

OWNER'S INSTRUCTIONS MACGREGOR 26 M

PAGE

1 **SPECIAL SAFETY WARNINGS**

4 **GENERAL INFORMATION**

4 **RECOMMENDED EQUIPMENT**

4 **RIGGING THE MAST**

6 **PREPARING FOR TRAILERING**

7 **PREPARING THE TRAILER**

8 **TOWING THE BOAT AND TRAILER**

8 **ATTACHING THE MAST SUPPORT WIRES**

8 **RAISING THE MAST**

9 **OPTIONAL MAST RAISING SYSTEM**

11 **ADJUSTING THE MAST SUPPORT WIRES**

12 **RAMP LAUNCHING**

12 **THE WATER BALLAST SYSTEM**

13 **RETURNING THE BOAT TO ITS TRAILER**

13 **EMPTYING THE BALLAST TANK**

13 **CONNECT THE BOOM TO THE MAST**

13 **MAINSHEET**

PAGE

14 **MAINSAIL**

15 **JIB (FORWARD SAIL)**

16 **GENOA (OPTION)**

16 **REDUCING THE AREA OF THE MAINSAIL**

16 **DAGGERBOARD**

16 **RUDDERS**

17 **HATCHES**

17 **BOOM VANG**

18 **SELF-RIGHTING CAPABILITY**

18 **FOAM FLOTATION**

18 **POWERING**

19 **BOAT MAINTENANCE**

20 **WIRING DIAGRAM**

20 **TRAILER MAINTENANCE**

20 **LIMITED WARRANTY**

22 **HOW TO SAIL**

27 **SAFETY DECALS**

SPECIAL SAFETY WARNINGS:

Boats, like any other form of transportation, have inherent risks. Attention to these warnings and instructions should help keep these risks to a minimum.

THE WATER BALLAST TANK SHOULD BE FULL WHEN EITHER POWERING OR SAILING.

IF THE BALLAST TANK IS NOT COMPLETELY FULL, THE BOAT IS NOT SELF RIGHTING. (IF YOU CHOOSE TO OPERATE THE BOAT WITH AN EMPTY TANK, SEE THE SECTION ON OPERATING THE BOAT WITHOUT WATER BALLAST.)

WHEN THE BALLAST TANK IS FULL:

- NO MORE THAN 6 PERSONS, 960 POUNDS.

WHEN THE BALLAST TANK IS EMPTY:

- NO MORE THAN 4 PERSON, OR 640 POUNDS.
- CREW WEIGHT CENTERED FROM SIDE TO SIDE.
- ALL SAILS REMOVED, ENGINE POWER ONLY.
- NO ONE ON THE CABIN TOP OR FOREDECK.
- WAVES LESS THAN 1 FOOT.
- OPERATE WHERE WATER IS WARM AND RESCUE IS LIKELY.
- NEVER OPERATE THE BOAT WITH A PARTIALLY FILLED TANK.

WHEN POWERING OVER 6 MILES PER HOUR:

- RUDDERS AND DAGGERBOARD FULL UP.
- SAILS REMOVED.
- NO ONE ON THE CABIN TOP OR FOREDECK.

ALWAYS, BEFORE OPERATING THE BOAT, CHECK TO CONFIRM THAT THE BALLAST TANK IS FULL. THE WATER LEVEL IN THE BALLAST TANK SHOULD BE NO MORE THAN 1" BELOW THE LEVEL OF THE FORWARD VENT HOLE.

THEN MAKE SURE THAT THE FORWARD VENT PLUG AND THE TRANSOM VALVE ARE CLOSED AND SECURE.

THE FOLLOWING COMMENTS EXPLAIN WHY THE ABOVE RULES ARE NECESSARY.

STABILITY.

Unless the water ballast tank is completely full, with 1000 pounds of water ballast, the sailboat is not self-righting. Without the water ballast, the boat may **not** return to an upright position if the boat is tipped more than 60 degrees, and can capsize like most non-ballasted sailboats.

The MacGregor is big, but relatively light, and excessive crew weight can overpower the basic stability of the boat. For this reason, we have placed the restrictions on crew capacity, shown in the preceding section.

OPERATING WITHOUT WATER BALLAST.

There may be times when you wish to operate the boat with an empty ballast tank. For example, when pulling a water skier, when trying to conserve fuel, when a faster ride is desired, or when you are in the process of filling the tank. Since only a few miles per hour are lost with a full tank, we recommend that most of your use of the boat be with a full tank. **If the tank is empty, carry no more than 4 persons, or 640 pounds.**

When operating with an empty ballast tank, keep the crew weight aft, low in the boat, and centered from side to side. Keep the crew in the cockpit, sitting down. The rear of the hull is relatively flat, and the nose area has a deep V to allow the boat to slide through waves with less slamming. If there is a lot of crew weight forward, the flat part of the hull bottom, which normally provides the stability, is raised higher out of the water, and is less effective in

providing sideways stability. With the crew weight forward, the nose is depressed. The deep V nose shape does not contribute much to stability. When excess weight is at the front of the boat, the less stable nose area is carrying more of the weight of the boat and crew, the boat becomes far more easily tipped. Keep weight off of the forward V berth when under way, and avoid storing heavy items under the V berth. Crew members on the foredeck or cabin top are far more likely to get bounced out of the boat than those in the cockpit or inside the cabin. Anyone on the cabin top will have a natural tendency to grab the mast or mast support wires if the boat tips. That puts a heavy load high on the mast and tends to lever the boat over. Keep the weight low. Obviously, it is best to have the crew positioned so the boat sits or rides level rather than leaning to one side or the other.

Do not have the sails up when the ballast tank is empty. They can produce a very strong sideways force and capsize the boat.

If the waves are larger than one foot, they can induce a lot of rolling motion and compromise stability. Keep the ballast tank full in such conditions.

If you are operating where the chance of outside rescue is slim, where conditions are rough, or where the water is cold and uninviting, fill the ballast tank. You will go slower, but you will be a lot safer. A full ballast tank gives greater safety.

NEVER SAIL OR POWER WITH THE BALLAST TANK PARTIALLY FULL (except for the few minutes that it takes to drain the tank when you are under power). With the water sloshing around in the tank, the center of gravity of the water changes rapidly, which can make the boat relatively unstable. Fill the ballast tank full and make sure the vent and valves are securely closed. Be extra cautious when the tank is filling or draining. You can drain the tank by powering the boat at 7 miles per hour. You will be able to see the water shooting out the valve in the transom. The water tank will empty in about 3 to 4 minutes.

If the valve or vent plug is open, even slightly, the motion of the boat can drain the ballast water from the tank or allow the boat to fill with water. If either the vent plug or the filling valve is open, ballast can be lost when the boat leans over. You might think that the tank is full, and that the boat is self righting, but you may be unpleasantly surprised by an unexpected capsize. If the transom valve is left open, or partially open, the forward motion of the boat can drain the tank. Drain the tank in the smoothest water you can find. Avoid fast stops and starts, or turns, while the tank is draining. After you think the tank is empty, check the level with the dip tube just to make sure.

NEVER POWER THE BOAT OVER 6 MILES PER HOUR WITH THE SAILS UP. The forward speed of the boat can create enough wind to capsize the boat if the sails are up. The result could be instant capsize. If the ballast tank is empty, the boat will not be self righting.

NEVER POWER THE BOAT OVER 6 MILES PER HOUR WITH THE DAGGERBOARD OR RUDDERS DOWN. If you hit something at high speed with the dagger-

board or rudders down, you will stop really fast, and may damage the board or rudders. At high speed, the daggerboard and rudders create lots of sideways lift and can cause the boat to be unstable. This can roll the boat severely or possibly cause a capsize. Pull the daggerboard all the way up into the boat and secure it well. It is extremely important to check the control line frequently while powering to be sure the board has not come loose and lowered itself. This is particularly important when the boat is pounding into waves and things tend to get jiggled loose. It is OK to leave the daggerboard down for low speeds (under 6 mph), where it will significantly enhance steering control.

BE EXTRA CAREFUL WHEN POWERING FAST.

Slow way down in waves or when powering with large crews. Waves come in all shapes and sizes, and can yield some nasty surprises. Wave induced problems, particularly with large crew loads, or crew weight high on the boat, can cause an upset.

Watch the water ahead of you. Hitting heavy stuff in the water at high speed can damage the boat or cause capsize. There is a lot of junk out there that floats just at the surface, and it is often barely visible. Bumping into something at sailing speeds is one thing, but at high speed, it can be nasty.

The boat will be less stable with the mast up than with the mast down. The mast is light, but it is up there, and, like any other weight aloft, reduces stability. When conditions are marginal, (high winds, waves, lots of crew weight, etc.), lower the mast and secure it to the pulpit and mast carrier.

DO NOT OPERATE THE BOAT WITH A LOT OF WATER IN THE BILGE (OUTSIDE OF THE BALLAST TANK). It can slosh around and seriously degrade stability. Always keep your bilges dry. Check the bilge frequently. There are a number of places where water can collect. Check them all.

THE TOP OF THE DAGGERBOARD MUST NEVER GO MORE THAN 57" BELOW THE LEVEL OF THE DECK. There is a line, with a knot and washer, that will keep the board from going too far down. Do not change the position of the knot, and make sure that it is in the same position if the line is replaced.

DO NOT ALLOW ANY PART OF THE BOAT, TRAILER, MAST OR RIGGING TO COME IN CONTACT WITH ANY SOURCE OF ELECTRICAL POWER. If your mast or any part of your boat or rigging comes in contact with a power line, you could be killed or injured. Don't sail your boat into a power line. Don't raise the mast into a power line. Don't move your boat, on its trailer, into a power line. Masts, wires, or wet fiberglass are good conductors of electricity and can carry current directly to you. Look up and make sure you will be clear of sources of power before doing anything with your boat. Don't remove the warning decal from your mast. It may help you remember to look and avoid a major calamity.

If you are caught in an electrical storm, don't touch anything that

is metal, including the mast, shrouds, boom, lifelines, rudder, tiller or metal hardware. If possible, don't touch anything that is wet. Many experts recommend that a heavy gauge copper wire be securely fastened to one of the shrouds and allowed to hang in the water to carry off the electricity from a lightning strike.

MAKE SURE THAT YOU TOW YOUR BOAT WITH A LARGE ENOUGH CAR. Check with your car manufacturer or dealer to determine if the weight of the boat and trailer is within your car's towing capacity. Load your boat so the weight on the trailer hitch is between 250 and 300 pounds. If the weight is less, the trailer will tend to swerve dangerously from side to side. If the weight is more, an excessive load will be placed on the rear end of your car, and the trailer will be very difficult to hitch or unhitch. To protect your back when removing the trailer from the car, use the hitch jack or have an adult hang on the back of the boat to take some weight off the tongue.

NEVER OVERLOAD THE BOAT AND TRAILER. THE MAXIMUM WEIGHT IS 4200 POUNDS, AS SHOWN ON THE CERTIFICATION DECAL NEAR THE HITCH, ON THE LEFT (PORT) SIDE OF YOUR TRAILER. Remember, the maximum gross vehicle weight (G.V.W.R.) includes the weight of the trailer as well as the weight of the boat and all gear in the boat. You may not deduct the weight that is carried on the hitch of the car in arriving at the G.V.W.R. Check your state law to determine if there are any other weight or braking requirements that must be met.

MAKE SURE THE TRAILER WHEEL LUG NUTS ARE TIGHT BEFORE TRAILERING THE BOAT.

BEFORE TRAILERING THE BOAT, MAKE SURE THE NOSE OF THE BOAT IS TIED SECURELY TO THE TRAILER.

MAKE SURE THE OUTBOARD MOTOR AND MAST ARE ATTACHED FIRMLY TO THE BOAT WHEN THE BOAT IS BEING TRAILERED.

DO NOT TRAILER THE BOAT WITH ANY WATER IN THE BALLAST TANK. THE 1000 POUNDS OF WATER WILL SEVERELY OVERLOAD THE TRAILER AND THE CAR. Open the transom valve and vent, and drain the tank completely before trailering. Leave the valve open when trailering.

DON'T STORE FUEL CANS INSIDE THE BOAT. Gas fumes are explosive. Keep all gasoline containers out of the boat. Store fuel tanks in the open compartments next to the pedestal.

BATTERIES ARE DANGEROUS. TREAT THEM CAUTIOUSLY. Batteries can produce explosive gas, corrosive acid and levels of electrical current high enough to cause burns. Always wear eye protection or shield your eyes when working near any battery and remove all metal rings and jewelry. Never expose a battery to open flames or sparks. Do not smoke near a

battery. It could blow up. Do not allow battery acid to contact eyes, skin, fabrics or painted surfaces. Flush any contacted area with water immediately and thoroughly. Get medical help if eyes are affected. Do not charge the battery, adjust post connections or use booster cables without making sure the battery compartment is properly ventilated. When charging the battery, carefully follow the instructions on the charger. Keep the battery filled to the proper level with distilled water. Always keep vent caps tight. Do not allow metal tools or metal parts to contact the positive (+) terminal and the negative (-) terminal or any metal connected to these terminals.

DO NOT REMOVE ANY OF THE FOAM FLOTATION BLOCKS. Loss of any of the foam could seriously impair the ability of the boat to stay afloat if damaged.

IF THE CABIN OF THE BOAT IS ENTIRELY FILLED WITH WATER, AND THE BOAT IS DEPENDENT ON THE FOAM FLOTATION TO KEEP IT AFLOAT, IT WILL BE VERY UNSTABLE, AND MAY TURN UPSIDE DOWN.

WHEN RAISING AND LOWERING THE MAST, DON'T ALLOW ANYONE TO STAND WHERE THE MAST OR SUPPORT WIRES COULD FALL IF SOMETHING, OR SOMEONE, LETS GO.

BE EXCEEDINGLY CAREFUL WHEN SAILING IN HIGH WINDS. LEARN BASIC SEAMANSHIP. The Coast Guard Auxiliary Power Squadrons offer excellent courses at low cost. This is a worthwhile investment.

BE READY TO RELEASE SAIL CONTROL LINES (SHEETS) QUICKLY IF A GUST OF WIND CAUSES THE BOAT TO LEAN EXCESSIVELY. Lines should be free of kinks and knots so they will run freely through the pulleys when it is necessary to let the sails out quickly. Tie a knot in the extreme end of the line to keep it in the pulley. Letting the lines go is your best protection from a knockdown. For best performance under sail, and for safety, keep the boat from leaning (heeling) more than about 20 to 25 degrees.

ALWAYS SHUT OFF THE OUTBOARD MOTOR WHEN THE BOAT IS NEAR PEOPLE IN THE WATER. EVEN WITH LOW HORSEPOWER MOTORS, THE PROPELLER CAN DO SERIOUS DAMAGE. Don't allow ropes to hang in the water (particularly the rudder ropes). They could tangle in the prop and stop or damage the motor.

DON'T PULL THE BOAT OVER ON ITS SIDE USING THE MAIN HALYARD. If you have to tip the boat for maintenance or for any other reason, use the jib halyard. Using the main halyard will break the mast.

DO NOT SAIL OR POWER THE BOAT WITH THE STEERING SEAT IN THE RAISED POSITION. If the

motion of the boat or the wind causes the seat to fall into the lowered position, someone could be hurt. Make sure the seat is secured in the open position, with the snap cable to the lifeline, every time it is opened.

AVOID ENGINE EXHAUST FUMES. Engines emit carbon monoxide, which can be fatal. Don't wake board or swim near the stern of the boat with the engine running. Avoid sitting near the engine in still air or breathing exhaust fumes.

DON'T INSTALL LIFTING HYDROFOILS ON YOUR OUTBOARD MOTOR. They are designed to lift the stern when powering. They also contribute to instability. The benefits are not worth the risk.

GENERAL INFORMATION

TERMINOLOGY. In the following instructions, we have tried to avoid the use of nautical terms wherever possible. If you are new to the sport, having to learn a new language while you are learning to rig and sail the boat can be grim. If you are an experienced sailor, be patient with our use of non-nautical words, rather than the more technically correct sailing language.

JOBS THAT ONLY HAVE TO BE DONE ONCE. Much of what you will read in the following instructions will involve the initial setup and rigging of the boat, and will only be done once. Once this is done, it will not have to be redone each time you sail. So don't be intimidated by the length and detail of these instructions.

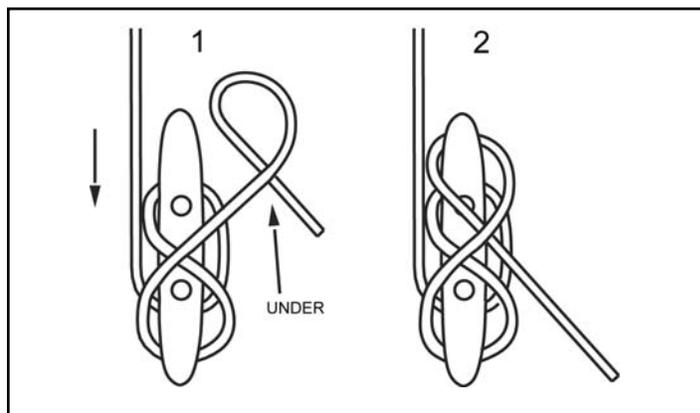
BOWLINE KNOTS. It is essential to learn to tie a bowline knot. It is used all over the boat to tie stuff together. The bowline is shown below. Pull the loops tight. It will not jiggle loose, and can be easily undone even after being pulled tight under really heavy-loads.



Bowline knot

SECURING A LINE TO A CLEAT:

The proper way to secure a line to a cleat is shown in the following drawing.



Securing a line to a cleat

RECOMMENDED EQUIPMENT

You will need at least the following items on the boat for assembly, maintenance and safety.

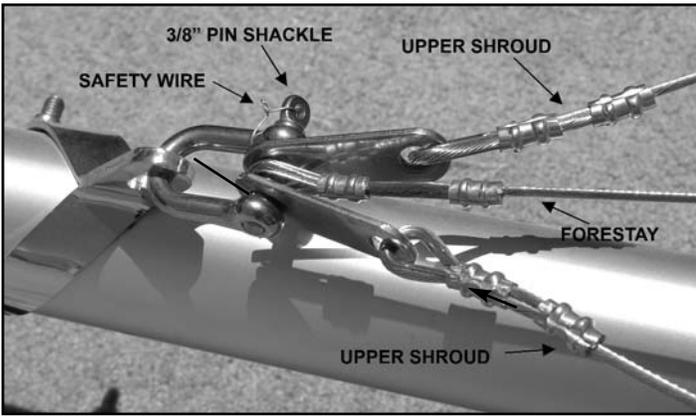
- 7/16 and 9/16 end wrenches (2 of each)
- Vice grip pliers
- Screwdriver, common
- Screwdriver, phillips
- Knife
- Spare bulbs and fuses
- Flashlight
- Lifejackets, as required by the Coast Guard.
- Type IV throwable flotation device
- Horn or whistle
- Bailing bucket and bilge pump
- Compass
- Flare kit (with 3 day use and 3 night use flares)
- Fire extinguisher, type B1
- Danforth T-1200 anchor, or equivalent, with 26 feet of 1/4" chain and 150' of 3/8" nylon line
- VHF radio (transmitter and receiver)
- Fenders for docking (2)
- Chart of your sailing area
- Dock lines

If you are sailing where rescue is not readily available, an Emergency Positioning Radio Beacon (EPIRB) is highly desirable. A small hand-held GPS set is a good idea for basic navigation.

RIGGING THE MAST

RIG BOX. Open up the box of rigging that comes with the boat and do a complete inventory to make sure everything is there. A checklist, showing each item, is packed with the parts.

UPPER SHROUDS AND FORESTAY (MAST SUPPORT WIRES). Connect the upper shrouds and forestay to the upper shroud straps (6' from the top of the mast) with a 3/8" screw pin shackle. The side shrouds go on the right and left side, and the forestay goes between them. Tighten the shackle really tight, and put a safety wire in place so it never comes loose. The setup is shown in the photo on the next page.



Upper shrouds and forestay attachment

sockets as shown below. Secure the spreaders with 1/4" x 2" bolts and lock nuts. The nuts face the lower end of the mast. Tighten the nuts tight.

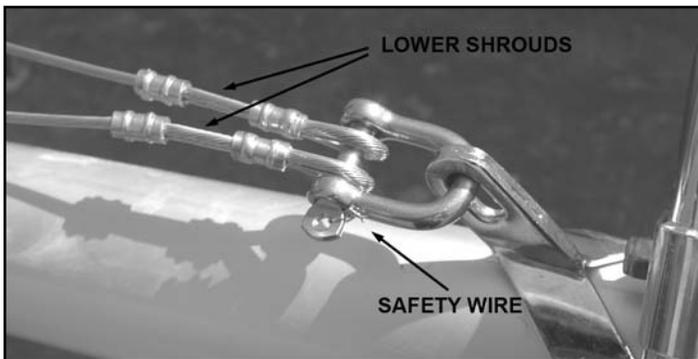


Spreader tube attachment

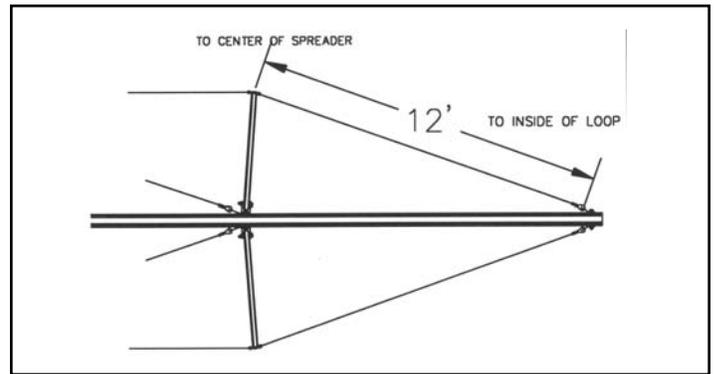
LOWER SHROUDS.

The lower shrouds are installed on the lower mast brackets (12' from the base of the mast) with a 3/8" screw pin shackle, in the same manner as the upper shrouds (except that there is no forestay between them. (The following photo shows how it all looks when completed.) Use safety wire.

The end of the spreader tubes should be located as in the following drawing. The measurement should be taken with the upper mast support wire pulled tight.



Lower shrouds and spreader sockets



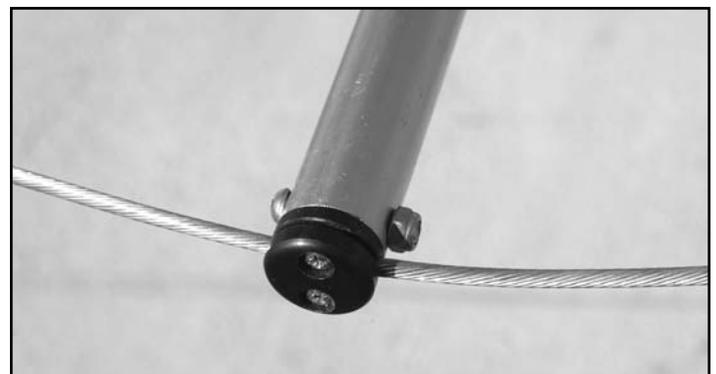
Spreader position on upper shrouds

JIB HALYARD BLOCK. The jib halyard block is hung from the strap that holds the upper shrouds and forestay. Use a 1/4" screw pin shackle hung from the slot behind the hole that holds the shrouds. Tighten and safety wire the shackle as shown below

Connect the spreaders to the upper shrouds as shown below. Make sure the spreader end fittings are clamped securely to the wires. Don't tighten the small screws too tight or the tips may strip. The spreader tip slots that hold the wire should be parallel to the mast.



Jib halyard block.



Spreader ends

SPREADER TUBES. Insert the spreaders into the spreader

MAIN HALYARD (MAINSAIL HOISTING LINE). The main halyard passes through the block at the masthead. The forward end ties off to the cleat on the right side of the mast (right when looking forward). Use a bowline knot and tie a twist pin U

shackle to the back end of the halyard.



Main halyard with shackle

JIB HALYARD (JIB HOISTING LINE). The line that hoists the forward sail (jib) passes through the pulley near the top of the forestay and ties off to the cleat on the left (port) side of the mast. Tie a twist pin U shackle (with a bowline knot) to the forward end of the halyard.



Jib halyard with shackle

PREPARING FOR TRAILERING

CARRYING THE MAST ON TOP OF THE BOAT. The mast is carried on the boat with the bottom end forward and the slotted side down. Bolt the mast base to the forward rail with a 3/8" x 4 1/2" bolt and lock nut, as shown below. This bolt also serves as the mast hinge. Use locknuts on all hardware holding the mast to the boat.



Mast bolted to front rail

Make sure the bolt is secure. Use the 9/16 wrenches. You will not believe the chaos if the front end of the mast gets loose while you are trailering. If you just tie the mast to the bow rail, a sudden stop could catapult the mast into your car or even into the car ahead of you. Again, the bolt is better than rope. Extra rope tie downs are always a good precaution. Insert the mast carrier into the sockets near the captain's seat as shown below. Fasten the carrier with bolts and lock nuts. You can keep the carrier in place when sailing.



Rear mast carrier

With an extra piece of line, take a few wraps around the mast and secure the ends of the line to the mooring cleats on each side of the boat. Use a truckers hitch (see page 14 and 15) to really get it tight.



Mast tie down

SECURE ALL GEAR. Stow all loose gear inside the cabin. Leave enough separation to avoid chafing. Lock down the galley. Make sure the outboard motor is clamped tight to the boat. Add a safety cable to make sure it stays with the boat. Most motors have holes in the bracket to permit bolting the bracket to the boat. This is a good idea. Be sure to use some sealant so the bolts won't leak. When the mast is in its trailering position, neatly coil all mast support wires and lines, and tie them securely to the mast. If a wire or line gets loose and gets caught under the moving trailer wheel, or under the wheel of the following car, there will be big problems.

When the boat is on its trailer, don't load up the cockpit with gear

and people unless the rear of the trailer is blocked up. The weight could cause the trailer and boat to tip backwards.

Make sure the outboard motor is secured in the up position for trailering. Make sure the rudders are tied securely and pinned in the full up position. Use 1/4 x 2 1/4" bolts and lock nuts. The rudders will get a lot shorter if they drag on the ground.

SECURING THE BOAT TO THE TRAILER. Secure the trailer winch line to the nose of the boat as shown.



Trailer winch line

While keeping tension on the line, winch the nose of the boat snugly into the rubber bow support. Make sure these connections are good. If the line comes loose, the boat could slide off the trailer and end up on the street, or worse.

As an extra security measure, tie a line to one of the trailer side rails near the rear end of the trailer. Pass the line across the boat (under the lifelines). Pull it tight, and tie it to the other trailer rail.

PREPARING THE TRAILER

LUG NUTS.

It is the owner's responsibility to check the lug nuts that secure the wheels to the axle before using the trailer. The wheels may have been removed in order to ship the boat to you or your dealer, and it is important for you to check to see that the lug nuts have been properly tightened. If they are loose, you may lose a wheel, with serious consequences. They should be tight. The proper setting, using a torque wrench, is 90 to 95 foot pounds. Don't move the trailer one foot before checking these nuts.

TIRE REGISTRATION.

It is a federal law that the first licensed purchaser of any trailer must register the tires with the trailer manufacturer. Your dealer will complete the tire data on your warrantee card. Your name, address, tire serial numbers, trailer serial number and date of purchase must appear on this card. Make sure the dealer completes the warrantee registration card and sends it to us.

TIRE PRESSURE.

Before using the trailer, check the tire pressure. The recommended pressure can be found on the side wall of the tire near the tire size. Always check the tire pressure when the tires are cold, at frequent, regular intervals. Under inflation can cause excessive sway

at certain speeds and could cause loss of vehicle control. Over inflation can cause a tire to blow out, which is also very dangerous. Check tire pressure at frequent, regular intervals.

HITCHING UP. Place the trailer coupler over the ball on your car, and make sure the snap latch is all the way down and locked. Try to lift the trailer off the ball to make sure the hitch is securely fastened to the ball. Insert a 1/4" x 1 1/2" bolt and lock nut through the locking hole in the tongue to make sure the trailer doesn't jump off. **Tongue weight should be between 250 and 300 pounds.** The ball should be 2" in diameter. You are responsible for making sure that the trailer hitch ball is secured properly to your car. Get some qualified help in mounting the hitch to the solid structure of your vehicle. Get help to install proper wiring.

SAFETY CHAINS. Secure the 2 safety chains to a solid bumper brace or through the hole normally provided in your hitch. Leave enough slack so that the trailer and car may turn without putting tension on the chains. Secure the end of the chain to itself with the locking device mounted on the end of the chain. This must be solid. **Remove the nose wheel caster and raise the jack.**

TOTAL WEIGHT. The weight of the boat, trailer and all other items cannot exceed 4200 pounds. The empty boat, without mast and cushions, weighs approximately 2600 pounds. The trailer weighs 720 pounds.

LIGHT WIRES. Our trailers come with a trunk harness (you will find it plugged into the trailer harness near the hitch). The exposed ends of the trunk harness must be wired into the light wiring of your car. The other end should be plugged into the trailer wiring harness. The wires on the trunk harness and trailer wiring are color coded as follows:

- White - Ground
- Brown - Running lights or tail lights
- Yellow - Left turn signal and brake light
- Green - Right turn signal and brake light
- Blue - Backup switch

Make sure you have a good ground or you won't have lights. The light mounting brackets and ground wire must contact metal (you may have to scratch through the paint). Don't use the trailer unless all lights are working. You must have the following:

- One red tail light at each rear corner of the trailer.
- One red clearance light as part of the above lights.
- One clear license plate illuminator.
- One amber clearance light mounted at the outboard rear corner of each fender. (These must be visible from the front.)
- One 3 lens gang light centered on the rear of the trailer.

You must have a red light at the extreme rear end of the load (normally on the end of the mast). Use a red flag in the daytime.

If your trailer has brakes, make sure the ground wire is connected to the trailer frame, and not to the moving portion of the brake actuator.

HYDRAULIC SURGE BRAKES. State laws concerning brakes vary. Check with your dealer or with your appropriate

state agency to determine whether or not trailer brakes are required in your area.

If your trailer is equipped with brakes, read the following carefully to make sure you understand their operation.

When you apply your car brakes, the trailer will try to push forward against the car. This push compresses the actuator mounted as part of the hitch, which applies force to the master cylinder, which creates hydraulic pressure to operate the trailer brakes. The harder you stop, the more hydraulic pressure you generate, and the more forcefully the brakes will be applied. The safety chain must be loose enough to permit free motion of the actuator assembly.

The surge brake system has a breakaway chain that connects to the car (this is not the same as the safety chain mentioned above). If the trailer gets loose from the car, the breakaway chain will cause the brakes to engage and try to stop the trailer. Make sure that this chain is fastened securely to the tow vehicle. It should have some slack so that it will not engage the brakes while the trailer is still connected to the car. The chain should be loose enough, even during turns, so that the breakaway lever is released (pointing all the way to the rear of the trailer) while the car and trailer are engaged. Check this each time before you use the trailer. No teeth on the breakaway lever should be engaged in the leaf spring. Accidental application of the lever will cause the trailer brakes to engage, drag, heat up and perhaps burn out. Do not use the emergency breakaway system as a parking brake.

The surge brake actuator linkage and the sliding mechanisms should work freely through the full range of travel. Do not mistake shock absorber resistance in the system for binding. Nylon bearings and the plated shafts do not normally need lubrication, but should be checked periodically. If you encounter erratic or unusual braking performance, investigate the cause immediately. The trailer should not push the tow vehicle, or try to jackknife during stops. The brakes should release when the trailer is pulled from a dead stop.

The surge brake system has an electronic disconnect, tied in with your car's lights, that disengages the surge brakes when you try to back up.

TOWING THE BOAT AND TRAILER

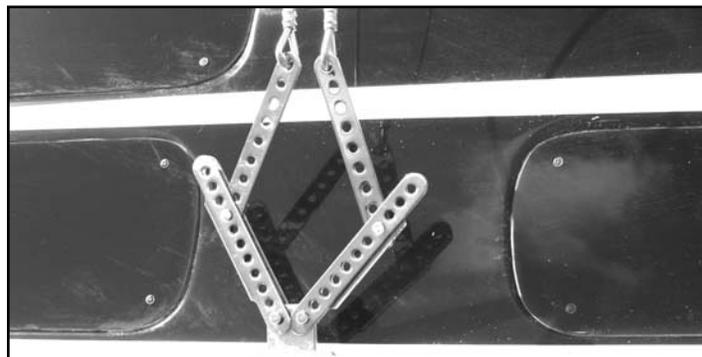
TURNING. Don't try to make really tight turns. Extreme turns, while going forward or backwards, may damage the actuator or other parts of the trailer or car.

Make sure that the trailer is towed in a level position. It should never be towed with the tongue lower than the rear of the frame, as this will cause the brakes to activate and stay on during normal towing.

Make sure your car brakes stay dry. They are less efficient when wet. Be extra careful just after ramp launching or recovery.

ATTACHING THE MAST SUPPORT WIRES TO THE BOAT

UPPER AND LOWER SHROUDS. The upper and lower shrouds should be connected to the chainplates (on both sides of the boat) with stay adjusters as shown below.



Side shrouds and stay adjuster channels

The upper shroud goes in the rear chainplate hole. Use 1/4" clevis pins and cotter rings, and mount them as shown. Put the clevis pins through the third hole in the strap as shown, and through the end hole in each channel. Note that the open side of the stay adjusters face each other. The cotter rings should go toward the inside of the chainplate, so the sheets won't pull them off.

FORESTAY AND TURNBUCKLE. Attach the turnbuckle to the forestay. Adjust the turnbuckle so that it is 1/3 closed. Don't attach it to the forestay chainplate at the front of the boat until the mast is raised.

RAISING THE MAST

ATTACH THE MAST TO THE MAST HINGE. Unbolt the mast from the forward rail, and unbolt it from the rear support. The 3/8" x 4 1/2" bolt and lock nut that holds the mast to the forward rail for trailering also serves as the pivot pin for the hinged mast step. With the rear of the mast supported by the mast carrier, move the forward end of the mast back to the hinge area. Insert the hinge pin (see below) and make sure the lock nut is on tight enough that the plastic seal engages the threads. (You will need two 9/16" end wrenches for this.) It is not necessary to run the nut down tight on the hinge plates. Just make sure the nut is on tight enough so that you can't turn it with your fingers.



Mast hinge

LIFTING THE MAST. Make sure all mast support wires except the forestay are connected to the mast and boat. Make sure that the mast wires are not entangled on the boat or trailer, and then raise the mast (below). This is best accomplished by standing on the cabin top, aft of the mast, and lifting the mast into position. Be careful not to hit a power line with the mast or rigging. You could be injured or killed.



Lifting the mast

The mast lifting task is made much easier if a second person stands on the foredeck and pulls on the forestay as the mast goes up. Look up to make sure the wires are not kinked on their attachment fittings, or tangled on the boat or trailer.

CONNECTING THE FORESTAY. After the mast is up, tie the jib halyard to the bow rail to keep the mast from falling backwards while you connect the forestay to the forward hole in the forestay chainplate (at the front of the boat). Make sure both ends of the line are secured to keep the mast from falling backwards. Insert the clevis pin that comes with the turnbuckle to secure the forestay to the chainplate. Then install the ring ding so the pin can't come out. (Whenever you use a ring ding, make sure that it is turned fully onto the pin, and that the ring ding can then be rotated freely without coming out of the hole in the pin). Do not release forward pressure on the mast until the forestay is connected. If you have to move the boat after the mast is up, be watchful that you don't run it into a power line.

RAISING THE MAST WITH THE OPTIONAL MAST RAISING SYSTEM

GENERAL. The following photo gives you an idea of how the optional mast raising system works.



A pair of wires keeps the mast from falling sideways as the mast goes up and down. A mast raising pole provides leverage to lift the mast. There is a fixed length line that goes from the top end of the pole to the mooring cleat at the front of the deck. This line keeps the pole from falling to the rear of the boat as the mast is lifted. Another line goes from the winch (mounted on the pole), through a pulley at the top of the pole, then down to a strap on the mast. The winch provides the power to easily lift the mast.

MAST RAISING WINCH. The following photo shows the brake winch that raises and lowers the mast. You crank it one way to raise the mast, and the other way to lower it. Always keep a firm grip on the winch handle when cranking.



Mast raising winch

MAST RAISING POLE. Connect the end of the mast raising pole to the forward holes in the mast base as shown below. Use a 3/8" x 4 1/2" bolt and lock nut.



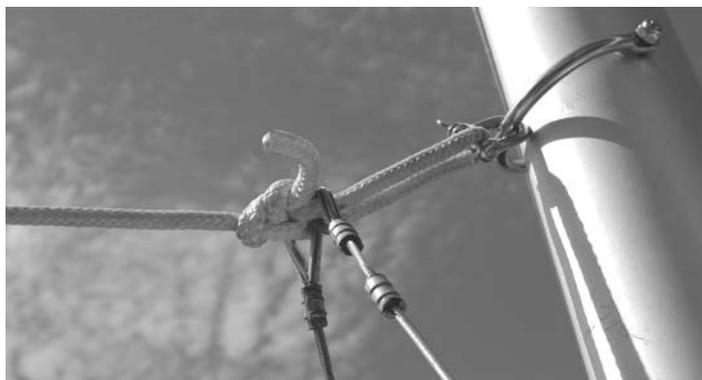
Mast raising pole attachment

The following photo shows how the pulley and forward line look in their position at the top end of the pole. Make sure the forward line has a good bowline knot securing it to the eye on the pole.



Pulley and forward line at top end of pole

SIDE SUPPORT WIRES AND WINCH LINE - ATTACHMENT TO MAST. After the mast pivot pin and front line are in place, with the top end of the mast resting in the mast crutch in the cockpit, connect the side support wires and winch line to the fittings on the mast (about 6' up from the mast bottom). The assembly is shown in the following photograph.



Side support lines and winch line - attachment to mast.

The U shaped bracket is bolted to the mast with a 1/4" x 4" hex head bolt and lock nut. There is a 3" long loop tied into the winch line with a bowline knot. Do not untie this loop. The side support wires are captured on this loop. The loop attaches to the U shaped bracket on the mast with a 1/4" screw pin shackle. The lower end of the side wires attach to the loop on the lifeline posts on each side of the mast as shown below.



Side support lines - attachment to lifeline posts

The wires are attached to the loop on the lifeline post with 1/4" screw pin shackles.

The system works like this. The side support wires are short enough to cause a bend in the line that goes from the winch to the mast. When the winch line is pulled tight by cranking the winch, the line tries to straighten out, causing the side support wires to become very tight, giving lots of side support to the mast.

When the mast is up, and the wire forestay is attached to the front of the boat, the winch line is released, and the side support wires go slack, allowing easy removal. The side support wires are, in effect, self adjusting.

RAISING THE MAST. Before starting to crank the winch to raise the mast, look around to make sure all mast wires are clear and free of tangles. Again, make sure you are clear of all overhead power lines and that the mast won't hit them when it goes up or when you have to move the trailer after the mast is up.

Look up at the rig to make sure that none of the loops in the wire ends are kinked or hooked over the stainless steel fittings to which the wires attach.

All of the comments in the section describing how to raise the mast manually still apply to raising the mast with the optional pole. The optional system simply reduces the physical effort involved in the mast lifting.

Begin cranking. The load will be heavier at first, but lighten as the mast goes up. Keep tension on the line as you start to crank the mast, otherwise the handle may unscrew.

Don't stand under the mast or under the mast raising pole. If something lets go, or the mast falls, these are not the places to be.

After the mast is fully up, connect the bottom end of the forestay turnbuckle to the hole in the stainless steel fitting at the nose of the boat, as shown at the start of the next page.

Reverse the process to lower the mast. Remember, the winch is a brake winch, and you must crank the winch to lower the mast.

After the mast is lowered, the winch line is relaxed and the side support wires go slack. This allows easy removal of the mast hinge pin, which you need to do in order to move the base of the mast forward to the bow rail for trailering.



Forestay connection

Don't release tension on the mast raising line until the forestay is secure and the clevis pin and cotter ring are in place.

Tighten down on the turnbuckle so the rig is really snug. Then secure the turnbuckle barrel with its cotter pins. Make sure the cotter pins are spread to their full open position. Fold the pointed ends back so they won't cut hands or tear sails. One nice thing about this setup is that you will not have to adjust the turnbuckle after it is once set. The winch provides sufficient power to stretch the rig enough to remove or install the pin. (This is the only disconnect that you have to make for raising and lowering the mast.)

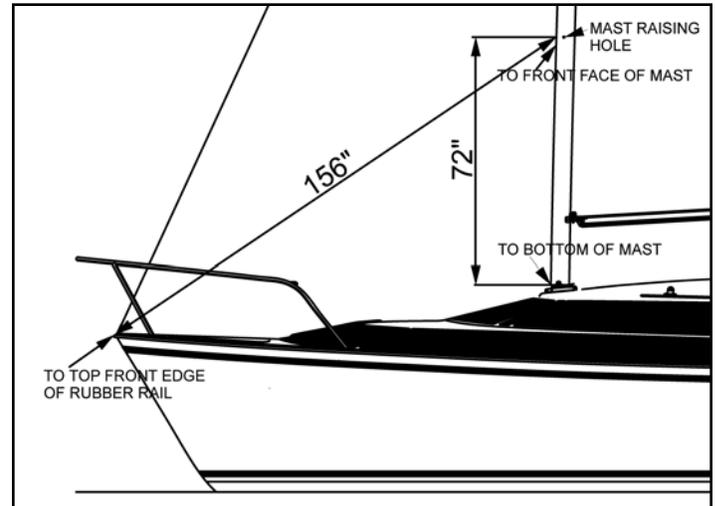
LOWERING THE MAST. To lower the mast, reverse the process used for either the standard or optional system. First, remove the boom. Before you lower the mast, put the mast support in its holder in the cockpit. Otherwise the mast will come down on the cabin hatch and cause damage. Remember, the load gets greater as the mast gets lower. Be prepared. Get a good grip on the winch or mast. Don't be fooled by the very small loads while the mast is close to vertical. When the mast is down, hold down on the base of the mast when you try to remove the hinge bolt. It will want to pop up when the bolt is released.

People have been killed or badly injured as a result of sailboat masts or support wires coming into contact with overhead power lines. Be watchful whenever you rig, launch, trailer or do anything else with your boat that might involve contact with power lines. If there is a threatening power line anywhere near areas where you sail, call or write to the power company and try to get them to move it or bury it. Notify us and we will also lean on them. Don't remove the warning sticker on the mast. The repeated warnings may get boring, but power lines are life threatening risks.

ADJUSTING THE MAST SUPPORT WIRES.

MAST POSITION. The following drawing shows the proper angle of the mast in relation to the waterline. Make sure the tank is full and the boat is loaded so that the molded in waterline is parallel with the water. Use a level to establish a true vertical, and adjust the wires so that the mast is tilted to the rear as shown.

When properly tuned, all of the mast support wires should be quite snug.



Mast angle

FORESTAY. Take up the slack in the forestay by adjusting the turnbuckle.

UPPER SHROUD. Adjust the upper shrouds so that the mast is straight from side to side. Try to make them snug. The stay adjuster channels are designed as "verniers" to provide adjustments in 1/8" increments. This is accomplished by having the holes in the wire straps spaced at different intervals than the holes in the adjuster channels. As the wire is extended every 1/8", a new set of holes will line up, allowing very precise tuning adjustments. A small screwdriver can be inserted in one of the sets of non-aligning holes to provide leverage to get tension on the wires while the clevis pin is being inserted in the proper holes. Use the 1/4" clevis pins and cotter rings to connect the channels to the straps fastened to the support wires. These channels are stronger than turnbuckles, better able to stand the bending loads resulting from raising and lowering the mast, and less likely to accidentally come loose.

LOWER SHROUDS. Adjust the lower shrouds as described above. Don't get them too tight or the center of the mast will be pulled toward the rear of the boat.

ALTERNATE METHOD OF TENSIONING THE WIRES. With all the rigging in place, grip the upper shroud about 4 feet above the deck and pull inboard toward the center of the boat. The lower wire will go slack and allow another hole to be taken up in the adjuster channel. To adjust the upper wires, pull inboard on the lower wire. This method takes 2 people, and can get the rigging tighter than is desirable. You can also loosen the forward turnbuckle, make the necessary adjustment in the side wires, and then retighten the turnbuckle. The final tightening of the forward wire provides the final tightening of the entire rig.

MAST APPEARANCE AFTER PROPER TUNING. All support wires should be tight. Ideally, the mast should have about a 1" bow. In other words, the center of the mast should be about 1"

forward of a straight line drawn from the top of the mast to the base of the mast. The downwind wires will be somewhat slack when sailing hard. When sailing into the wind, the mainsail takes over the task of supporting the mast from the rear.

SECURE ALL COTTER PINS AND RINGS. Make sure all the cotter pins and rings are in place and the cotter pins are opened and secured. Once again, the ring dings should be fully on the pin, so they can be rotated freely 360 degrees without coming out of the hole in the pin. Wrap them with electrical tape so they can't come loose.

INSPECTION OF THE RIGGING. It is a good idea to periodically inspect the mast and rigging. Look for broken strands in the wire bundles, signs of wear, and for kinks in the wire. Inspect the nicopress fittings to make sure the wire hasn't slipped through the fittings. Replace any damaged wire.

RAMP LAUNCHING

Remove the trailer lights. Attach a 15' line to the nose of the boat. Back the trailer into the water until the boat floats free. Do not untie the nose of the boat from the trailer winch until the boat is in the water. On a reasonably steep ramp, the boat could slide off the trailer before it gets near the water. This is a good way to look really stupid. If you leave the car for any reason, make sure the brake is well set, or the whole works may end up under water. This will look even worse.

Make sure the rudder and the outboard motor are secure in the full up position so they won't hit the ground when launching and recovering the boat.

After launching, go inside to make sure there are no leaks. If you raise the mast after the boat is in the water, first fill the water ballast tank to give yourself a more stable platform.

THE WATER BALLAST SYSTEM

FILLING THE BALLAST TANK. The water ballast tank has a vent that allows air to escape when the tank is being filled. It is also used to allow air to enter as the tank is being emptied. Normally, this vent is sealed except when the tank is being emptied or filled. It is located directly under the hatch at the rear end of the forward V berth. Lift up the V berth cushion, remove the wood hatch cover, and the vent will be visible. It is surrounded by a fiberglass dam that helps keep water from sloshing out of the vent hole and into the bilge of the boat.

The vent hole also allows you to check the level of the water in the ballast tank. (There will be more on this subject later in these instructions.)

The following photograph shows the vent with its plug installed.



Vent hole and plug

FILLING THE TANK. To fill the tank, first open the air vent by removing the lever plug shown in the above photo. Then open the gate valve on the transom by pulling upward on the valve handle. This handle is located just to the left of the engine (as you face aft). Remember to close it after filling the tank. The following shows the approximate time needed to fill the tank with the boat in the water.

With 50 hp Tohatsu and 70 lbs of fuel:	5 minutes
With one 170 lb. person, no motor or fuel:	8 minutes
With no motor, fuel or crew:	18+ minutes

The more weight in the boat, the faster it will fill, because the valve is more deeply submerged. With no motor or crew, the valve is about 40 % under water, and the fill is really slow. However, there is almost always a crew member or a motor. Keep the weight aft to make sure the transom valve is under water.

You can empty the tank underway. With the vent and transom valves open, and the boat going about 7 mph, the tank will drain in about 4 minutes.

At a sloped standard launch ramp, with the boat on its trailer and out of the water, the tank will drain in 3 minutes. When you open the valve, get out of the way, because the water comes out like from a fire hose.

CHECKING THE LEVEL OF THE TANK. When the tank is full, and with the boat level, the water level in the tank is approximately 1" below the vent hole. **If it is more than 1" down from the vent hole, the boat may not be self righting. Do not sail it.**

There is a 16" long clear plastic tube in the rig box. Stick this in the vent hole, push it to the bottom of the boat and put your finger over the top end of the tube. Keep the tube top sealed tight and lift out the tube. The water level in the tank will show in the tube.

CLOSING THE WATER VALVE AND AIR VENT. Re-install the lever plug in the vent hole. Make sure it is tight, or the water ballast will spill into the boat when the boat leans over. There is an adjustment nut at the bottom of the lever plug. If the plug is too loose, hold the metal parts at the top and turn the rubber. The

rubber portion of the plug will become fatter or skinnier as the rubber is rotated. Adjust it so that it must be forced into the hole. Then, when the lever is pressed to the horizontal position, it will really grip the hole and stay put.

Close the transom gate valve by pushing down on the handle. Make sure the valve is closed tight, otherwise water may be sucked out by the forward motion of the boat and ballast will be lost, making the boat capsizable.

CHECK TO MAKE SURE THE VALVE AND VENT ARE SEALED. While you are sailing and the boat is tipped, check the air vent and transom valve to make sure there are no leaks. The more the boat leans over, the more water pressure will be on the vent and valve, making a leak more likely. Watch it closely. Once again, always make sure the transom valve is closed tight, or you may lose water ballast.

It is possible to test the watertightness of the transom gate valve by pulling the boat out of the water on its trailer with the tank full and valve closed. Check to see if it leaks. Do this frequently, preferably every time you sail the boat. Avoid opening the vent hole in choppy water or when the boat is leaning, because the water can surge around in the tank and spill out into the boat. The only time the valve and vent hole should be open is when you are emptying or filling the tank, or when the boat is out of the water. Do not leave the valve and vent hole open and unattended.

PREVENTION OF ALGAE IN THE BALLAST TANK. If you leave the ballast tank full of water for long periods, drop in a few swimming pool chlorine tablets to prevent a bad case of algae. Be cautious when handling the chlorine tablets. Follow the directions on the chlorine tablet container very carefully. Don't put chlorine in the galley water tank. Don't leave water in the tank in freezing weather. Damage could result.

RETURN THE BOAT TO ITS TRAILER

Simply drive the boat onto its trailer. Try to steer the nose into the V on the front of the trailer. Leave the outboard running to hold the boat against the rubber V pad, and go forward to secure the nose to the trailer.

Before pulling the boat out of the water, winch the nose to the trailer to prevent the boat from sliding backward off of the trailer. Make sure the boat is centered on the trailer.

If you pull the boat out of the water and find that the nose of the boat is not quite in its rubber pad, drive the car and trailer forward at low speed and tap the brakes. The boat will easily slide into the rubber block. This saves having to overload the winch and line to move the boat. Don't go too fast or make a real hard stop, or the boat may end up in or on your car. Carefully store and secure all lines and mast support wires to avoid entanglement in the trailer wheels while towing.

EMPTYING THE BALLAST TANK

This section describes emptying the tank when the boat is being pulled out of the water at a launch ramp. Emptying the tank when the boat is in the water is described in the Powering section.

To drain the tank, make sure both the vent and the transom valve are open. Remove the water tank vent plug inside the boat. Pull the boat slowly out of the water, and the water ballast will begin to drain out of the boat and into the ocean. As the boat comes out of the water, the water level in the tank will be higher than the water level surrounding the boat. The water in the tank will try to seek the level of the surrounding water, and the tank will drain.

If the ramp is steep or slippery, or if your car is feeble, it may not be able to pull the boat and the 1000 lbs of water up the ramp. If so, move forward just a small amount and wait for some water to drain. Then move forward some more, and let more water drain. Keep inching forward until the water is gone. In this manner, you will never have to pull out the entire 1000 lbs in one swoop.

Do not try to tow the boat with water in the tank. The trailer was not designed to carry the extra 1000 lb load. Trailering with the water ballast in the tank will overload the trailer and probably your car. When trailering, leave the valve open so all the water can slosh out. There is no sense in carrying around unnecessary water.

CONNECT THE BOOM TO THE MAST

The finished assembly is shown below. Use a 1/4" x 1 1/2" bolt and lock nut to secure the boom to the mast bracket.



Connect boom to mast

MAINSHEET The lower end of the mainsheet (mainsail control line) is attached to the mainsheet traveller in the cockpit as shown.



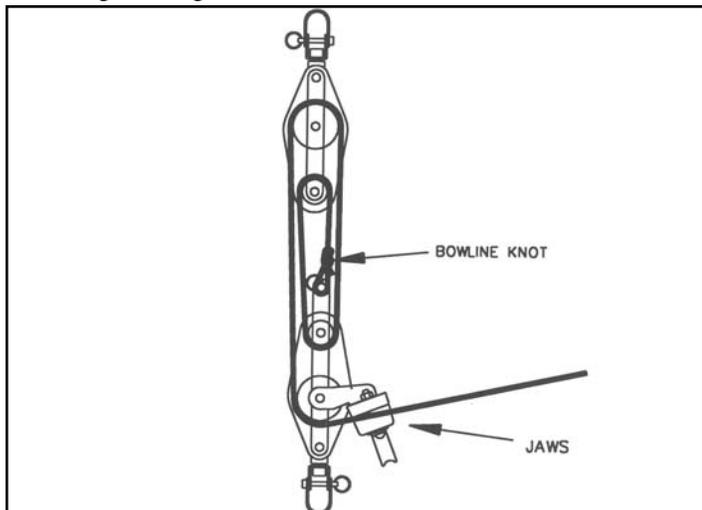
Mainsheet attached to traveller

The upper end of the mainsheet is attached to the boom as shown below.



Mainsheet attached to boom

The mainsheet threads its way through the pulleys as shown in the following drawing.



Mainsheet

MAINSAIL. Feed the lower rear corner of the mainsail into the open slot in the front end of the boom and pull it along the full length of the boom as shown below.



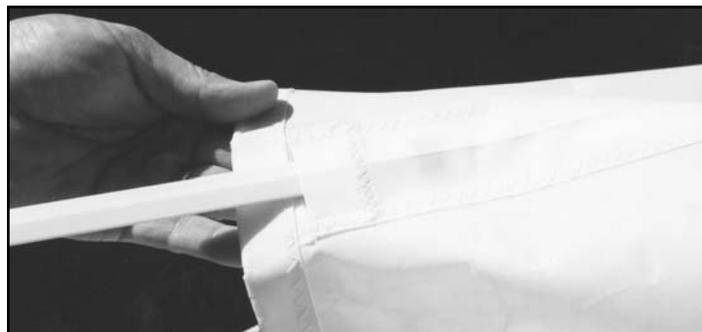
Feeding mainsail onto the boom

Connect the main halyard snap shackle to the top of the sail, and start feeding the rope on the leading edge of the sail into the spread portion of the mast.



Attaching the mainsail to the mast

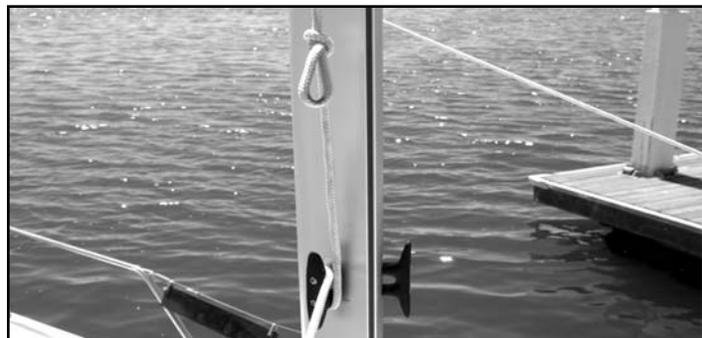
BATTENS. Insert the 4 fiberglass battens in the pockets in the rear edge of the sail as shown. The short batten goes in the top pocket. The other three battens are of equal length. Make sure that the rear edge of the batten is tucked into the pocket sewn into the rear edge of the batten slot. If it is not secure, the batten will work its way out of the sail when you are sailing.



Batten, partially inserted

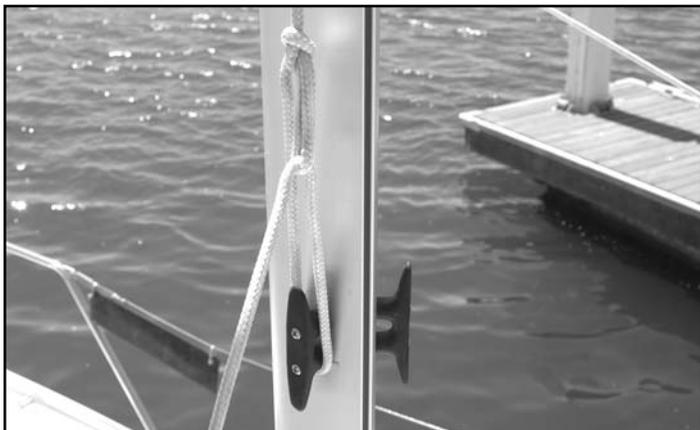
With the boat pointed directly into the wind, hoist the sail while guiding the rope into the slot in the mast. The ring in the front lower corner of the sail attaches to the stainless steel ears on the gooseneck with a 1/4" x 1 1/2" bolt and lock nut.

Secure the end of the main halyard to the mast cleat on the left-side of the mast (when looking forward) with a trucker's hitch, as shown. First make a loop in the line about 2' above the cleat.



Trucker's hitch, top loop

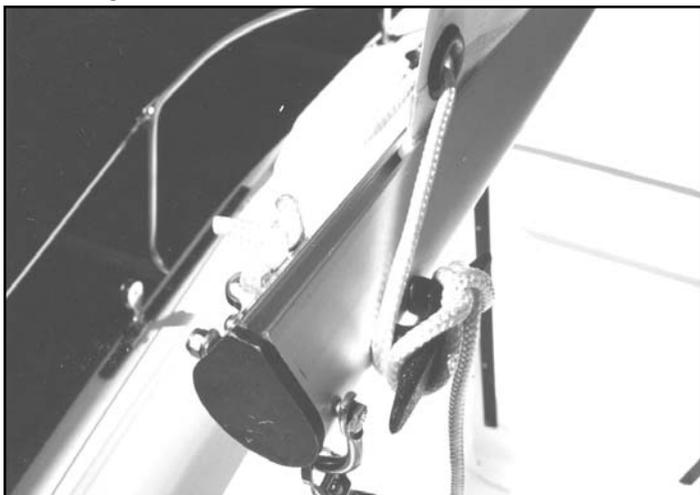
Wrap the loose end of the line around the cleat just once and then pass it through the loop that you made above the cleat.



Trucker's hitch, complete

When you pull down on the loose end, you will get a 2 to 1 power advantage. (For every pound of pull you put on the loose end, you will get a 2 pound pull on the halyard). When the mainsail is up, secure the loose end to the cleat as shown at the beginning of these instructions. The front edge of the sail should be stretched tight, but not so tight that vertical wrinkles appear in the front of the sail.

Run the rope at the rear end of the boom through the sail and tie the line tight to the cleat at the end of the boom.



Mainsail attachment, lower rear corner

For light winds, the sail should be full and somewhat baggy along the boom. As the wind increases, the sail can be flattened for better efficiency by tightening the halyard and boom end line (outhaul). A common error is not having the halyard tight enough. However, don't get it so tight that the sail has long vertical wrinkles along the mast.

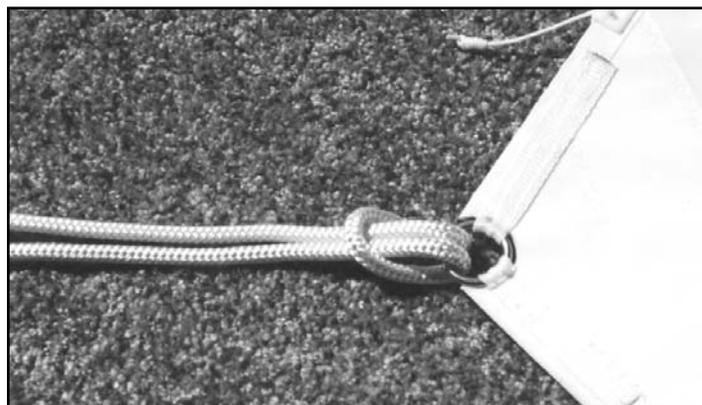
JIB (FORWARD SAIL, OPTION).

Attach the forward corner of the jib to the rear hole in the forestay chainplate, using shackles as shown.



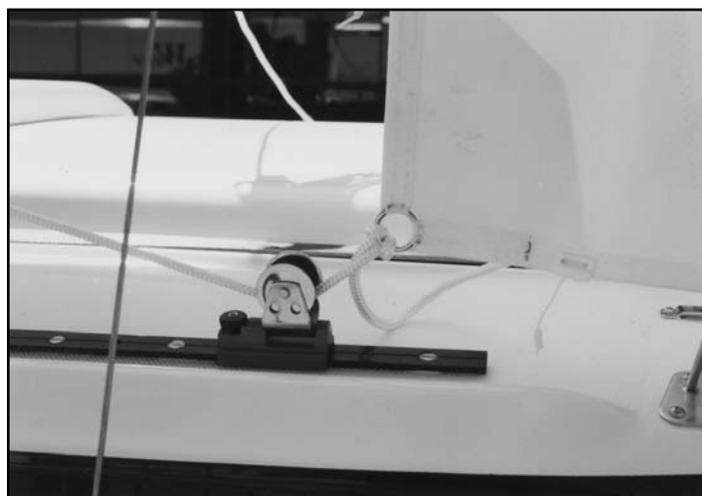
Jib, forward lower corner

Clip the jib to the forestay with the bronze snaps on the sail, and tie the jib sheet.



Jib sheet

When the jib is raised, use a trucker's hitch. Get the halyard really tight. Secure the halyard to the left (port) cleat on the mast. The jib sheets go through the low profile blocks that slide on the jib tracks on the cabin top. Make sure the blocks are pinned securely so they don't fly off the ends of the tracks. The lines then go directly to the jib winches at the rear of the cabin top. The position of the blocks on the tracks is very important for good performance. When you turn the boat into the wind, if the top portion of the jib collapses and loses its shape before the bottom part of the sail, move the blocks forward. If the bottom half of the sail collapses first, move the blocks to the rear.



Jib sheet blocks

There should be no scallops or sagging between the clips on the jib sail. A loose leading edge is a very common error and hurts the boat's windward performance.

GENOA (OPTION)

The genoa is similar to the jib, except that it is longer along the base. It adds a lot of power and is particularly effective in light winds. The genoa is installed and handled just like the jib, except the genoa sheets go to the spring mounted standup blocks on the coaming aft of the cabin as shown in the following photo. The lines go outside of the shrouds that hold up the mast, and outside the cockpit lifelines.



Genoa sheet blocks

REDUCING THE AREA OF THE MAIN-SAIL (REEFING)

Don't hesitate to reef when it blows hard. The boat will be more manageable and usually faster. To reef, release the mainsail halyard and lower the sail until the reefing eye on the front edge of the sail (about as high on the sail as the first batten) can be hooked into the hook that is attached to the gooseneck. Then re-tighten the halyard. Release the line that holds the rear end of the sail to the boom. Pass the line through the reefing eye on the sail (near the bottom batten), around the boom, back through the reefing eye, then to the cleat at the end of the boom.



Reefed mainsail, lower rear corner

DAGGERBOARD

The daggerboard slides up and down in a watertight compartment (daggerboard trunk) just to the rear of the mast.

It is raised and lowered by a line attached to the top of the board. The line then passes through a pulley that straddles the trunk, through a cheek block on the cabin top, and then back to the winch and cleat at the rear of the cabin. The line is shown below.



Daggerboard lifting line

The daggerboard should be fully lowered when sailing into the wind, to keep the boat from sliding sideways. It should be raised completely for sailing downwind. When sailing at right angles to the wind, leave the board about half way down. At low speed under power, the boat steers a lot better when the board is about 1/4 down. **When powering over 6 mph, the board must be all the way up.** At high speed, water may splash out the top of the trunk. Lower the board an inch, and it will stop.

Never let the top of the board go more than 57" below the level of the deck. If it goes lower, it will not have adequate support in the hull, and may be damaged. There is a knot in the lifting line, and a large washer ahead of the knot that will come to rest against the cheek block when the board is down as far as it should go. Do not move the knot. If you replace the line, make sure the knot is in the same exact position. There is also a safety line that prevents the top of the board from going more than 57" below the deck level. Do not remove this line.

To remove the board, lower the mast and remove the mast from its mast step. The board can be lifted straight up and out.

The board has a few holes in the bottom and top that will let it fill completely with water. This eliminates its buoyancy and improves the stability of the boat. When raising the board, do it slowly to allow water to drain out and make it easier to retract. With the board full of water, it is heavy.

RUDDERS

The rudders are lowered by pulling on lines that protrude from the deck near the mooring cleats at the back of the boat. They are raised by pulling on the lines that are secured to the rear end of the

rudders. There are cleats near the lines to secure the rudders either in the up or down positions. When you are steering with the rudders, make sure they are fully down and well secured. If the rudder blades angle back, the rudder area moves aft of the pivot point, and the loads on the steering system increase dramatically. It is also possible to have the rudders too far forward. If the center of pressure is ahead of the pivot point, the steering wheel will pull to the right or left (much like a steering wheel on a car behaves when you are backing up). Adjust the rudders to the position where there are only small loads on the steering wheel.

There is a small adjustment screw on the leading edge of each rudder fitting. Turn the screw to adjust the fore and aft angle of the rudder blades.

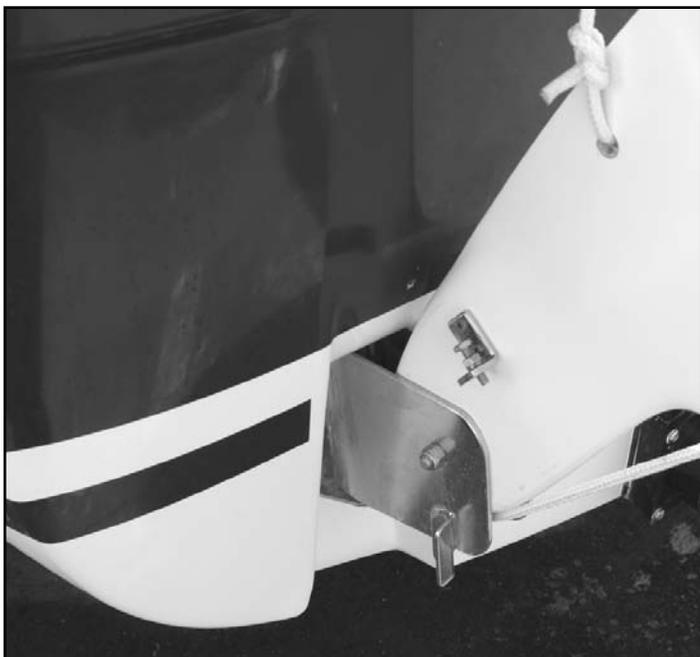
If steering loads are heavy, first make sure that the rudder blades are really pulled down tight against their stops. If the blades stick out from the rear of the boat, steering will really be difficult.

After you are sure the blades are fully down, turn the screw clockwise to cause the rudder to angle forward. Adjust it so that there is very little load on the steering wheel. When underway, pull hard on the rudder line to once again make sure that the blades are down and against their stops.

If the rudders are angled too far to the rear, and there is too much pressure on the rudders, you can damage the steering system.

If the steering cable system becomes inoperative, you can remove the cable from the tiller cross bar and steer by pushing and pulling on the tiller cross bar or on the motor pushrod that protrudes from the deck near the motor well. (This is awkward, but you can still get home.)

The following photo shows the rudder secured in the up position, ready for powering or trailering.



Rudder secured in the up position.

Secure both lifting and lowering lines to keep them from getting

caught in the outboard motor's propeller. Tighten the rudder pivot bolt (3/8" x 2 1/2" bolt and lock nut) tight enough to prevent sideways movement of the rudder in the rudder head, but loose enough to allow the rudder to be moved up and down easily. Watch for wear on the rudder lines, and replace them as necessary.

The following photo shows the rudders in the full down position,



Rudders secured in the full down position

When you power the boat over 6 mph, or trailer the boat, make sure the rudders are fully up, and well secured. If they fall down under power, steering loads will increase dramatically. If they fall down on the highway while trailering, the rudders will get a lot shorter very quickly.

One rudder can be raised while sailing in order to reduce drag. This should be done only in light airs when the boat is sailing level. If the boat leans beyond 20 degrees, the windward rudder will be mostly out of the water. If it is the only rudder down, you will lose your steering control.

You might also check to make sure your rudders are parallel with each other. If not, they tend to fight each other and create unnecessary drag. You can adjust them by judiciously bending the tiller cross bar. Frequently check the rudder cable for corrosion. It must move freely

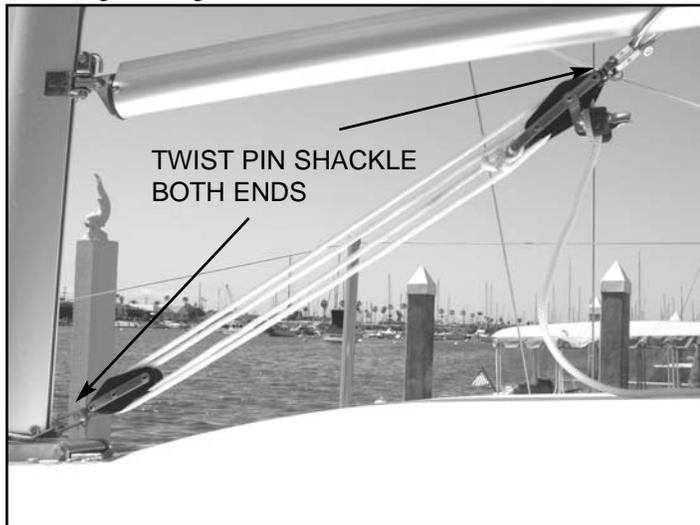
HATCHES

SECURING HATCHES IN HEAVY WEATHER. In windy conditions, make sure all hatches are secured, so no water can get into the boat if the boat leans over or gets buried in a wave. The last thing you need is a boat full of water.

BOOM VANG

The optional vang is used to take the twist out of the mainsail and is very important for good performance. The hardware is just like the mainsheet, and attaches to the mast and boom as shown in the

following drawing.



Boom vang

SELF-RIGHTING CAPABILITY

With sails rigged to the mast and boom, the water ballast tank full, and the masthead pulled to the level of the water, the boat, when released, should return to an upright position. With virtually any sailboat, it is possible for the belly of the sails to trap enough water to hold the boat down on its side if the sheets (sail control lines) are not released. In the event of a knockdown, release all sheets to prevent this possibility.

In rough seas, it is possible for waves to enter the cabin through hatches if the boat is held on its side. While sailing in rough weather, it is advisable to keep all hatches closed and secured.

FOAM FLOTATION

With the normal gear and crew, the MacGregor 26 has sufficient solid foam flotation material to keep the boat afloat in the event the cabin fills. When completely filled with water, the boat will be relatively unstable, and can roll over.

Do not remove the foam flotation blocks from the interior of your boat under any circumstances.

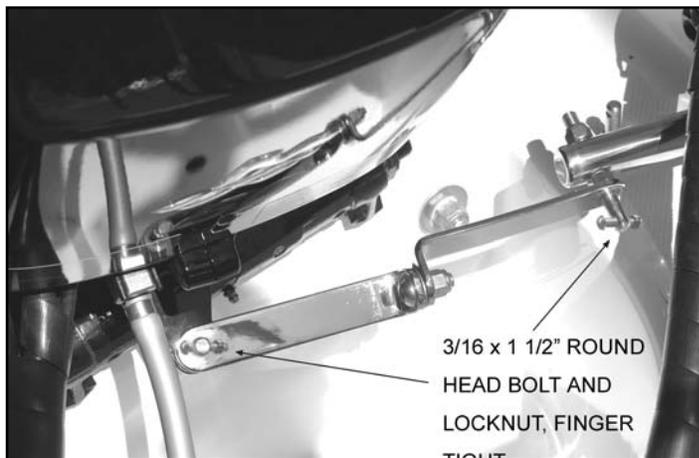
POWERING

The boat is designed for an outboard motor of no more than 50 horsepower. Do not use a larger engine.

Have the outboard installed by an experienced installer. The motor must be installed on the center of the transom, and clamped or bolted securely. Any bolts through the transom should be well sealed to prevent leakage. Don't locate these bolts below the waterline.

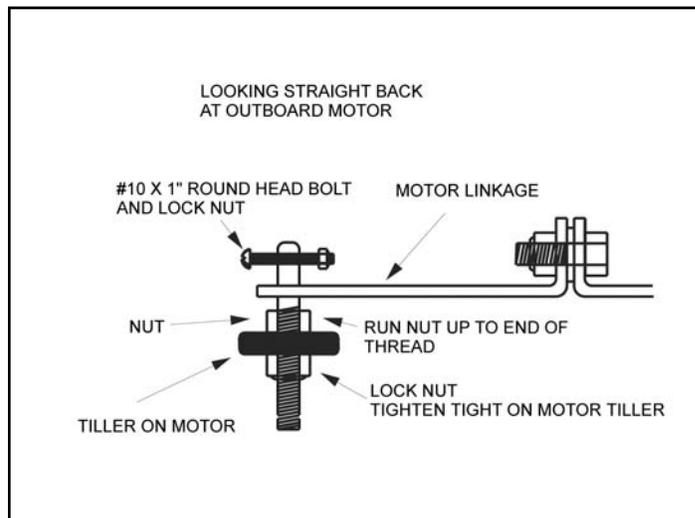
Follow the manufacturer's instructions to the letter when installing the engine.

We offer a motor linkage that connects the rudders to the engine. It causes the engine to turn with the rudders. It is shown below.



Motor linkage, motor connected to steering

The system consists of a stainless tube that protrudes through the deck and bolts to the port tiller. The linkage bar connects this tube to a small bracket on the front of the outboard with a special 3/8" stud. The following drawing shows the way that the linkage bar connects to the motor



Motor linkage, motor connected to linkage bar

The 3/8" bolt and lock nut that hold the two halves of the linkage

bar together should be loose enough to allow the bar to pivot as the engine is raised up and down.

When powering, the engine should be connected to the rudders with the linkage bar. With the engine linked to the rudders, the rudders will still turn when the engine is turned, but the blades, when raised, will be waving harmlessly in the air, which is fine. With the rudders down at high speed, you run the risk of bending the rudder heads, or overloading and damaging the steering system, or contributing to capsize. You also run the risk of the rudders hitting something and being damaged. With rudders up, the boat steers fine at the higher speeds with just the engine. Also, the rudders create a lot of unnecessary drag, and can knock a few miles per hour off the top speed. Pull them up!

When powering at 6 mph or less, you can steer with the rudders down. With the engine and rudders linked and the rudders down, control at low speed is as good or better than any other boat. At low speed, you will have even better steering control if the centerboard is about 1/4 down. Remember to pull it all the way up when you are powering faster than 6 mph.

When under sail, you can keep the rudders and engine linked with the engine retracted, with only a slight increase in the load on the steering wheel.

If you are racing, or want less load on the wheel, you can disconnect the retracted engine so it won't turn with the rudders. This takes a relatively small load off of the wheel. To keep the engine from flopping from side to side as the boat leans, you can disconnect the linkage bar from the tube coming out of the hull, and drop it over the stud protruding up from the deck near the motor well.

Linkage bar on deck bolt



The boat will be a little faster under power with the ballast tank empty, but you will be a lot safer with the ballast tank full. Please reread the section on stability. This information is really important.

It is possible to drain the ballast tank while moving under power. You have to be going about 7 mph. Open the vent plug and the valve on the transom. The nose of the boat will be high and gravity will drain the tank.

When the tank is empty, immediately close the vent plug and the transom valve, or the tank will again fill with water. Always make

sure the vent and valve are closed except for times when the tank is emptying or filling. (At dockside, a hose end siphon inserted in the vent hole will empty the tank in about 12 minutes.)

When powering at any speed over 6 mph, make sure the daggerboard is all the way up. At high speed, with the board down, the board will create lifting forces to the right and left as the boat moves through the water, tending to make it unstable. This could possibly cause capsize. Check frequently to make sure the board stays up during powering. This is important.

If the boat is loaded with a lot of weight on one side, it may capsize. Make sure the weight in the boat is placed so that the boat remains reasonably level when underway when traveling in a straight line.

Do not power over 6 mph with the sails up. If you are going 20 miles per hour in calm air, and the boat is turned, it will slide sideways and you will now have a wind of 20 mph filling your sails. The result could be a knockdown or capsize.

Make sure the mast support wires are tight when powering fast. The pounding and slamming can otherwise make your mast really rattle around.

The turning radius at high speed is relatively large, so allow yourself lots of room.

Most outboard motors have a kill switch that shuts off the engine if you fall out of the boat. This involves a cable that attaches to the switch and to you. It is an excellent safety feature, and should be used.

BOAT MAINTENANCE

LEAKS. It is a good idea to check the water tank, cockpit, outboard well and galley vents and drains to make sure all connections are tight and waterproof. Check the water ballast valve for leakage as described earlier. Pull the boat out of the water frequently with the water tank full. If anything is leaking, you will see water coming out.

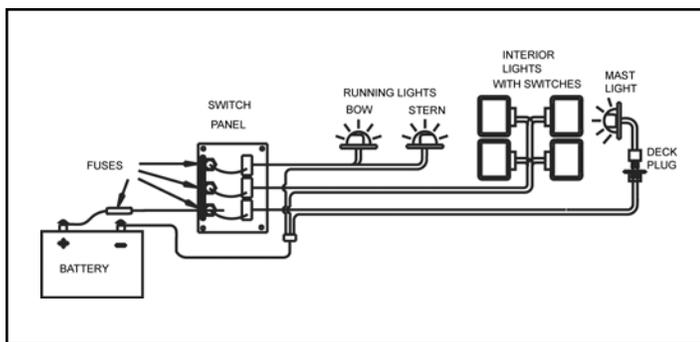
INSPECTING THE HULL AND DECK. Periodically inspect the boat for cracks, delaminations, blisters or signs of impact damage. Gel coat, the outer cosmetic finish, is fairly brittle and occasionally cracks and crazes where it is stressed. This is normally cosmetic only. If crazing appears, check to see if the fiberglass itself, and not just the colored gel coat, is damaged.

INSPECTING MAST SUPPORT WIRES AND LIFELINES. The wires should be checked frequently to make sure there are no broken strands. If you find a broken strand, replace the wire immediately.

INSPECTING HARDWARE. Also check all bolted-on hardware to make sure everything is tight and leak proof. Squirt the boat with a hose and look for leaks. If one is found, make sure the bolts are tight and all joints are sealed.

EXTERIOR FINISH. The fiberglass finish should be protected in the same manner as an automobile finish. An occasional polishing and waxing (with any good quality automotive polish and wax) will keep the surface in excellent condition. If the boat is left in the water (either fresh or salt water), apply a coat of top grade anti-fouling bottom paint with an 18 mil thick (.018") epoxy undercoat. Without good bottom paint and epoxy primer, the white gel coat exterior surface may blister.

WIRING DIAGRAM



TRAILER MAINTENANCE

GENERAL. A good periodic inspection and clean up can add years to the trailer's life.

Frequently check the trailer to insure that all bolts and nuts are tight, that all welds look solid, and that there are no cracks or bends in the trailer structure. Inspect tires for wear, cuts, bad bruises.

Replace tires if they become worn or damaged.

All of the maintenance and operation procedures mentioned are very important as there are no warranties of any kind on brake systems for boat trailers.

Always hose the trailer down with fresh water after immersing in salt water. Salt water is very corrosive, and removing it will add years to the life of the trailer.

AXLE MAINTENANCE. Buy a small grease gun for the hubs and use a high quality multi-purpose non-fibrous grease, similar to the grease used in automobile wheel bearings. Put in enough grease to move the spring loaded piston about 1/8" outward from its seated position. Check the lubricant level in the hub by pressing the edge of the spring loaded piston. If you can move or rock the piston, the hub has sufficient grease. If it cannot be moved, add grease with the grease gun. Do not overfill.

TRAILER LIGHT CARE. All lights should be removed before putting the trailer in the water.

SURGE BREAKS. Please read the surge brake instructions that are included in the rig box.

LIMITED WARRANTY

MacGregor Yacht Corp. makes the following warranty to purchasers:

SAILBOATS AND SAILBOAT PARTS AND EQUIPMENT.

For a period of two years from the date of sale to the first use purchaser, MacGregor Yacht Corp. will, through its selling dealers, repair or replace any sailboat part or sailboat equipment manufactured by MacGregor which is proven to MacGregor's satisfaction to be defective by reason of faulty workmanship or material.

TRAILERS AND TRAILER PARTS AND EQUIPMENT.

For six months from the date of sale to the first use purchaser, MacGregor Yacht Corp. will, through its dealers, repair or replace any trailer part or trailer equipment manufactured by MacGregor which is proven to MacGregor's satisfaction to be defective by reason of faulty workmanship or material.

THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

- (1) All items determined by MacGregor to be the responsibility of the dealer in launching or otherwise handling or preparing a new boat or vessel.
- (2) All items installed by the dealer or anyone else other than MacGregor.
- (3) Any failure resulting from lack of maintenance, normal wear and tear, negligent operations or maintenance. Negligent operation includes, but is not limited to, failure to properly and completely fill the water ballast tank when sailing, failure to empty the water ballast tank before trailering, failure to heed adverse weather warnings, and failure to use care when operating the boat near sources of electrical power.
- (4) All accessories or equipment not manufactured by MacGregor. Any warranty furnished by the manufacturer, if possible, will be passed on to the boat owner.
- (5) Trailer brake systems and trailer lighting systems.
- (6) Exterior paint and gel coat finishes. Although we use the finest finishes available in the industry, they cannot be warranted because they are affected by climate and use conditions beyond the control of MacGregor Yacht Corp.
- (7) Any other person than the first use purchaser of the boat.
- (8) Any boat or part manufactured by MacGregor which shall have been altered in any way so as to impair its original characteristics.

The foregoing warranties are made in lieu of all other warranties, obligations, liabilities, or representation on the part of MacGregor, and the purchaser waives all other warranties, guaranties, or liabilities, expressed or implied, arising by law or otherwise, including without limitations any liability of MacGregor for consequential damages.

The purchaser should understand that the dealer is not an agent of

MacGregor Yacht Corp. and MacGregor does not authorize the dealer or any other person to assume for MacGregor Yacht Corp. any liability in connection with such warranty or any liability or expense incurred in the replacement or repair of its products other than those expressly authorized herein.

MacGregor reserves the right to improve its products through changes in design or material without being obligated to incorporate such changes in products of prior manufacture.

FOREIGN CUSTOMERS. The foregoing limited warranty shall be null and void (and MacGregor Yacht Corporation expressly disclaims all warranties of any kind, express or implied, including the implied warranty of merchantability and fitness for a particular purpose), if a foreign customer (in other words, a retail customer not located in the United States or Canada) purchases a MacGregor boat and/or trailer directly from a United States dealer of MacGregor Yacht Corporation rather than from an authorized foreign dealer of MacGregor Yacht Corporation.

The terms of the above paragraph are necessary because of the extremely complex legal and certification requirements of most foreign countries. It is essential for our protection and for the protection of the customer that foreign sales and service are handled by authorized foreign dealers who thoroughly understand the complex rules of the countries in which they sell, and who can modify the boats to meet these requirements.

DEALER'S RESPONSIBILITY. The processing of claims against the transportation company for any damage occurring during shipment, or by deliberate act of vandalism or by normal intransit hazards shall be the dealer's responsibility. MacGregor Yacht Corporation's responsibility for safety against damage to the boat ceases at the time the boat leaves the MacGregor Yacht Corp. facility; thereafter responsibility is either that of the common carrier or the dealer.

The dealer must fill out and return to MacGregor, within ten days after the boat is sold to a retail customer, the attached Warranty Registration Card.

It is further the responsibility of the dealer to furnish guidance and information to the purchaser on matters pertaining to service and maintenance during the warranty period, and in addition to process any claims under the warranty to MacGregor Yacht Corp. The dealer is responsible for making sure that the owner receives the Owner's Instructions and understands all information contained therein.

OWNER'S RESPONSIBILITY. The Owner's Instructions, as well as any instructions furnished with any accessories installed on the boat, shall be placed in a large envelope and remain aboard the boat. Purchasers should make special effort to make sure that this literature is delivered to them by the dealer or MacGregor Yacht Corporation. Careful attention to these instructions will add many years to the life of the boat and equipment. It is understood that all matters of service are handled with the selling dealer. Purchaser should notify his selling dealer regarding any problems under the warranty. The above warranties will be in effect only if

such part is promptly returned to the dealer with a sum sufficient to pay transportation charges to the MacGregor plant. The dealer shall be given an opportunity to supply parts needed for all repairs for which a claim is to be made.

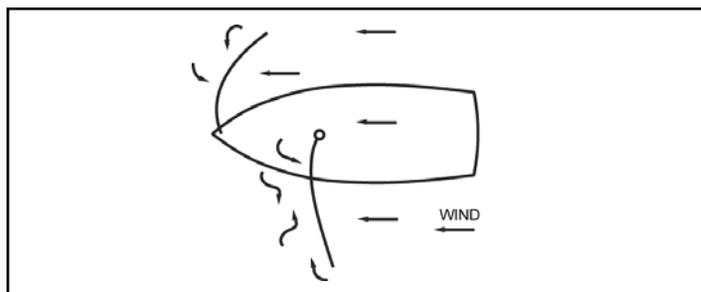
The purchaser agrees to use the boat in a reasonable and safe manner. It is necessary for the owner or operator to use extreme caution when operating the boat in severe weather, or when trailering and raising and lowering the mast near power lines or sources of electrical power (contact between a power line and the mast or rigging could cause injury or death), and when preparing the boat for trailering. The purchaser must use care to assure that the boat is not sailed unless the ballast tank is completely full and the valve is closed and sealed. The purchaser must familiarize himself with all information contained in the Owner's Instructions, particularly warnings contained in pages 1, 2, 3 and 4.

HOW TO SAIL

THE MOST IMPORTANT THING YOU MUST KNOW IS THE DIRECTION FROM WHICH THE WIND IS BLOWING.

ING. Program someone to ask you, every 2 minutes “where is the wind coming from?” You must point to it instantly, and be right. Put a Windex wind vane at the top of the mast, and keep your eye on it. If you don’t know wind direction, you will look sort of stupid when trying to use the wind as your engine. There are clues everywhere; flags, smoke, dust, moving clouds, ripples on the water, other sailboats, and blowing debris. Above all, you can feel the wind direction on your face. Turn toward the wind. When you are aimed straight at it, you will feel it evenly on both ears, cheeks, hair, etc. Be aware.

SAILING DOWNWIND. Sailing with the wind is easy. Just aim the boat and the wind will blow you along. A boat sailing downwind looks like this.



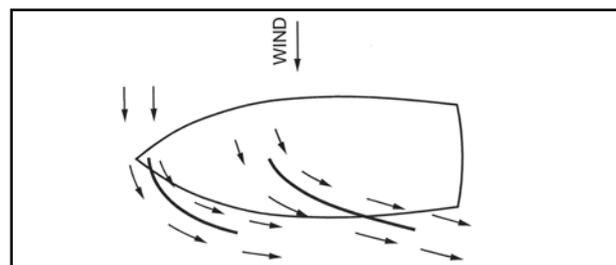
Sailing downwind

This is no more complex than letting a balloon blow with the wind. (Except that you can steer.) You can sail downwind, slowly, even without sails. (This is good for docking.)

Just get the sails out there at right angles to the wind. You control

the angle of the sails to the wind with the sheets (the lines that connect to the rear of the jib and to the rear of the boom). The wind pushes on the sails, and the boat moves. Notice the turbulence behind the sails, just like the turbulence behind a truck as it speeds along. If the wind gets on the wrong side of the mainsail, it can slam over fast and hard, just like the wind will slam a door if it gets on the wrong side. This is called jibing. Be careful. More on this later.

SAILING ACROSS THE WIND. This is a whole different act. Notice, in the next set of drawings and photos, that the wind is now flowing smoothly across the sails, much like the wind moves across the wing of an airliner.



Sailing across the wind

Basically, the sails are diverting wind from its original direction toward the rear of the boat. Every pound of wind that is deflected toward the rear of the boat gives a forward push to the boat. Actually, the wind gives a push both forward and sideways (making the boat lean). However, the rudder and the daggerboard keep the boat from sliding sideways, so it squirts forward, much like a watermelon seed shoots out forward when you squeeze it between your fingers.

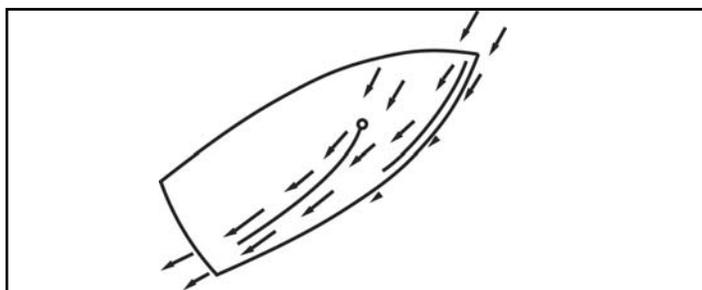
SAILING INTO THE WIND. This is just like sailing across the

wind, except that the sails are pulled in closer to the centerline of the boat, and you are now trying to sail as close into the wind as you can. This is tougher to do, and the boat won't go as fast as when sailing across the wind. The following drawing shows the boat sailing toward the wind. This is as close into wind as you are going to get.



Zig zagging (tacking) into the wind

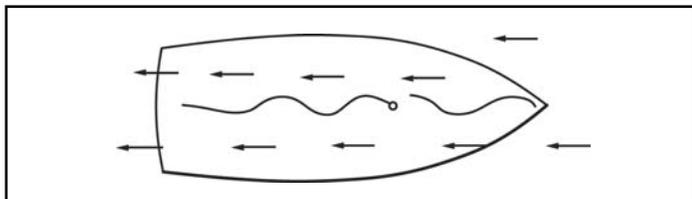
THE FIRST DAY OUT. Launch the boat on a nice day with a light breeze. There should be just enough wind to move the boat around. (You have to be moving if you expect the rudder to work.) Fill the ballast tank. Make sure the rudders and daggerboard are all the way down. Start the engine. Power slowly out to the middle of a calm body of water, where there is nothing to bump into, point into the wind, and put up the mainsail. Keep the engine running slowly, moving the boat about 2 mph. With the engine running and moving the boat forward, try to duplicate what you see in the above diagrams. Sail with the wind, across the wind and as close into the wind as you can go. Blunder around like this for a while, trying to match the angle of the boom to the wind as you see in the diagrams. After a half hour or so of this, you will get a good feel of what works and what doesn't. If you screw up, or the sails shove the boat in a direction that you don't wish to go, overpower the sails with the engine. Use reverse if you have to stop. In a tug of war between the engine and the sails in moderate winds, the engine will win.



Sailing into the wind

Notice the smooth wind flow across the sails, and the lack of turbulence. Wind is being properly diverted toward the rear of the boat, and like the blast of air coming out of the rear of a jet, pushing the boat forward and sideways. More of the force is now sideways, so the boat will tend to lean more, but it will still squirt forward, since the daggerboard is keeping it from going sideways.

SAILING STRAIGHT INTO THE WIND. You can't. The sails will flap like flags, divert no wind, and you will just sit there, frustrated, dead in the water. This is being in "irons".



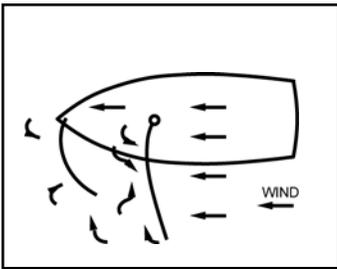
Trying to sail , unsuccessfully, straight into the wind.

So how do you get to point A in the above drawing if you can't sail directly toward it. You zig zag, (tack) like this.

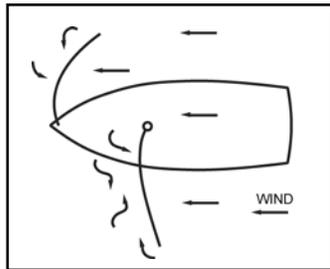
Then raise the jib. Remember that the jib control line is pulled in on the side of the boat away from the wind. The line going to the other side is left loose. As you zig zag into the wind (tacking), you will have to release the jib line (sheet) from one side and pull it in on the other. The mainsail control line (mainsheet) takes care of itself. You don't have to reset it each time you turn through the direction from which the wind is blowing.

STOPPING THE BOAT. If you are sailing, with the engine off, you can always stop the boat by turning into the wind and letting go of the jib control line and the mainsail control line. When you do this, the wind pressure is off of the sails, the boat will coast a few more boat lengths and come to rest. This also is good for docking when the dock is upwind. A motor is better.

HOW DO YOU KNOW IF THE SAILS ARE SET AT THE PROPER ANGLE TO THE WIND? There are some simple tricks that are used by the experts. When sailing in the same direction as the wind (called "running"), just let the sails out until they are at right angles to the wind. You are trying to catch as much wind as possible. Unfortunately, the mainsail blocks the wind from hitting the jib, so the jib will just hang, unless you can hold it out on the opposite side of the mainsail, as shown below. This adds sail area, but it only works when the wind is coming from directly behind the boat.



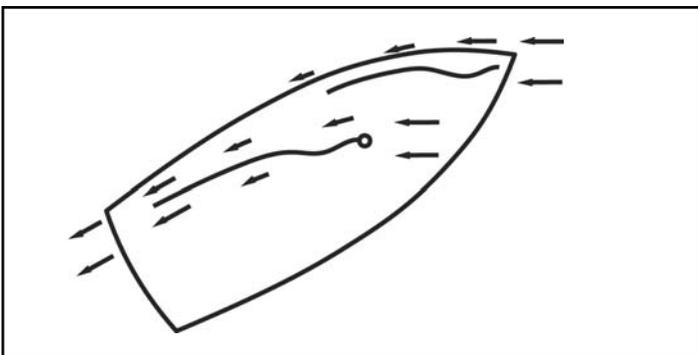
Normal downwind sailing



Sailing downwind, jib out

When sailing at right angles to the wind (called “reaching”), pull in the mainsail control line (mainsheet) and the jib control line (jibsheet) until the wind completely fills the sails.

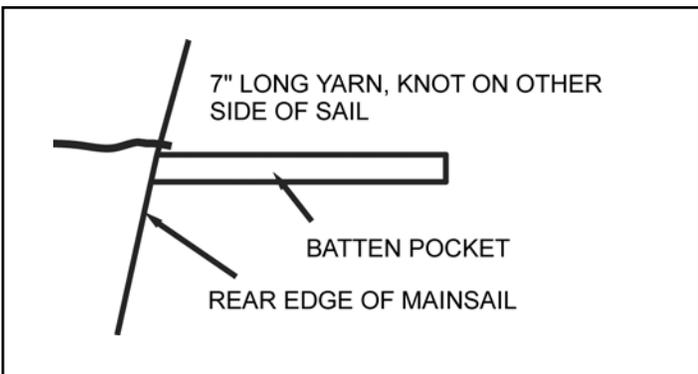
If the sails are not pulled in far enough, the fabric near the leading edge will flutter and ripple. This is the result of the wind hitting the sail on the wrong side and forcing the fabric toward the upwind side. This fluttering is shown in the following drawing.



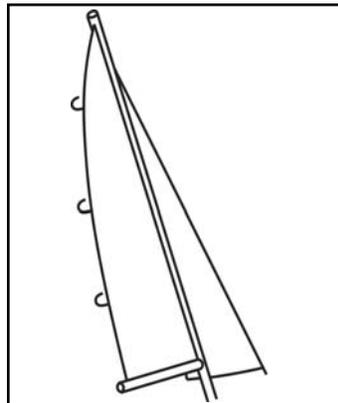
Sails not pulled in enough

Keep pulling the mainsheet in until the fluttering just disappears, and the sail forms a smooth curve from the mast to the rear edge. Unfortunately, the sail will not tell you if it is pulled in too far; it will still look smooth and full, but will not move the boat well. Let the mainsheet out until the fluttering and bubble reappear along the mast. Then pull the sail in until the fluttering and bubble just disappear. This is now the perfect sail setting. Because the wind is always changing, you have to keep making this test for top performance.

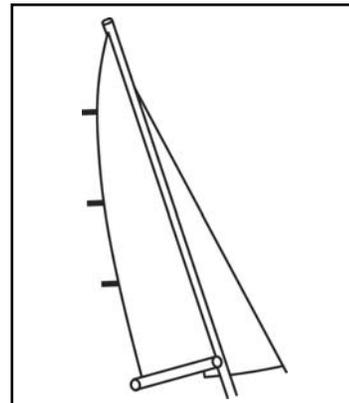
There is another neat trick to let you know when the mainsail is pulled in too far. Secure a 7” long piece of yarn near the rear end of every batten pocket. Use a large needle to push the yarn through the sail.



Mainsail streamer



Streamers curling--bad



Streamers straight--good

When the sails are in too far, the yarns will curl around the back-side of the sail.

If they curl, gently let out the mainsail until they stream out straight and not try to hide behind the sail. The yarns tell when the sail is in too tight (which really slows up the boat and causes it to lean over more), but they do nothing to tell you when the sail is let out too far.

Even if you point the boat straight into the wind and the sail is doing an impersonation of a flapping flag, the yarns will stream nicely to the rear. You have to watch for the fluttering and ballooning to appear at the front edge of the mainsail. Pull it in until the fluttering disappears. So, the fluttering tells you if it is out too far, and the yarns tell you if it is in too far.

Trimming the jib is just about the same as trimming the mainsail. The jib, however, comes with built in streamers (called “tell-tales”) to make it easy. The streamers are about 12” in from the front edge of the sail. There are 2 sets, evenly spaced up the sail.

When the sail is pulled in just right, all of the streamers, on both the upwind and downwind sides of the sail, will be flowing straight to the rear.

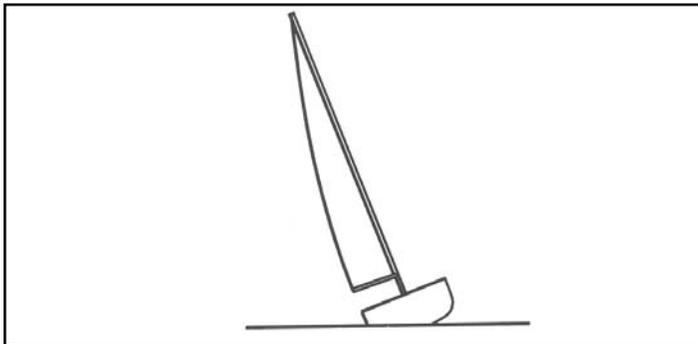
When the streamers on the downwind side are going around in circles and not flowing to the rear, the jib is pulled in too tight. The wind cannot make the sharp turn around the front edge of the sail, and the streamers are caught up in the resulting turbulence. Let out the sail.

If the streamers on the windward side of the sail are dancing around and not flowing to the rear, the sail is not pulled in tight enough. Always trim the jib first, then the mainsail, since the flow off the jib affects the mainsail trim.

You always have two ways to get the angle of the sails to the wind just exactly right. You can pull the ropes to change the sail angle, or you can keep the ropes as they are and steer in a new direction. The latter is easier on the arms. You may not get exactly where you want to go, but you will be going a lot faster.

When you are sailing as close as possible into the wind, secure the sails and adjust the angle of the sails to the wind by steering the boat into or away from the wind.

When sailing across the wind or into the wind, try to sail a constant leaning (heeling) angle. If it leans too much, sail into the direction from which the wind is blowing (called “heading up”), relieving some pressure on the sails. If the boat starts to stand up straighter, steer away from the wind direction (called “heading down”). The wind will hit the sails at more of an angle and cause the boat to lean more, and you will get more power. This helps to keep the sails at the proper angle to the wind. A leaning (heeling) angle should look about like this when going into the wind in an 8 mph wind.



Proper leaning angle in 8 mph wind

APPARENT WIND. This is tricky, but important. The wind that the boat feels is actually two winds. The first is the wind that moves across the water, that creates the waves and makes flags stream downwind. (This is called the true wind). The second wind is the wind produced by the speed of the boat. If there is no true wind, and your outboard pushes the boat at 5 mph, you and the boat will feel a 5 mph wind coming right at the front of the boat. (This is called the apparent wind).

If there is a 10 mph true wind, and the boat is going straight into it at 5 mph, you and the boat will feel a 15 mph apparent wind from straight ahead.

If there is a 10 mph true wind, and the boat is going with the wind (downwind) 5 mph through the water, you and the boat will feel a 5 mph wind at your back.

If there is a 10 mph true wind, and you are powering at right angles to the wind at 5 mph, the situation is more complicated. The wind the boat feels will be a combination of the two winds; the true wind from the side and the wind created by the motor from straight ahead. The apparent wind will appear to come from about 60 degrees from the side of the boat. It takes trigonometry to calculate the exact apparent wind speed and direction. Looking at the wind vane is easier.

The sailboat has only a small brain, and only feels the apparent wind, and this is what it must sail in. The apparent wind will determine how the sails are to be trimmed, and how the masthead wind indicator will point. It is the wind you must use to sail. But the complexity gets worse. As the speed of the boat changes, and as the true wind speed gusts and eases, the apparent wind strength and direction will change, and you have to keep trimming the sails or altering course as the changes occur. You don't have to, of course. You can just get it close enough to enjoy the ride. But if you want to sail like a superstar, you will have to keep tweaking and adjusting for perfect trim all the time. This wins races. (You

can learn to sail quite well in a matter of hours. But it will take a lifetime to master all of the subtle little intricacies.)

Another complexity. As you pick up speed, the wind from the front of the boat increases, and the apparent wind will come more from the front of the boat. Actually, the apparent wind will now be stronger than the true wind, so you have more usable wind to sail in. With each new change in wind speed or boat speed, you will need a new sail trim.

When you watch the telltales on the jib and the streamers at the rear of the mainsail, you will notice that the top ones don't always flow in the same manner as the lower ones. This means that the sail is not at the same angle to the wind at various heights. Wind blows harder as you go higher, and there will be a different apparent wind (and wind angle) up there. (This is because the friction of the earth and water slows wind down at low levels.) You may see the upper mainsail streamers trying to hide behind the mainsail, and the lower ones flowing nicely to the rear. This means that the top of the sail is in too tight. The boom vang controls this. Loosen the vang, and watch the upper part of the sail sag outward away from the wind. Tighten the vang, and it pulls down on the boom and pulls in on the upper part of the sail. When the vang is set right, all the streamers will behave the same. Fortunately, sailcloth is a bit stretchy, and the top will usually sag off just about enough to match the angle change caused by stronger winds higher up.

The jib has no boom, therefore there is no vang. But you can use the position of the jib sheet pulley on the deck track to control twist. If you move the sliding pulley forward on the track, the top part of the sail will be pulled in tighter. Move it to the rear, and the top part sags off downwind. Move the jib pulley on the track so that all of the telltales flow the same. If the top one on the upwind side flutters before the bottom one, move the pulley forward. If the bottom one is the first to flutter, move the pulley to the rear.

When sailing upwind you can also tell how you are doing by watching the forward edge of the jib. As you point the boat up into the wind, the leading edges of the jib will start to flutter and collapse inward. Turn away from the wind until the fluttering at the front part of the sail stops and the sail appears full. Try to steer the boat so that the front of the jib is just on the edge of starting to flutter and collapse. You will notice that the telltales start flopping around just as the sail starts to flutter in front of the telltales. The telltales and the fluttering are both giving you the same message.

The jib halyard must be very tight, or the sail will sag between the snaps on the forestay. This is a most common problem for beginners. The mainsail halyard should be tight, but not so tight as to create vertical wrinkles at the leading edge of the sail, parallel the mast.

The outhaul, mainsail halyard and jib halyard should be tighter in heavy air to flatten the sails, an loosened in lighter wind. In general, you want a very flat sail in heavy wind, to kill off some of its power, and very full and baggy sail in light wind, when you need all the power you can get. The fuller the sail (baggier) the more the power.

There are light lines sewn into the rear edge of each sail. Adjust

these lines just tight enough to keep the rear edge of the sail from fluttering. If you get the lines too tight, the rear edge of the sail will cup toward the wind and slow the boat up a small amount.

The time to reduce sail area is when you first think that it might be necessary. Even with less sail, the boat will be faster if the heeling angle can be kept below 25 degrees. Beyond that, performance goes all to hell.

The reefing sequence goes like this:

1. If you can't keep the leaning angle below 25 degrees, flatten the mainsail with the halyard and outhaul. Flatten the jib or genoa by tightening the halyard. Loosen the vang to allow the top of the mainsail to twist downwind and spill wind. Move the jib deck pulley to the rear of the track to let wind spill out of the top of the jib.
2. If you still can't stand up straighter than 25 degrees, roll the genoa about 1/2 way in. If you don't have roller furling, change from genoa to jib.
3. After that, put a reef in the main, and keep the partially rolled genoa or the full jib.
4. If it still leans too much, roll in more genoa, (or get rid of the jib) and keep the reef in the mainsail.
5. If that isn't enough, consider pulling down the sails and powering home. Or pull down all of the sails and ride it out until the wind lets up. If you are sailing downwind, you can use just the jib or reefed genoa. (This doesn't work well upwind.)

When sailing into the wind, try leading the genoa sheet between the upper shroud and the lower shroud. This will allow the boat to point 5 to 7 degrees closer into the wind.

When racing in heavy wind, have at least a 4 man crew. In light air, the fewer the better. Remember it is against the rules to throw crew members overboard to lighten the boat.

The boat's bottom, rudders and centerboard must be clean and shiny. A few days of marine growth will slow the boat dramatically. Any bumps at all, even microscopic, will create turbulence and destroy the orderly flow of water across the surface, and really screw up performance.

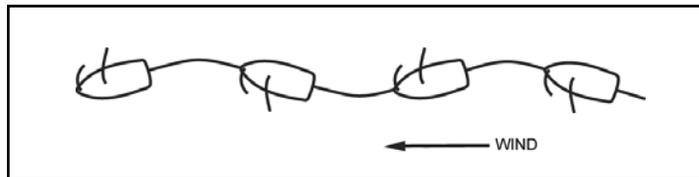
Keep the boat moving. With the small daggerboard, forward speed is essential to keep the board lifting the boat into the wind. No speed, no lift, and the boat will just slide sideways.

Be sure to get rid of all extra weight. Crew can be moved to the windward side to keep the boat level. Junk in the boat is hard to move, and it will just slow the boat down. Light weight is very important downwind. Going upwind, added weight can sometimes be helpful. Waves and chop tend to slow up a light boat, while a heavier boat can plunge right on through. Keep rudder motion to a minimum. Steering creates lift from side to side. Lift is always accompanied by drag. Keep the rudder angle steady.

When trimmed properly, the boat should want to head up into the

wind when you let go of the wheel. When sailing into the wind, the front of the rudders should be turned about 5 degrees toward the upwind side of the boat.

When sailing with the wind, avoid sailing straight downwind. Point up into the wind about 20 degrees, until the jib is not smothered by the mainsail, and starts to work. If your destination is straight downwind, tack back and forth as shown below. The boat will go a lot faster, which will more than make up for the fact that you have to sail a bit farther.

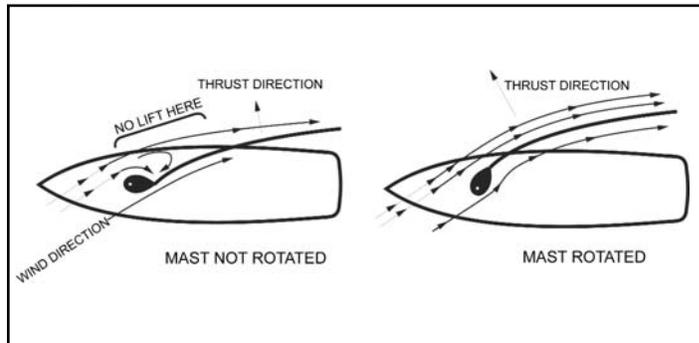


Tacking downwind

This will also reduce the risk of accidentally jibing. When you do want to jibe, pull in the mainsheet until the boom is near the centerline of the boat, and gradually let it out on the other side. Don't let it slam over hard. Keep the crew off the cabin top if there is risk of jibing. The boom can whack them.

Rotating the mast.

Allowing the mast to rotate, as shown below, gives a major boost to the power of the mainsail.



Mast rotation

With the mast centered, there is a major amount of turbulence over the first third of the mainsail. Rotating the mast gets rid of the turbulence, and allows a smooth flow of air along the backside of the sail. This reduces drag. It also caused the sail to direct its force more forward, creating less tipping force and more forward push.

Weight and crew position.

When sailing, make sure the ballast tank is full. When under sail in heavy winds, keep the crew weight aft and to the windward side. In light wind, keep the crew forward and positioned so the transom is almost out of the water and the boat heels about 5 to 10 degrees. This heeling reduces the amount of hull surface in contact with the water. In light wind, the surface area touching the water creates most of the drag. The more surface in contact with the water, the slower the boat will go. A 10 degree angle of heel reduces this area significantly.

It has been said that the art of seamanship is not getting yourself in a position where you need seamanship. Be careful.

The following is a reproduction of the decals that are placed on the steering pedestal and on the cabin wall inside the boat. These the decals contain important safety information, and should not be removed. If the decals become defaced or illegible, please call or write to us and we will provide new ones.



DANGER

Engine exhaust contains carbon monoxide gas (CO) that can cause injury or death. Spinning propellers can be extremely dangerous. Shut off the engine when near the transom or in the water behind the boat.

Get fresh air to anyone with signs of CO poisoning (nausea, headache, dizziness, drowsiness, or lack of consciousness). Get medical help.

Do not let the mast or rigging touch overhead power lines. The results could be fatal.



WARNING

Fill the ballast tank before sailing or powering. (See Owner's Instruction Manual for possible exceptions.)

Maximum crew capacity is 6 persons, not to exceed 960 pounds.

If the ballast tank is not full, the following applies: (1) Maximum crew capacity is 4 persons, not to exceed 640 pounds. (2) No one should be on the cabin top or foredeck. (3) Remove all sails and operate only in calm water and where rescue from capsize is possible. **THE BOAT CAN CAPSIZE IF THE BALLAST TANK IS NOT FULL.**

After filling the ballast tank, close the vent plug and transom valve. Check them for leaks. The vent must stay closed to prevent flooding.

When powering over 6 mph, always remove the sails, raise the rudders and daggerboard, and allow no one on the cabin top or foredeck.

Watch where you are going. The boat's rigging, sails, deck and crew can occasionally block your view. Move around to assure a clear view.

Maximum trailering weight is 4200 pounds, including boat, trailer and all equipment. The trailer tongue weight should be between 250 and 300 pounds. Always empty the ballast tank before trailering. Make sure the trailer wheel lug nuts are tight.

Read and understand the contents of the Owner's Instruction Manual.

This boat complies with U. S. Coast Guard safety standards in effect on the date of certification.

