

Sailing Fundamentals

By Gary Jobson

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With over 150 line drawings and photographs, and clear, detailed coursework covering every aspect of beginning sailing—from hoisting sail to docking and anchoring—*Sailing Fundamentals* is the authoritative text designed to prepare the learning sailor for certification according to international standards.

Written by America's foremost instructional authority, the new edition of *Sailing Fundamentals* is the official learn-to-sail manual of the United States Coast Guard Auxiliary. *Sailing Fundamentals* is also used in the programs of yacht clubs, colleges, and sailing groups around the country. Unlike many sailing books, which can reflect the biases and idiosyncrasies of their authors, this book has been extensively pretested to ensure that it offers the fastest, easiest, most systematic way to learn basic sailing and coastal cruising.

Widely acclaimed author Gary Jobson has won several major races, including the 1977 America's Cup victory as tactician aboard Courageous. He was head sailing coach at the US Naval Academy, and has conducted sailing clinics across the country.

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Editorial Review

Amazon.com Review
Published under the pennants of the American Sailing Association and the United States Coast Guard Auxiliary, *Sailing Fundamentals* is an excellent guide for novice sailors ready to get their feet wet. This comprehensive manual helps beginners learn basic sailing and coastal cruising with step-by-step instructions for everything from hoisting the sail to docking. Written with clear prose by Gary Jobson--tactician aboard the 1977 America's Cup-winning *Courageous*--*Sailing Fundamentals* is specially designed to help sailors qualify for ASA certification--essential if you wish to charter a boat.

Necessary reading for novice sailors--and an excellent reference for intermediate to advanced sailors. --*M. Stein*

About the Author
Gary Jobson lives in Annapolis, Maryland.

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Chapter 1
ASHORE KNOWLEDGE
ALL ABOUT BOATS
PROPULSION TYPES
Recreational boats are designed to use one or more of three propulsion types. Selfpropelled vessels, including kayaks, rowboats, rafts, and canoes, are designed to be propelled by people using paddles, oars, or poles. Power-driven vessels (powerboats) typically use gasoline or diesel motors for propulsion. Sailing vessels (sailboats) are wind powered, using sails to capture the wind's power (see below).
Powerboat -- a recreational boat typically powered by a gasoline or diesel engine. Powerboats may be subdivided into several types, including utility boats (prams, skiffs, dinghies, inflatables, and utility outboards), runabouts (bowriders, open fishermen, center consoles), cruisers (trawlers, houseboats, larger sportfishing vessels), pontoon boats, and personal watercraft (PWC). Each type has certain uses, characteristics, and limitations. Utility boats, for example, are used as tenders for larger craft and as platforms for fishing and hunting in protected waters. Because utility boats are generally small with limited stability, boaters should enter them carefully to avoid overloading. Caution should also be exercised when moving within these boats to avoid tipping them over. Runabouts are generally fast, maneuverable craft, used for fishing, hunting, cruising, and waterskiing. Cruisers are generally larger, more seaworthy (except for houseboats) craft, equipped with berths (sleeping areas), a head (marine toilet), galley (marine kitchen), and other facilities necessary for living aboard. Powerboats are subject to particular navigation rules and have specific responsibilities under those rules.
Personal Watercraft -- also called "water scooters" as well as a variety of trade names. They are highly maneuverable, fast, fun-to-operate, low-cost, power-driven (jet drive) craft capable of operation in very shallow water. Many PWC are designed for one person, but larger models are available for use by two or three people. PWC are not toys and are governed by navigation rules applicable to power-driven vessels. In addition, most states and many localities have established specific laws that regulate PWC activities, such as prohibition of night operations, speed limitations, prohibitions of specific activities (e.g., wake jumping), limitations on operator age, and education requirements. These popular craft have unique operating capabilities (e.g., high speed, shallow draft), but are also subject to limitations. For example, PWC are steered by altering (via handlebars) the direction of the jet drive, and if power is not applied, steering is lost (the so-called off-throttle steering problem). Operators who are unfamiliar with this design feature may have

difficulty controlling the vessel. PWC are designed for operation in relatively calm waters, have limited fuel capacity, and are not highly stable or maneuverable at slow speeds.

PWC operators often focus their attention on nearby waves or wakes, which can impair their ability to maintain a proper lookout. Operators of other vessels should exercise caution when operating in the vicinity of PWC to minimize the likelihood of collision.

Persons using PWC can expect to be thrown into the water and should wear personal flotation devices (PFDs) suitable for PWC use. The ability to swim and knowing how to reboard a PWC from the water are also essential. Many PWC are equipped with engine kill switches rigged to shut the engine off if the riders are thrown from the craft. Fuel management is very important for PWC. Not all PWC are equipped with fuel gauges. Instead, they have reserve tanks and riders need to know how to switch to the reserve tanks and must know the PWC's endurance when using the reserve tanks. Weight and balance are important for PWC operators. Thorough familiarity with owners' manuals and strict adherence to the published limitations are essential. Finally, it is important that operators of PWC (as well as other craft) display environmental sensitivity. Operations in shallow water areas may disturb a fragile ecosystem and its inhabitants.

Sailing Vessel -- as noted above, this is a wind-powered vessel that uses only sails for power. Many sailboats are also equipped with gas or diesel motors for use (either as primary or supplemental power) when winds are light or from the wrong direction, for docking or other precise maneuvering, and for operation in waters (e.g., certain canals) where use of sails is prohibited. A sailboat is a power-driven vessel, as defined in the navigation rules, when the motor is in operation, and must observe regulations applicable to this type of vessel. When powered solely by sail, a sailboat is termed a sailing vessel and is subject to other specific regulations and (because of its limited maneuverability) enjoys certain privileges under the navigation rules. Various types of sailboat are discussed later in this text.

Sailboard -- a modified surfboard with a mast attached that holds a sail and is capable of swiveling. They are one-person craft, so the "skipper" operates the sail, steers, and acts as lookout. Visibility on these highspeed craft may be limited when the operator is positioned behind the sail. Skippers of other craft should understand this limitation and exercise caution when operating in the vicinity of sailboards.

HULL

The hull is the basic boat minus the rigging. The hull comprises the bottom, topsides, buoyancy tanks, and deck. One way to classify boats is based on hull design. Displacement-hull boats move through the water and push it aside or displace it. Planing-hull vessels move faster and, after gaining speed, ride more nearly on top of the water. All boats at rest or moving slowly are displacement boats. Each displaces a volume of water equal in weight to its own weight when operating in displacement mode.

A displacement-hull vessel always displaces a volume of water equal to its own weight, regardless of its speed. At slow speeds, it is easy for a displacement-hull boat to push the water aside, forming a bow wave. As speed increases, the bow wave becomes higher and the boat tries to climb it. But the boat is not designed to do this so there is a practical limit to its speed. Displacement vessels with longer waterlines have the capability of attaining higher speeds as long as they have adequate power. Most sailboats (except sailboards and certain other light-weight boats such as racing dinghies), tugs, freighters, and true trawlers are displacement-hull vessels. The theoretical upper limit (the hull speed) of a displacement hull can be calculated with relative precision. Hull speed in knots (nautical miles per hour) is approximately 1.34 times the square root of the waterline length in feet. Thus, a displacement-hull vessel with a waterline length of 36 feet has a maximum speed of approximately 8 knots (9.2 statute miles per hour). Despite their slow speed, displacement-hull vessels have many advantages and special uses. They are steady and comfortable and can handle rougher water than their planing hull cousins (see below). Engine-powered displacement-hull vessels are typically highly fuel efficient.

Above hull-speed a planing-hull vessel rides on its bow wave or "on-plane." When planing, it uses most of its power to move forward instead of pushing the water aside and displaces a volume of water less than its own weight. Generally, flatter hull bottoms allow boats to plane more easily. Runabouts, speedboats, sportfishing boats, and PWC are examples of planing-hull vessels. Powerdriven planing-hull vessels are

generally less fuel efficient than displacement-hull vessels of comparable size and weight.

As the name implies, a semidisplacement hull has both displacement and planing characteristics. Up to a certain power and speed, a semidisplacement hull behaves as a displacement hull. Beyond that point, the hull can rise to a partial plane. Increasing the power of a semidisplacement hull vessel increases its speed. It never gets fully "on top," however, and is not as fast as a vessel with a true planing hull. Most trawlers and many cruisers fit into this category.

Multihull vessels include sailing catamarans (two hulls) and trimarans (three hulls). Although technically a displacement-hull vessel, a multihull is able to escape the restriction of hull speed because the narrow hulls create very little wave resistance and because this type of vessel typically carries a great deal of sail. These boats may be difficult to maneuver at docking speeds because they lack the momentum that heavier, ballasted boats use to maintain forward motion.

There is no single, all-purpose, perfect hull design. Boat builders strive to find a happy compromise among conflicting design objectives.

THE BASIC BOAT

Learning to sail is rather like going to a foreign country. Everyone seems to speak a different language. But don't let this trouble you, for the language will soon become familiar. Once you cast off from shore, your boat becomes a self-contained world. To function within that world you need to learn the parts of your boat and their uses. Go over them often so there is no question in your mind.

Keel -- a weighted fin that, when attached to the bottom of a sailboat, keeps the boat from slipping sideways in the water and allows it to sail upwind.

Centerboard -- A sailboat without a keel may have a centerboard. A centerboard is a wooden or metal fin housed in a centerboard trunk that serves the same purpose as a keel. It can be lowered to overcome the boat's lateral motion.

Beam -- the maximum width of the hull.

Deck -- the horizontal upper surface of the boat.

Stern -- the back of the boat.

Bow -- the front of the boat.

Aft, after -- toward the stern.

Forward -- toward the bow.

Windward -- toward the wind.

Leeward -- away from the wind.

Aloft -- overhead.

Rudder -- the fin at the stern of the boat used for steering.

Tiller -- the wooden or metal steering arm attached to the rudder. It is used as a lever to turn the rudder.

Tiller extension -- a wooden or metal pivoting extension attached to the tiller. It is usually found in dinghies and enables the skipper to steer accurately while hiking out.

Wheel -- On larger boats the wheel replaces the tiller and is used to turn the rudder.

Mast -- the vertical pole or spar that supports the sails and boom. The top of the mast is called the masthead.

Boom -- the horizontal spar which is attached to the mast to support the bottom part of the mainsail.

Hiking out -- leaning the weight of the crew over the windward side to help keep the boat on an "even keel."

Port -- the left side of the boat as you face forward.

Starboard -- the right side of the boat as you face forward.

Mainsheet -- the line used to make the major adjustments to the trim of the mainsail.

Boom vang -- an adjustable tackle or rod that prevents the boom from lifting. A rodtype boom vang also keeps the boom from dropping on deck.

Lifelines -- plastic-coated wires enclosing the deck to keep the crew from falling overboard. Lifelines are suspended from metal supports, called pulpits and stanchions.

Traveler -- a slide, running across the boat, to which the mainsheet is led. The crew can change the trim of the mainsail by adjusting the slide position.

Topsides -- the sides of the hull above the waterline.
The **standing rigging** is a collection of wires that supports the mast. On more sophisticated boats, the standing rigging is more complex and can be adjusted to optimize a sail's performance. The basic standing rigging consists of:
Headstay -- a wire that runs from the top of the mast (or near the masthead) to the bow and onto which the jib is attached. It supports the mast, preventing it from falling backwards.
Backstay -- a wire that runs from the top of the mast to the stern and supports the mast.
Shrouds (sidestays) -- wires that run from the masthead (or near the masthead) to the sides of the boat to support the mast and prevent it from swaying.
Sails -- are the power supply of the sailboat. They are most frequently made of Dacron, a synthetic fiber, used because of its resistance to stretching. Other materials such as nylon, Mylar, and Kevlar are also used in sailmaking. Types of sails are:
Mainsail -- the primary and most easily controlled source of sail power, attached along the front edge to the mast and along the bottom edge to the boom.
Spinnaker (chute) -- a balloonlike sail, often colored, used when running with the wind.
Jib (headsail) -- the sail set forward of the mainsail and attached to the forestay using jib hanks.
Genoa (headsail) -- a large jib with an overlap aft of the mast.
Each part of a sail has a name:
Head -- the top corner of the sail.
Tack -- the forward lower corner of a sail.
Clew -- the back lower comer of a sail.
Luff -- the leading edge (front) of a sail. The luff of the mainsail attaches to the mast, and the luff of the jib attaches to the forestay.
Foot -- the bottom edge of a sail. The foot of the mainsail attaches to the boom. The foot of the jib is unattached and consequently more difficult to control.
Leech -- the trailing (back) edge of a sail.
Battens -- support sticks held in pockets to keep the leech from flapping and to add support to the sail.
Draft -- the fullness or roundness of a sail.
The **running rigging** consists of ropes (called lines) that pull the sails up and adjust the sails' shape. Unlike the standing rigging, the running rigging is not stationary. When sailors speak of "trimming" sails to find the most efficient shape, they mean that the sheets are being let out (eased) or pulled in (trimmed).
The running rigging includes:
Halyards -- lines used to raise (hoist) sails and hold them up.
Mainsheet -- a line used to trim the mainsail; it is led through a series of blocks to form a block and tackle.
Jib sheets -- two lines, one on each side of the boat, to trim the jib.
The **topping lift,** which prevents the boom from dropping on deck, is part of the running rigging. The **downhaul, outhaul,** and **cunningham** are also running rigging. We will discuss them later.
Halyards attach to the top or head of a sail. Halyards run through the top of the mast by means of a **sheave** or **block** (pulley) and then down to the bottom of the mast. A halyard can be **internal,** inside the mast, or **external,** outside the mast. The **main halyard** raises the mainsail and the **jib halyard** raises the jib. Halyards sometimes terminate at the base of the mast, requiring the crew to be at the mast when hoisting and lowering the sails. A better system is to have the halyard lead back to the cockpit through **turning blocks** and **padeyes** (blocks and eyes through which a line is threaded to give it a clear, safe run). The sail can then be hoisted by the crew without leaving the safety of the cockpit.
Most boats have **winches** on the mast or on the deck to aid in the hoisting of sails. Winches pull on lines mechanically and safely. They consist of a drum that rotates only in a clockwise direction around which the line is wrapped and a crank handle to rotate the drum. Winches are discussed in the Skills Afloat section of this part.
Sheets control the shape of the sail and **sail trim** or position of the sail. The mainsheet and jib sheets are

quite different from one another. The mainsheet is a multiplepart block and tackle used to increase an individual's pulling power. By giving a sheet a 2:1, 4:1, or 8:1 advantage, the device lets you trim your sails more easily. This is particularly helpful in strong winds.

The jib sheet consists of two lines connected to the clew of the jib that lead along each side of the boat to the cockpit. Although the actual leading of the jib sheets varies from boat to boat, the system illustrated in this book is among the most common.

The jib sheets are attached to the clew of the jib with a knot called a **bowline.** This knot provides a temporary loop that allows the jib sheet to be securely attached to the sail. The key feature of the bowline, like any properly tied knot, is that it unties remarkably easily, even after being under strain for days at a time.

The other end of the jib sheet leads through a **block** (a pulley), or series of blocks, around a winch, to a cam cleat or deck **cleat** (a wooden, plastic, or metal fitting used to secure lines). The crew controls the sail trim by pulling in or letting out the sheet.

Since the jib sheets are led along both the **windward** (toward the wind) and the **leeward** (away from the wind) sides of the boat, they are referred to as the **leeward** and **windward sheets.** The leeward sheet is led along the leeward side of the boat. It is the working sheet and will be taut when the jib is in use; the windward sheet is the nonworking or *"lazy"* sheet and will be slack. Of course, as the side of the boat the wind is blowing from changes, reference to the windward or leeward jib sheets also changes.

At the tail end of the jib sheet will be a **figure eight** or **stopper** knot. The knot will keep the line from pulling through the turning block or fairlead.

The topping lift, or boom lift, holds the boom off the deck when the sail is not being used. If the mainsail is lowered without the topping lift attached, the boom will fall to the deck.

A topping lift should be adjustable, either from the cabin top or from the boom itself. One of the simplest types of topping lift attaches to the backstay and consists of a few feet of wire with a clip or shackle on the end. Although this type of topping lift serves the basic purpose of support for the boom, it is difficult to use and almost impossible to adjust or disconnect once the sail has been raised.

RESPONSIBILITIES OF THE SKIPPER AND CREW

The terms **helmsman** and **skipper** are often used interchangeably; however, they are not the same. The skipper (whether on deck, at the wheel, or taking a nap below) is the person responsible for the safe operation of the vessel. The helmsman is the person steering the boat, a role which may be performed by any member of the crew, including the skipper. The crew (including the helmsman) is responsible for assisting the skipper in the safe operation of the boat.

Traditionally, the captain of a vessel is responsible for the safety of the vessel and all persons aboard. This is particularly true on commercial vessels. However, on a recreational boat the operator (skipper) assumes many of the responsibilities of the captain. If the boat is boarded by federal, state, or local law-enforcement personnel, the skipper must answer for the condition and conduct of the boat. For example, the skipper is responsible for ensuring that:

* The boat carries all required safety equipment.
* Proper lights are displayed at night.
* Correct sound signals are used when required.
* No-wake zones and restricted areas are correctly observed.
* The boat isn't operated in a manner that will endanger life, limb, or property of any person. Negligent or grossly negligent operations could include: operating in a hazardous manner, operating in a designated swimming area, excessive speed in the vicinity of other boats, hazardous waterskiing practices, overloading, overpowering, boating in hazardous weather, bowriding (or riding on a gunwale or transom), and operating under the influence of alcohol or drugs.
* The boat complies with the rules for preventing collisions.
* Proper registration numbers are displayed and the certificate of number is carried on board.
* An accident report is prepared if the boat or persons aboard are involved in an accident that involves a fatality (or disappearance), injuries requiring more than first aid, more than $500 damage to vessels or

property, or the complete loss of a vessel.
* Assistance is rendered to persons overboard and to other boats needing help. (The operator or any person in charge of a vessel is obligated by law to provide assistance that can be safely provided to any individual in danger at sea. The Good Samaritan rule in the Federal Boat Safety Act of 1971 will protect you from liability if you act reasonably and prudently. The operator is subject to a fine and/or imprisonment for failure to do so.)
* Trash, oil, and other pollutants are properly disposed of, and that permanently installed marine toilets comply with United States Coast Guard (USCG) regulations.
* The owner is responsible along with the operator if an injury occurs or if the boat causes damage.
The above list is illustrative, not exhaustive. It identifies some of the specific required actions and responsibilities of the skipper. Being a good skipper, however, entails more than satisfying the specific requirements listed above. It is also a matter of attitude. To a degree unmatched by many other forms of transportation, passengers and other boaters are dependent upon the skipper's skills and responsible approach to boating. In boating, responsibility and fun go hand in hand.
To ensure the safety of the crew, the skipper must organize the operation of the boat so that tasks will be performed efficiently. This means delegating jobs according to the abilities of different crew members.
As a skipper, be tactful when giving an order; as a crew member, be willing and able to obey all reasonable commands. The great General "Stonewall" Jackson once said, "Obedience to orders, instant and unhesitating, is not only the life blood of armies and navies, but the security of states." This statement applies perfectly on sailboats.
Give orders in a friendly but firm tone of voice. Never shout: it only makes the crew nervous and leads to mistakes. Explain commands to inexperienced crew members in advance so they feel more relaxed. Give commands in exact terms. For example, ask for sails to be trimmed in four inches instead of "a little." By putting commands in precise terms, you leave no doubt as to what you want. The best skippers are those who ask the advice of the rest of the crew. However, in times of quick action, the crew must obey commands immediately and ask questions later.
One of the greatest yachtsmen of all time, Ted Turner, establishes the role of each crew member when that person steps on board the yacht. He clearly defines the job of every person on the boat. In case there is an emergency or an important maneuver, each person is assigned a specific task. Turner has earned great loyalty from his crews over the years because they have faith in his ability to make clear decisions in the heat of baffle. His secret? Taking good advice when asked for, assigning specific duties, and motivating the crew by giving everyone on board a reason to excel.
This book will introduce and develop the skills you must have to be a good skipper and crew member. Whether you are tending docking lines, trimming the mainsail, or maneuvering through a crowded marina, each task undertaken and learned in this course will make you a better and safer sailor. More on the duties and responsibilities of a skipper will be discussed in Part Six, Basic Coastal Cruising.

ALCOHOL AND DRUG ABUSE

The National Transportation Safety Board (NTSB) estimates that between 37 and 76 percent of all boating fatalities can be traced to operators with measurable levels of alcohol in their blood. Moreover, studies show that, compared with sober operators, legally drunk boaters are ten times more likely to be fatally injured.
Alcohol consumption while boating is problematic for several reasons:
* Boating exposes the operator to natural stressors (e.g., noise, shock, extreme temperatures, vibration, sun, glare, and wind) that increase fatigue, decrease dexterity, and interfere with judgment. Alcohol exacerbates these effects.
* Complex reaction time (that associated with more difficult tasks or divided attention) is increased with moderate alcohol use. In tasks requiring vigilance (i.e., prolonged periods of task concentration or attention to task) accuracy decreases and the time required for correct response increases with blood alcohol content.
* Alcohol impairs the psychomotor performance of tasks that are vital to safe boat operation, such as steering and signal anticipation. Visual acuity is reduced in low contrast situations such as twilight and night

conditions.
* Fatigue increases with alcohol consumption.
* Intellectual functions are sensitive to the effects of alcohol. Verbal performance, problem solving, and short-term memory are adversely affected by alcohol.
* Balance is adversely affected by alcohol, increasing the likelihood of falling from the boat.
* Judgment is adversely affected by alcohol. Persons under the influence appear to be willing to take greater risks and to underestimate their degree of impairment.
* These are all excellent reasons to refrain from consumption of alcohol while boating. Nonetheless, the American Red Cross National Boating Survey reveals that 29 percent of all boaters reported using alcohol during typical outings, and the percentages for operators of cabin cruisers and cabin sailboats were higher, 44.6 percent and 41.6 percent, respectively.
Here are some ideas to reduce alcoholrelated risks:
* Refrain from alcohol consumption until safely tied up at the end of the day. This is the best strategy.
* Limit consumption to one drink or less per hour.
* Eat before and while drinking.
* Alternate between drinking alcoholic and nonalcoholic beverages. Use nonalcoholic beverages to quench thirst before drinking alcoholic beverages.
* Don't invite people who characteristically drink to excess.
* Don't bring large amounts of alcohol.
* Don't stop at waterside drinking establishments.
Operating a vessel while intoxicated became a specific federal offense effective January 13, 1988. The final rule set standards for determining when an individual is intoxicated. If the blood alcohol content (BAC) is 0.10 percent (0.08 percent in some states) or greater for operators of recreational vessels being used solely for pleasure, violators are subject to a civil penalty not to exceed $1,000 or a criminal penalty not to exceed $5,000, one-year imprisonment, or both. State laws may have other penalties, such as forfeiture of vessel (or motor vehicle) operating privileges. Most states have an implied consent law and refusal to take a blood alcohol test can be used against the boater.
A 160-pound person who consumes five drinks (twelve ounces of beer equals five ounces of wine equals one ounce of eighty-proof liquor equals one drink) in a two-hour period will raise his or her BAC to 0.1 percent.
Intoxicating drugs may not show up in a sobriety test designed for alcohol. However, many jurisdictions give law-enforcement officers great latitude in determining the probability of drug use by operators. If behavior and/or other outward signs indicate that drugs may be present, the officer may charge the operator with boating under the influence (BUI).
FEDERAL REQUIREMENTS FOR RECREATIONAL BOATS
As noted above, the prudent skipper ensures that the recreational vessel carries all required safety equipment (e.g., personal flotation devices, fire extinguishers, appropriate lights, sound-producing devices) and operates the vessel in full conformity with the navigation rules (both topics are covered in parts two and five). Additionally, the operator must comply with other federal and state requirements, such as registration or documentation, numbering, display of capacity information, ventilation systems, use of approved backfire-flame arresters, appropriate pollution placards, and marine sanitation devices (MSDs).
REGISTRATION AND DOCUMENTATION
A vessel of five or more net tons may be documented through the USCG. Documentation is a form of national registration available to citizens or corporations of the United States. In the documentation process, USCG issues papers similar to those issued for large ships. Bills of sale, mortgages, and other papers of title may be recorded with federal authorities, giving legal notice that such documents exist. Documentation may provide additional security and aids in financing and transfer of title. Many states also require that you register documented vessels (see below). If a documented vessel is registered, a decal issued by the state is displayed in lieu of the usual registration number. The decal must be in a clearly visible location. The name and hailing port of a documented vessel must be displayed on an exterior surface that is clearly visible

(typically a transom). The original documentation papers (not copies) must be carried aboard.
If your vessel is not documented, registration in the state of its principal use is probably required. Check with state authorities to determine if your vessel must be registered. If you use it mainly on an ocean, gulf, or other similar water, register it in the state where you moor it. Registration fees vary with state, vessel length, and type of propulsion. The period of registration also varies with the state and may be one year or more.
All states, except Alaska, register boats. (The USCG issues the registration numbers in Alaska.) You must have the original registration certificate (certificate of number) aboard (not a copy) when the boat is in use. Some states will issue duplicate originals for a small additional fee for operators concerned over the certificate's security or susceptibility to water damage.
An alpha-numeric sequence (the registration number) is provided on the certificate of registration. It usually consists of three groups: two letters (indicating the state), up to four numerals, followed by one or two additional letters. Registered vessels must have their registration number painted or permanently attached on both sides of the forward half of the hull. This registration number must be clearly visible in block characters (of contrasting color to the background) at least three inches high, which can be read from left to right. The three character groups must be separated by a space or hyphen. Most states issue a decal, along with the registration, which identifies the expiration date of the registration. This decal must be affixed in close proximity to the registration number.

HULL IDENTIFICATION NUMBER

A boat manufactured for use in the United States after 1972 must have a hull identification number (HIN) permanently attached to the transom on the starboard side, above the waterline. The number must also be located in an unexposed location. The vessel's HIN should be recorded by the owner -- it may be helpful in identifying a lost or stolen boat. Moreover, the HIN is required on many state registration forms.

CAPACITY INFORMATION

Manufacturers must put capacity plates on most monohull recreational motorboats less than 20 feet long. Sailboats, canoes, kayaks, and inflatable boats are exempt. Outboard boats must display the maximum permitted horsepower of their engines. The plates must also show the a

Users Review

From reader reviews:

Herman Lewis:

Here thing why this Sailing Fundamentals are different and dependable to be yours. First of all studying a book is good nonetheless it depends in the content of computer which is the content is as scrumptious as food or not. Sailing Fundamentals giving you information deeper since different ways, you can find any book out there but there is no publication that similar with Sailing Fundamentals. It gives you thrill reading journey, its open up your eyes about the thing that will happened in the world which is might be can be happened around you. You can easily bring everywhere like in area, café, or even in your way home by train. For anyone who is having difficulties in bringing the paper book maybe the form of Sailing Fundamentals in e-book can be your alternate.

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