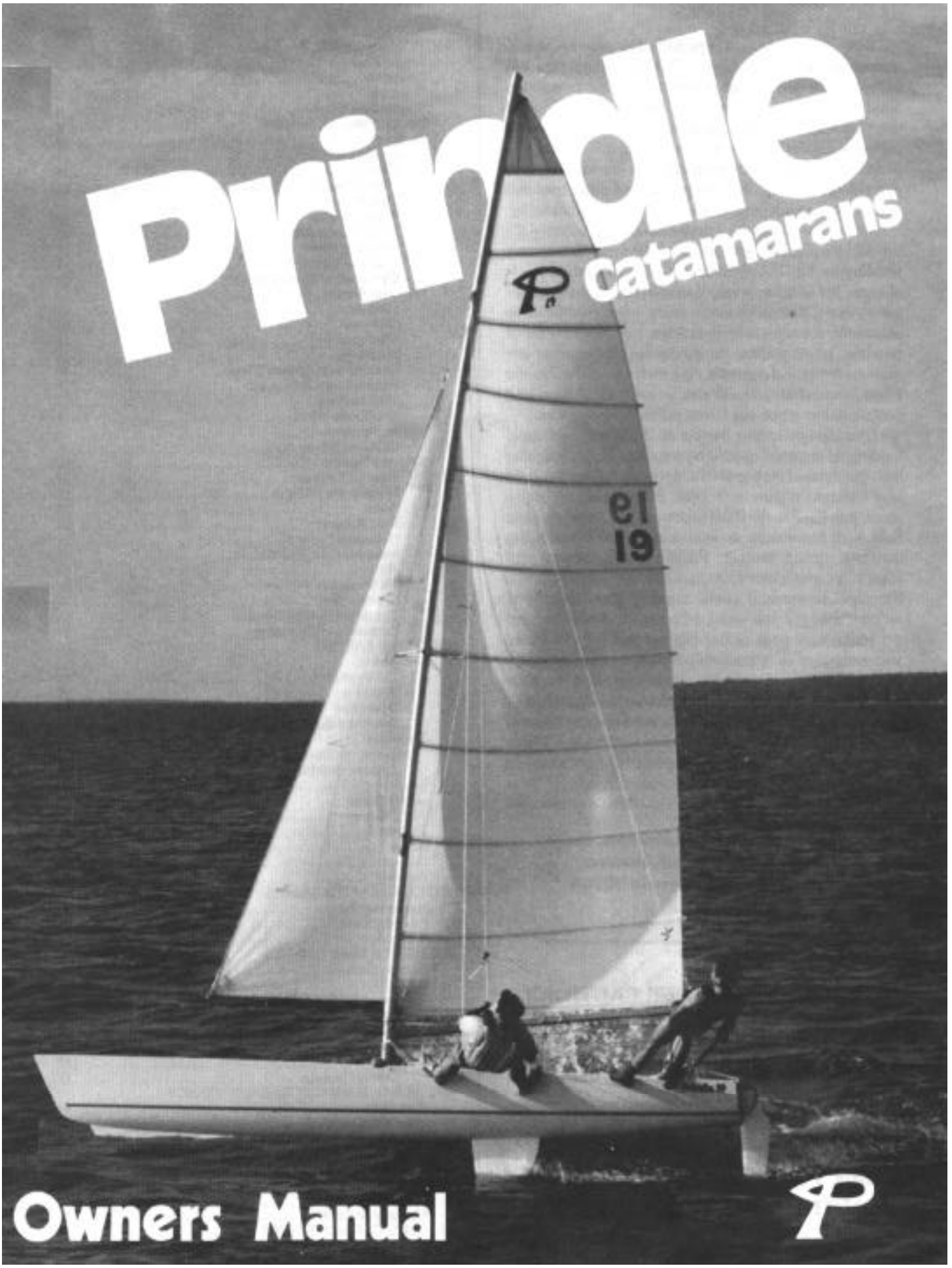
Prindle
catamarans
19
Owners Manual

INTRODUCTION

This owner's manual is provided to ease assembly, maintenance and use of your Prindle Catamaran. We believe these instructions portray the simplest methods. Do it our way the first time and learn from us. Then, if you discover a better method, feel free to tell us about it by faxing (714) 541-6643 or e-mailing pcat@performancecat.com. You may see your idea appear in the next edition of the owner's manual.

We are sure you will enjoy your Prindle Catamaran and hope that this manual will make your enjoyment easier to come by.

Make sure you join the Prindle Class Association - it's fun and it's free to any new owner of a Prindle Catamaran ($20 annually after the first year). You will receive the Performance Sailor, our official class newsletter. This newsletter contains feature articles, news and results of regattas, photographs, timely tuning tips, special announcements and contests. As a member of the Prindle Class Association, you will also be entitled to enter and participate in all of our Class sanctioned regattas.

One design racing begins at the local fleet level leading to regional qualifying regattas and culminates with the Annual National Championship Regattas held in a different region every year. Even if you are not a racer, join the Prindle Fleet in your area. Our fleets have held such fun events as watermelon hunts, hull flying contests, group cruises, Prindle barge picnics and clinics. It's much more fun to share the joy of sailing a Prindle Catamaran. If a fleet does not exist in your area - start one! All you need is a few enthusiastic owners!

Make sure your dealer fills out and submits your warranty card for your new boat. Not only does it validate your warranty, but it will also automatically register you as a member of the Prindle Class Association. If you have purchased a used Prindle, please send us your sail and hull numbers as well as your complete address. Make sure to notify us when you move too, the Performance Sailor does not get forwarded.

Keep in touch. We love to hear from our owners!

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Performance Catamarans, Inc.

CONTENTS

Prindle 18-2 & 19 Owner's Manual

Section I:
ASSEMBLY

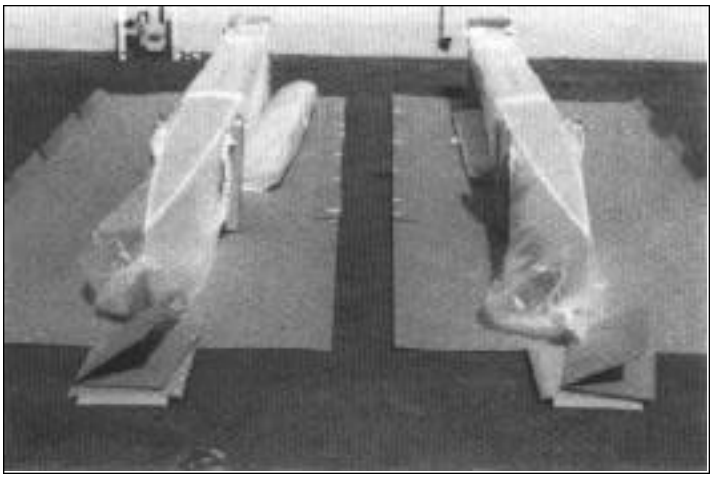
Preparation

Tools needed:

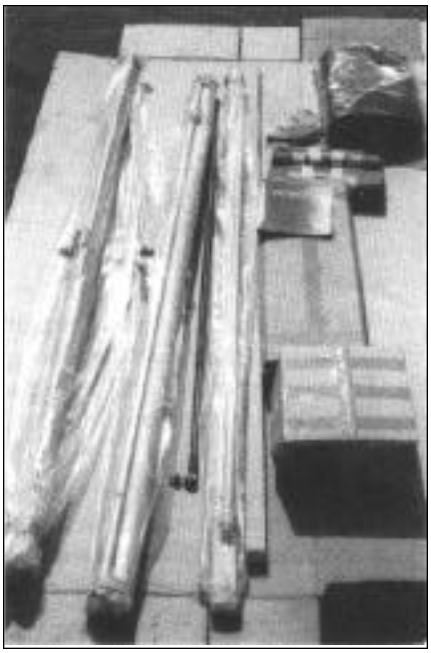
- ✔ large screwdriver
- ✔ pliers
- ✔ needle-nose pliers
- ✔ 1/2" offset wrench
- ✔ combination 1/2" & 9/16 box-end wrench
- ✔ adjustable wrench
- ✔ silicone sealant

Your Prindle Catamaran comes packaged in two hull containers, one large hardware box and one mast box.

Place the two hull containers approximately 6 feet apart with stapled seams at the top of the cartons facing each other. This will insure that both hulls will be facing the same direction.



Open the hull containers. Leave the hulls standing on the cardboard supports.



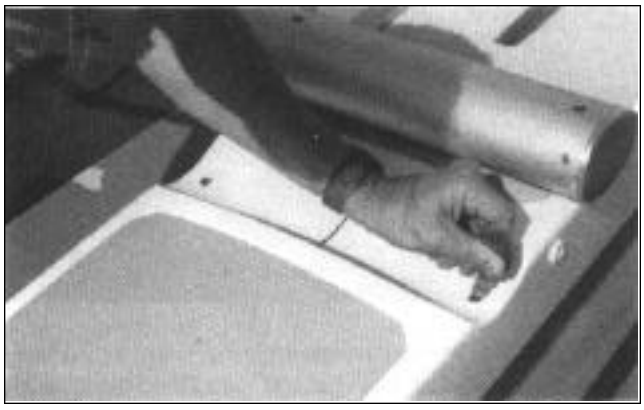
Open the hardware box and familiarize yourself with the major parts of your boat. The contents of the hardware box should include:

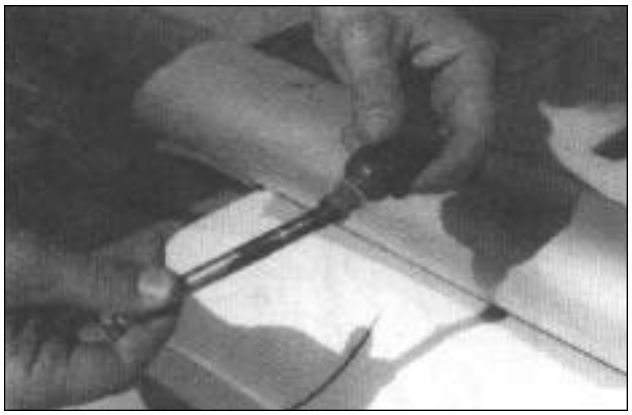
boom	trampoline
battens	rudder box
rear crossbar	tiller crossbar
sails (may be packed with hulls)	tiller extension

Open the rigging box. The contents will be listed on the sheet enclosed.

CROSSBARS

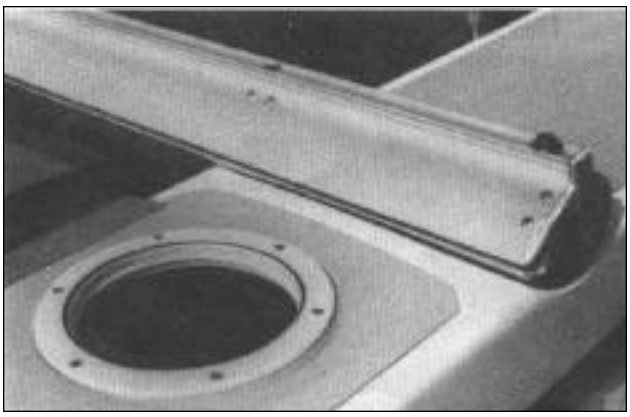
Put a dab of grease (included in bolt kit) into each hole in the hull for the front beam bolts. This is very important! Put a small amount on each of the 3/8" hex head front beam bolts before assembling crossbars. The front beam bolts are tapped into an aluminum plate.





Lay both the front and rear cross bars on the hulls with the outside edges even with the outside edges of the hulls. The curf (groove) on the front crossbar should face aft and the curf on the back crossbar should face forward.

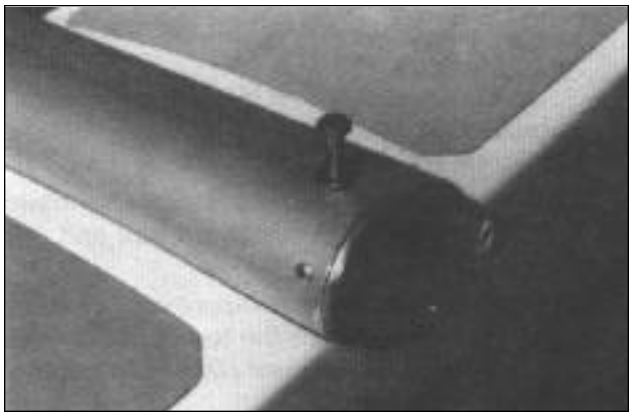
To attach inside bolts on the rear crossbar, insert one of the 5/16" flathead screws through the inboard hold of the rear crossbar. Apply silicone sealant to washer and nut and tighten with *fingers only*.

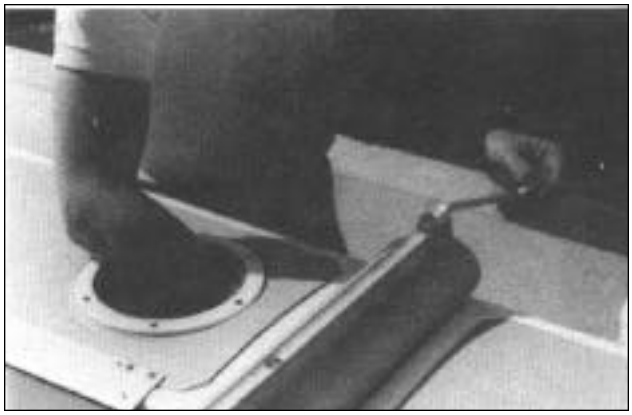


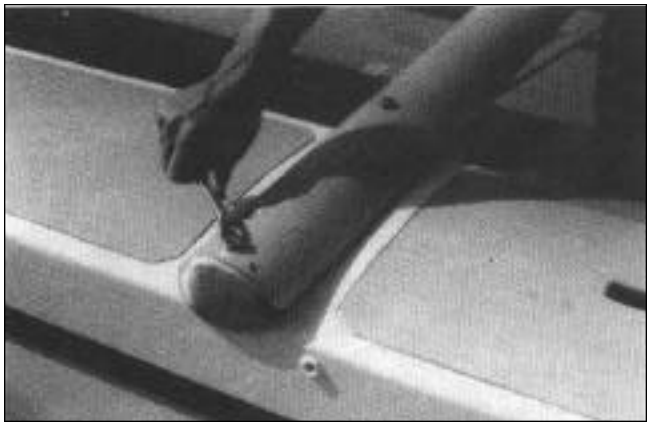
Align holes in front beam with the holes in the hull. Carefully thread all 4 of the 3/8" hex head bolts, with grease on threads, through the beam and into the hull until they are about 1/8" from being completely tight. CAUTION!!!

If the 3/88" bolts bind at all, remove the bolts and check fit of bolt without the beam on. DO NOT force bolts as you could strip out the aluminum plate inside the hull. If the bolt continues to bind, use a 3/8-16 tap and rethread the hole to rectify the problem.

Tighten all rear beam bolts until about 1/8" from being fully snug. This allows beams to properly align themselves. Snug down all 8 bolts and then tighten all 8 bolts.

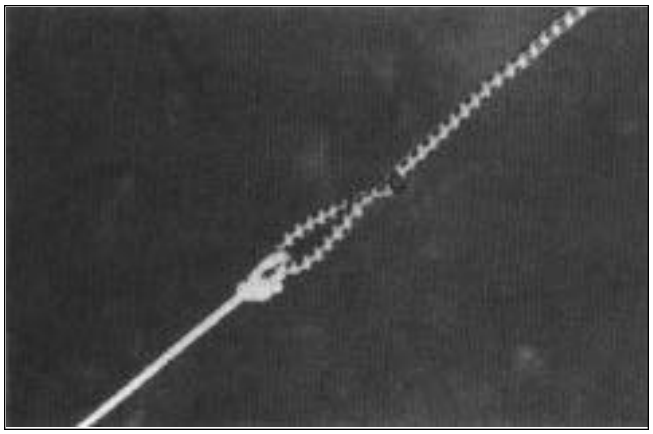




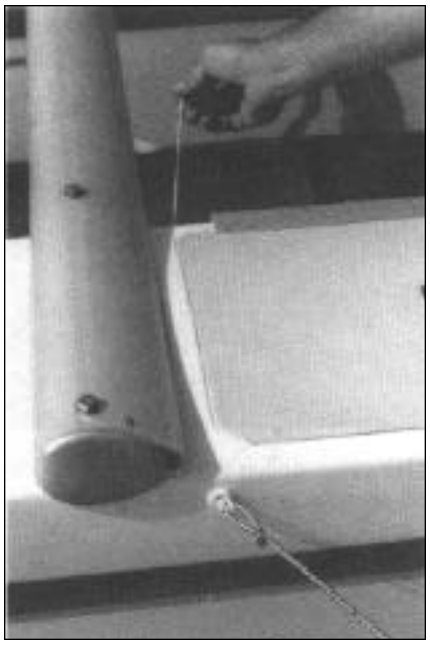


TRAMPOLINE

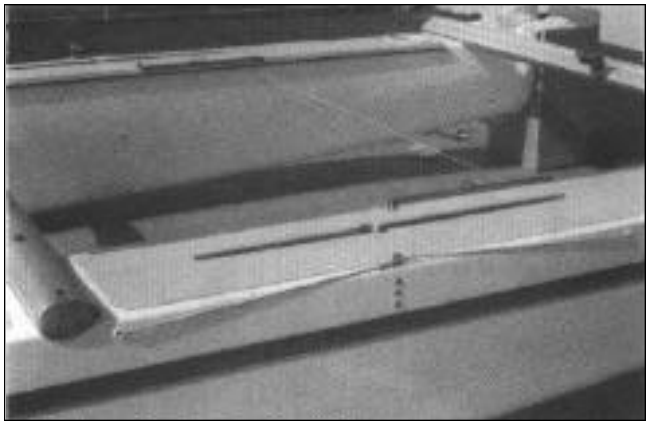
Lead trapeze shockcords before putting trampoline on hulls. Tie one piece of 1/8" x 2' paracord to one end of shock cord using a small bowline knot.



Feed the line through the white fairlead on side of hull and out the other side. Continue across to the other hull and repeat procedure.

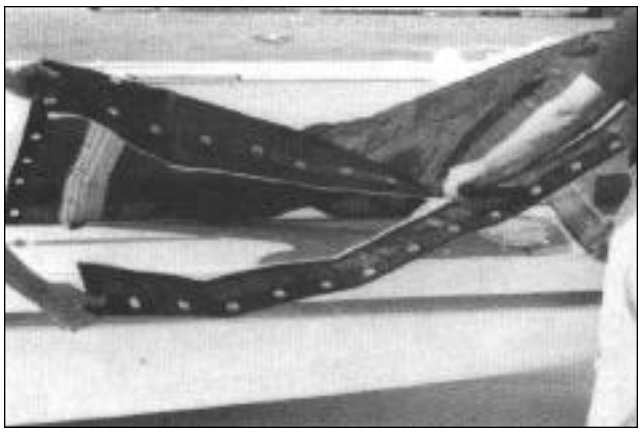


The trapezes are continuous from one hull to the other.

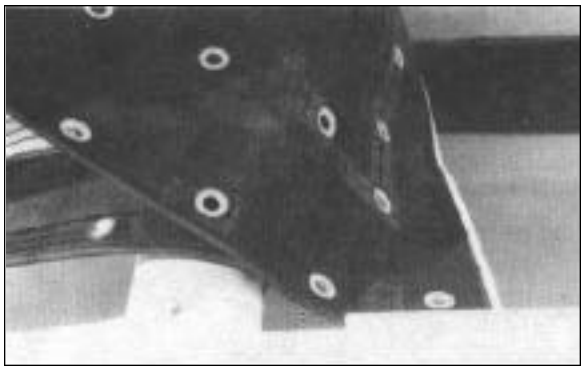


If one of the fairleads should come loose during assembly, simply apply some silicone sealant and push into place.

To install the trampoline, first unzip and remove the rear section. Slip the front of the trampoline onto the front crossbar.

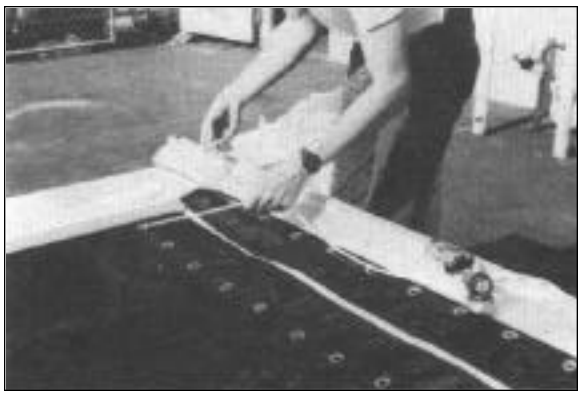


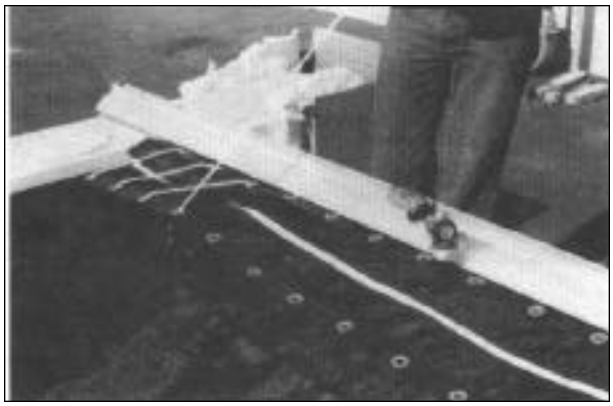
Slide the sides down each side of the trampoline track. Two people are needed here.

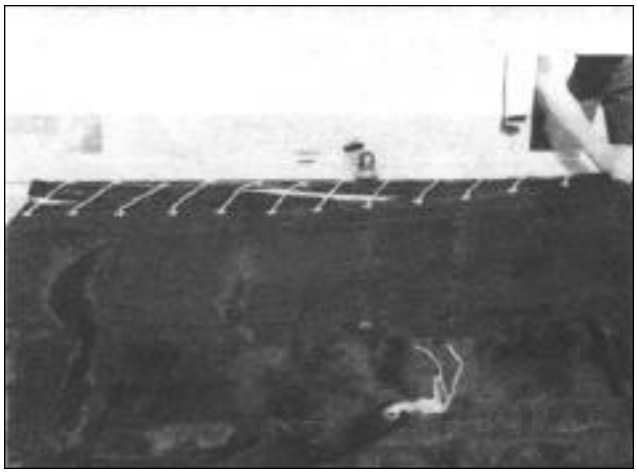


Slide the rear piece and zip the two pieces together.

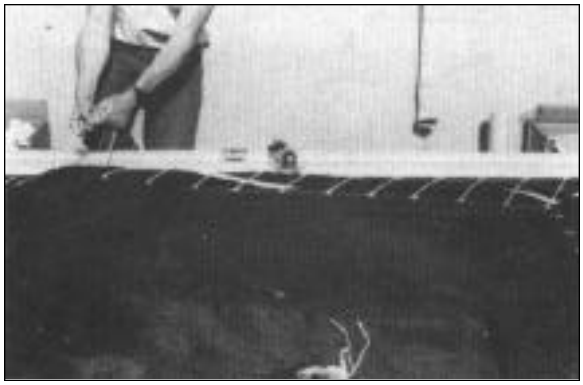
Center the trampoline in the front. Lace up the back of the trampoline with 1/4" x 19' lacing line. Begin by tying a double overhand knot in one end of the line and thread through the right/aft grommet.

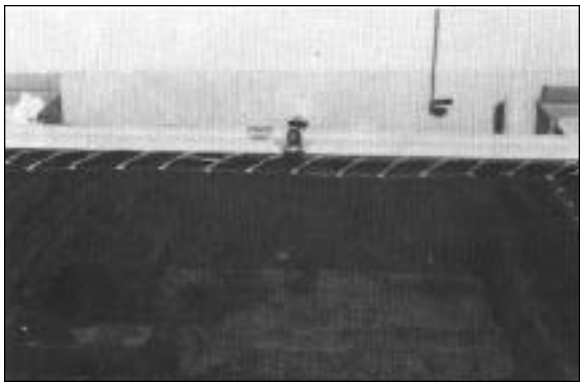






Always tighten rear lace line first. Stand at the back of the boat and tighten lines by bracing your foot or knee on the rear crossbar for leverage. Pull tight. Tie line off under trampoline. Do not trim excess line as it leaves something to hold onto when re-tightening trampoline.

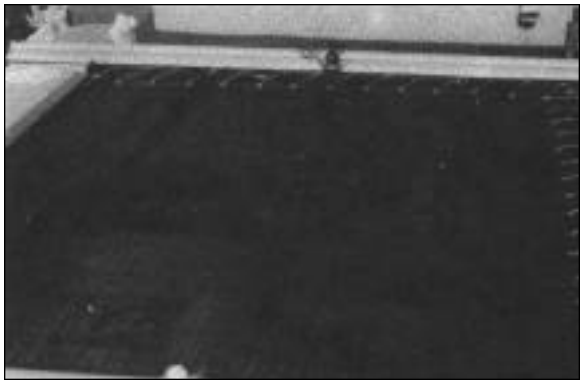




Lace up the side of the trampoline with 1/4" x 19' lacing line. Begin by tying a double overhand knot in one end of the line and thread through the forward/inboard grommet.

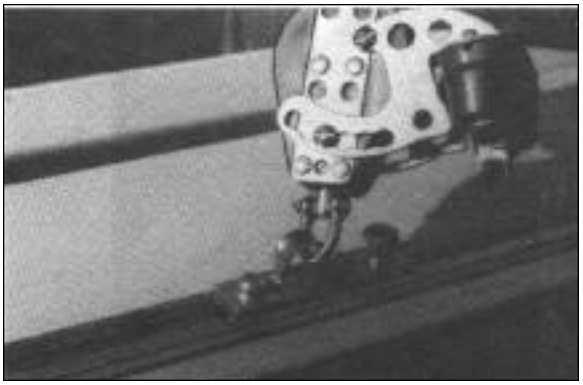
Tighten starting at the front.

Complete lacing.



STANDARD JIB SYSTEM

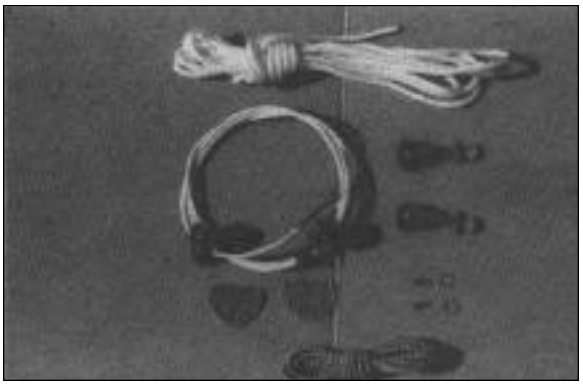
Attach jib block to padeye on side jib tracks.



Note: there will be an aluminum cleat on the deck just forward on the jib track, this is for future addition of the 4-way jib system as is the "sock" on the trampoline.

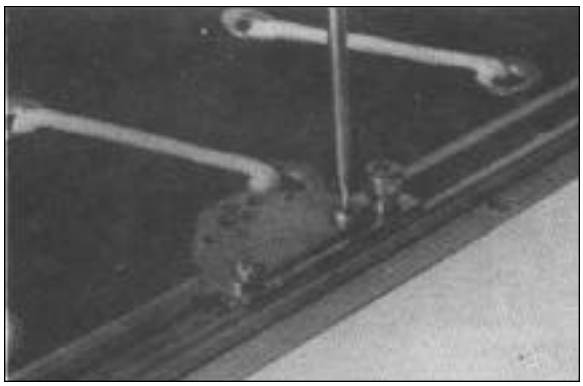
DELUXE 4-WAY JIB SYSTEM

The parts are included in a separate bag.

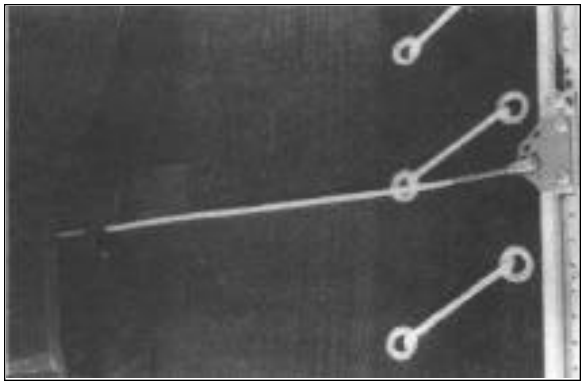


If the jib cars have installed padeyes remove them since they will not be used.

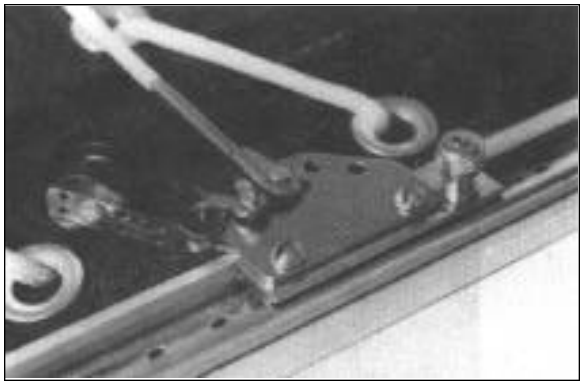
Attach jib adjuster plate to both sides.



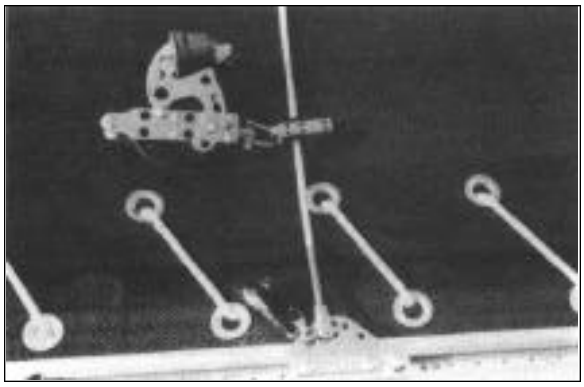
Attach jib crosswire to adjuster plate, leading wire through the tramp sock, choosing one of four middle holes on each side so the wire is snug. NOTE: You may find it necessary to remove the plate to put the "O" ring on the clevis pin.



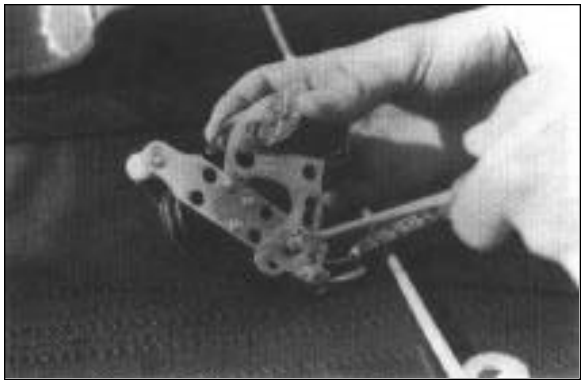
Attach the small bullet blocks to the forward most hole on each adjuster plate using a 3/16" shackle.

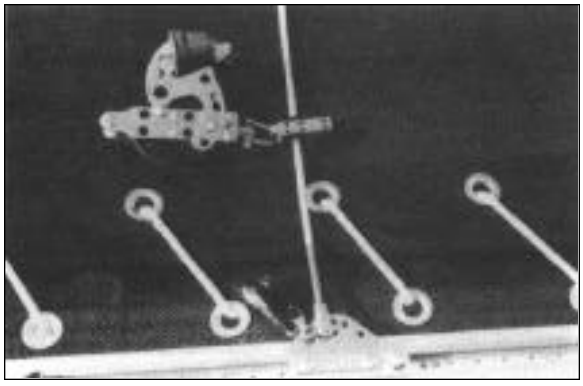


Shackle the jib blocks to each of the two bullet blocks on the crosswire.

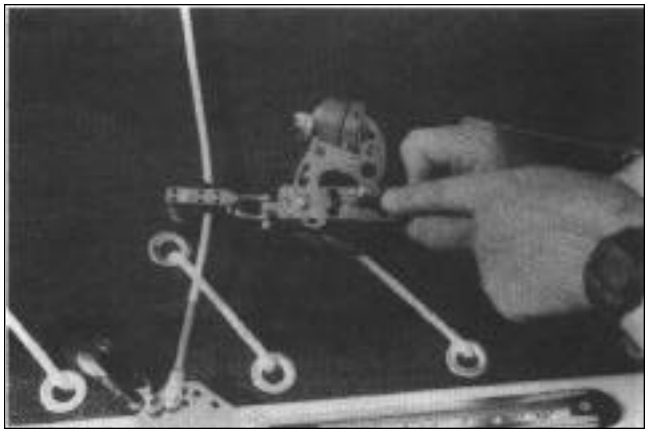


Adjust the cleat angle as high as possible using the side set screws. Most people prefer this position.

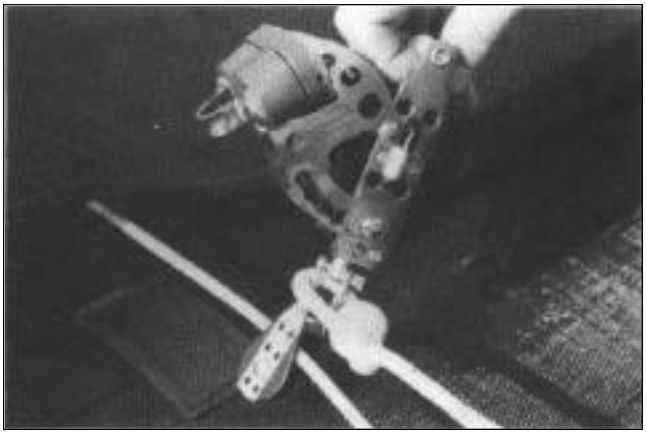




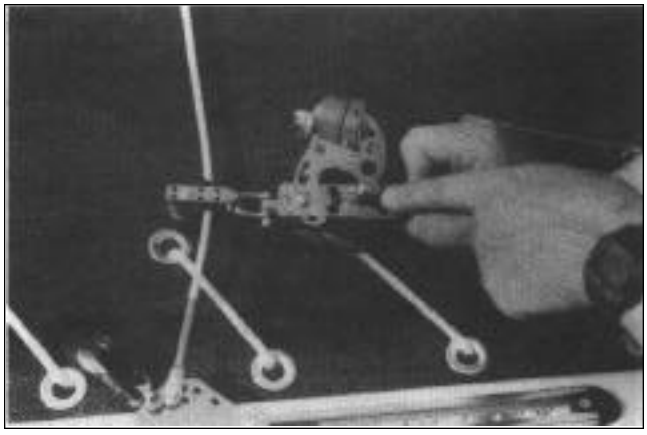
The jib blocks have a ratchet which can be turned off and on by using the button on the side of the block.



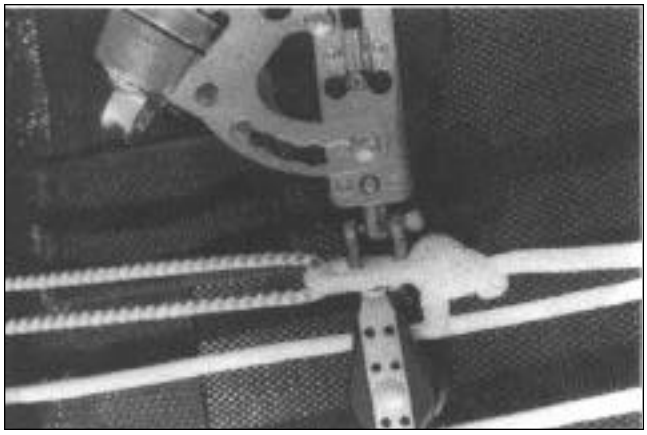
Tie each 1/4" x 8 1/2' line completely around the jib block shackle – not through.

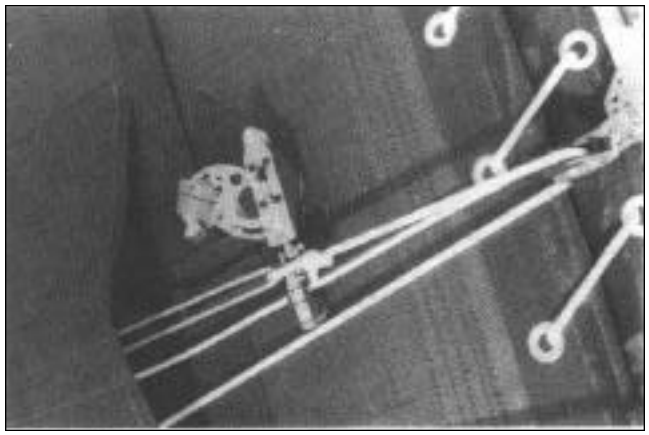


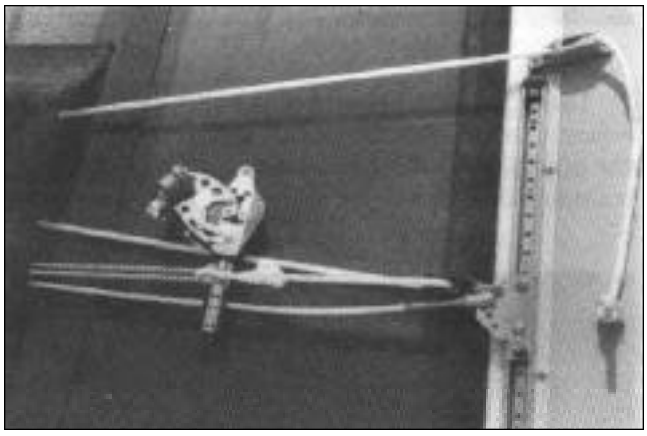
Lead the line around the bullet block on the adjuster plate and through the aluminum cleat on the opposite side of the boat leading line through the trampoline sock.



Lead the shockcord through both loops in the lines around jib shackles and tie shockcord together. Slide the knot into the sock to hide from view.

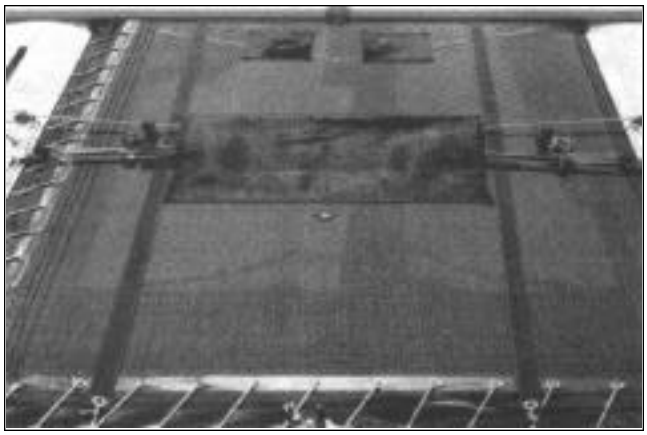






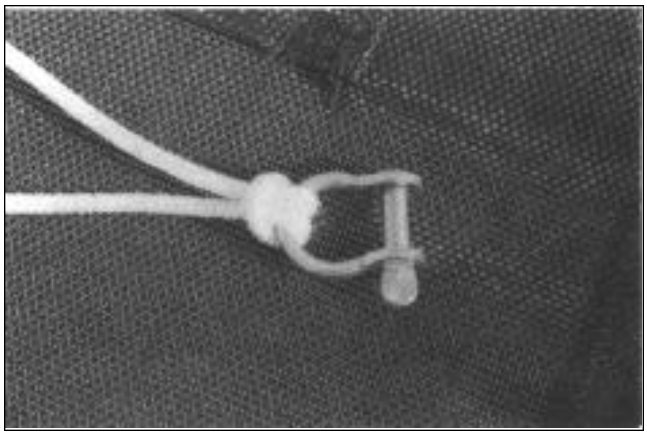
One side of 4-way system completed.

Entire 4-way system completed.

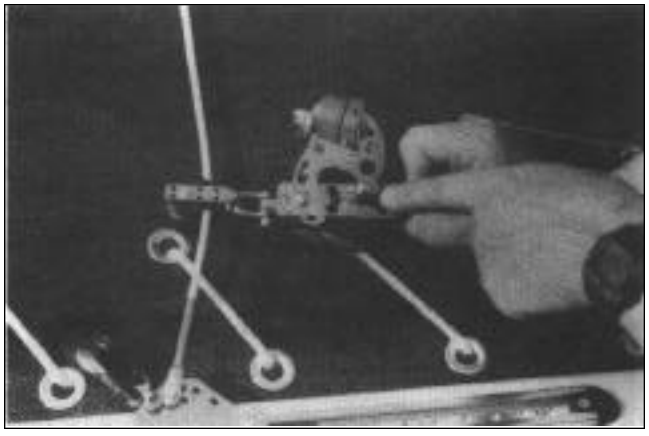


JIB SHEET

Tie a 1/4" shackle to the middle of the 3/16" x 6’ line provided.



Tie the small jib clew blocks to each end of the line using a small bowline. Thread the 5/16" x 33’ jib sheet line by tying off one end to jib ratchet block with a bowline. Thread through small jib clew blocks, through cleat of jib block, across trampoline and through opposite jib block in opposite direction. Jib sheet should be one continuous line.



RUDDER SYSTEM

Remove cradles out from under hulls and peel off protecting paper from Prindle logo on hull.

Open rudder box, it should contain: left & right rudder castings with tiller arms and complete workings installed, and two rudder blades with lock pins attached.

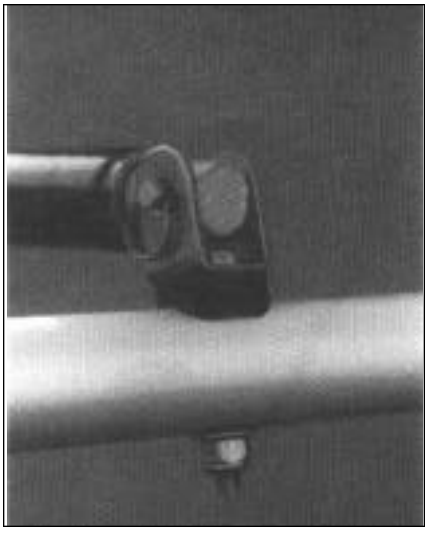
CASTINGS

To install rudder castings onto transom, make sure Prindle insignia is on outboard side. Remove cotter key and pintle from casting. Line up casting with gudgeons on transom and reinsert pintle through gudgeons and casting.

TILLER CROSSBAR

To attach tiller crossbar to tiller arms, remove 1/4" bolt, washer, and lock nut from end of tiller arm. Place tiller crossbar over tillers with large hole at end facing up and end cap pop rivet facing aft. Drop 1/4" bolt down through crossbar, putting washer between tiller crossbar and tiller arm. Insert 1/4" bolt through hole in tiller arm and put lock nut on end. Make sure lines inside tiller go on either side of bolt, do not cross them. Do not put the nut on the bolt at adjuster end of crossbar until rudders have been aligned (instructions later).

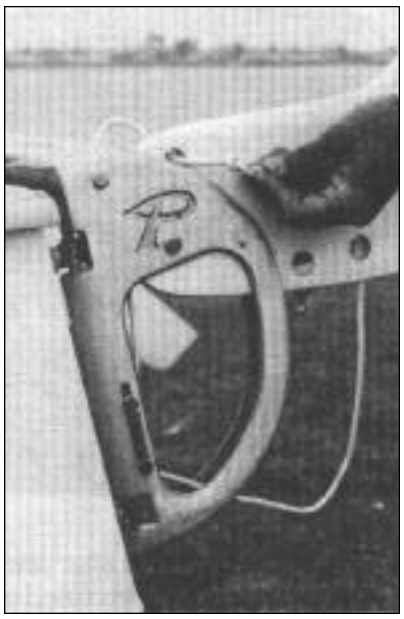
TILLER EXTENSION



Remove lock nut from end of tiller extension. Attach extension to tiller crossbar and reattach lock nut.

Tiller extension should be able to touch trampoline easily. If it does not, the tiller crossbar has been installed backwards.

RUDDER BLADES



To install rudder blades into rudder castings, untie ends of downhaul and uphaul lines in castings, but do not unlace. Remove 1/4" bolt with lock nut. Place rudder blade between casting with lock pin forward. Reinstate 1/4" bolt through casting and 1/4" hole in rudder blade. Replace lock nut and tighten until rudder will just fall by itself. Do not over-tighten as this will restrict rudder movement, too loose and rudder will be sloppy in casting. Thread downhaul and uphaul lines into rudder blade and tie off ends with a figure eight knot. Make sure the ends do not extend beyond the edge of blade. Follow same procedure on both blades.

RUDDER LOCK BOLT

The rudder lock bolt is on the forward edge of each rudder blade. It is necessary to adjust this bolt to obtain proper helm. Making the bolt longer produces more weather helm (heavy steering) and shortening the bolt decreases weather helm (easier steering).

ADJUSTING HELM

We recommend the following method for adjusting the rudders before the boat is sailed.

Place boat so there is clearance to lower rudders and lock down. Take a short batten or yardstick and lay the straight edge flush against the transom. Adjust the lock bolt so that the forward button edge of the rudder is about 1/4" to 3/8" forward of the forward edge of the batten. (Pull rudder back lightly to pull out any slop). 1/4" to 3/8" forward is a good starting point, further adjustment may be necessary for personal preference.

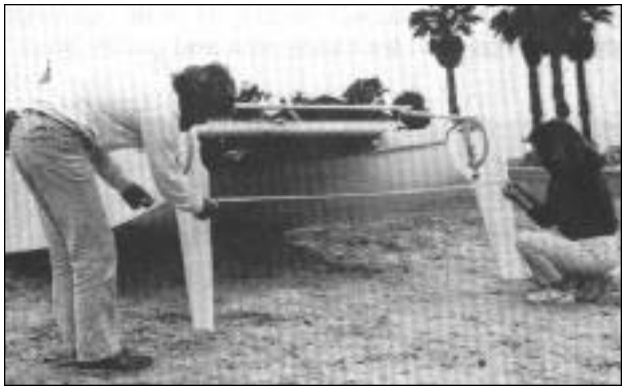
Note: As the mast is raked aft, the rudders must be raked forward to balance helm.

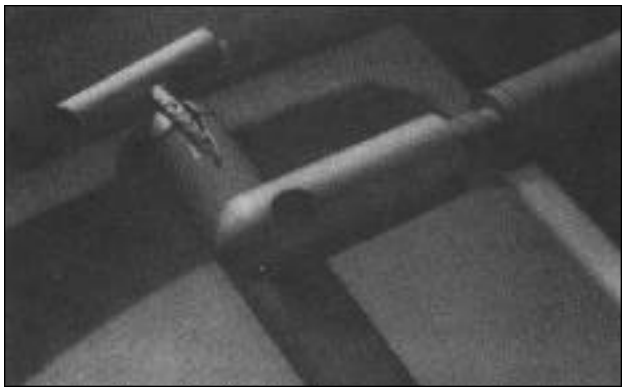
RUDDER ALIGNMENT

Lock both rudders down. Measure 20" up the leading edge of rudcder and mark this measurement. Do the same on the trailing edge.

Turn the rudders so they are pointing down the hull as if sailing straight ahead.

Measure from the front edge of one rudder blade (20" up) to the centerline of the front edge of the other blade. Do the same with the trailing edge.





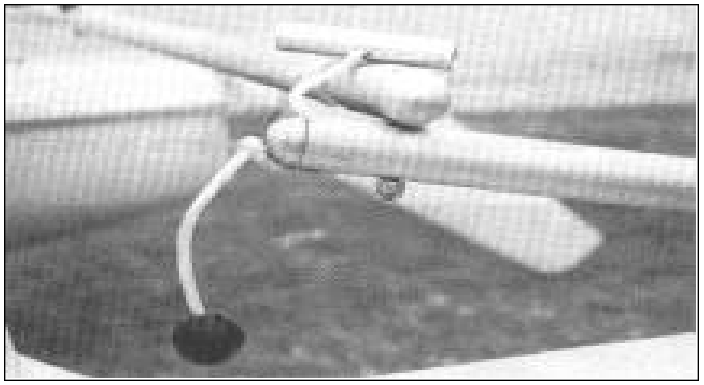
If the distance between the trailing edges is greater than that of the front edges; lengthen the tiller adjuster by unscrewing it.

If the distance between the front edges is greater than that of the trailing edges; shorten the tiller adjuster by screwing it in.

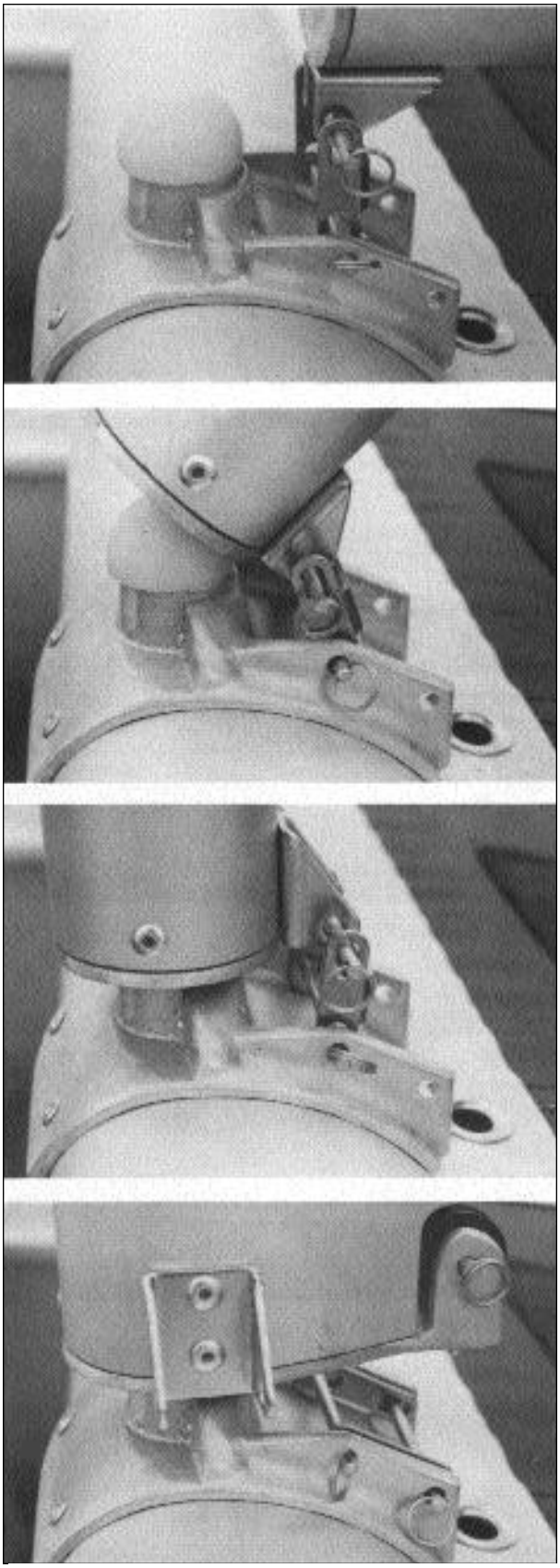
One complete turn is 1/16 of an inch.

Attach adjuster end of tiller crossbar to tiller.

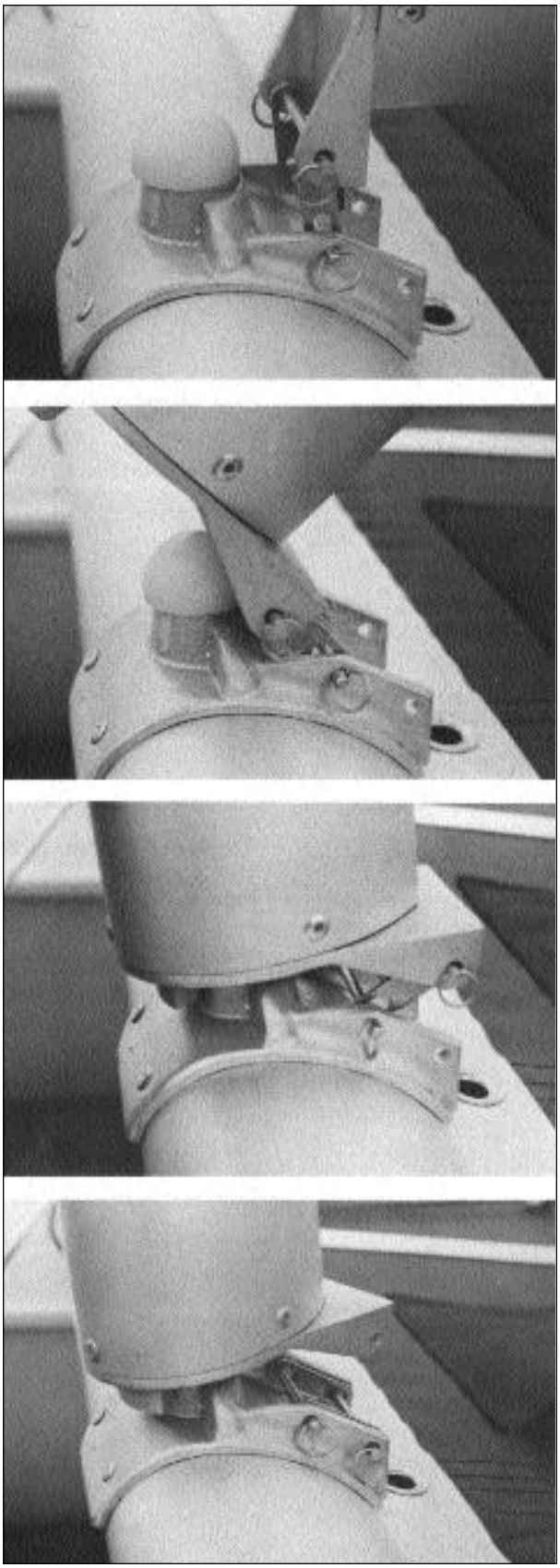
Example: if the distance between the front edges is 86" and the distance between the trailing edges is 86-1/2"



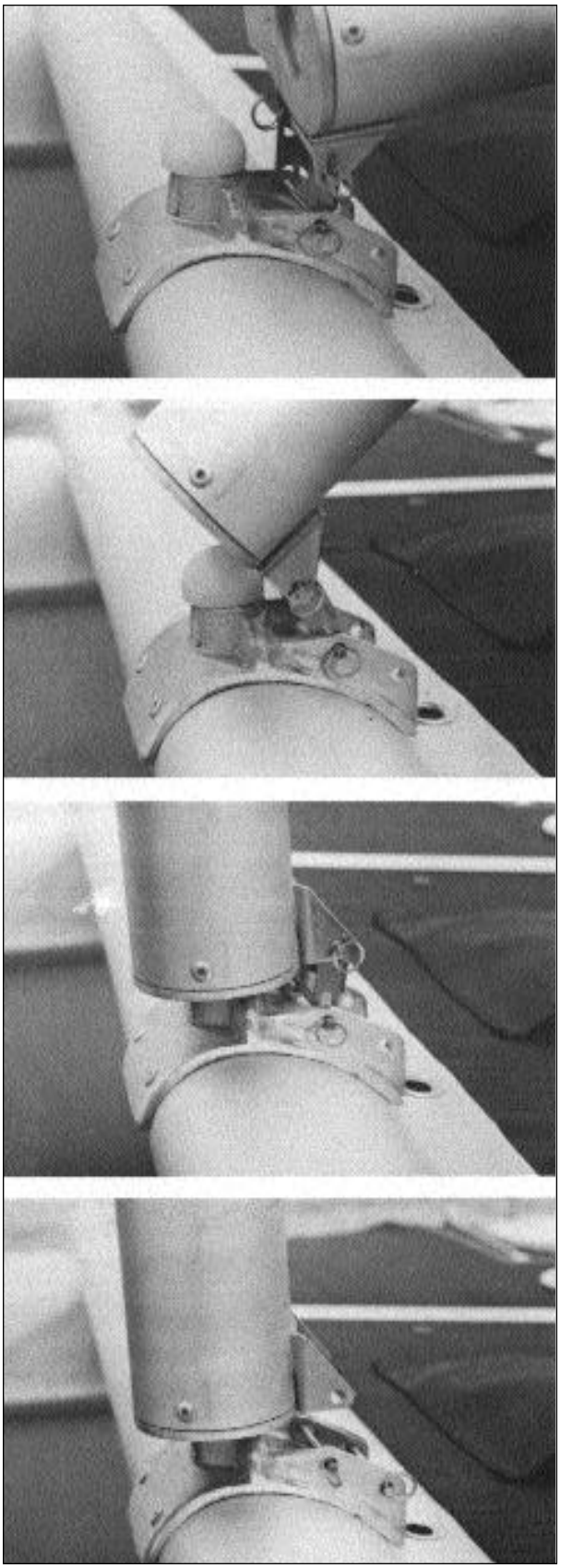
CAUTION!!!! Check for overhead wires before raising mast. A mast which comes in contact with electrical powerlines can cause serious injury or death.



Prindle 15 mast step hinge in use

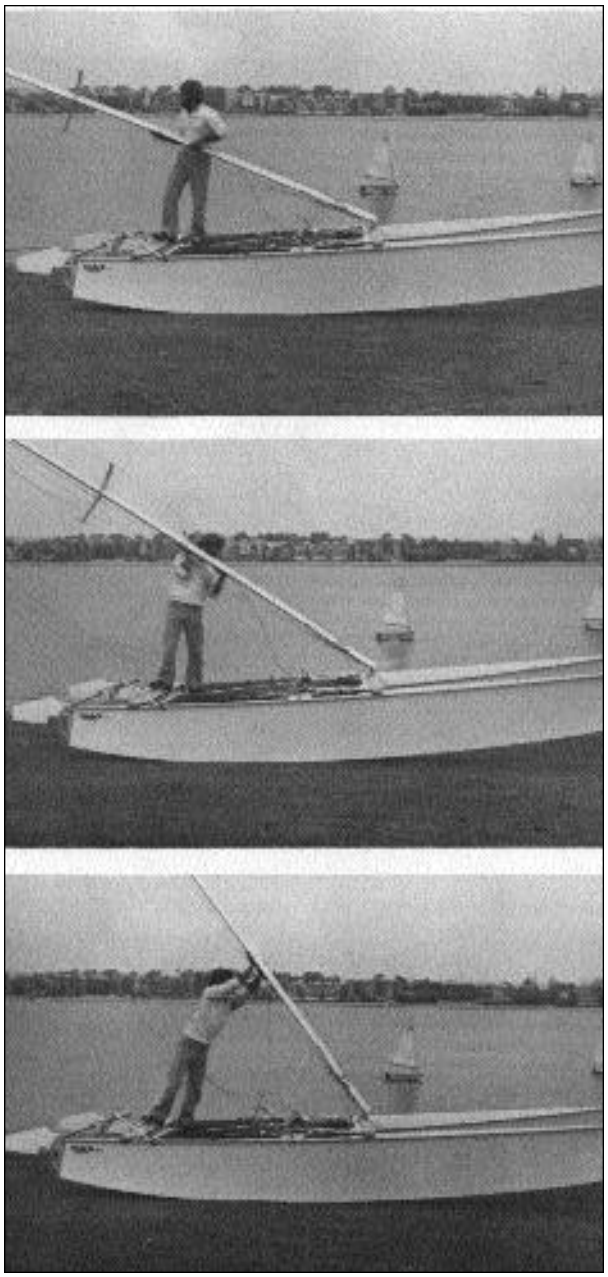


Prindle 16 mast step hinge in use



Prindle 18 mast step hinge in use

Stand on trampoline with one foot on rear crossbar to steady yourself.

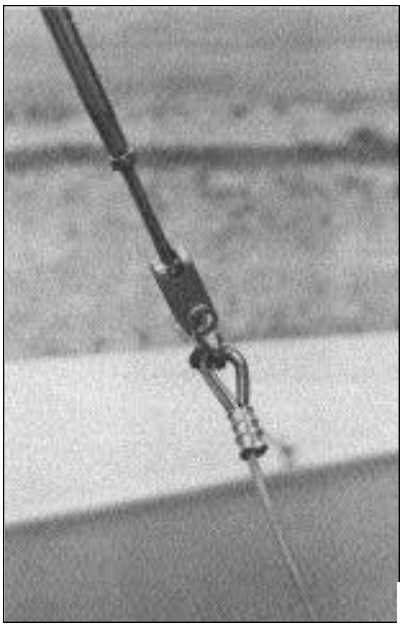


Raise the mast to your shoulder and walk forward with it while extending arms over your head until the mast is held by the side shrouds.

Attach the forestay to the 1/4" shackle holding the bow bridle wires together. After this initial rigging you can leave the forestay turnbuckle preset.

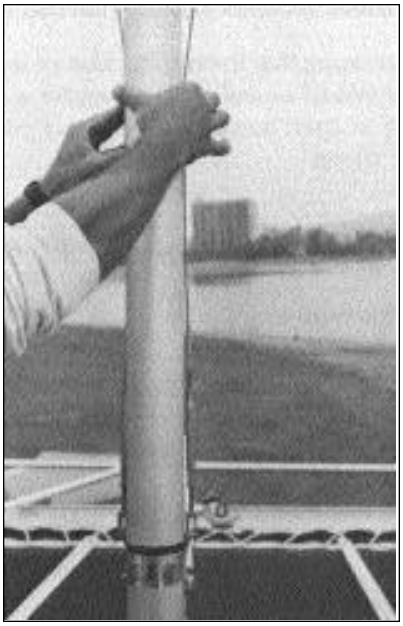
Tighten turnbuckle until mast is raked slightly aft of straight up. See Performance Tuning section for optimum mast rake suggestion. If the shrouds are in one of the top holes the rig will be a little loose.

After hoisting the mainsail we will explain how to tighten the rig., Use a wrench or pliers to tighten the nuts against the turnbuckle barrel. This will help keep it from unturning.



NOTE: Make sure to tape the turnbuckle barrel and nuts to prevent them from loosening.

Diamond Wires



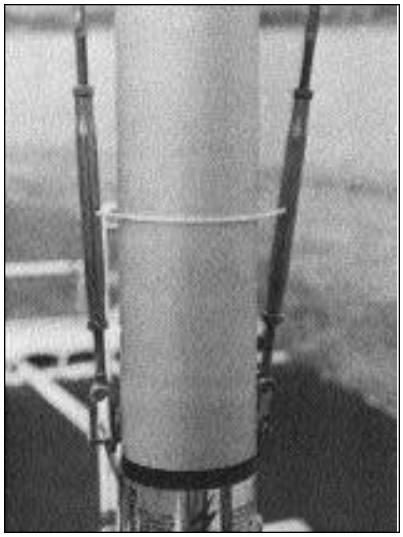
Prindle 18: Adjusting the tension of the diamond wires should be done with care. Before the sails are hoisted, but after the mast has been stepped; adjust both diamond wires to the same tightness. If one is looser than the other your mast will bend more on one tack than the other.

Push both wires towards the mast with equal tension at the same time. The wires should touch the mast at least 12" above the lower attachment point but not more than 20" above.

If the diamond wires are too tight, your mast will not bend and undo strain will be put on these wires.

WARNING: *If the diamond wires are too loose the mast could break under high pressure loads.*

Be sure to tape the locking nuts on turnbuckles after you have adjusted the wires so that they will not unturn. SAILING NOTE: The looser the diamond wires are the more the mast will bend and the flatter the sail will become (and vice versa).



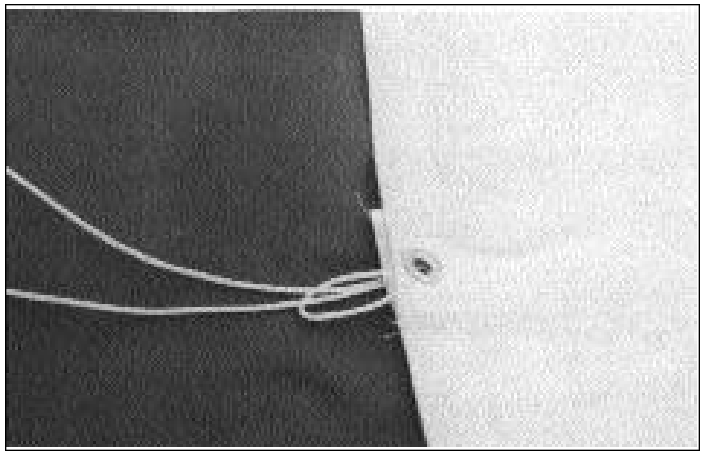
A way to insure that the turnbuckles on mast do not loosen is to thread a small line (batten tie) through the center hole in each barrel, tying a knot on the back side of the barrel.

SAILS AND BATTENS

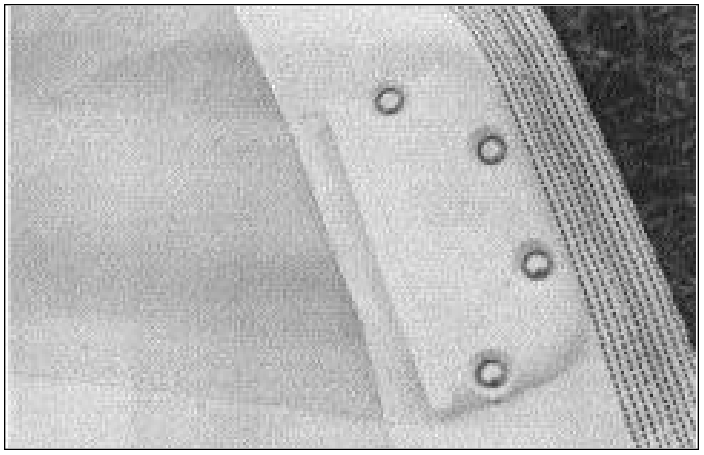
Mainsail battens

The Prindle mainsail has a batten between each panel of cloth. The longest one is the second one up from the boom. The rest go from long to short as you progress up the sail. The 15 and 16 each have nine battens, the 18 has 10.

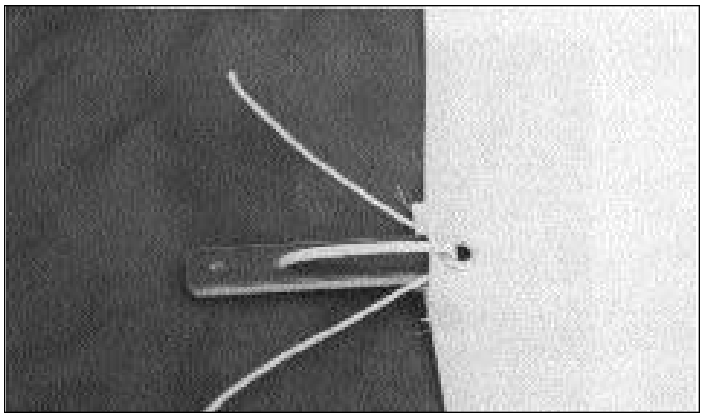
Remove batten string ties from clew of mainsail.



Fold batten string in half and loop through batten grommet on leech of sail.

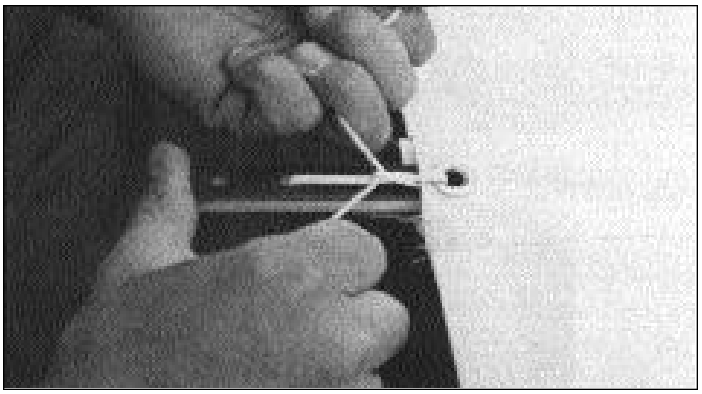


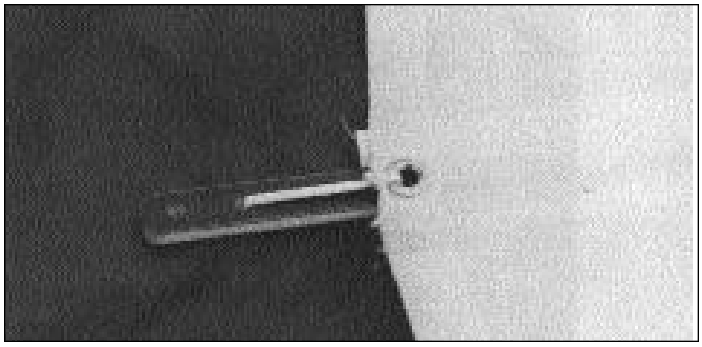
Insert tapered end of each batten (foam core) or the end with rounded edges (fiberglass) into batten pockets making sure each batten fits into the pocket end protector at forward edge of sail. Put plastic caps on aft end of fiberglass battens.



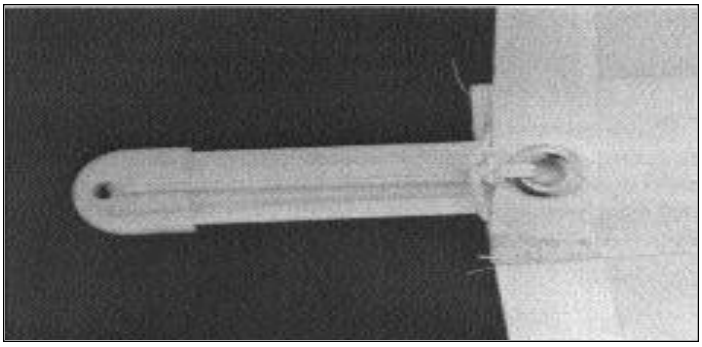
Lead string up through either hole in foam batten or through end cap and down through top grommet and tie an overhand knot (tightly) while pushing batten into sail with thumb.

Push batten tight enough to eliminate all wrinkles in batten pocket if using fiberglass battens. Foam battens should be tight enough to just “flop” from side to side.





Finish tying string with a square knot and tuck loose ends into batten pocket.



Finished tie on fiberglass batten.

Hoisting the mainsail

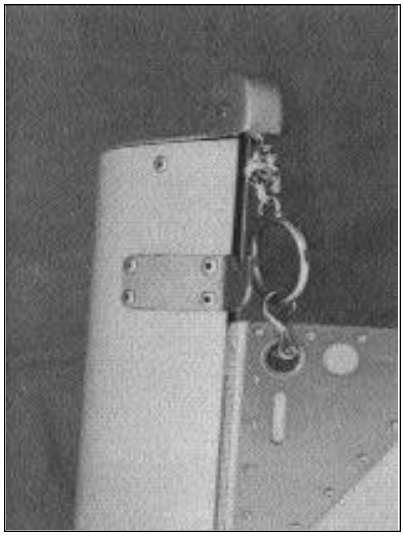
Face your boat into the wind when raising or lowering your sails. Lay the mainsail to the batten ends will not get caught on the tiller crossbar.

Prindle 15 & 18: Attach the twisted shackle to the main halyard ring. NOTE: The halyard should follow the curf of the mast and not wrap around the hook at the mast-head.

Attach the twisted shackle to the head of the mainsail and place forward edge of sail into curf of mast.

With one hand, feed the sail into the curf and pull on rope tail of halyard (exiting at base of mast) with the other.

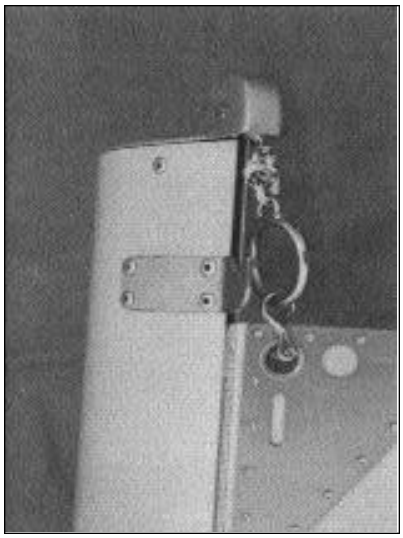
Make sure the mast base sheave, or roller, spins freely while raising the sail. If it does not, you may need to file the inside of the mast base casting.

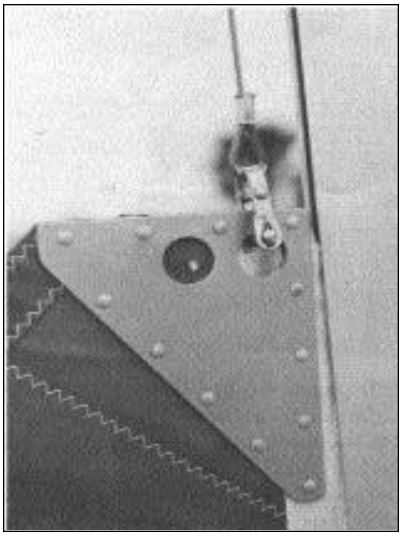


When the sail reaches the top of the mast, you must lock the ring on the hal-yard line to the hook at the head of the mast. To do this, pull hal-yard until the ring is above the hook.

Rotate mast (push rotator) towards the starboard hull) so hook is inside ring and pull down on the tack of the sail gently until the ring locks onto the hook.

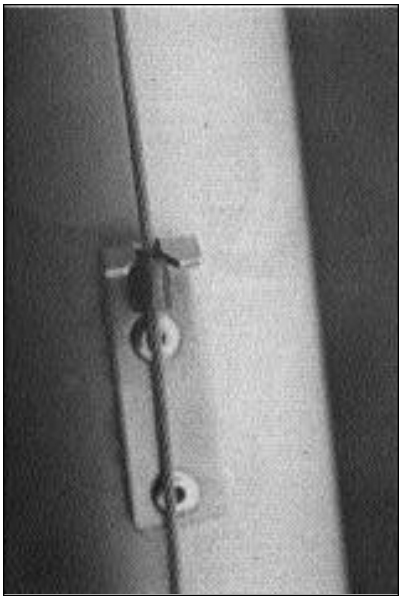
Coil the extra main halyard line and store in one of the pockets on the trampoline.





Prindle 16: Attach main halyard shackle into hole at head of mainsail.

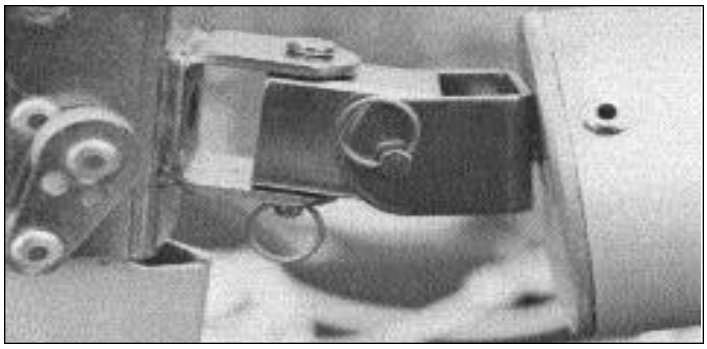
Place forward edge of sail into curf of mast. With one hand, feed the curf and pull on rope tail of halyard with the other. Pull from directly forward of mast and not off to either side. This helps to prevent halyard from jumping out of mast head sheaves.



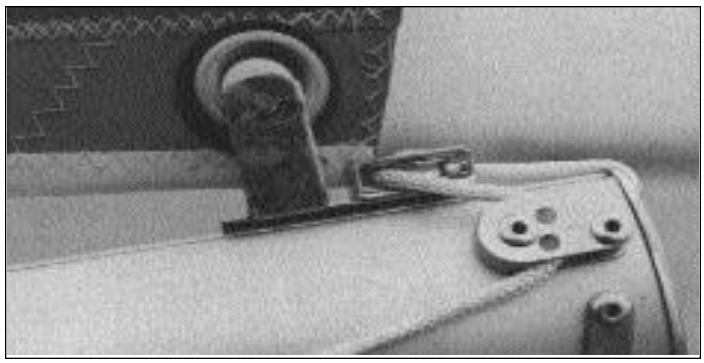
When the sail reaches the top of mast, you must secure the second metal stop on the halyard wire into the halyard lock on the mast. DO this by leading wire between teeth on lock and pulling down on sail to put tension on the metal stop. The other stop, further down on the halyard wire, is for a reefed main only.

Cleat main halyard off and stow extra line.

Boom

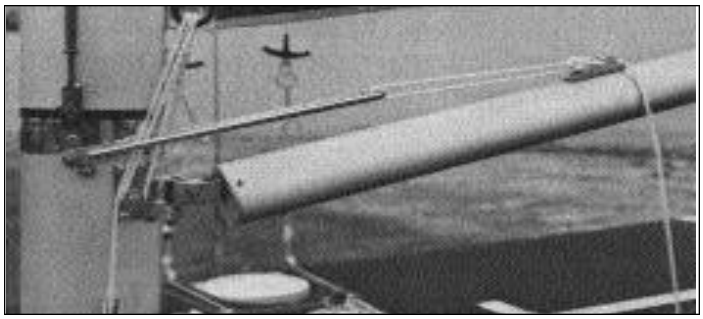


Remove clevis pin from gooseneck assembly attached to forward end of boom. Connect boom to the bracket on the mast using this clevis pin and cotter ring.



Remove clevis in from outhaul car on aft end of boom and lift boom to aft end of mainsail. Clew ring of sail goes in between sides of outhaul car. Reinsert clevis pin through sail and outhaul car. Install cotter ring in end of clevis pin.

Mast Rotator
(previously installed onto mast)



Tie rotator line 3/16" x 5') to fairlead built into the aluminum clam cleat, down through the eye in the rotator wishbone and back through the cleat. This provides a 2:1 purchase for adjusting mast rotation. 45 to 75 degrees rotation is considered normal for most sailing.

Downhaul

Tie downhaul line (3/16" x 7') to tack ring of mainsail and lead:

1) Through pulley on gooseneck on port side of mast

2) Through tack ring on sail

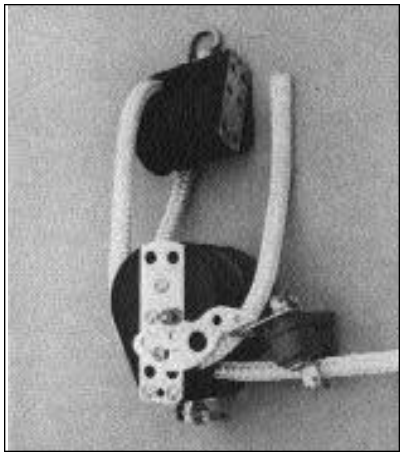
3) Around pulley on starboard side of mast

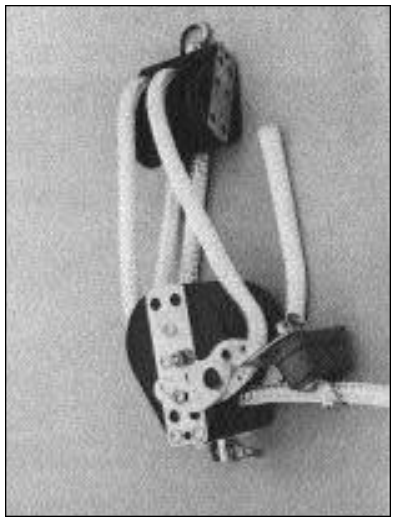
4) Back through tack ring and down to cleat

Prindle 15 and 18 Note: Lines are lead through inside of rotator wishbone. A method used by many racers to increase purchase is to tie the line through "U" bracket on gooseneck base first, lead it up through the tack ring, and then follow steps 1 to 4.

Mainsheet and Traveler

Prindle 15 & 16:
To thread mainsheet blocks (6:1 purchase) lay blocks on a flat surface with the lower ratchet block facing right and the upper block on rollers as shown. Feed line through cleat and middle roller (ratchet) of lower block and lead:





1) Through first roller of upper block

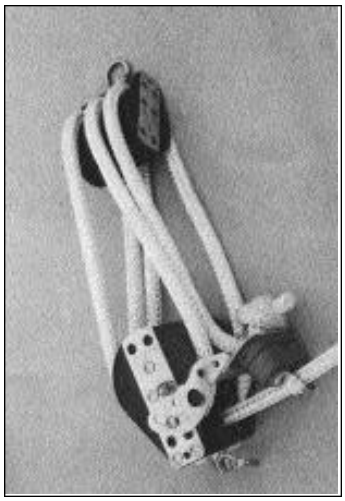
2) Up through outside roller of lower block

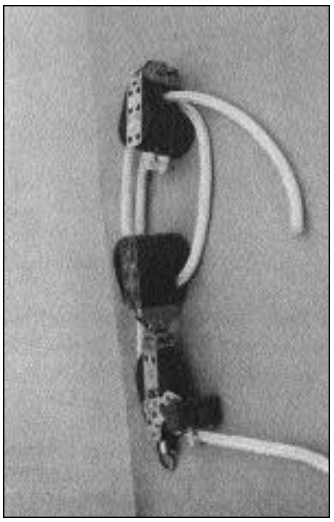
3) Down through middle roller of upper block

4) Up through inside roller of lower back

5) Through last roller of upper block

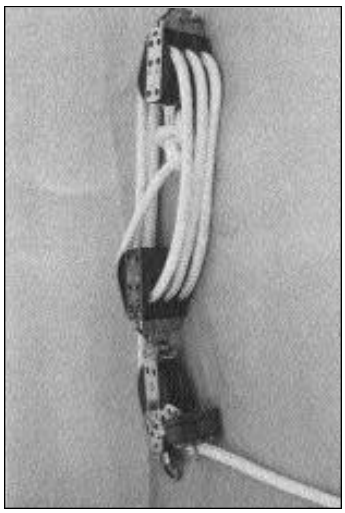
6) Down through fairlead on cleat base of lower block and tie off with a single overhand knot.





Prindle 18:
To thread mainsheet blocks (7:1 purchase) lay blocks on their sides on a flat surface. Feed line away from you through cleat and ratchet roller of lower block and lead:

1) Towards you through bottom of roller of upper boom block



2) Away through bottom roller of lower block

3) Towards you through top roller of upper block

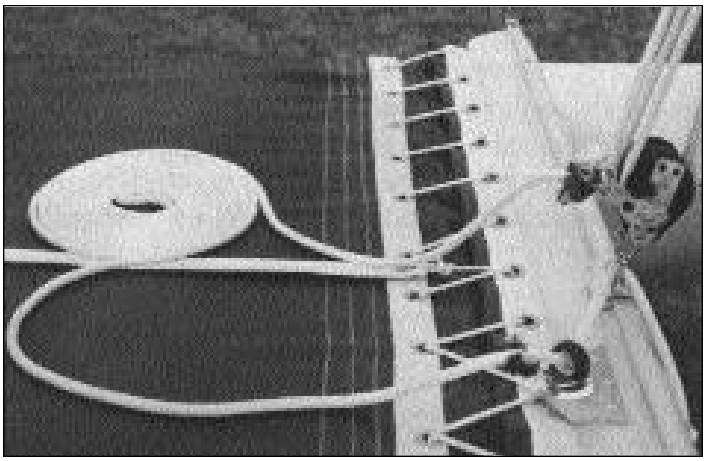
4) Away through middle roller of lower block

5) Towards you through top roller of upper block

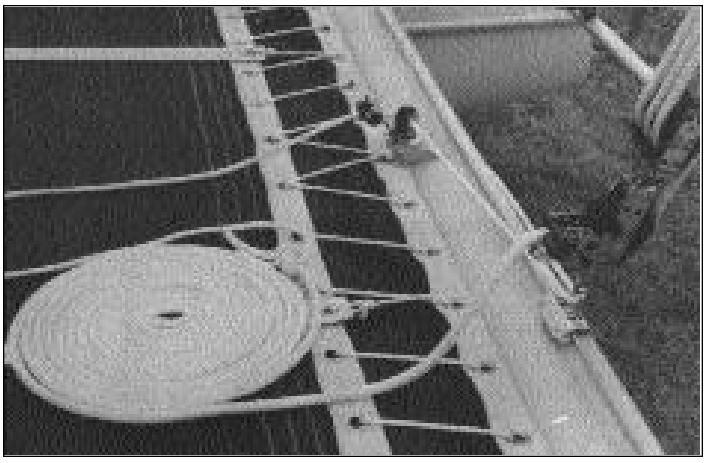
6) Away through top roller of lower block

7) Tie to becket of upper block with bowline

All boats: Install upper block to block hanger on boom with 1/4" shackle. Install lower block to traveler with 1/4" shackle.



Prindle 15 and 16:
Thread loose end of mainsheet through traveler cleat and fairlead (mounted on swivel pedestal, rear crossbar), traveler car, and pad eye. Tie off with figure eight knot.



Prindle 18:
Tie or splice 5/16" traveler line to loose end of mainsheet and thread same as 15 and 16.

Complete mainsheet and traveler on Prindle 18

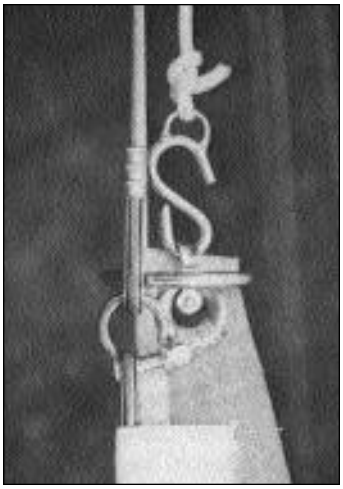
Complete mainsheet and traveler on 16 (same as 15)

Tips on splicing from Leigh Martin: Cut the bitter end of the mainsheet off with a new single edge razor. Pull out 8 to 12 inches of the center core and cut with a hot knife (or tape, cut with a razor, and burn end). Put the end of this core up to end of traveler sheet and carefully sew them together, end to end with no overlap using a good, heavy dacron-polyester thread. Feed the core and traveler sheet back into the mainsheet cover until it is all smooth. Sew the traveler sheet into the mainsheet cover for the last 8 to 12 inches. This can be done neatly by stitching with the weave of the braid so that your stitches do not show. Make sure the stitches go through the middle of the new core (traveler). Complete it by turning end of the mainsheet cover over the traveler sheet.

Jib

Prindle 16 and 18 only:
Tie "S" hook to the aft half of the jib halyard. This can be left on permanently. Attach "S" hook to the head of the jib with a 3/16" shackle. Hook opening must face toward mast.

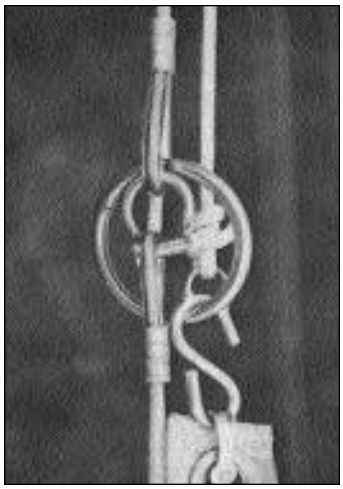
Start the zipper around forestay wire and jib halyard line. The jib halyard is internal in the luff of jib.

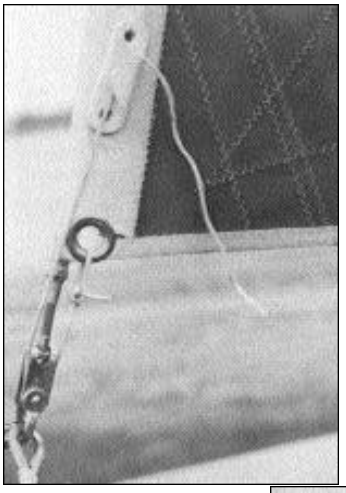


Hoist jib up, closing sipper as you do until "S" hook just passes ring.

Slowly pull the jib back down at the tack (forward lower corner) until the hook is locked in place. Note: the opening on hook should be between1/4" to 3/8" for easiest operation.

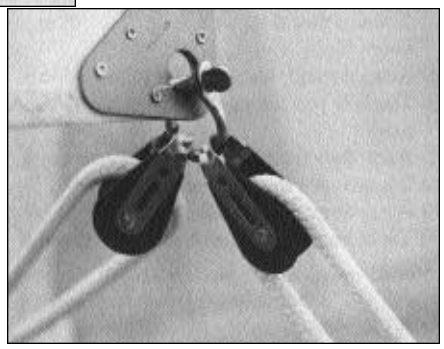
Unlock the brummel hooks from each other and store extra halyard length in one of the pockets on the trampoline.

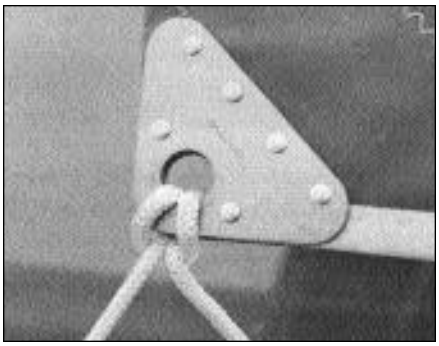




Lead jib downhaul line around shackle pin and cleat downhaul line snugly into cleat on jib tack.

Prindle 16 only:
Attach two small pullies (attached to jib sheet line earlier) to foot of jib by leading each one around the front of the mast, one from each side. Put a 1/4" shackle through grommet in lower aft corner of jib (clew) and reattach pullies with

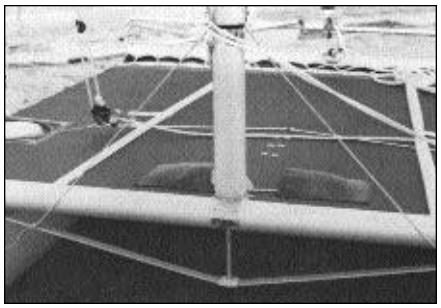




shackle pin. Make sure that these lines are not twisted. Pull up slack from line leading between the jib sheet blocks and trampoline.

Prindle 18 only:
Tie jib clew blocks to sail clew rather than with shackle. Use one of the 3/16" x 3' 7" lines. Tie one block to each end.

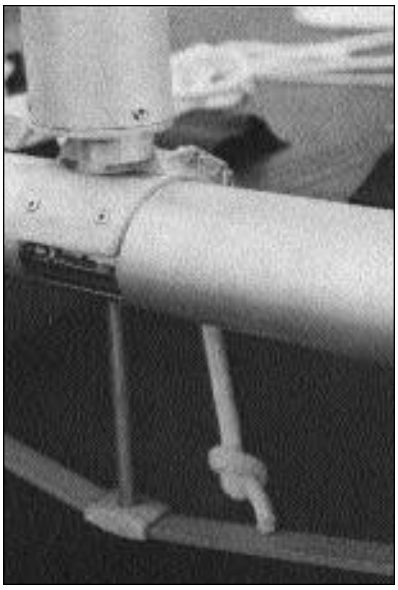
Jib Sheet and Jam Preventer



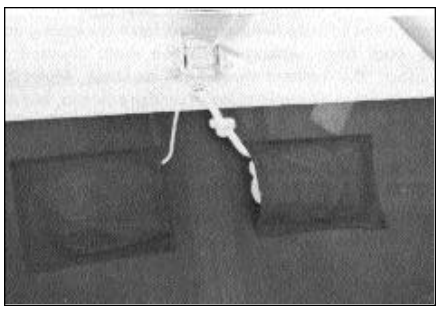
Using the extra 7' piece of shock cord supplied attach the center to the mast and tie each end to dolphin striker bar on opposite sides of mast. Be sure the jib sheet is lead outside shock cord. This will keep the jib sheet from catching under mast base.

Rigged boat ready to sail.

Righting Line



It is recommended that you always carry a righting line on your boat. A grommet and pouch are on the trampoline to facilitate this. You will need a line at least 14' long and 3/8" or 7/16" in diameter. Tie a figure eight knot about 9" from one end. Insert the tail down through the grommet in tramp by the mast and tie another figure eight knot on this end. You might also find it useful to tie knots on the line every few feet so your wet hands do not slip when righting the boat. Coil the line and store it in a pouch until needed.



Tightening the rig tension

After the boat is completely rigged with sails up and mainsheet connected, it is time to tighten the rig. You should not attempt to do this by yourself or if it is windy until you have done it several times.

Turn the boat until the wind is blowing from a 45^{o} angle to the bow. Ease the traveler out to the lee side and sheet the main in tight. Have your crew sit on the trampoline to keep the mainsheet from uncleating and the boat from tipping. With the main sheeted to leeward, the leeward shroud will be loose. Move the shroud down a couple of holes on the adjuster, but not all the way down. Replace clevis pin and ring. Loosen mainsheet.

Turn the boat so the wind is coming from the opposite side. Ease the traveler out to what is now the lee side and sheet in. The new leeward shroud will be loose. Move the shroud down to the corresponding hole in the adjuster as the first shroud. If the rig is still loose, move the shroud down one or two more holes and repeat with the other side until the rig is fairly tight and both shrouds are in the same hole on the adjuster.

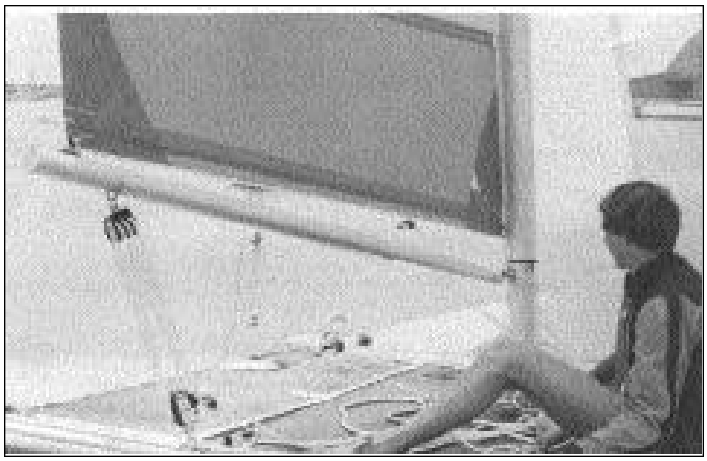
It is possible to over-tighten the rig which will make the mast hard to rotate.

When you take the boat apart, be sure to loosen one side only before taking the main down. By leaving one shroud in the correct hole, you will only have to tighten one side next time you go sailing.

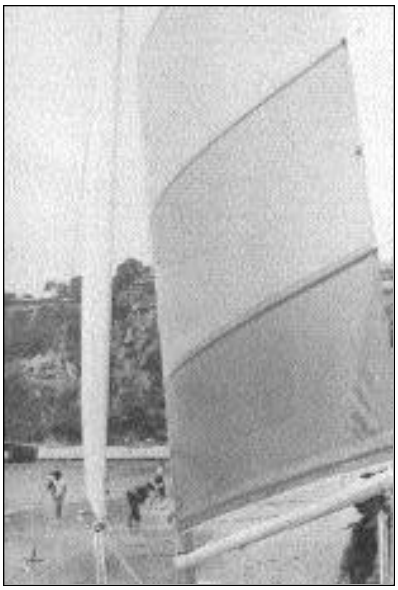
If you are not happy with the mast rake you have, simply lengthen or shorten the forestay turnbuckle. Be sure to leave at least 10 complete threads into each side of the barrel.

SECTION II: Sailing

Sail Trim
To Weather



The main traveler should be centered with the main and jib sheets in snug. Be careful not to pull the sails in too tight. If the main is oversheeted (too tight), the mainsail will be too flat and the boat will not move very fast.



If the jib is oversheeted it will stop the air flowing between the leech of the jib and the mainsail. This gap (slot) between the jib leech and the mainsail should be about 12 inches near the top of the jib.

The jib tell-tale on the leeward and windward sides should be streaming back. If the windward tell-tale on the jib is flopping forward you should head the boat downwind a little. If the leeward tell-tale is flopping forward, you should head the boat into the wind a little, or if you do not want to head up any further, let the sail out a little.

Reaching

The main traveler should be set a few inches from center with the main sheet snug and the jib sheet slightly looser than used when going to weather. This will allow the distance between the main and the jib to increase. Both sails should be sheeted in so that both the leeward and windward tell-tales are streaming back.

Downwind

Let the main traveler all the way out to the end of the crossbar and sheet the main loosely. Do not let the main out far enough to rub against the shrouds if at all possible. Trim the jib sheet loosely trying to keep the windward and leeward tell-tales streaming back.

If your boat is equipped with a barber hauler, see Section V - Tuning for Performance for instructions regarding its use.

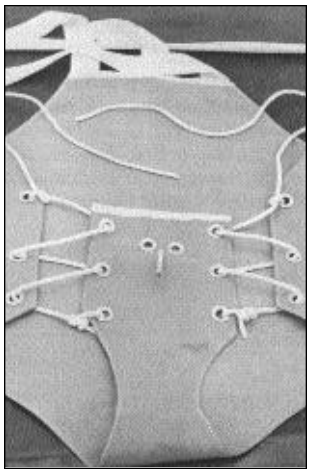
Downhaul Systems

The luff of both the main and jib should be pulled down tightly to pull all the wrinkles out when sailing. You have to be quite strong to over-downhaul the mainsail, so give it a hard pull. You can easily over-tighten the jib downhaul, so just pull hard enough to get wrinkles.

Notice the diagonal wrinkles in the luff of both the main and jib. Both sails should be downhauled until they disappear.

TRAPEZING

Lacing the Harness



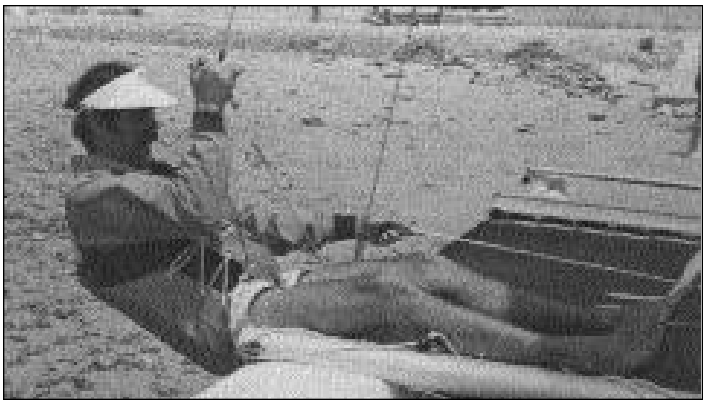
Using bowlines, tie each of the lines supplied onto the bottom inside grommets. Lace back and forth loosely and tie a half hitch at the top outside grommets.

Put the harness on. It should be slightly loose. Most people find a tightly laced harness uncomfortable. Slip the webbing over your head. Feed the lines through the webbing grommet from the backside, then feed one through each backside of top grommet near hook. Tie ends together using an overhand knot. Do not use a square knot. The webbing over your shoulders should fit tightly. The tighter it is the more it will support your back and shoulders.

Trapeze Positioning
We recommend that you practice going out on the trapeze on shore before you try it while sailing.

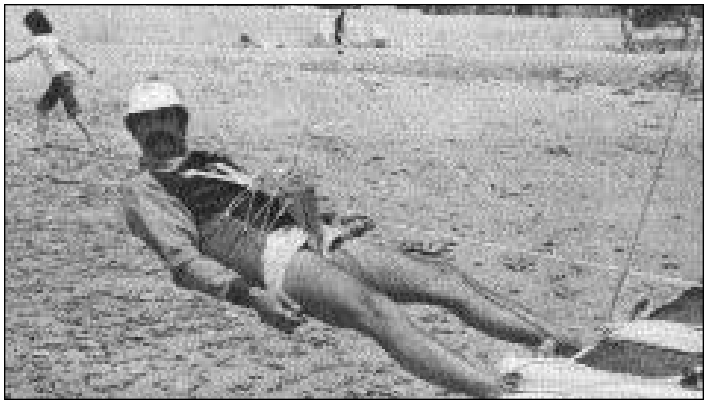
Before hooking up, pull the dog bone down and see if it will reach the trampoline. The lowest ring should almost reach the outside edge of the trampoline. If it does not, adjust the length using the height adjuster.

Sit on the side of the hull just forward of the shroud. Pull the dog bone down and hook the uppermost ring onto the harness hook.



Lean back until you are being supported by the trapeze wire. Hold the jib sheet in your back hand.

Bring your forward leg out, put foot on rail.



Now bring your aft leg out and put that foot on the rail. Slowly straighten your legs out, keeping your feet two feet apart. Lean back! Do not hold onto the handle as you could unhook yourself.

When trapezing on a reach, move your weight back on the hull to keep the bows up.

LAUNCHING
Always launch with your bows into the wind. There are two basic wind conditions that will affect the way you launch:

Onshore - (wind blowing from the water towards the land)

Offshore - (wind blowing from the land towards the water)

Before leaving the beach, make sure that the rudders are up all the way, the main traveler is out all the way, both sheets are loose and the hiking stick is on the windward side of the boat.

Onshore

Push the boat off at a 45 to 60 degree angle to the wind until it floats, jump on and sheet in the jib (only) tight. (Do not sheet in the main yet.) This will pull you out at a good angle until you can safely drop your rudders.

As soon as water is deep enough, drop and lock both rudders, bring traveler to center and sheet in main. You're off!

This method can be used when very light offshore winds are blowing. Otherwise use the following method.

Offshore

Look to make sure it is totally clear where you will be backing.

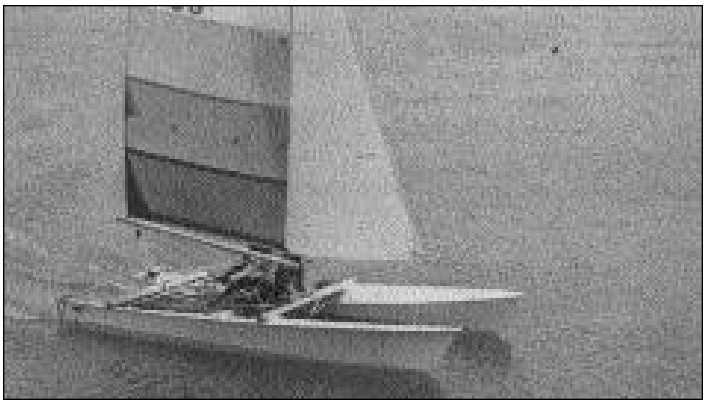
Walk boat out backwards until it is floating. Give boat a big shove and jump onto the bows. Keeping the transoms out of the

water, have the crew hold jib clew out as far forward as necessary to fill jib with air and keep boat moving backwards. Keeping the transoms out of the water will keep the boat moving straight out. When you are far out enough (usually about 100 feet) let the jib go, move to the proper sailing positions, drop rudders down, sheet in both sails and go.

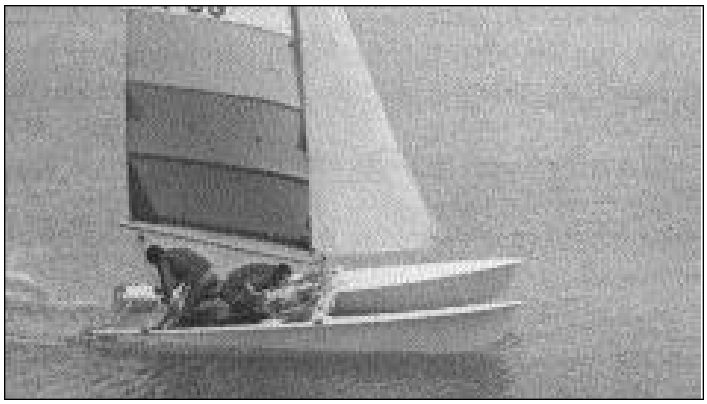
TACKING

Before starting your tack, be sure you are sailing to weather with good speed (sheeted in and traveler centered). Do not attempt to tack while sailing on a reach.

Make a smooth turn to windward using about one half the amount of rudder throw. Turning the rudders too sharply will stall the boat and bring it to an abrupt stop.



When the bows are pointing into the wind, release the main sheet 1 or 2 feet. Leave the jib cleated.



The skipper should now move aft, into the center, and swing the hiking stick to the new side. Do not straighten the rudders out. If you do, you will find yourself into "irons" (boat pointing directly into wind making no headway).

Leave the jib cleated until the boat is on its new heading. When the main "pops" to the new side, release the jib, bring it across quickly and sheet in. Keeping the jib on the windward side is called "backwinding". It helps pull the bows around until your tack is completed.

While the crew is sheeting in the jib, the skipper should be sheeting in the main and moving to the proper position on the wind-

ward side of the boat. Tack is now completed.

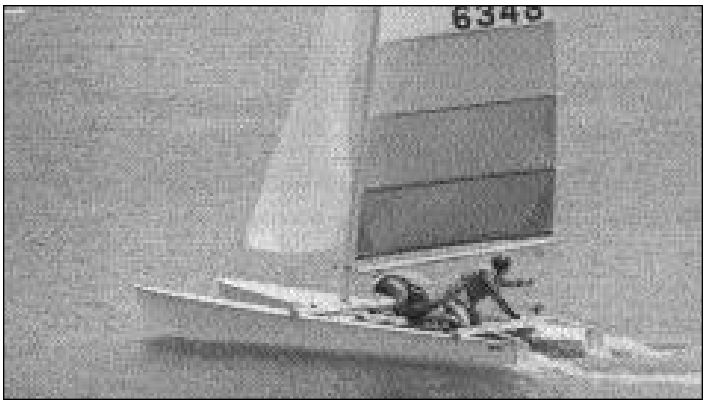
NOTE: *If you end up "in irons" you will start to drift backwards. While sitting on the weather hull, uncleat the main and push the boom to leeward. Backwind the jib and push the tiller away from you. This reverses the rudders and allows the boat to sail backwards. Leave them reversed until the bows are pointed in the direction of a close reach. Release the jib, straighten the rudders and sheet both sails in quickly.*

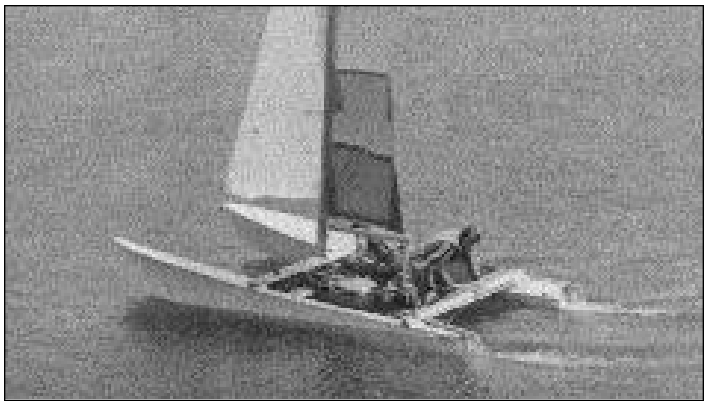
JIBING

When sailing downwind or on a broad reach you must jibe. To do so, first check new direction to be sure it is clear of other boats.

The skipper should move aft and to the center of the boat while turning the rudder about 1/3 of the full throw.

Swing the hiking stick to the opposite side, placing the end aft of the rear beam and forward of the tiller arm. Keep the rudders turned by holding onto the tiller crossbar.





When boat is heading straight downwind, grab the sheets between the main blocks and pull the sail across. BE SURE TO KEEP LOW AS THE BOOM CROSSES THE BOAT.

When the main fills on the opposite side it may "snap" across so be ready for it. Have your crew bring the jib to the new side. Move to the side of the boat and pick up the hiking stick.

BALANCE

Your Prindle Catamaran will sail faster and easier if it is sailed on its "lines" so that the water flows across the hull as it was designed to do.

Note how the transom is almost under water and the bows are very high. The sailors are too far aft - MOVE FORWARD!

Bows are too low and transoms are too high out of the water. Sailors are too far forward - MOVE AFT!

Trim fore and aft here is good, but there is too much weight on one side for the light air. Move the crew to the middle or leeward side.

When balance is proper, the leeward bow will be between 6 and 12 inches out of the water and the weather hull will just touch the water. The idea is to sink the leeward hull deep into the water, thereby using the hull to reduce side slippage.

RIGHTING

Even the best sailors flip occasionally, so prepare your boat for the inevitable. Install a righting line according to instructions in Section I - Assembly.

The boat will lose speed as it raises up on one hull and usually flips over slowly. Sit down on the flat surface of the hull.

Ease yourself down to the bottom hull using the mast as a step.

It is important to get off the top hull quickly to prevent the boat from turning upside down (turtle). Do not jump off the boat as current and wind may not allow you to return to it.

The skipper should uncleat the main while the crew uncleats the jib.

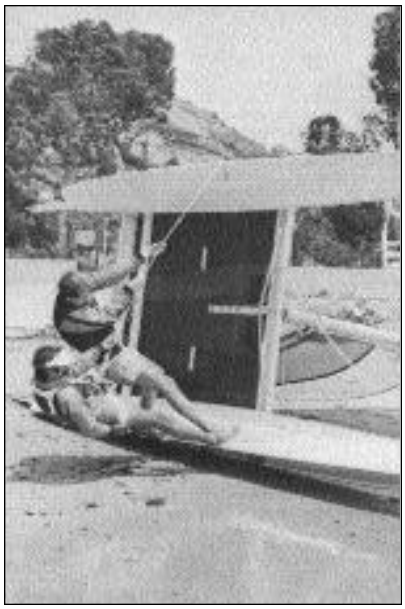
The crew should reach around the front crossbar for the righting line and throw it over the top hull. Make sure the bows are pointing into the wind.

If the mast is pointed into the wind, the boat may flip over in the other direction as you try to right it. To swing bows around into the wind, walk back towards the transom slowly until bows are positioned properly.

Be careful not to shift your combined weight too far forward or aft as this may cause the boat to roll and turn "turtle".

Standing even with the front crossbar, the skipper and crew should grab the righting line and lean backwards. Knots in the line help keep your hands from slipping. If you are single-handing your boat, carry your jib bag on board. Grab onto the righting line, scoop up a bag of water and hold it over your shoulder while leaning back. This extra weight should allow you to right the boat.

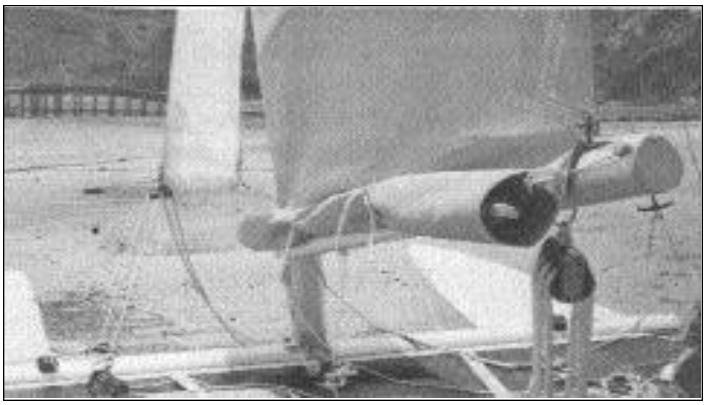
An alternative method is to tie a loop in the end of the righting line and attach the loop to your trapeze harness hook for more leverage.



Once the tip of the mast comes out of the water, the boat will right quickly. Be sure to hold onto the righting line until you can grab the boat and pull yourself up. The boat will now be pointing directly into the wind and moving slowly if at all. Stow the righting line back in the pouch and you are sailing again!

REEFING

Unlock the main halyard and lower the mainsail down about 4 feet. Lock the lower metal stop on the halyard wire into the halyard lock on the mast. The sail should now be about 4 feet short of being fully hoisted. Downhaul the luff using the ring in the reef patches.



Attach the outhaul car to the aft ring. Starting with the bottom batten, roll the extra sail up and tie with two 2 foot pieces of line using the reef points (grommets) in the sail. Do now tie around boom.

Reefed sail on a Prindle 16.

SECTION III:
AFTER SAILING

Loosening the rig

Before you lower your sails, you must loosen the rig tension using the mainsheet and traveler method (explained in Section I - Assembly). With the wind coming from the bow at a 45 degree angle, travel the main all the way out to the leeward corner. With the crew sitting on the trampoline, sheet the main in tight. The lee shroud should become loose.

Move the shroud up to the second to the top hole in adjuster, insert pin and ring and uncleat the main. You do not need to loosen the other shroud. Leave it in the proper sailing position and you will know where to place the loosened shroud the next time you go sailing.

Lowering the sails

Point your bows into the wind. Uncleat the main downhaul and disconnect the boom from the mainsail.

To lower the jib, uncleat the jib downhaul. Rehook the jib halyards together with brummel hooks. Hoist the jib slightly until "S" hook is just above the ring and quickly pull the jib down by the tack.

NOTE: *If the jib does not lock or unlock the first time, try again. Remember the hook must face aft and to hoist the "S" hook just above the ring. Pull down slowly to lock and quickly to unlock.*

Lower the jib and tie the jib halyard at the base of the mast. Use the downhaul cleat for this purpose. Pull the lines tight to keep them from flapping while trailering. Leave zipper open with the zipper car at the head of the sail. If it is allowed to go to the bottom, it may fall off.

Fold the jib in half and start rolling from the middle.

Roll tightly without any folds. If it is windy, put the jib under the hiking strap to keep it from blowing away while you lower the main.

To lower the main on the Prindle 15 and 18, hoist the mainsail up as far as possible and rotate mast away from sail to unhook main halyard. This rotation should be towards the side of the mast that the hook is riveted onto. The object to turn the headboard and ring away from the hook enabling the sail to be lowered past the hook.

NOTE: *The best way to do this is to have one person pull the sail up and rotate the mast using the rotator wishbone while some - one else pulls the clew of the mainsail in the opposite direction than the mast is rotated. The person hoisting the sail lets the halyard go and pulls down on the tack while keeping the mast rotated.*

Once the sail has dropped a couple of inches below the hook, let the clew and rotator go and drop the sail.

NOTE: *Be sure to have a knot tied in the end of the halyard to keep it from going inside the mast.*

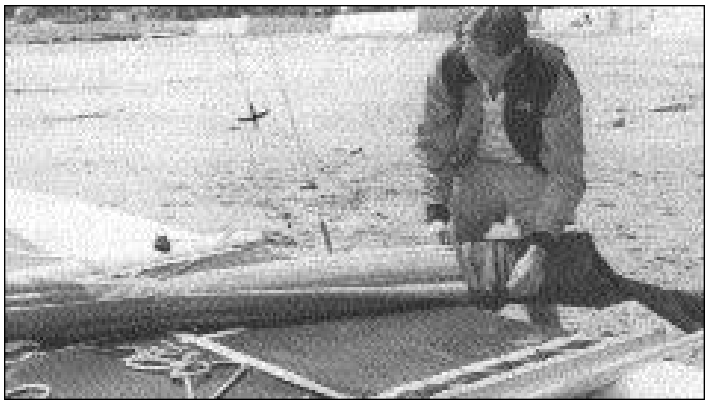
After the main is down, attach the twist shackle to the rotator bar and pull the main halyard firmly and tie off.

To lower the main on the Prindle 16, hoist the mainsail up as far as possible and it should release from the halyard lock. Let the sail drop.

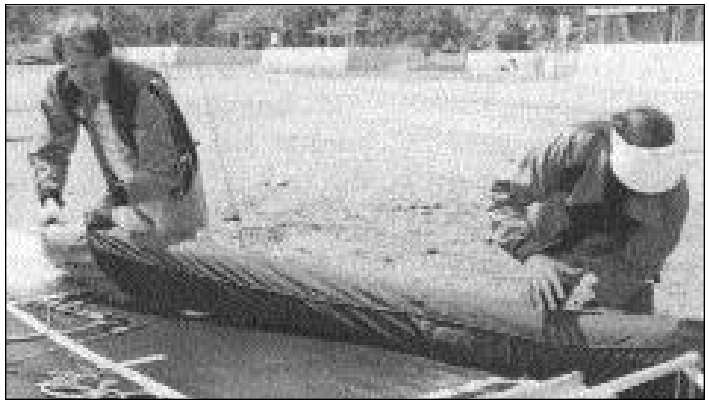
After the main is down, store the shackle in the curf on the mast, pull firmly on the main halyard and wrap the line around the mast (below the shrouds) 3 or 4 times. Cleat off using the main halyard cleat.

Roll the main starting with the second or third batten from the top. Roll smoothly and tightly. Stop when you get to the next to the last bottom batten.

Insert the rolled jib and continue rolling.



Wrap and tie downhaul line around rolled sails.

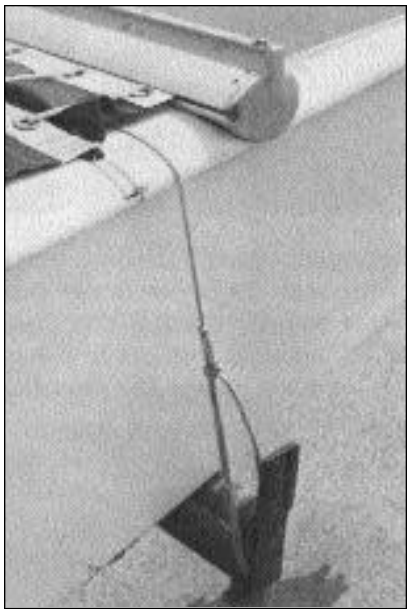


Place sails in long mainsail bag. Your jib bag can now be used to carry other miscellaneous items.

We strongly recommend that you store your sails in this manner rather than folding them as they will last much longer.

Unfasten the lower main block from the traveler car and the traveler line. Tie the outhaul line tail to the lower main block shackle and coil the excess mainsheet. This keep everything from becoming tangled in storage.

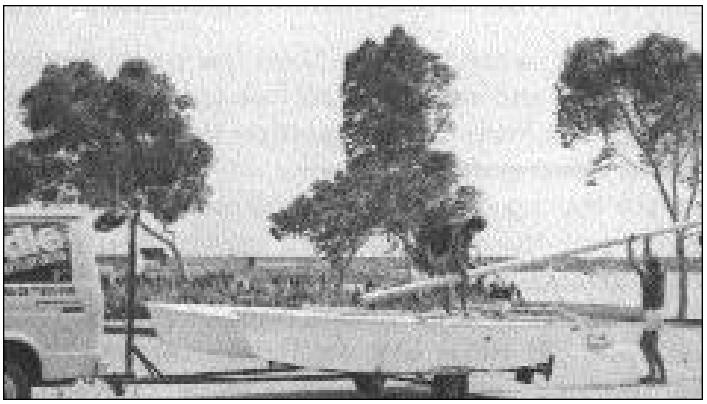
Trailering



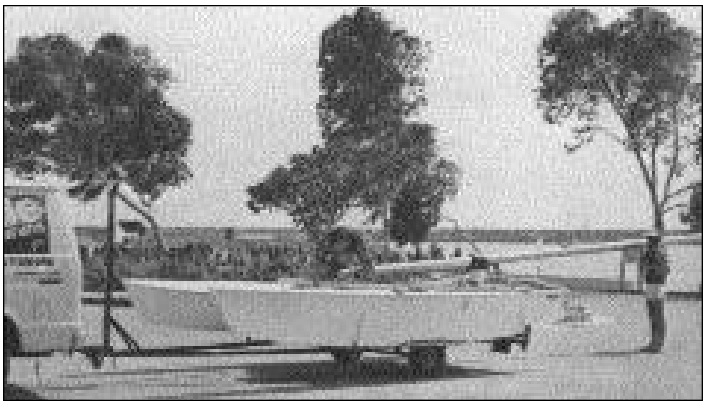
Place the boat on the trailer. Tie the boat down using at least 1/4" nylon or dacron line. DO NOT TIE ANYTHING TO THE DOLPHIN STRIKER OR ROD. Remove the rudder blades from castings. Be sure they are marked port or starboard so you don not have to retune them the next time you go sailing.

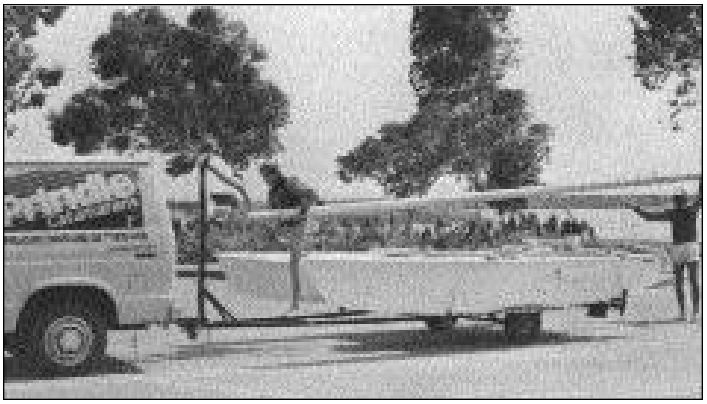
Attach mast hinge to the mast. With one person on the trampoline, push the mast forward and disconnect the forestay shackle. DO NOT undo the turnbuckle. Rig shackle so it holds the two bow bridle wires together. Check in back of boat to make sure you will not be lowering the mast onto a person, car, or power line.

CAUTION - ***Extreme caution must be observed when launching and sailing near overhead wires. A mast near a wire could be fatal!***



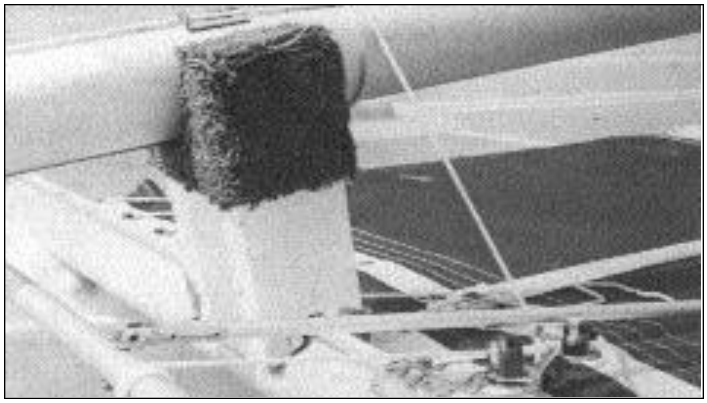
The second person should move to the back to catch the mast as it is lowered.





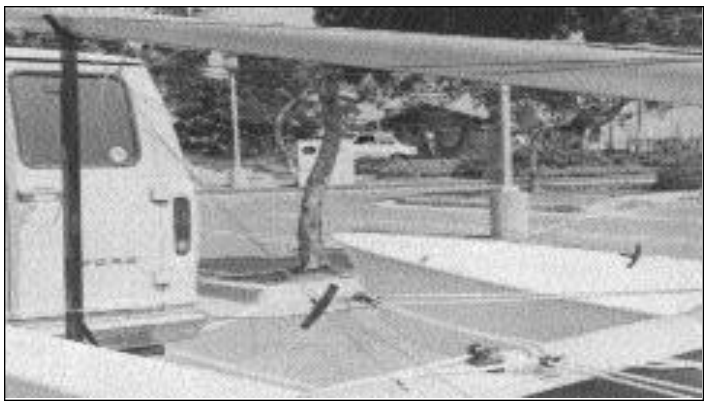
While the second person holds the mast, remove the hinge pin and walk the mast forward until you can place it in the front mast support on the trailer. Store hinge in down position.

Place the top of the mast in the rear mast support making sure the mast does not extend beyond the rudder castings. Trailer the Prindle 15 and 18 with curf up to prevent damage to rear support padding and mast. DO NOT trailer with the Prindle 18 mast on its side. The bouncing will put excess shock loads on the spreader assembly.

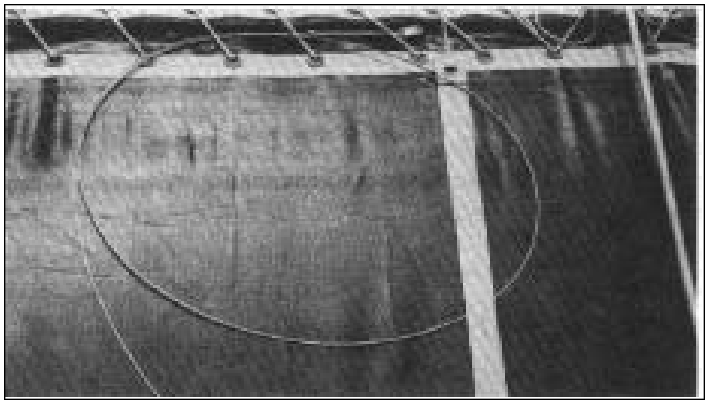


Secure the mast and support to the boat by wrapping the tie down line around the mast twice and down through the trampoline grommets. Store the tiller under a hiking strap or jib lead line to keep it from flapping around. Tie a 3 or 4 foot piece of line to the traveler pad eye, around the tiller crossbar twice, and through the fairlead and cleat. This will keep the rudder castings from swinging. Tie the front end of the mast down making sure to wrap line twice here also.

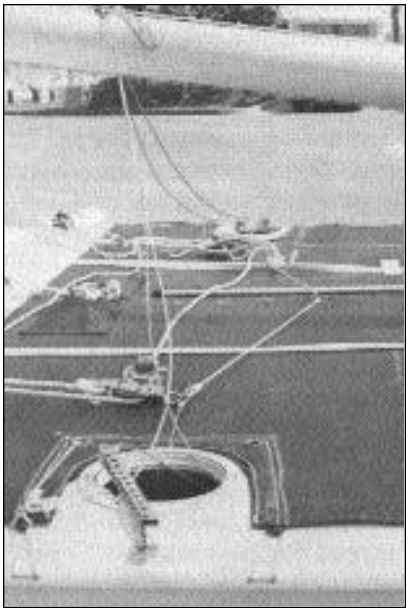
There are several ways to store your rigging while trailering. Here are two popular methods.



#1 Tie a 6 foot line to the front mast support. Bring all shroud and trapeze wires forward to the front support and tie the line around them.



Lace the forestay through the back lace lines 2 or 3 times. Store trapeze dogbones under trampoline to keep them from banging around. You may wish to tie the wires up off the front crossbar to keep them from rubbing on a long trip with a line over the mast.



#2 This method is not recommended if the boat is stored outside during the rainy season. Remove both hatch covers and feed shrouds and trapeze wires into each hull. Store forestay as in method #1.

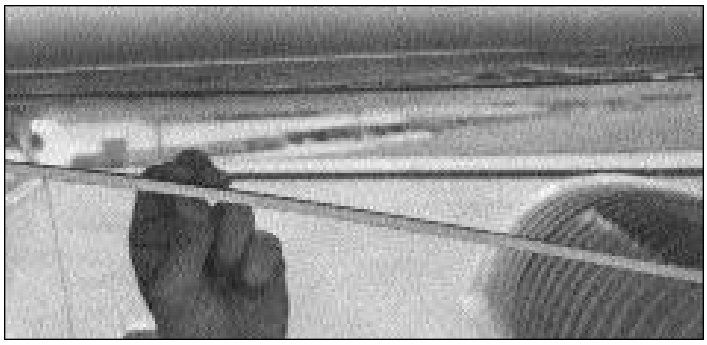
With any method you use, the important thing is to keep all rigging separate and tangle-free.

Store the jib sheet by tying or shackling the jib clew blocks to the bow bridle shackle. Pull the jib sheet snug and cleat each side. Store the extra line in the halyard pouch or loop around hiking straps.

SECTION IV: Maintenance

Dolphin Striker

The single most important maintenance procedure is done on the dolphin striker. This MUST be kept snug at all times with no play between the vertical rod and the bar. Think of the dolphin striker as the backbone of your boat.



To test the snugness of your dolphin striker, grab the aluminum bar between the side and the rod, push up and then pull down. If you can move it more than 1/4" you must tighten the rod.

To tighten the rod, first loosen the nylon mast bearing (half-round ball on top of mast step).

Loosen screw at bottom of striker rod.

Turn dolphin striker rod clockwise using a wrench and the flat spot on the rod designed for this purpose until the bar is snug again.

Retighten the nylon ball and screw.

The bolts that connect the striker bar to the front crossbar should be loosened occasionally to check for cracks in the crossbar. If cracks are apparent, the crossbar should be replaced. There is a back-up plate inside the crossbar so these bolts can be tightened easily from the outside. Again, do not overtighten, since the bolts could snap.

BATTENS

Prindle 16 and 18 Catamarans are equipped standard with solid fiberglass battens. These are virtually unbreakable but do require some attention.

Make sure that battens are inserted all the way into the batten pocket with tapered end inside the stop at the luff of the sail. If it is not, the batten may tear the sail. The battens should extend about 1-1/2" past the end of the batten pocket. You may wish to trim them to this length.

Loosen battens when storing the sail for more than a few weeks or during extreme temperature changes. This relieves pressure on the sail and battens and will preserve the life of both.

Foam/Fiberglass Battens

Race equipped Prindle 16 and 18s and all Prindle 15s are equipped with foam/fiberglass battens. These battens are much softer and more fragile requiring more care.

Occasionally, a delamination may occur at the tapered end where the foam narrows towards the tip. To repair, spread the glass and foam apart slightly and coat with 5-minute epoxy, clamp tip together, and let harden. This repair should be stronger than new.

Take care when rolling a sail with foam battens. If the sail is rolled unevenly and battens are allowed to twist they will hold the twist. This may hamper your sail shape. You can however, remove this twist by removing the batten from the sail and twisting it in the opposite direction and holding it for a moment or two. The batten should spring back fairly straight.

GENERAL MAINTENANCE TIPS

After your second sail on your Prindle Catamaran and periodically thereafter:

1) Tighten the 8 crossbar bolts. This is very important as most of the strain on the boat is concentrated on these bolts.

2) Check all shackles (shrouds, forestay, etc.) and other fasteners (including nuts and bolts on blocks and cleats). Tighten where necessary.

3) Check all hardware attached to hulls (bow tangs, shroud pins, gudgeons) for tightness. Do not over tighten.

4) Cut off excess length on solid fiberglass mainsail battens leaving 1-1/2" past aft edge of sail.

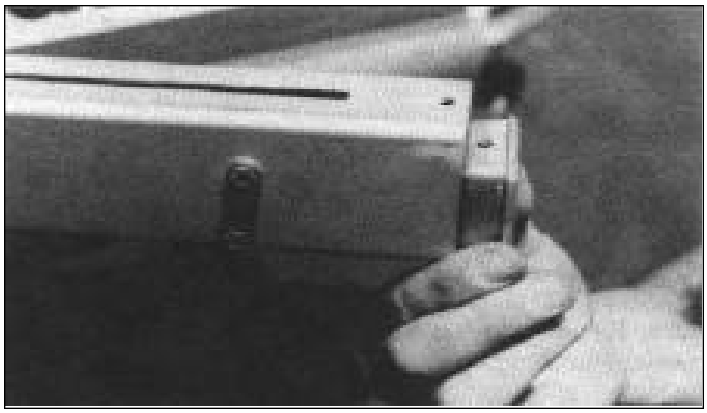
Hulls
Check for leaks at all hull fittings by covering these areas with detergent and blowing air (from your lungs) into drain plug hole. DO NOT USE A VACUUM CLEANER AS THE EXCESS PRESSURE CAN DAMAGE THE HULLS. If detergent bubbles, there is a leak. Remove fitting and cover area with clear silicone sealant and replace.

Rudders
Rub paraffin on the inside of casting where blade slides to ease operation. To fine tune: remove uppermost bolt on casting and paraffin. If there is slack between sheaves add a washer on nut end of bolt. Insert and tighten. This will help keep lines of sheaves. Remove bolt which holds top of spring and rub with paraffin. If rudders do not kick up easily: pull spring to loosen tension and replace bolt. Paraffin lock pin. Sand all rough edges on blades lightly. Always remove blades for trailering.

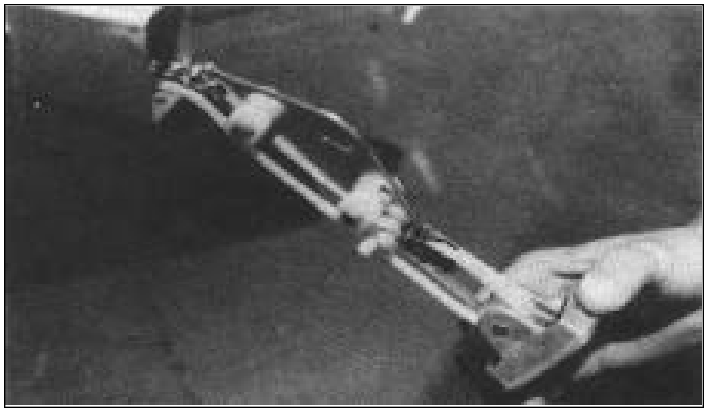
Sails
Rub paraffin on the luff of mainsail to ease hoisting. Sail tape should be applied to batten pockets where it hits shrouds to avoid chafe. Always fold your jib and store it in the envelope bar or roll it - DO NOT JUST STUFF IT IN BAG. Roll your main front the third batten (from top) to your boom and store in long boom bag. Storing your sails will greatly lengthen their life. Rinse the fresh water whenever possible.

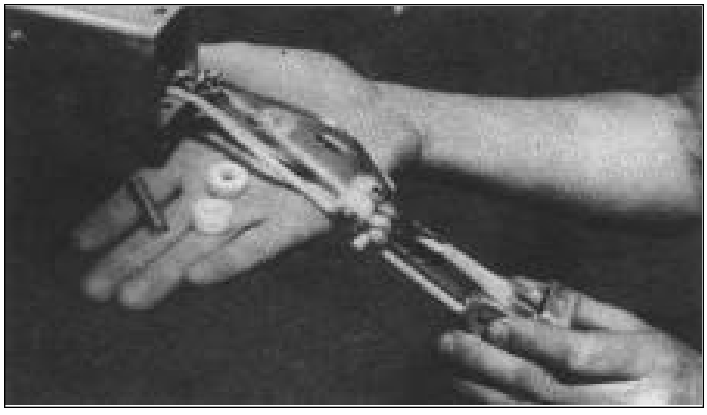
NOTE: Howe and Bainbridge, Inc., the manufacturers of our sail cloth have sent us the following memo which we felt was important enough to pass on to you.
-- To prevent color transfer on your sails, dry them as thoroughly as possible after using. Try not to store wet in sailbag for any longer periods of time than necessary.
When either dyed nylon or dacron sail fabrics are stored wet, the color will bleed or transfer form the colored to the white or even from a darker shade to a lighter shade. The wetter and more compressed the fabric, the greater the bleeding - such as stuffed in a sailbag. --

Outhaul System
The Prindle 18-2 and 19 boom is equipped with an internal 4:1 outhaul system with shock cord load return. Shock cord tension can be tightened simply by pulling some corder out of the boom at the front end of



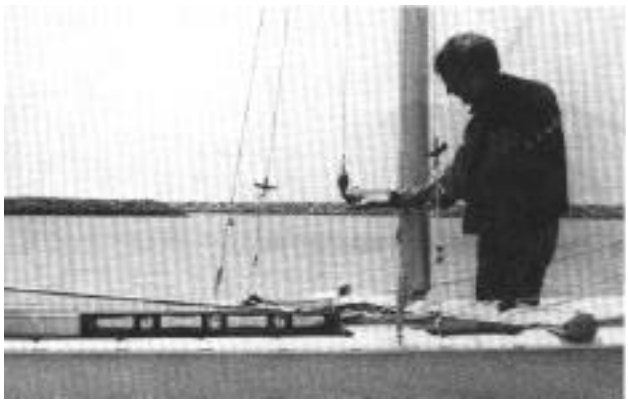
tieing a new know. DO NOT LET THE SHOCK CORD GO! To relead the shock cord you must disassemble the entire aft end of the boom. DO NOT REMOVE the small clevis pin in the outhaul car unless you need to remove the internal workings of the outhaul system.





SECTION V:
TUNING FOR PERFORMANCE

Mast Rake:
To measure the amount of mast rake, your mast must be up with your rig tension snug. Lay a carpenter's level on the trampoline just aft of the hatch. Adjust the boat until it is level fore and aft and relatively level from side to side. Attach a one or two pound weight (a heavy wrench will work) onto the main halyard. Using the main halyard as a plumb, measure the distance from the aft edge of the mast at the black band to the center of the plumb. This distance is how much mast rake you have. We recommend between six and ten inches of aft rake. You may find that you prefer slightly less or more.



MAST ROTATION
The Prindle 15 and 18 come equipped standard with an adjustable mast rotation control (wishbone device on the mast). For most sailing this rotation should be set between 60 and 75 degrees from straight back. A good rule of thumb is to have the wishbone pointing at the shroud when you are sailing to weather. As you ease the traveler out, the rotation will automatically increase so that it should be between 80 and 100 degrees for downwind sailing. When sailing to weather, an increase in rotation will flatten the mainsail and less rotation will make the mainsail fuller.

BARBERHAULER
A barberhauler system works like a traveler for the jib and is used for broad reaching and downwind sailing. It is optional equipment. This system is generally used to get that "extra edge" while racing and is not necessary for pleasure sailing. The barberhauler will pull the clew of the jib out to the end of the front crossbar which will give it a slightly better shape and make it easier to trim properly.

FOUR-WAY JIB SYSTEM
The optional four-way jib system has a few basic positions and infinite options in between. Use these basic guidelines to discover your preferences.

The four and aft track:
Set at center position for light to medium air.
Set at aft position for heavy air.

To side to side lead:
Set at 8" inboard in light air.
Move position outboard as wind picks up until lead is about 2 to 5 inches inboard when you are a little overpowered.
You may find in certain downwind conditions that having the barberhauler (option and seperate from the four-way jib system) all the way out is too far for proper wind flow. In medium to heavy conditions setting the barber 8 to 15 inches from fully outboard is optimum.

SECTION VI:
SUPPLEMENTAL INFORMATION

GLOSSARY OF TERMS

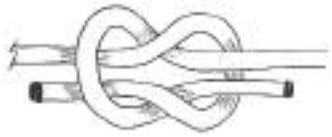
Aft . . . . . toward or near the rear part of the boat
Asymmetrical . . . . not symmetrical. On Prindle hulls - flat on one side, curved on the other
Batten. . . . . thin, narrow strip of material used to stiffen the shape of a sail
Beat . . . . . to sail to windward
Block . . . . . roller or pulley
Boom. . . . . aluminum tube that holds the foot of the mainsail and attaches to the mast
Bow . . . . . the forward part of the hull
Capsize . . . . . to turn the boat over
Cleat . . . . . device which secures a line or rope by jamming or tying off
Clew . . . . . lower, rear corner of sail
Closed Hauled. . . . . sailing close to the eye of the wind
Crossbar . . . . . aluminum tube connecting two sides together
Curf . . . . . grove in boom, mast or crossbar
Diamond Wire . . . . . wire that attaches to mast and spreader to control mast bend
Downhaul . . . . . line used to pull down the tack of a sail
Downwind. . . . . sailing away from the wind
Eye of the Wind . . . . . exact direction the wind is blowing from
Foot . . . . . bottom edge of sail
Fore & Aft . . . . . from the bow to the stern
Forestay . . . . . forward wire supporting mast
Gooseneck . . . . . fitting connecting the boom to the mast
Grommet . . . . . metal ring set into a sail
Gudgeon. . . . . fitting bolted through transom of hull for attaching the rudder system
Halyard . . . . . line or wire used to hoist and lower sail
Harness . . . . . a support worn while hooked to trapeze wire
Head. . . . . top of sail
Head Off . . . . . to steer the boat away from the wind
Head to Wind . . . . . also referred to as “in irons” - pointing the bows directly into the wind
Head Up . . . . . to steer the boat into the wind
Helm . . . . . tiller which controls the rudders
Hike . . . . . to position weight as far as possible to windward
Hoist . . . . . to pull up
In Irons. . . . . heading directly into the eye of the wind, unable to tack or go forward
Jibe . . . . . also gybe, to change course of boat without tacking
Lee . . . . . side falling away from the wind
Leech . . . . . back edge of sail
Lee Helm . . . . . tendency of boat to turn away from the wind
Leeward . . . . . side away from the wind
Line . . . . . rope
Loose Footed . . . . . mainsail not held to a boom for its entire length
Luff . . . . . leading edge of sail, or flagging of sails due to improper trim or heading
Mast . . . . . aluminum tube used to support sails
Mast Rake . . positioning the top of the mast fore and aft in relation to straight up and down
Outhaul . . . . . system used to pull clew of mainsail away from the mast
Pintel . . . . . pin which holds rudder casting onto gudgeons
Port . . . . . the left side
Reaching. . . . . to sail across the direction of the wind
Reefing . . . . . to reduce sail area

Rigging. . . . . lines, wires and spars used for support and operation of mast and sails
Rudder . . . . . wing shaped devies used to steer the boat
Shackle . . . . . "U" shaped fitting with removable pin used to fasten lines or parts together
Sheaves . . . . . roller or pulley
Sheet. . . . . lines used to control sails
Shroud . . . . . wires on each side of boat supporting the mast
Spreader . . . . . strut projecting from side of mast to brace diamond wire
Starboard . . . . . the right side
Stern . . . . . back of hull
Tack. . . . . to turn the bow by having the bows cross through the eye of the wind, ... or lower forward control of the sail
Tell Tale. . short pieces of ribbon or yarn attached to sail or rigging for reading wind direction
Tiller Extension . . . . . device which controls rudder steering
Trampoline . . . . . material stretched between hulls and crossbars to sit on
Transom . . . . . aft most end of the boat
Traveler . . . . . "car" which rolls width of rear crossbar
Trim. . . . . to adjust sheet tension, or to balance hulls in water . . . . . so they function to maximum efficiency
Turnbuckle . . . . . threaded fitting for adjusting wire length
Upwind . . . . . to sail into the wind
Weather . . . . . to sail to windward
Windward . . . . . side toward the wind

GLOSSARY OF KNOTS

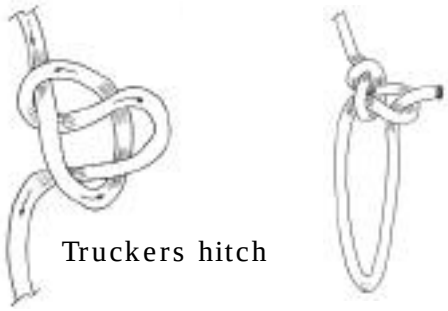
Figure eight

Cleat half hitch

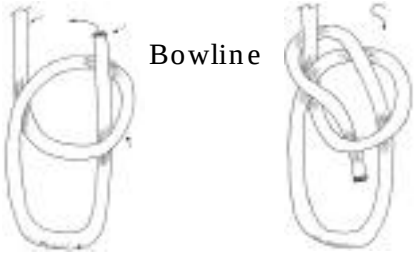


Reef knot or square knot

Two half hitches

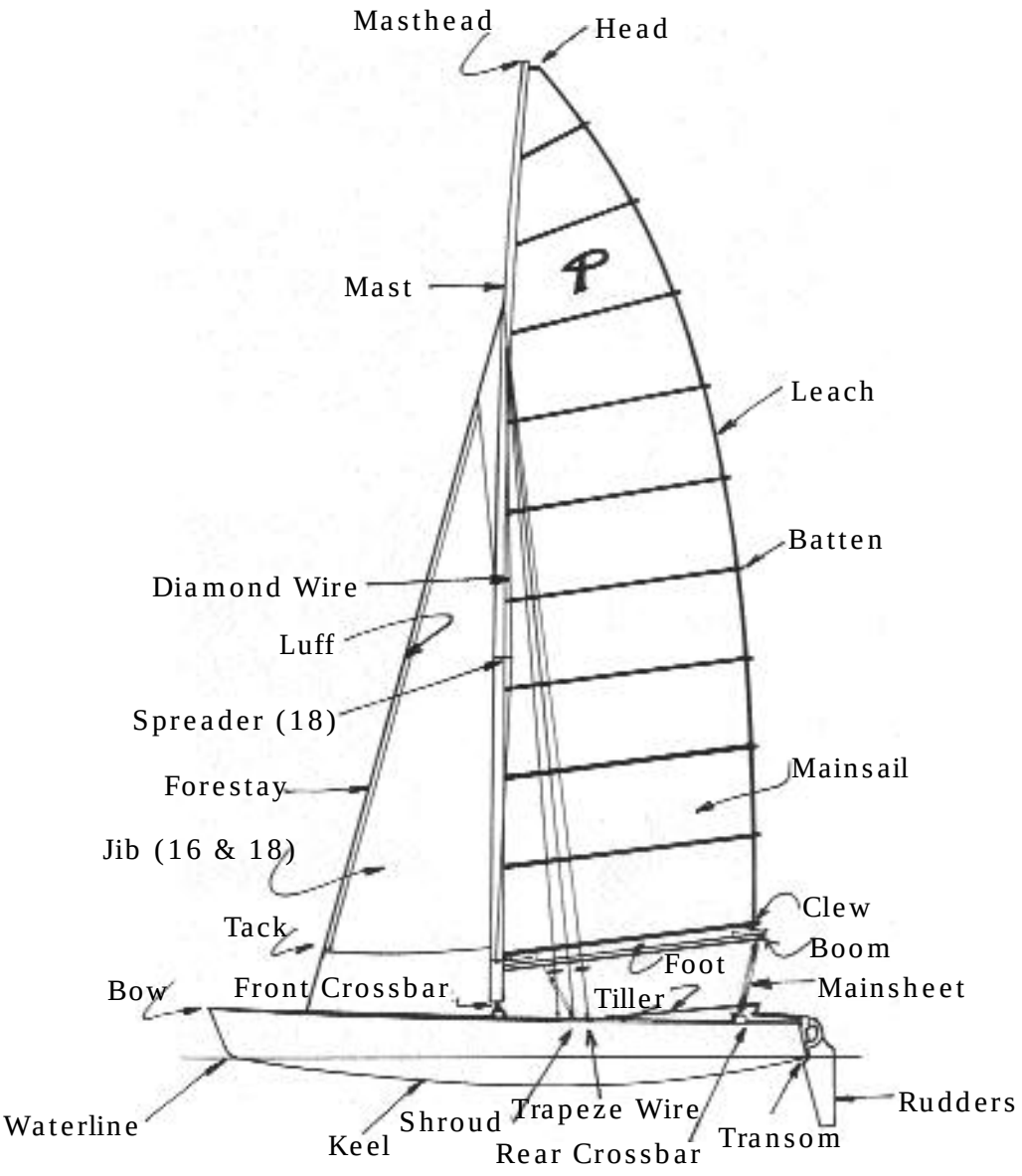


Truckers hitch



Bowline

Double overhand knot


Masthead
Head
Mast
Leach
Batten
Diamond Wire
Luff
Spreader (18)
Forestay
Mainsail
Jib (16 & 18)
Clew
Tack
Boom
Foot
Bow
Front Crossbar
Tiller
Mainsheet
Waterline
Keel
Shroud
Trapeze Wire
Rear Crossbar
Transom
Rudders