

Nautical Notes

**A Primer on
Boat Handling**



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Recreational Marine Insurance

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Introduction

This INAMAR primer explains, using simple terms and easy-to-understand illustrations, how to cope with many everyday boating and navigational situations. It's designed to serve as both a handy guide for the skipper and a quick reference for the nonprofessional crew.

INAMAR urges everyone involved in boating to complete one of the safe boating courses offered by the U.S. Coast Guard Auxiliary, U.S. Power Squadron or State Boating Law Administrator in your area.

Courses for home study using video and printed materials are also available.

To obtain more information about safe boating or to learn who to contact about local courses available, dial the U.S. Coast Guard Boating Safety Information Hotline toll-free at 1-800-368-5647 (1-800-DOT-LOGS) for calls made within the United States. If you're placing an international call, dial 1-202-267-1060.

Know the "Rules of the Road"

All boaters should carry a copy of the U.S. Coast Guard's *Navigation Rules*, available at government and marine bookstores.

Making a Float Plan

Not even the most experienced skipper should go boating unless a detailed float plan has been entrusted to a friend, relative or marina manager. The plan may never be needed, but if it is, the crucial information it contains may save lives and reduce needless worry.

Inspecting Your Boat

Your vessel should be thoroughly inspected on a periodic basis and always at the start of each boating season. INAMAR offers a handy Self-Survey Check Off Guide that covers many of the common discrepancies that our staff surveyors encounter. A copy of this guide is available through your insurance agent.

It's just as important to make sure the vessel's registration, documentation papers, local charts, FCC licenses and insurance documents are up to date and on board. Extra copies of all pertinent documents should be kept at home.

The owner's manual that came with your boat and equipment manuals offer service and maintenance guidelines. Remember that some equipment, including fire extinguishers and life rafts, requires annual authorized servicing. If you're uncomfortable conducting any aspect of the inspection, get assistance from your boatyard service manager or a marine surveyor.

You can also contact the U.S. Coast Guard Auxiliary for a free Vessel Safety Check. Coast Guard staffers will check your boat's equipment and provide information about its use, safety procedures and applicable regulations. Visit the U.S. Coast Guard website at www.uscgboating.org for more information, or www.vesselsafetycheck.org to locate a Vessel Examiner near you.

Fueling Procedures

When fueling your vessel, follow the procedures outlined below:

Before Fueling

1. Send all persons not involved in the fueling process ashore.
2. Stop all engines and auxiliaries.
3. Shut off all electricity, open flames and heat sources.
4. Check bilges for fuel vapors.
5. Extinguish all smoking material.
6. Close all hatches, windows and doors.
7. Make certain marina will deliver the proper fuel.

During Fueling

1. Maintain nozzle contact with fill pipe.
2. Avoid overfilling.
3. Wipe up spills IMMEDIATELY.
4. If fuel is spilled, notify the marina and the Coast Guard immediately. If fuel enters the bilge, evacuate the boat and get professional assistance.

After Fueling & Before Starting Engine

1. Inspect bilges for leakage or fuel odors.
2. Open all windows and hatches.
3. Ventilate bilges for a minimum of four minutes using the installed blowers.

Fire Extinguishers

Coast Guard-approved fire extinguishers are required on certain boats. Extinguishers are classified by a letter and a number symbol. The letter indicates the kind of fire the unit is designed to extinguish. (Type B extinguishers, for example, are designed to put out fires involving flammable liquids such as gasoline and diesel fuel, oil and grease.) The number indicates the relative size of fire the extinguisher can effectively extinguish. (A size II extinguisher can extinguish twice as big a fire as a size I.)

Coast Guard-approved extinguishers may be either hand-portable or fixed for use in an engine compartment. Portable extinguishers will carry an A (wood, paper, etc.), B (flammable liquid), or C (electrical) classification. Along with each classification is a size rating. Portable extinguishers should be permanently and conspicuously mounted for ready use in their approved bracket. A fixed extinguisher should be mounted in accordance with the manufacturer's instructions.

The minimum number of hand-portable fire extinguishers required, along with other information, is shown on the next page in the charts provided by the American Boat and Yacht Council (ABYC). Note that these are minimum requirements as set forth by the National Fire Protection Association and the ABYC. They exceed the minimum requirements established by the U.S. Coast Guard and are considered by INAMAR to be more prudent.

In order for a fire extinguisher to be ready in the event of an emergency on board your boat or that of a fellow boater, you should:

Inspect all extinguishers monthly to make sure that:

- Seals and tamper indicators are not broken or missing.
- Pressure gauges or indicators read in the operable range. (Note: CO₂ extinguishers may not have gauges.)
- No obvious physical damage, corrosion, leakage or clogged nozzles exist.

Until the Coast Guard can change the regulations, fire extinguishers should be serviced annually by a servicing company, especially any fixed unit or CO₂ unit. If you have a Halon or one of the newer Clean Agent fixed fire extinguishers onboard a diesel powered boat, it must be wired to shut down all diesel engines. Failure to do so could render the extinguishers useless since the extinguishing agent may be ingested by the diesel engines. This would result in an insufficient quantity of extinguishing agent to completely put out the fire.

All extinguishers should be tagged to indicate the date and place of servicing. The tag should have a place for you to initial monthly inspections.

Fire Extinguishers continued

U.S. Coast Guard Classification of Portable and Semiportable Fire Extinguishers					
USCG Type	Size	Halon – Lbs. (See Note 2)	Halocarbon	CO ₂ – Lbs.	Dry Chemical – Lbs.
B	I	2 1/2	(See Note 3)	5	2
B	II	10	(See Note 3)	15	10
B	III	—	(See Note 3)	35	20

NOTES:

1. The listed weights are minimum for the stated classification.
2. The Halon column shall be used for extinguishers containing Halon 1211, Halon 1301 or mixtures of these agents only.
3. See extinguisher label.

Boats 65 Feet or Less in Length				
Type of Boat	Number of Extinguishers	USCG Type (See Note 1)	ANSI/UL 711 Type (See Notes 2&3)	Location
Open boats under 16'	1	B-I	ABC	steering position
Open boats over 16'	2	B-I	ABC	steering position & galley or passenger cockpit
Boats under 26' in length	2	B-I	ABC	steering position & galley (see Note 4) or passenger cockpit
Boats 26' to 40' in length	3	B-I	ABC	outside engine compartment, steering position & galley (see Note 4) or passenger cockpit
Boats 40' in length & over, but not over 65'	4	B-I	ABC	outside engine compartment, steering position, crew's quarters & galley (see Note 4) or passenger cockpit

NOTES:

1. If a discharge port is installed (ABYC A-4.5.2.2), a USCG type B-I portable fire extinguisher may not be adequate.
2. Extinguishers intended for machinery space protection in accordance with ABYC A-4.5.3.1 or ABYC A-4.6.4 are not required to have a Class A rating.
3. Boats under 26 feet without enclosed accommodation spaces or enclosed galleys may be equipped with a bucket with attached lanyard and BC-rated extinguisher(s) in lieu of class ABC-rated portable fire extinguisher(s).
4. On boats having galley stoves, one of the required extinguishers of the table types shall be readily accessible thereto.

Boats Over 65 Feet in Length

Gross Tonnage	Number of Extinguishers	USCG Type (See Note 3)	ANSI/UL 711 Type (See Notes 2&3)	Location
Not over 50	1 (Note 1) and	B-II	ABC	outside engine compartment
	1 (Note 2) and	B-II	ABC	helmsman's position
	3 (Note 2)	B-I	ABC	galley, crew's quarters & cabin
50 – 100	1 (Note 1) and	B-II	ABC	outside engine compartment
	2 (Note 2) and	B-II	ABC	helmsman's position & galley
	2 (Note 2)	B-I	ABC	crew's quarters & cabin
100 – 500	1 (Note 1) and	B-II	ABC	outside engine compartment
	3 (Note 2) and	B-II	ABC	helmsman's position, galley & crew's quarters
	1 (Note 2)	B-I	ABC	cabin

NOTES:

1. If the total horsepower exceeds 1000 B.H.P., an additional B-II portable fire extinguisher is required for each additional 1000 B.H.P. or fraction thereof.
2. The required B-I and B-II portable fire extinguishers may be distributed among the recommended locations as desired.
3. If a discharge provision is installed (ABYC A-4.5.2.2), a USCG type B-II portable fire extinguisher may not be adequate.

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For a Coast Guard Auxiliary Courtesy Motorboat Examination, Halon and CO₂ units to be counted toward minimum requirements must be inspected and tagged by a recognized authority within six months of the auxiliary examination. The pressure gauge is not an accurate indicator that Halon extinguishers are full.

All portable extinguishers should be permanently mounted in a visible and readily accessible location near the exit for the space they are intended to protect.

Personal Flotation Devices

All Personal Flotation Devices (PFDs) aboard your vessel must be Coast Guard-approved and in good condition. Sizes must correspond to the needs of intended users. Wearable PFDs must be readily accessible so they can be put on quickly if an emergency arises. They should not be stowed in plastic bags, placed in locked or closed compartments or placed beneath other gear. PFDs designed to be thrown must also be readily available.

Though not required by law, prudence dictates that a PFD should be worn at all times when the vessel is underway. It cannot save your life if you are not wearing it. Many states now require that all children don an approved PFD and new regulations have been introduced that require all children to wear one even if the boat is tied to a dock. We recommend consulting with your local boating resources for specific laws and child age requirements.

Boats less than 16 feet in length (including canoes and kayaks) must be equipped with one Type I, II, III or V PFD for each person aboard. Boats 16 feet and longer must be equipped with one Type I, II, III or V PFD for each person aboard plus one Type IV.

Remember, PFDs can keep you from sinking, but not necessarily from drowning. Only a Type I PFD is designed to turn an unconscious person's face upward and out of the water. Take extra time when selecting a PFD to make certain it fits properly. For extra reassurance, test your PFD in shallow water or a guarded swimming pool.

If your boat is used for chartering, all PFDs must be Type I.

Types of PFDs

Type I PFD, also called an **Off-shore life jacket**, provides the most buoyancy. It is effective in 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.* The adult size provides at least 22 pounds of buoyancy; the child size, at least 11 pounds. It is the only type approved for most commercial uses, such as chartering.

Type IV PFD, or **Throwable Device**, is designed to be thrown to a person in the water, and grasped and held by the user until rescued. It is not designed for use as a personal flotation device that can be worn with confidence. Type IV devices include buoyant cushions, ring buoys and horseshoe buoys. Ring buoys and horseshoe buoys should have a 60-foot length of 1/4-inch polypropylene (which floats) attached for emergency use.

Type II PFD, or **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 in the water, but not as many as Type I under the same conditions. An adult-size device provides at least 15 1/2 pounds of buoyancy; a medium child size 11 pounds. Infant and small child sizes each provide at least seven pounds of buoyancy.

Type V PFD, or **Special Use Device**, is intended for specific activities and may be carried instead of another PFD only if used according to the approved condition designated on the label. Some Type V devices provide significant hypothermia protection. Varieties include deck suits, work vests, board sailing vests and hybrid PFDs. Type V PFDs have use restrictions marked on them that must be observed. If a Type V PFD is to be counted toward minimum carriage requirements, it must be worn.

Water Skiing and PFDs

Type III PFD, or Flotation Aid, is also good for calm, inland water or where there is a good chance of quick rescue. It is designed so wearers can place themselves in a face-up position in the water, although they may have to tilt their heads back to avoid turning face-down. The Type III has the same minimum buoyancy as the Type II. It comes in many styles, colors and sizes and is generally the most comfortable type for continuous wear. Float coats, fishing vests and vests designed with features suitable for various water sport activities are examples of this type.

Type V Hybrid Inflatable PFD is the least bulky of all PFD types. It contains a small amount of inherent buoyancy and an inflatable chamber. Its performance is equal to Type I, II or III PFDs (as noted on the PFD label) when inflated. To be acceptable, hybrid PFDs must be worn when underway.

Water skiers are considered “on board” the vessel even when being pulled behind it and a PFD is required for the purposes of compliance with PFD carriage requirements. Skiers are advised to wear a PFD designed to withstand the impact of hitting the water at high speed. Note that the “impact class” marking on the label refers to PFD strength, not personal protection. Some state laws require skiers to wear a PFD.

* When purchasing or using a PFD, you should consult your local safe boating resources and consider that larger children may not fit properly in a child’s PFD, and smaller adults may not be large enough to be properly protected with an adult PFD. Be sure to check the “user weight” on the PFD label. Professional advice will help you select the safest PFD for each individual.

Guests on Board

Like most boat owners, you're proud of your vessel. You experience some of life's greatest moments aboard her, and naturally you want to share the pleasures of boating with your friends.

That's the way it should be. What you don't want is to expose yourself unnecessarily to the loss of friendship that may follow a careless or irresponsible act. Therefore you should avoid such dangerous actions as allowing inexperienced operators to handle your boat unsupervised, drinking or taking drugs, ignoring the laws of the waterways and the "Rules of the Road," sending people forward to tend lines in rough weather and a host of other risky activities.

No one can eliminate the possibility of accidental injury. But you can demonstrate that you are a prudent boater by exercising common sense and following a few simple guidelines:

(1) Be Prepared for Guests. (2) Educate Your Guests.

Assume your inexperienced friends do not know how to behave after leaving the dock. Be ready for them. They may not have suitable shoes, so keep a bunch of old deck shoes available to avoid slips. Supply sweatshirts, sunscreen and extra hats. Offer seasick pills or "patches" that can be purchased over-the-counter. Do not offer any prescription drug such as Scopolamine. Carry a good first-aid kit.

Non-sailors are likely to show up dressed inappropriately for the trip. They should be told before arriving how to dress and what to bring to assure pleasant memories. Children aboard may want to run around the deck as you head through swells. Teach them respect for the sea before getting underway and reinforce the lessons once underway. If guests are required to wear PFDs, make sure the PFDs are properly secured and kept on at all times.

Take time to explain how a boat works. Novices have a penchant for tripping, catching fingers in winches and getting rope burn. If you're on a sailboat, describe heeling and what guests can expect when heeled over hard. Tell them the boom and spinnaker pole can be deadly, and that sheets and halyards are loaded with tension. Consider writing a simple set of safety rules for each guest to read before leaving the dock.

Write each guest's name into the ship's log along with a notation that each was "furnished a copy of 'Day Sail Instructions' and told to read them." Such an entry will help you to remember who enjoyed the hospitality and friendship your boat offered. And if there's an accident, you'll know that you took reasonable and prudent precautions to avoid it.

(3) Warn about Dangers.

You should warn your guests if you see a dangerous maneuver about to occur.

If you're sailing and are about to tack, do more than yell "ready about," because guests may not understand that phrase. Instead, instruct them well in advance about what is going to happen and what they're expected to do.

Never let anyone jump from the boat to assist in tying up. If the marina will not provide assistance, use a boat hook to place the line.

Don't let friends steer without your close supervision. When fighting a large fish, be sure everyone is well back in the cockpit. If a lure pulls out or a line snaps, people can be injured. Most importantly, make sure the person gaffing or tagging the fish is well-trained and experienced.

(4) Log Even Minor Injuries.

If, despite your precautions, someone does get hurt, take action to assist the individual. If the injury is serious, immediately contact the Coast Guard on channel 16 using "PAN PAN." This signal should clear the airwaves so that you can talk without interruption.

Write in the log a detailed narrative of what happened. If you can, document injuries with photographs or a video of the persons hurt and their injuries. Such information may help a treating physician.

Include a full description of how injured persons say they feel. If they're conscious, ask if they are in pain and, if so, where. Note outward or visible symptoms. If injured parties are able to walk off the boat without assistance, note that fact in the log.

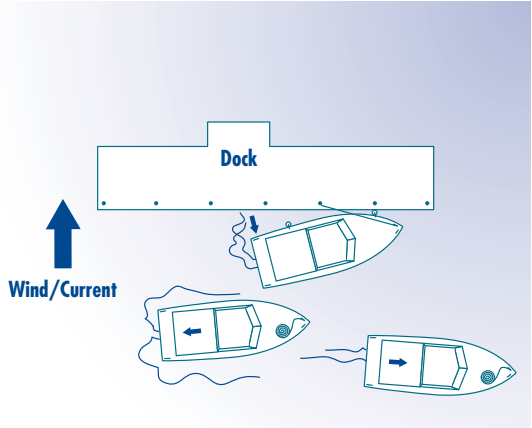
If the accident was witnessed by other individuals onboard, try to get written statements from them. Their versions of the incident may be valuable. Put copies into the log and keep the originals elsewhere.

If following these suggestions becomes routine, your chances of having fond memories and accident-free outings will vastly improve.

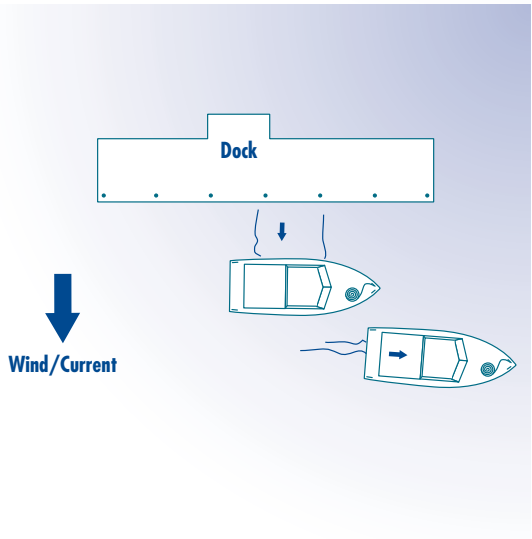
Leaving a Dock

Before getting underway, go through your boat checklist to make certain you have everything aboard that you and your guests may need. Stow it conveniently, yet securely. Look the area over. Observe wind direction, current and the movement of other boats – not only those close to you, but also those at the end of the pier.

If you're tied to the weather side of the dock or the current is pushing you onto the dock and your boat has only one engine, use both the engine and a bow line to get underway. Cast off all lines but the bow line. Turn the wheel toward the dock and, with a little forward throttle, swing out the stern. Make sure an experienced crewmember is forward with a fender to cushion your bow against the dock, and never use feet or hands to fend off. By proceeding ahead for a few seconds at dead slow, the stern should be kicked a safe distance away from the dock. Then take in the bow line and, with the wheel amidship, back slowly away from the dock. When completely clear, head to open water.



A twin screw boat will respond differently. Normally, light application of forward throttle on the dockside engine and reverse on the outboard will bring the bow out. Once the bow is clear, light ahead throttle on both engines should be used until clear of the marina.

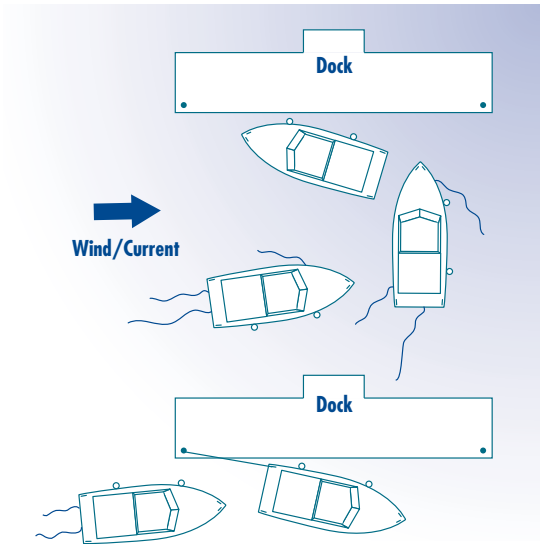


If tied to the leeward side of the dock, use an oar or a boat hook and simply push off. The wind or current will carry you far enough out for a safe departure.

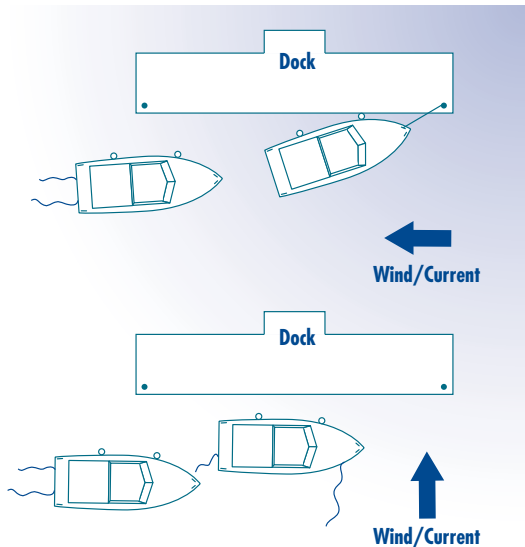
Docking

Never use hands or feet to slow or fend off a boat coming alongside, or to prevent two boats from banging together while docking or rafting. This is extremely dangerous and can result in serious injury.

Never approach a dock at high speed. Throttle down gently to keep your craft under control. Decide whether you will dock on port or starboard. Put out fenders and docking lines and ready the boat hook. Tell each crew member what specific chore he or she is to do before you get to the dock.



Docking technique is dictated by whichever is stronger at the moment: the wind or the current. This can be determined by the way in which moored or anchored boats in the immediate vicinity are lying and from flags that show the direction and strength of the wind. The simplest method is to head into the wind or current so that it will help you stop as you make your approach. Wise boat owners bring their boats to a dead stop a few lengths away from the dock. This gives them a final opportunity to observe the combined effect of wind and current and to check that the engine controls are responding in forward and reverse.



Rafting and Beaching

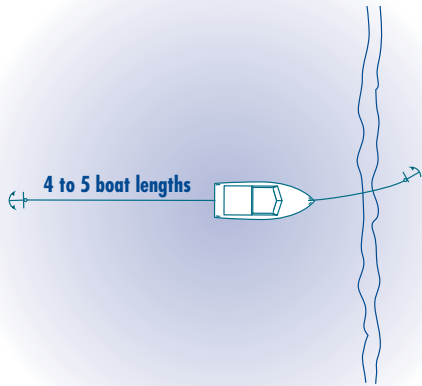
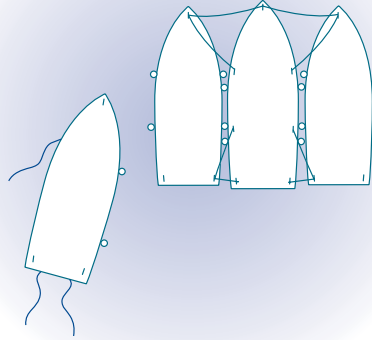
Rafting

You should make your approach at dead slow from behind and slightly to one side of the boat to which you're tying up. Arrange fenders and dock lines before tying up, not after. Pay careful attention to the positioning of fenders and arrangement of mooring lines so that no damage will result from the wake of passing boats. Both vessels should have fenders placed. If one sailboat is rafting up to another sailboat, be sure to check that the masts of the two boats aren't side-by-side, to prevent the possibility of the spars colliding if the rafted boats are rocked by a wake.

If a boat is lying to an anchor and another ties alongside, the added pull may cause the anchor to drag. Determine before tying up if your anchor will be necessary because it is very difficult and dangerous to set an anchor at night when the wind picks up. Be sure all vessels are displaying the proper day shape for an anchored vessel and burning their anchor lights at night.

Beaching

When coming in for a landing, drop an anchor over the stern four to five boat lengths away from the shore and, as your boat proceeds slowly toward shore, set the anchor by placing tension on it until it holds. This stern anchor not only keeps the stern and propeller away from the beach, but when hauling in the anchor line as you get underway, automatically pulls the boat away from shore. Just as the boat reaches shore, a bow anchor can be set ashore or the bow line tied to a sturdy, handy object. For obvious reasons, never drive your boat up on the beach.



Stand-On and Give-Way Vessels

When you allow someone to take the helm, make sure that person knows the basic “Rules of the Road” and what actions need to be taken to avoid the risk of collision.

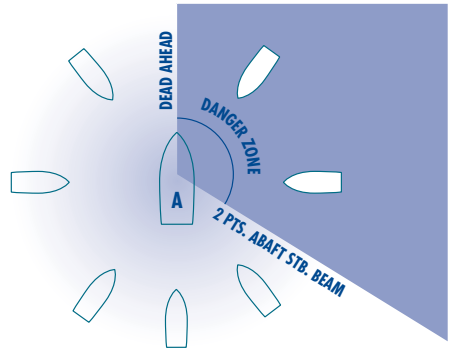
When in close proximity, vessels are said to be either “stand-on” or “give-way.” Usually, the stand-on vessel need not give way, but is obliged to keep her course and speed. It is the duty of the give-way vessel to avoid the stand-on vessel. The stand-on vessel ordinarily maintains both course and speed, while the give-way vessel is obligated to alter course and/or speed so as not to interfere with her.

Generally, a sailing vessel is considered stand-on in relation to a power boat. But this is not true if the power boat cannot safely navigate outside the channel in which she’s cruising. Overtaking vessels are obliged to keep out of the way of overtaken vessels.

Whether stand-on or give-way, it is the duty of every vessel to avoid collision and at all times maintain a proper lookout by all available means.

When Crossing:

If you are the skipper of Vessel A (at right), you must keep clear of any boat approaching you from any direction within the Danger Zone. You are the give-way craft. Boats approaching from all other directions (except the meeting vessel) must keep clear of you.



When Meeting Port-to-Port:

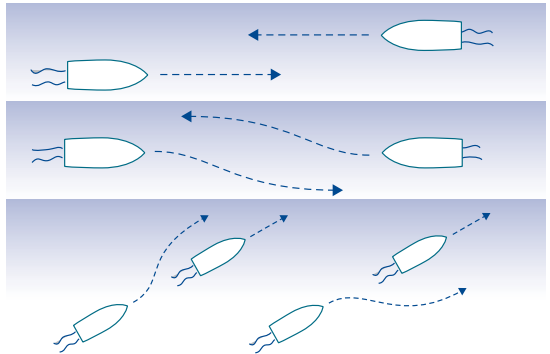
Merely continue on course. The same holds true when meeting starboard-to-starboard.

When Meeting Head-On:

Each boat should signal its intentions by sounding one short blast, then turn to starboard and pass port-to-port.

When Overtaking:

The boat being overtaken is the stand-on vessel. Only after signaling and receiving an acknowledgment can the overtaking boat pass. (Use two long blasts and one short one to pass on the right; two long and two short blasts to pass on the left.) The stand-on vessel shall respond by sounding one long, one short, one long and one short blast, in that order.



NOTE:

In past years, many skippers used the terms “privileged” rather than stand-on, and “burdened” rather than give-way. Stand-on and give-way are the terms used in the *International Regulations for Preventing Collisions at Sea* (COLREGS), 1972 (as amended).

Aids to Navigation

Navigational aids include both floating and fixed objects, and range from a small buoy to a large fixed offshore tower or a lighthouse complete with audible, visible and electronic signals. Such aids help you determine your location and the safe course on which to proceed. Prior to traveling in unfamiliar waters, get current charts and “Local Notices to Mariners” from the Coast Guard. These will tell you if there are any changes to the charts you may already have.

Common aids to navigation include: Buoy:

A floating marker anchored to the bottom and sometimes equipped with audible, visual and/or electronic signals. It marks out navigable channels as shown on the chart. Because these buoys swing with the current, they cannot be used for fixing your boat’s position.

Daybeacon:

An unlighted fixed structure with pointer, sign or “daymarker.”

Light:

An aid (floating or on land) with an identification number and a light at the top.

Ranges:

Pairs of lighted or unlighted fixed aids that indicate the centerline of a channel. One marker is closer to you than the other. When they line up, your craft is in the center of the channel.

Radiobeacon:

A transmitter that broadcasts a characteristic signal to aid in navigating at night, in fog or between distant points beyond the range of normal visibility.

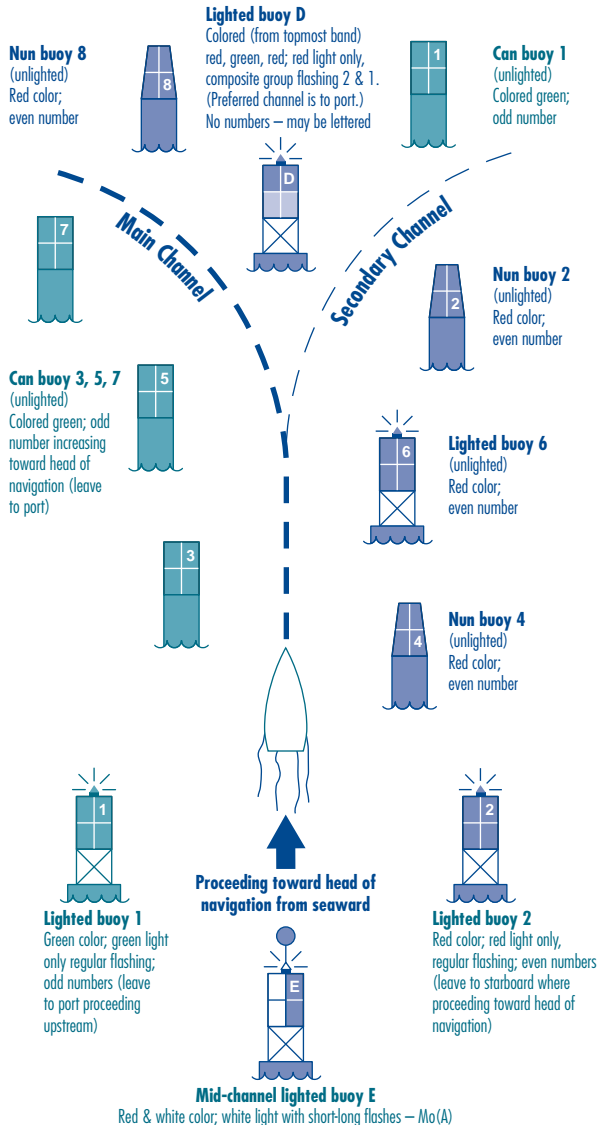
Electronic Navigation System:

One or more radio transmitters or satellites emitting special signals to aid in navigating in fog or when out of sight of land.

Easily Memorized Reminder:

RRR = Red Right Returning

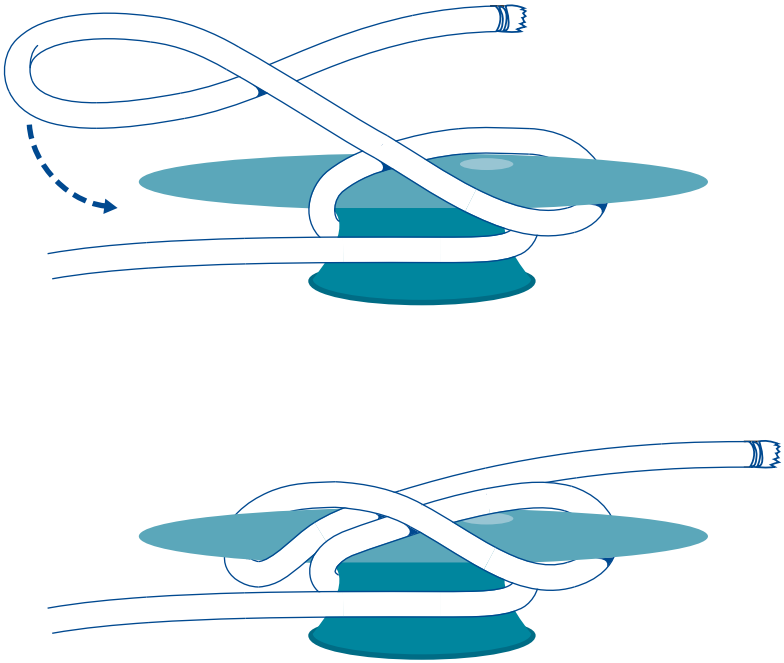
Example of the safest way to proceed toward the head of navigation (from seaward) using the buoy system.



Cleating

Everyone should know how to make fast to a cleat quickly and correctly. Tied in the right way, the line exerts the greatest strain next to the deck. Improperly making fast to a cleat can create one of two problems: Either the line will come loose suddenly and unexpectedly or you won't be able to free the line quickly when it's needed. At best, incorrect cleating can result in a good-natured ribbing. At worst, it can cause a serious accident. Make sure the cleats on your boat have been thru-bolted with heavy duty backing blocks. Screws, nuts and bolts alone may not hold.

Make sure every crew member knows how to cleat properly. "Take a round turn, figure 'eight' and secure with a half hitch."



Anchoring

The best anchorage offers a good holding bottom, water of suitable depth and protection from wind, waves and passing craft. Anchorages are often indicated on charts by the anchor symbol and desirable anchorage areas are shown by solid magenta lines. However, many marked anchorages are for large ships, so it is a good idea to check with the local Coast Guard station before anchoring. If you can't find a suitable harbor, select a cover that protects you from the wind or the direction from which it's expected.

An alternative choice is under a windward bank or beside a windward shore (where the wind blows from the bank or shore toward your boat). In such cases, however, you must be wary of wind shifts that might expose you to possible grounding. Leave enough room so that your boat can swing safely toward shore.

Types of Bottoms	Scope
<p>When anchoring, remember that the best holding bottoms are mixtures of mud and sand, mud and clay or firm mud and sand. Hard sand or gravel bottoms will hold well if your specific anchor can penetrate them. Loose sand or gravel and soft mud should be avoided. Don't anchor in deep water unless your boat is specifically rigged for such anchoring. You will have to use too much line for the proper scope and will end up with too wide a swing for the boat.</p>	<p>Adequate "scope" is necessary if your boat is to be anchored safely, where scope is the ratio of the length of the anchor line to the water depth plus the freeboard at the bow chock/pulpit. Adequate scope assumes that your anchor rode has a minimum of six feet of heavy chain at the anchor to help the stock lie at the proper angle so that the flukes can take a bite and hold.</p> <p>Satisfactory scope under normal conditions is generally considered to be a ratio of seven to one. If you anchor in seven feet of water and the freeboard from the bow chock to the water is three feet, you should pay out 70 feet of rode. ($7 + 3 = 10$ and $7 \times 10 = 70$.)</p> <p>Remember also that a rising tide will change the scope. If the total distance becomes 15 feet to the bottom, you should pay out another 35 feet of rode. Stormy conditions may require a 10 to one scope and extra chain or a weight at the anchor.</p>

Temporary Anchoring

Choose a naturally sheltered spot and be sure there is ample depth to remain clear of hazards at low tide, such as sandbars or reefs. Be sure of a good holding bottom. Approach the anchorage by running directly into the wind or current, whichever is stronger.

In crowded areas, use an additional bow or a stern anchor to prevent your boat from swinging into another craft. Never anchor solely by the stern! Be aware of any cross currents or winds that may cause the anchor(s) to drag. Whenever you anchor, be certain that someone is constantly checking to be certain that the anchor is not dragging, particularly at night. No one likes to wake up with the boat bumping bottom.

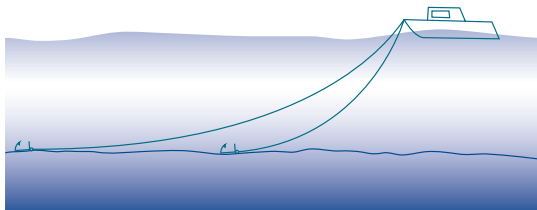
Consider that your boat and all other boats in the anchorage area are in the middle of "circles." Don't anchor too close to anyone and let your "circles" overlap. Different kinds of boats, whether sail or power, will react differently to changes in wind or current.

When anchoring overnight, always display a strong, bright anchor light.

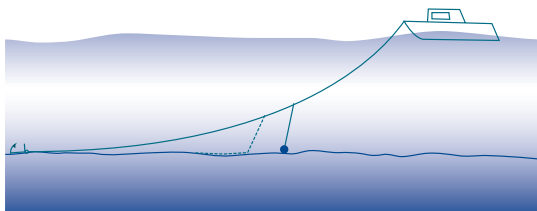
Anchoring in Special Situations

Two Techniques to Reduce Wave Effects:

1. To reduce wave effects use two anchors. Place a small anchor ahead of your main anchor and double the scope.

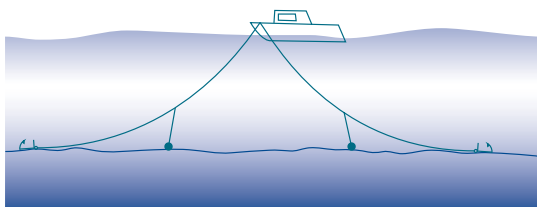


2. Weights or heavy chain on the rode will effectively reduce wave shocks.



Reducing Boat-Swing

To reduce boat-swing use two anchors with or without weights. They will reduce the diameter of the swing by about 50 percent.



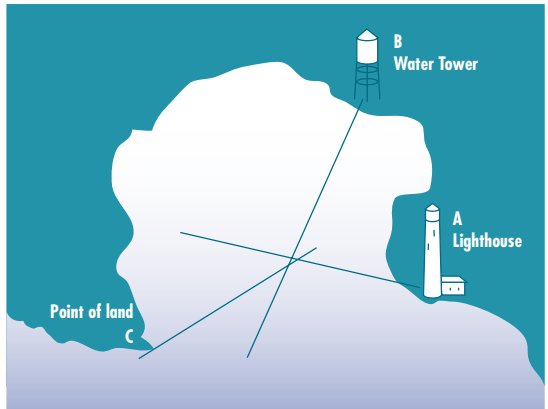
Coastal Navigation

When cruising close to the shore line, look for points that will be easy to identify. Good boaters always plot their position on a chart, rather than relying solely on electronic equipment. A good practice is to try and determine your position every 15 minutes and plot it on your chart, using prominent points of land and fixed aids to navigation as guidelines. Never use a buoy, as it swings with the current. By traveling at a constant speed, on a steady course over a known time interval, you can approximate your current position from your last known position. This technique is known as dead reckoning.

The two basic methods of using charts with compass bearings to find your approximate position are:

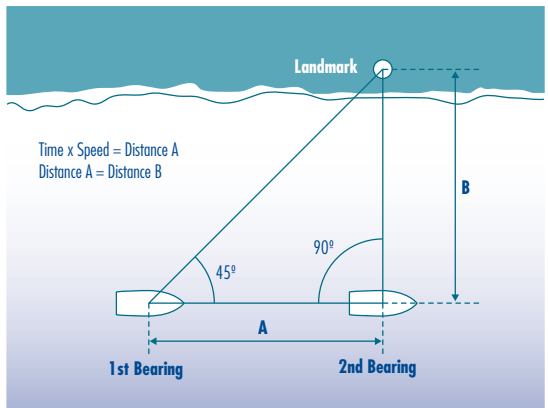
The Cross-Bearing Method:

Used whenever two or more charted objects, such as fixed aids, lighthouses, light vessels, church steeples, etc., are visible. These references should not be less than 30 degrees apart and preferably closer to 90 degrees apart. To obtain a cross bearing, take a bearing on each object, draw the lines on the chart and ascertain your position at their intersection. If more than two bearings are taken, they will not usually intersect at a point, but rather in a triangle. The size of the triangle is proportionate to the accuracy of your bearings. The smaller the triangle, the more accurate your plotting. Be certain to use the inner (magnetic) compass rose in drawing a bearing line on your chart and make certain you correct for deviation of your compass.



The Bow and Beam Method:

Keep dead on your course, and when the charted landmark (lighthouse, church steeple, etc.) is exactly 45 degrees, or "Four Points" off your bow, note your time and speed. When the landmark is exactly abeam, note your time and speed again. The distance you run between these two bearings is your distance off the object on the Beam Bearing. You've formed a 90-degree triangle (two equal sides). That means, if you have traveled three miles between the two bearings, your distance off the charted landmark is three miles.



“Thick Weather” Piloting

“Thick weather” includes fog, haze, heavy rain or snow – anything that creates conditions of reduced visibility on the water. Fog is probably the most common, as well as the most severe and most likely to be encountered.

In “Thick Weather,” You Have One Objective: The Safety of Your Boat and Crew

The most common form of fog is created when a humid mass of air is cooled by passing over a cold area of water (or land). When caught in fog, you may escape it by searching out warmer areas of water. On the East Coast, these can be found in shallow water or off river and stream mouths, and in inlets or bays where tidal currents aren’t strong.

Operate Your Boat at a Safe Speed

Consider safe speed to be the speed that allows you to stop your boat in half the limit of your visibility or to take proper and effective action to avoid a collision. In other words, you should be able to stop fully in 50 feet if you can only see for 100 feet. Radar is not an acceptable alternative for operating your vessel at a safe speed, because it will often “miss” vessels and objects that may not reflect a radar signal.

Turn on Your Running Lights

Lights can be seen at relatively great distances even during fog and their use is required by the COLREGS. Unlit vessels are more difficult to see.

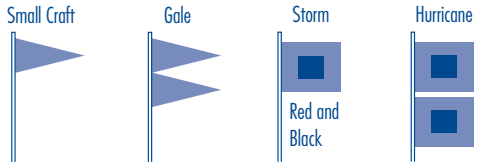
Give a Fog Signal

If a power boat underway: a prolonged blast of four to six seconds at intervals of not more than two minutes.

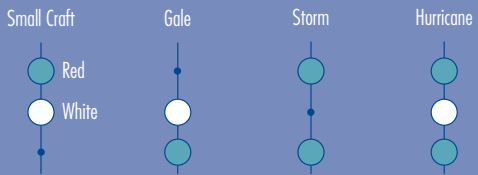
If a sail boat under sail only: a prolonged blast of four to six seconds followed by two short blasts at intervals of not more than two minutes.

Small Craft, Gale, Storm & Hurricane Warnings

Day



Night



If at anchor, ring a bell for about five seconds at intervals of not more than one minute and insure your anchor light only is lit.

Stop, Listen and Look

Stop your boat every few minutes and listen for fog signals, other boats and any other aids to navigation. Look and keep looking. Post crewmembers forward and aft to keep a “sharp eye” about them.

If You Hear a Sound Signal:

Try to determine its location and direction of travel. Thick weather can be very disorienting and you must listen closely to determine where a sound is coming from. Stop and listen again. Proceed only when you are certain that the sound signal’s direction and movement will not jeopardize your boat.

River Piloting

Rivers rarely offer broad water areas similar to coastal waters. Since you are almost always within sight of the shore or obvious landmarks, you are rarely making landfalls. Because river piloting requires directing your craft so that hazards such as shoals and sand bars are avoided, you'll find that your eyes, aided by binoculars, are more useful than your compass.

Tidal waters normally experience four water height changes every day. Non-tidal water variations are apt to be seasonal. Late winter or early spring thaws may bring flood conditions. A very hard downpour of rain may raise the water level several feet in a few hours.

Many rivers also have unique changes of condition. If you're new to a river, be sure to check with local people who are familiar with its specific quirks and hazards.

Right Bank or Left Bank?

Banks of a river are either "left" or "right" as viewed going downstream.

Take Advantage of the Current

River currents flow in just one direction from the headwaters to the mouth. But tidal rivers may feel the effect of tidal conditions that occur at the mouth and back up the water. When that occurs you may take advantage of such currents by going upstream.

Choosing the Best Current

Surface currents on a river may change from bank to midstream and you can take advantage of that variation. Captains of large commercial vessels generally use the strong midstream current on the run downstream to save fuel and time. When going upstream, they will stay as close to the bank as safety allows, taking full advantage of counter currents that flow opposite to the main stream. You can do the same thing, but be sure to give large vessels a very wide berth. The combination of hull suction and large wake of a loaded barge or ship can quickly overcome a careless small boat operator.

Watch the Telltale Wake

Keep an eye on your wake in unfamiliar waters. If the natural wave sequence of your wake is broken, realize that something like a high bottom or submerged stumps must have disturbed it. Quickly move away from the side on which such "telltale" changes occur.

Barges Call for Caution

Prudent boaters steer clear of barge operations, especially at night, when visibility is limited. Remember that, although barges rafted to tow or push can be hundreds of feet long, they're required to have only one side light at the front of the raft. Consequently, most of the barges are unlit. A similar situation applies at the bow: When barges are rafted three or four abreast,

only the extreme outboard barges are lit. An even more dangerous situation occurs when a tug is pulling one or more barges on a tow line. The tow line can cut a boat in two or rip off the underwater gear. Never pass between a tug and its tow.

Anchoring on a River

Check your chart, cruising guide or the local Coast Guard for a desirable place to anchor for the night. The ideal location protects you from the elements, passing traffic and debris.

If you decide to anchor near a sandbar or an island, pick the downstream rather than the upstream end. If you go aground on the upstream end, the current will push you farther on and make life even more difficult. Downstream water is apt to be much quieter and eddies, which naturally occur there, will help free a grounded craft.

Be sure to keep a strong anchor light burning all night.

Shallow Water

A good cruiser getting into water that is too shallow will settle aft or pull an abnormal stern wave. Most boats will seek deeper water of their own accord.

Should you touch bottom, instantly put your craft into neutral gear and release the wheel. The craft might work itself clear.

If you're too far aground, you will have to take soundings and determine the nearest deep water. Keep an eye out for passing boats and use the waves they throw to help work yourself free.

Navigational Rule for the River

If the area of a river on which you are traveling lacks aids to navigation, try to keep about one-quarter of the river's width off the outside bank of any turn.

Stranding, Assisting and Towing

Stranding (Running Aground)

Stranding, in most situations, is more an inconvenience than an actual danger. If you know what to do and work quickly, you'll probably lose only a few minutes from your otherwise enjoyable cruise.

Don't throw your engine into reverse and gun it in an effort to pull off. This is the typical, almost instinctive reaction and, in most cases, exactly what you shouldn't do!

Stop and Consider Three Things:

(1) The Stage of the Tide

If it's rising and the sea is quiet (and not pounding on your hull), time is on your side. Whatever efforts you make will be even more effective after time has passed and the tide has risen.

If the tide is falling, you must act immediately or you may spend a lot of time aground and possibly damage your boat.

(2) The Shape of Your Hull

What is its point of greatest draft? This should tell you what part is most likely to be touching. If the hull has any tendency to swing because of wind or waves, the spot above which it pivots is probably the part that is grounded.

(3) The Type of Bottom

If you're in sand, don't reverse hard. If you do, you'll probably wash sand from astern and throw it directly under the keel, bedding the boat even more firmly to the bottom. At all times while aground, use caution in reversing to avoid pumping sand or mud into the engine. If you reverse on rocky bottom, you may actually drag the hull and cause more damage.

If grounded forward, given the tendency of the stern to swing to port, reversing a single-screw boat that has a right-hand propeller may swing the hull broadside and create even greater contact with a soft bottom.

CAUTION: Cleats, chocks and other fittings on many recreational boats lack adequate strength to be used for towing and may fail without warning. This represents an extreme hazard to persons on both vessels. Broken lines or cleats recoiling back to either vessel at rapid speed have caused serious injury and death.

INAMAR recommends that towing be left to licensed professionals.

If you must tow or assist another vessel, we urge that you use extreme caution and keep everyone aboard both boats away from lines and cleats. We also recommend that you make sure your cleats are reinforced with through bolts and backing plates inside the hull, and that such equipment was installed by a qualified boatyard or boat manufacturer.

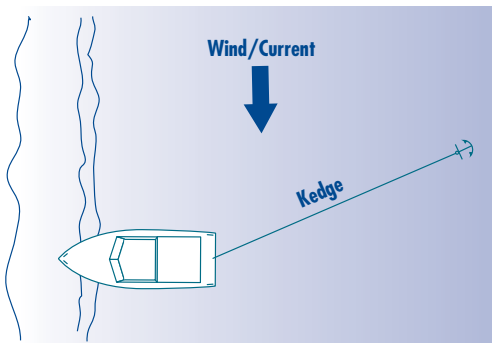
Using a Kedge

If your boat is solidly aground, your first action should be to take an anchor (kedge) and set it firmly. This is called kedging.

Make a line fast to the stern bits or something solid. Then, if you have a dinghy, row out as far as possible and set the anchor.

If you don't have a dinghy and the water is not hazardous, you may swim out while supporting the anchor on a PFD and drop the kedge. Make sure you wear a PFD to save your energy.

Ordinarily, an anchor should never be thrown. But this may be an exception, because it's crucial to get a kedge set. It may even prove necessary to pull the anchor and throw it several times to set it firmly.



Where to Set Out the Kedge

First, remember the sideways-turning effect of a reversing single screw. Unless the boat has twin screws, set the kedge at a compensating angle from the boat's stern. Because most propellers are right hand, setting the anchor slightly to starboard of the stern will give you two definite advantages. When pulling together with the kedge line and reverse, the craft will almost have a straight pull on it. When used alternately, first by pulling on the line and then by giving a short "jolt" with the engine in reverse, the "wiggling" to the stern and keel may help to start the boat moving.

At all times while aground, keep the kedge line as taut as the combined pulling strength of yourself and your crew permits. Such constant pull, in concert with the wake of a passing vessel of some size, may help lift the keel from the bottom.

Two kedges placed at an acute angle from either side of your craft may also be pulled upon alternately for additional stern "wiggle" that could set you free.

Where the bottom is sandy, you may also have the propeller going ahead while you pull so long as your kedge line is kept absolutely taut. This may wash some sand away from under the keel.

If you have several persons aboard, have them move quickly from side to side in an effort to roll the boat, making the keel "work" in the bottom. Shift any heavy objects from over the grounded portion so as to lighten that section and make it more maneuverable. If you have a dinghy, consider loading it with people and other ballast and taking it ashore.

If you have spars, swing the boom outboard with crew on it to heave the boat down and raise the keel.

Obviously, if the boat has been severely damaged and is taking on water, you may be better off where you are than back in deeper water. Under these circumstances, you may consider taking an anchor ashore and securing her while waiting for professional help to arrive. Be sure that everyone onboard dons a PFD and that efforts are made to slow the ingress of water.

Remember: The first thing to do when you go aground is to get out a kedge. It stops you from being driven further aground and may be used to pull yourself free as waves from passing craft lift your boat.

Stranding, Assisting and Towing

Assisting

More often than you may think, the assisting boat ends up needing assistance herself. Helping a fellow seaman requires more than good intentions. It also requires a healthy dose of common sense, the ability to recognize situations in which rescue is impossible, and sound judgment in determining what should be done and if your boat is capable of doing it.

Consider the Stranded Craft

Observe its size and approximate weight in comparison to your own boat. Then discuss possible rescue procedures with the stranded skipper and decide on a course of action.

Get a Line to the Stranded Boat...Safely

Before going in to pass a line, observe the shoal area thoroughly. Remember that wind, current and the effect of reversing your propeller may cause your boat to swing broadside in the shallows as she backs. If that possibility exists, it's better to figure some other way of passing the line.

If conditions do seem right to back in, remember that wind or current may compensate for the reversed screw, keeping your vessel straight and with her bow headed out for best maneuverability. Then, if assisting, you may pull straight ahead with full power.

If there is no way to make a reasonably safe approach, you may have to move off a fair distance and drop anchor. Then you can get a line over by dinghy, by buoying the line and floating it over, or by having someone on the stranded boat bring a line. Never consider leaving your boat to assist another boater unless there is great danger of loss of life on the other boat. Before leaving, call the Coast Guard and let them know what you are going to do. It is easier for them to lift someone from a stranded boat than from the water.

Don't Just Sit There Waiting for Assistance or the Tide!

Instead, gather valuable information. Take soundings around the entire perimeter of your boat. Seek bottom contour changes that you can either take advantage of yourself or tell the Coast Guard or tower about when they arrive.

You may discover through soundings that straight backward pulling with kedges and engine is not necessary. Swinging the stern to starboard or port may be just the thing to set you free or put the boat in a more maneuverable position.

If possible, hail a passing boat. Explain the situation and ask the skipper to run his craft back and forth, making as big a wake as possible. Then "work" with your muscles and your engine to try and pull her free.

If you're "high and dry," try to brace your boat so she is as upright as possible. When the tide comes in, she'll refloat much easier.

Straining with Success

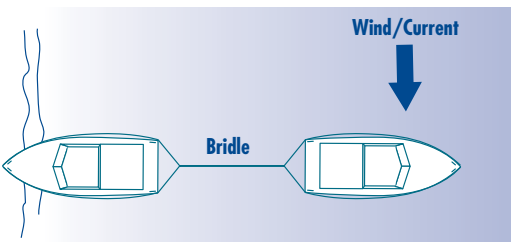
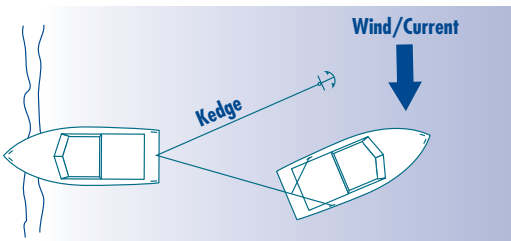
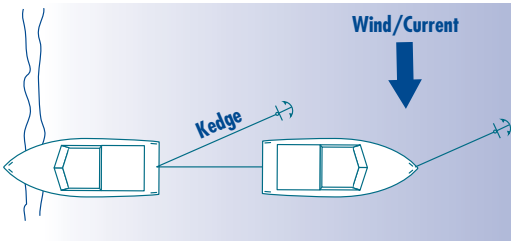
When the wind or current (or both) is broadside to the direction of the pull, it is best for the assisting boat to remain anchored while pulling. If not, when she takes the strain she will lose her own maneuverability and gradually make leeway or even go aground broadside.

Remember that recreational boats are not tug boats and their cleats and bits are usually not strong enough or properly placed for sustained pulling. It is best to run a bridle around the whole

hull of the stranded vessel. If there is any question of the assisting boat's ability to withstand concentrated strains, she should also be bridled.

In case the stranded boat should come off, she should have a kedge out for control. Because she may be without power, she should have another anchor handy to keep her from going back aground.

All the while, the assisting captain must make sure all lines are kept clear of propellers and that no sudden "surge snap" is put on a slack line.



Pulling Techniques

Small craft must generally make the pull with a line made fast near the stern. Because this restricts maneuverability, a bow anchor should be put out for safe control. As soon as the stranded boat comes free, anchor line slack should be taken up to prevent the assisting (pulling) boat from being carried into shoal water.

To increase maneuverability, in case a bow anchor cannot be set, the tow-line should be secured to a cleat located forward of the stern (and on the up-wind or up-current side). Be sure this cleat has the capacity to take a heavy strain.

Because the strains set up are greater than the capacity of most bits and cleats on small craft, a bridle is your best insurance. Be sure to pad any pressure points to protect both craft against chafing and scarring.

Stranding, Assisting and Towing

Towing

Towing requires careful attention to the physical capabilities of both your craft and the other vessel, as well as to location, wind and current.

In fine weather with a calm sea, towing is a relatively simple chore. Under foul weather conditions or when improper methods are used, it can prove both dangerous and expensive for everyone involved. When in doubt, it's better to wait for professional assistance than to risk a catastrophe.

Get a Line Over

Simply stated, towing requires you to maneuver your boat in line with, then ahead of, the other boat while also passing a tow-line. To avoid getting too close when approaching the boat to be towed, buoy a long line with life preservers. Tow the line astern and then make a circle under the stern of the disabled craft, getting the line to her, but making sure it stays clear of her propeller.

It is best if the line used to free a stranded vessel, or to tow a disabled vessel, belongs to the vessel in distress, if it has a line onboard that is of adequate size. In the event the line parts or causes further risk to the vessel in distress, the assisting vessel may avoid potential liability.

Tow from the Stern

It is best to tow from the stern, using a bridle between the stern cleats, to keep the lines away from everyone aboard. The effect on maneuverability of the towing boat can be dealt with easily by adjusting lines. Once the tow is underway, the vessel being towed can also steer and assist greatly.

For greatest maneuverability, the towing vessel should pull from its centerline. If the vessel lacks a centerline bitt of adequate strength, simply fashion a bridle between the two aft, outboard cleats (bits). The bridle should be at least twice as long

as the distance between the cleats. The tow-line should run from the bridle back to the forward cleats of the disabled vessel.

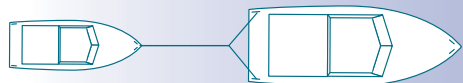
The best way to perfect your towing technique is to practice with a friend by towing his or her boat in quiet water.

Stand Clear of the Tow-Line

A tow-line that parts, or a cleat or bitt that suddenly lets go, can be very dangerous. Stand clear of the tow-line! If necessary, release it quickly or cut it with a knife or a hatchet.

Use Easy Motion...Not Just Muscle

Don't begin towing with a lot of power or too rapidly. Gain speed slowly and never exceed a moderate rate. There's no reason to put excessive strain on the crew or craft. Keep your craft "in step" with the boat you are towing. Be sure to adjust the tow-line length so that both boats are on the crest or in the trough of the sea at the same time. If your boat is towing and is the larger craft, be especially careful to cruise at a slow pace. Towing a larger boat alongside is not recommended. But, if it must be done, spring lines should take the strain. Be sure fenders are placed at points of contact and springs are made up with no slack. When the skipper of the smaller towing boat puts her rudder to port or to starboard for a turn, the two vessels should respond simultaneously as a single unit.



Helmsmanship

Helmsmanship is the ability of a seaman to steer a vessel. Some knowledge can be acquired in a classroom or from a book, but true ability comes only from actual experience. Be aware that helmsmanship “rules” are only general statements because boats, like seamen, have individual characteristics. Their specific strengths and weaknesses are their own. Obviously, a boat with a shallow draft will handle differently than one with a deep draft. Outboards and inboard-outboards are steered by changing their thrust direction, and react differently than rudder-steered boats. Likewise, heavy, slow displacement hulls will react differently than light, fast planing hulls.

“Feel” of the Craft Is Essential in Becoming a Good Helmsman:

When you take the helm of any boat for the first time, relax and get to know her. Don’t force large corrections. As much as possible, let her find her own way through the waves.

Compensating at the Helm:

When a craft swings and changes course, the inexperienced helmsman tends to oversteer because of the lag between the turning of the wheel and the craft’s actual response. The experienced helmsman will return the rudder to midships before the boat actually reaches the new heading. In some cases, he or she may use some opposite rudder action to check the craft’s swinging motion.

Yawing:

Yawing from side to side on an exaggerated, crooked course is a sure sign of a novice “at the helm.” To keep your craft on a straight course, you must “anticipate.” Only by constantly observing the boat’s swing can you quickly correct her course with just a little rudder.

Turn the wheel slowly. Sudden movements are the mark of an inexperienced helmsman.

Pick a Point to Steer By:

Choose an obvious landmark: a rock formation, church steeple, or at night, a star. Use such reference points for general direction and drop your eyes occasionally to check your course on the compass.

Never steer by cloud formations, because they not only move, but also change shape.

Let the Sea Dictate to You:

The direction and speed of waves relative to your craft can have a great effect on your ability to steer. Driving into a head sea, you’ll want to slow your craft and/or alter course slightly for a more comfortable ride. You may also have to correct for the swing of the bow with slight rudder changes.

Overtaking waves in a following sea have a tendency to lift and carry your stern. You must anticipate this effect and compensate with adequate rudder. An overtaking, following sea creates a dangerous situation. In severe cases, the waves can lift your stern, set your craft sideways and capsize you. This can happen offshore, but most commonly occurs when waves break as you’re entering an inlet. In a following sea, it is always best to proceed at least as rapidly as the waves are moving.

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