, broaches, strainers and low-head dams.



Entrapments

Usually happen when a person's foot gets wedged in a crevice or under a rock. The force of swift water may prevent you from being able to free yourself.

When you find yourself in swift water, **float on your back with your feet up and pointing downstream.** This position will enable you to fend off rocks while making your way to the shore. It also diminishes the chance of being entrapped. If your paddle craft remains afloat, hold onto the upstream side as you make your way to shore.

Broaches

A broach may occur when your paddle craft gets pushed sideways by the current and gets pinned against a rock.

Preventing a broach starts with avoiding obstacles in the water. You probably won't be able to miss them all even if you are an experienced paddler. Since being broached is being pushed into a rock by the current, do your best to avoid this situation.

Strainers

Strainers are a common hazard in rivers and streams and may be from a group of rocks, fallen trees or other debris. As the name implies, they have no effect on the flow of water but "strain" out people and paddle craft. Keep an eye ahead and do your best to avoid any strainers that you see.

Low Head Dams

Low Head Dams are serious risks that may be encountered when paddling. Sometimes referred to as "Drowning Machines," they are dangerous both above and below the dam.

From downstream, you may not realize the danger until it's too late. From upstream, low-head dams are difficult to detect. In most instances, a low-head dam does not look

dangerous, yet can create a life-threatening situation. **You should always pay attention to warning signs, markers or buoys and keep well clear of low-head dams.**

Water Skiing, Towed Devices and Wake Sports

https://www.youtube.com/watch?time_continue=2&v=TMv7YMWhrZw

Fast becoming one of the most popular sports in the nation, water skiing also has certain aspects of danger. "Skier mishaps" have been consistently listed in the top five types of boating accidents.



Skiing should be a team sport. The team players are the skier, the boat driver and an observer to keep a proper lookout. While the driver watch the traffic, the observer should continuously keep an eye on the skier and relay messages to the driver. The boat should also be equipped with a wide angle rear view mirror so the driver can see the skier.

Be sure to follow all normal operating procedures and stay well clear of other boats, docks and obstacles. Since the tow rope should be at least 75 feet long, remember to keep the skier at least twice that distance from potentially dangerous obstacles.

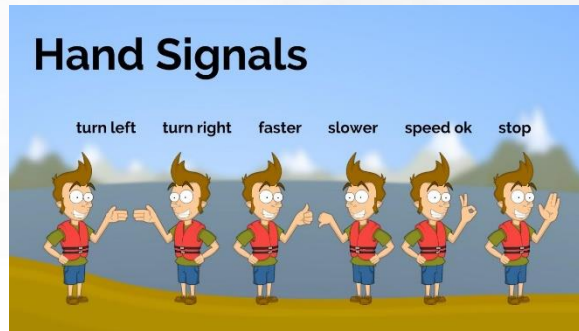
Anyone who is being towed behind a boat, in an activity such as water skiing, must wear a properly fitted USCG-approved PFD. **When a skier falls, it is important to hold up a water ski.** This makes it easier for the tow boat to see you and also notifies other boats in the area that you are in the water.

Do not water ski after dark. It is very dangerous and against the law. Many states have rules regarding when you can water ski. Check for state-specific information if water skiing in an area unfamiliar to you.

Hand Signals

<https://www.youtube.com/watch?v=pDR4Cx-SpJw>

The water skier should be **able to communicate to the towing boat with hand signals**. A clear understanding in advance of the desires of the skier will lead to a safer sport. Try not to think for the skier. Let him or her direct the actions of the boat.



Tips for Safe Towing Devices



- Check your equipment - make sure the towing cleat or transom eyes are tight and secure. You should also check the towable equipment before each use. Read your owner's manual for proper inflation and other safety issues relating to the particular piece of equipment.
- Select a safe area to tow. There should be a minimum of 100 feet of open water on each side of the boat, 3,000 feet of unobstructed waterway in front of the boat and there should be no in-the-water obstructions such as docks, pilings, rocks, speed signs, etc.
- State or local law may restrict towing areas. Check your State and local laws and ordinances prior to towing.
- Make sure the person(s) being towed are wearing their life jackets.

- Make sure there is a designated "spotter" on the towing vessel or the vessel is equipped with a mirror. The "spotter" should continually monitor the towing device(s) and status of the rider(s). He/she should keep the driver updated on the status.
- The driver should always be looking at the path of the boat, other boating traffic and potential obstructions.
- Choose a safe location to stop your boat and make sure that the towable device is slowing at the same rate as the boat.
- Wake surfing is permitted, as long as it is conducted behind a boat with an inboard motor.

Be extremely mindful of the slingshot effect. That is when the boat makes a sudden turn and the towable device continues in the same direction, crosses the wake and may be subject to hitting objects in the water.

Another popular water sport is "Tubing" or being pulled behind the boat with various "towable devices." Tubes and towable devices come in a wide range of shapes and sizes.

Water-Jet Propelled Watercraft

<https://www.youtube.com/watch?v=dn4Xh1cCILM>

A water-jet propelled watercraft is a vessel that uses an inboard motor powering a water jet pump as the primary source of propulsion. It's designed to be operated by a person sitting, standing, or kneeling on the vessel, rather than the conventional manner of sitting or standing inside the vessel. The most common water-jet propelled watercraft is the Personal Watercraft (PWC).

If you operate a PWC you have the responsibility of knowing and obeying boating regulations and practicing boating safety. **Approximately 30% of all injuries from boating accidents are attributed to the use of PWC.**

Federal Regulations require that all PWC:

- Be registered and display a registration number in accordance with state and federal guidelines.
- Have properly fitted, USCG **approved PFD** for each person on board (in most states they must be WORN by a PWC operator or passenger.).
- Have a USCG approved, **Class B-1 fire extinguisher** aboard the PWC.
- Have a **lanyard connected to the start/stop switch** of your PWC. This **will stop the engine if the operator falls off.**
- The Personal Watercraft Industry Association also recommends that the operator wear eye protection, a wetsuit, footwear, and gloves.

Most PWCs have a lanyard connected to the start/stop switch. If your PWC is equipped with this kind of switch, it will not start unless the lanyard is attached to it. **Never start your engine without attaching the lanyard to your wrist or PFD.** If you fall off, the engine automatically stops running so your craft will not travel a great distance and you can easily swim to it. It will prevent the PWC from running unattended into areas populated by swimmers or other watercraft.



PWC – Maneuverability

<https://www.youtube.com/watch?v=VvdTt65dtl8>

PWC operators need to keep in mind that a **jet drive requires moving water through the drive nozzle for maneuverability.** In other words **you must have power applied in order to maintain steering control. If you release the throttle to idle or if the engine shuts off during operation you will lose all steering control.** In either situation, the PWC will continue in the direction it was headed before the throttle was released or the engine was shut-off. Operation of the steering control will have no effect. If you are approaching a dock, shore, or other vessel at a speed greater than you can control and **you release the throttle to idle or shut off the engine, you will have no maneuvering capability and the PWC will continue its forward movement.**

Newer PWCs have a reverse mechanism that you can use to slow the forward motion of the vessel. These PWCs are equipped with cowlings that allow them to operate in reverse. Although this feature is convenient for low speed operations in close quarters, it can be quite dangerous if used in situations for which it was not designed.

Operating in reverse can greatly reduce the ability to steer. Using the reverse feature at other than idle speed can throw the operator forward, and perhaps off, the PWC. In addition, using reverse at high speed can raise the stern of the PWC, pushing the bow down and under water. If your PWC has this feature you should use it with caution only after you have tested its capabilities and limitations at low speed in open water.

PWC - Lookout – Stability



Lookout

Most PWC accidents occur from running into another object, most often another PWC. Operating in a crowded or congested area requires special precautions. **Always keep a proper lookout as to what is going on around you.**

- Look at what other boats around you are doing.
- Always look around and behind you before making a turn.
- Remember that you must obey all rules of operation as they apply to motorboats.
- **Larger boats may not even be able to see you if you are too close and they may not be able to get out of your way in time.**

Stability

The hull of a PWC is somewhat unstable while the craft is at rest in the water. **PWCs become more stable as they pick up speed.** The force of the water being propelled under the PWC and out the back adds some support to the hull during movement. Because typical PWCs utilize mechanical steering devices and directional jet nozzles to turn their craft, their center of gravity and pivot point are far forward and this can create an abrupt tail sliding instability problem

Load Capacity

Manufacturer's load capacities differ depending on the size of your PWC. Consult your owner's manual to determine your PWC's load capacity. **Do not exceed the manufacturer's recommended load capacities.**

Reserve Fuel Tank

PWCs, like most motorcycles, are equipped with reserve fuel tanks that can be switched to if you run out of fuel. With proper planning, you should never have to use your reserve tank. Always plan your outing according to the 1/3 rule to avoid running out of fuel. **Use 1/3 of your fuel going out, 1/3 coming back and 1/3 in reserve. (Do not count the reserve tank in this 1/3.)**

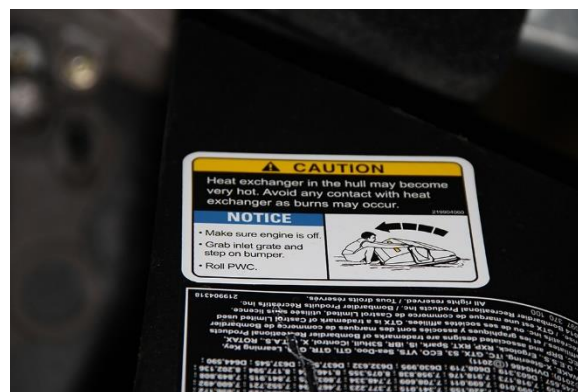
PWC – Reboarding

<https://www.youtube.com/watch?v=teNuNCCZw2Y>

Should you fall off your PWC don't abandon it. If it has not righted itself, turn it over. **Most PWCs carry a label on the hull that indicates the direction that the PWC should be rolled. Be sure to right the PWC in the direction that the label indicates.** If yours does not have a label, check your owner's manual.

- Approach the PWC from the stern and pull yourself up onto your knees on the boarding platform.
- From there continue to pull yourself back up on the seat.
- Be sure to attach the kill switch lanyard to the kill switch and to your body or PFD.
- Start up and get back underway.

You should practice reboarding prior to operating the PWC to make sure you are able to do it alone.



PWC – Courtesy

Most complaints to law enforcement officials regarding the operation of PWCs fall into the following categories.

- **Wake jumping:** This is not only irritating to boaters attempting to be watchful and maneuver in heavily congested areas, but it is extremely dangerous.
- **No wake zones:** No wake means the slowest possible speed your boat will go and still provide maneuverability. If you want to get on the wrong side of a responsible boater, disobey no-wake zones. You are likely to find yourself with a ticket, since most boaters and shoreline property owners will not hesitate to report violators of slow-no-wake areas.
- **High speeds too near shore or other boats:** Most states require **100-200 feet of separation** between boats and the shore when moving at more than no-wake speeds.
- **Noise:** Excessive noise near shore or near anchored boats is sure to draw negative attention. Be considerate of property owners and other boaters. **Consult your state or local government agencies who are responsible for setting legal noise limits.**



PWC - Environmental issues

There are environmental issues that PWC operators need to consider as well:

- **Pollution:** Refuel on land to reduce chances of spillage into the water. **Don't overfill your fuel tank.** Check and clean your engine well away from shorelines.
- **Turbidity:** In shallow waters where PWCs can easily operate, **the bottom gets stirred up, suspending sediment.** This cuts down on light penetration and depletes oxygen. This can affect bird and fish feeding. To avoid this, operate your PWC in deeper water. **If you do have to traverse shallow water, run at idle speed.**

- **Vegetation:** In coastal areas be aware of low tide. Low water levels expose sea grass beds and other delicate vegetation. Disturbances can cause erosion and long-lasting damage. **As a side effect, ingesting seaweed and seagrass or other debris into the drive intake is not good for your engine and can create a hazard by restricting water flow.**
- **Wildlife harassment:** A PWC near shore can interrupt feeding and nesting wildlife, and cause animals to deviate from their normal behavior. And that, by law, is illegal. Mammals such as otters, manatees, and whales can be injured by direct contact with a boat, and it is believed that the noise from watercraft can even adversely influence breeding cycles and cause birth defects. **So avoid areas of high animal populations.**

If all boaters act responsibly and courteously, obey the rules, and protect the environment, our seas, lakes and rivers will provide all of us a lifetime of enjoyment and recreation.

PWC - State Specifics



In addition to the general regulations in effect for motorboats, PWC owners must also be aware that there are local laws and ordinances around the country that further restrict PWC operations. They include age of the operator, hours of operation, special no wake zone provisions, assigned operating areas and restrictions, and speed and distance limits.

Study Guide Completed



Congrats! You've completed the study guide.