



Club 420 Class Rigging Manual

Performance sailcraft 2000 Inc
2555 Dollard
Lasalle, Quebec, H8N 3A9
Tel: 514 363 5050

eMail: info@ps2000.ca
Website: www.ps2000.ca

Mast set up

Remove the pole and unwrap the spreaders. Mount them in spreader bracket with the thick side of the airfoil facing forward. Put the clevis pins in from the top with the split ring under the bracket. Remove the shroud retainer clips from the end, slip in the shroud and replace the clip. Put the screw in from the top. (Both sides of the spreader are tapped so the screw goes in from either side).

Next examine the installation of the jib halyard block. We may have used a washer under the cotter pin to make sure that the cheeks are held closely together to prevent the wire



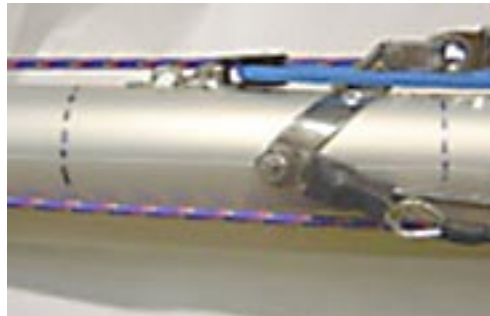
jumping the sheave. If you ever remove the sheave be sure to put back the washer. Also, examine the shroud and trapeze wire attachment. They are on the same tang as shown. A shrink wrap tube is then



placed over the whole assembly and heated. If you replace or disassemble, re-tape the area.



The mast has been foamed in the area shown between the two dotted lines. This has been done to ensure the watertight integrity of the mast. All rivets in the mast are either closed end or are sealed with a bedding compound after installation.



Mast Installation

Make sure all the halyards are loose and accessible from the deck once the mast is up. They are normally run in their proper positions at the factory but do not try and sort them out at this point because they will be rigged properly using the directions that follow.

Make sure the clevis pin is in the second hole from the front. This is the position that has been found to be the most effective and it places the mast in the position recommended



on the class Website in the Tuning Tips section.

www.club420.org/rigtips.htm

Set the boat up with supports under the hull that will allow a person to stand in the boat without it moving around. Stepping can be done by a single person from outside the boat but, if the mast is in the partner and you "loose it", you will destroy the partner!

It is better to stand the mast up and hand it to someone in the boat who will then position it over the step and



drop it in place. There is a vertical groove in the mast casting and **this goes OVER the pin.**





Position the mast in the partner and attach the forestay to the centre pin in the bow fitting. The mast can now



be released. It will fall back in the partner but will not fall out. Now attach the shrouds to the saddles and tape up all the split rings. If you do not they will eventually catch the jib sheets, spinnaker sheets and spinnaker cloth. We suggest you start in the third hole down in the front (the closed, curved side). There is no magic to this position but it is a good starting point that gives a good feel to the helm. For more rake, take the pins lower. You will note that there is



a second pin in the top of the chainplate which must be removed to allow the shroud to pass. Replace this after pinning the shroud as it is a safety device if the main pin happens to come loose (It happens!)



Running the halyards

Both the **Jib and Main halyards are purple**, high-load, Marlow Spectra line. Cleat the jib off on the port side of the mast and the main on the starboard. Tensioning them will be done later in the rigging sequence. The **Spinnaker halyard is blue** Spectra and is lead through a swivel block above the hounds. We suggest you rig it with the attachment to the spinnaker coming down on the port side of the hounds and the lead to the skipper coming down on the starboard side. This end is passed through the opening in the partner in front of the mast, then to the bottom

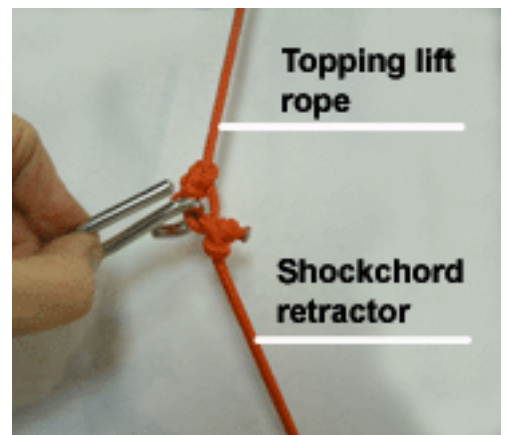


block on the side of the mast. See above. From there it is lead straight back to the aft end of the centre-board cap where it can be cleated off. See following photo. The other



end is rigged, typically, outside the jib, through the guy hook, then to the spinnaker head in the bag. The **Topping lift is red** Spectra and passes through a non-swivelling block on the front of the mast. Make sure the hook end of the line is coming out of the front of the pulley. The other end goes down through the partner and then to the second cheek block up from the bottom of the mast. See bottom photo, column 2. From there it is lead up through the centrecase cap to the forward most Clamcleat on the starboard side of the cap.

The hook end, is tied off to the retractor shockchord that comes from the back of the boat and up through the fairlead in the partner.

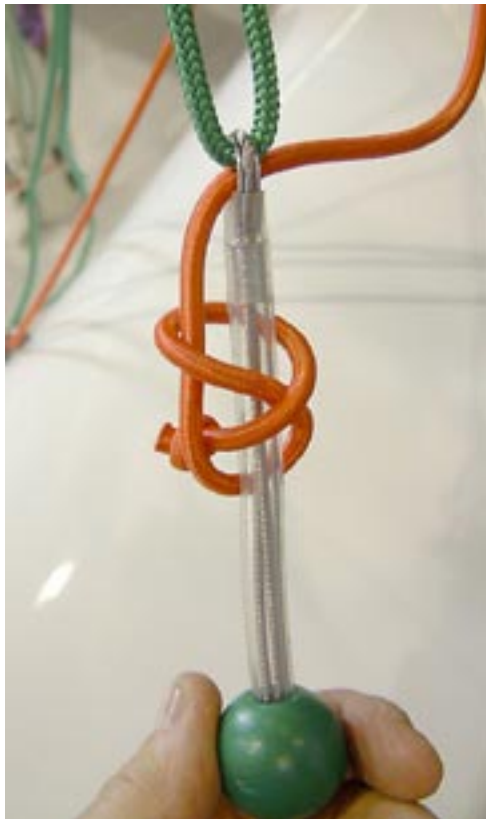




The topping lift is adjusted so that, when hooking up the pole, it will set approximately parallel to the water. It will then be readjusted for the conditions after the spinnaker is set. When the pole is not in use, the hook will lie about 10" below the ring fitting.

Trapeze wires

Performance Sailcraft do not deliver their boats with trapeze rings unless specifically requested to do so as there is a safer alternative available. The following photos show the rigging of the key balls for the Bethwaite harness which does not use a hook. If rings are used, the green adjusting line goes through the top of the ring instead of the eye in the keyball system. The retractor shockchord is supplied a little on the long side to allow for any configuration. When adjusted, wrap the end tightly with tape, cut with a sharp knife in the middle of the tape and burn the end with a match.



First, pass the green adjusting line from the Clamcleat through the thimble on the keyball then back up through the cleat after passing through the black rectangular spacer. Pass the shockchord through the thimble and tie a VERY TIGHT, simple overhand knot in the end of the shockchord - so tight that you can't pull it off the end! Then tie it off as shown above and finished below. This will prevent the thimble and keyball from inverting. Repeat on the other side of the boat but experiment with the length before you cut off the excess.



Setting up the boom

Remove the clevis pin from the universal square tube of the goose-neck and attach the tube to the bracket on the mast. Once in place, tape over the split ring as shown. Take the main halyard, tie it to the

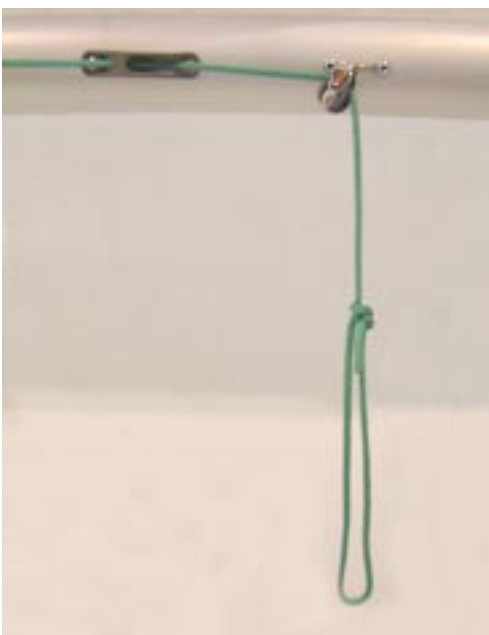
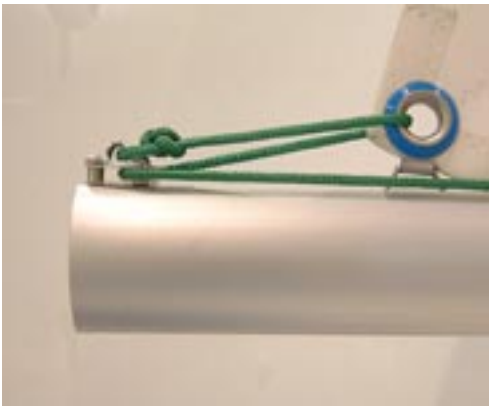


outhaul line at the end of the boom, set the boom level and tie off the halyard. This exercise could also be done after the mainsail is hoisted if there is not too much wind. Reeve the **purple mainsheet**, (which is shipped in the spinnaker bag), through the blocks on the boom as shown.





Make sure that the blocks are aligned fore and aft then lock them in that position. They usually leave the factory fully swivelling but there is a small, flat, red locking tab which can be pushed across the block to lock it on either 90 degree axis. The **red outhaul** is already rigged. After the mainsail is eventually hoisted, undo the line at the outhaul block, pass it through the clew cringle then tie it off on the deck strap on top of the block. Leave a long



loop at the front end of the outhaul so that it can be reached, and pulled on, from either side of the boom at the end of a reach or run. It is a little stiffer on port tack but it works, particularly if you put a little sun screen on the line!

Rigging the vang

The **blue vang** has been pre-rigged and attached to the mast but it can still be tricky to rig. Fully rigged, the 3-part cascade looks like the picture below.



The boom should still be held up by the main halyard, or sail. Attach the single block with the shackle (the first part) to the boom as above. This will leave a single piece of line, with a block attached (the third part) coming off the bottom block attached to the mast. You will find a blue line in the boat on the port side of the board box with its end attached to nothing



in particular. Pass this end through the block on the third part and take it back to the rear Clamcleat on the port side of the centrecase top. In the event that you have to replace this line, it is dead-ended at a deckstrap directly under the mainsheet block and held in place with the mainsheet block fasteners. A simple knot is tied in the end of the line so that it can be removed without untying anything. The photo below is a view of the underside of the centrecase top. Note the spinnaker halyard exit bushing. You will see later that this deckstrap is shared with the centre-board uphaul.



A close up of the bottom block and its attachment is shown below with the first and second parts coming off the shackle and the third part off the block.



Rigging the jib

The **aqua jib sheet** (shipped in the spinnaker bag) is supplied as a continuous sheet which can be cut or rigged to provide individual sheets. We suggest it be attached as shown below with a clove hitch through the cringle. Mark the centre of the sheet before starting.



Attach the jib luff wire to the rear pin position and attach the halyard shackle to the head of the jib. You will notice when you first attach your jib that the jib luff is tighter than the jib wire which means that the luff cloth



will be under tension when the jib halyard is tightened. You may not want this!

Tensioning the jib

If it is not already reeved, pass the end of the halyard through the cheek block at the bottom of the mast on



the port side then back up and through the in-line block in the halyard as pictured below. Take the line back down and pass it

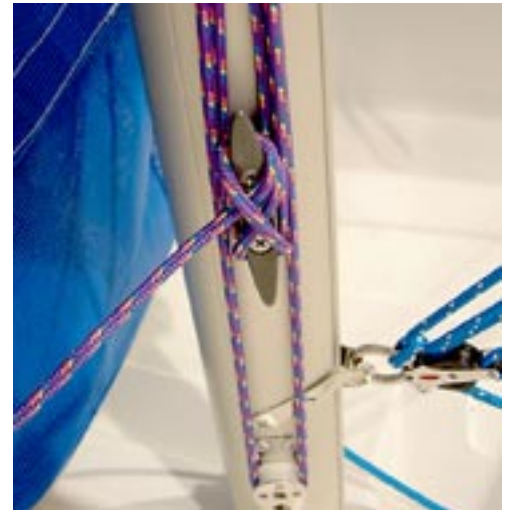


through the open space in the centre of the cleat.

From there, take it back to the in-line block and pass it through the becket on the block to which the bottom part of the halyard is also attached. It is a tight squeeze but it raises the purchase on the halyard to 5:1 from 3:1 and allows crews to get really good



tension if they are re-configuring the rig, on the water, between races.

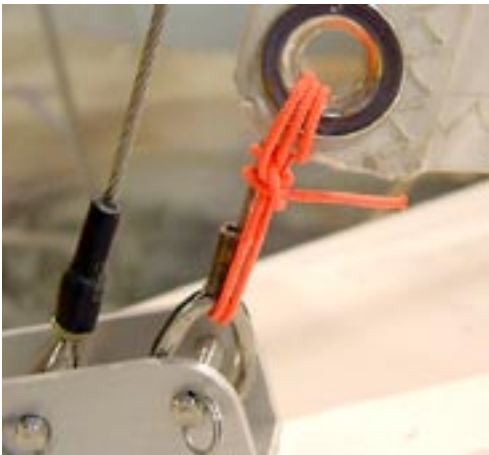


From this point, take the line down to the cleat and tie it off. Put the tail in the pocket of the spinnaker bag. The cloth of the 420 jib is seized to the wire at the tack and tied off at the top to the thimble in the wire. As delivered, tension from the jib halyard automatically puts tension into the cloth of the jib and is equivalent to having a jib Cunningham tightened all the time. This is not normal in light air as it is preferable to have the cloth relaxed so that the draft is not pulled too far forward in the jib. Adjustments can be made at the top of the sail by loosening the line and using it like a Cunningham to relax or tension the cloth for the conditions. The tensioning and knotting system



you use must be simple enough to make changes fairly easily after lowering the halyard. The operation, and effect, of this is really no different to the mainsail Cunningham - it's just a little harder to do!

It is possible to reverse the procedure and permanently fix the top of the sail to the wire (like the old jibs) and have an adjustment at the deck, as below. The disadvantage is that the skirt of the jib is not always as close to the deck as possible which is probably the most desirable configuration.



Rigging the mainsail

Check that the top batten is properly tied in then thread the foot of the sail into the boom and attach the outhaul. Fix the tack with the tack pin on the boom at the gooseneck. Hoist to the top then make a loop in the halyard



as shown in the following picture. Some Club 420s use a stainless ring knotted into the halyard but this is as effective, particularly if you put sun-screen in the end of loop. Pass the halyard around the cleat



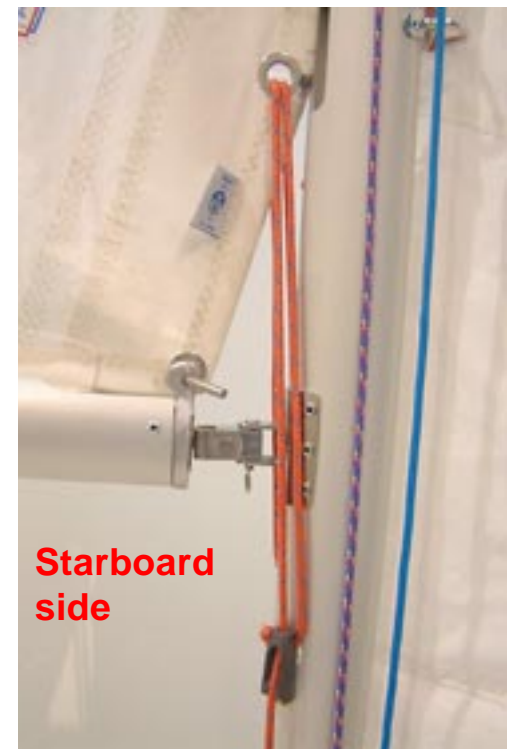
and back up through the loop. Tension firmly, tie off on the cleat and stow the tail in the pocket of the spinnaker bag

A word of caution in light air. If you happen to use an old main with a tack grommet and use this extra purchase to hoist the main as high as possible you will OVER tension the luff (like having too much cunningham) and the draft will be too far forward for light air. The extra purchase is to facilitate the hoisting and tying off of the main. It should NOT be thought of as a luff tensioning device. This is the job of the cunningham.

At this point there will be no numbers on the sail but you MUST put them on before going sailing while the sail is still clean and without too many wrinkles. Placement of the numbers is shown at the end.

Rigging the cunningham

The **red cunningham** line is knotted with an overhand knot at one end and passed from back to front through the channel in the Clamcleat where it is dead-ended. Pass it up through the cringle then down to the dead eye on the port side of the



Starboard side

Systems, controls and features



Port side

Centreboard system

The boat is shipped with the centreboard installed. If you take out the board you will find that the pin hole is bushed with an anodized aluminum sleeve glued in with Plexus. The pin

The board is operated by a **red up haul and down haul**, both using the same rope. The down haul runs from a trip cleat (more on its operation later) on the port side of the centreboard case top, through a fairlead to the tongue of the board where it is knotted then passed through the hole in the tongue.

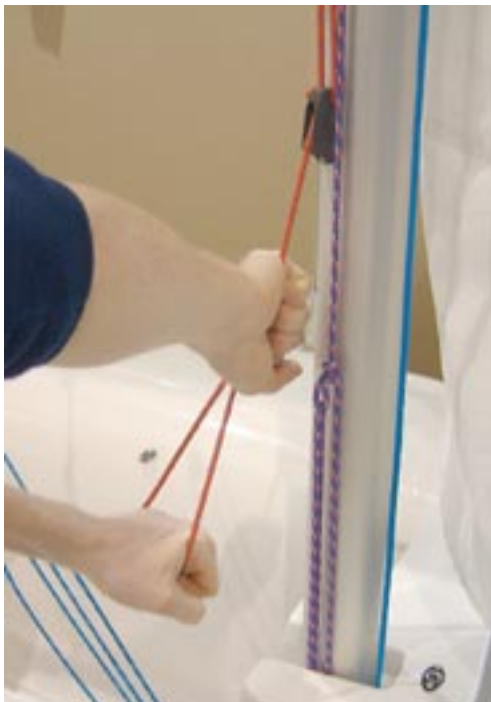
mast going from front to back. Pass it back through the cringle, being careful not to override the first pass then back down to the Clamcleat. This will give a 4:1 purchase but it will still be necessary to put a loop in the end so that the crew can use two hands, if necessary, in heavy air conditions.



passes through a stiffening plate to prevent a point load when tightening the nut to make waterproof. When



The line is knotted on the other side of the board where it now becomes the uphaul. It then passes down through an exit box in the cap of the centreboard case.



replacing the pin, place a ring of sealant around the pin on the inside surface of the aluminum only. The rubber washer will seal off any leak around the pin.





Once through the cap, the end is attached to a single block. A second red line, which is dead-ended under the back of the cap, is then passed through the block and back up through the cap to a CAM cleat. The reason for this type of cleat, as opposed to the Clamcleat is that the rope will run free, unattended, once released and the crew does not have to hold it to keep it from jamming.



This picture shows the vang (blue), and the c/b downhaul (red), sharing the deckstrap under the cap. The angle of the rope from the tongue of the board to the exit box is fine for sailing but it does not hold the tip of the board firmly in the box. When through sailing, wrap the line once around the tongue to be able to pull the board ALL THE WAY UP.



Bailer operation

A word about the bailer. We have had a policy for 30 years of never putting a steel bailer in a dinghy that can turn over because of the very real risk of a severe cut, usually to the leg or thigh of a crew sliding over the side. For this reason, the PS2000 C420 uses the IYE plastic bailer and its operation may be unfamiliar.

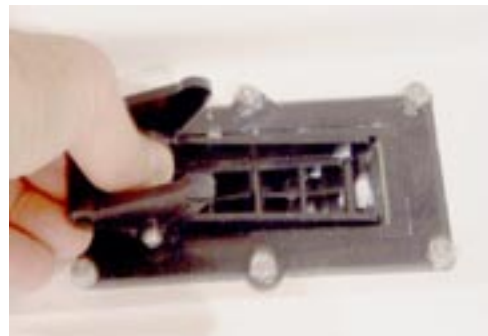
1. Raise the bar of the swinging lock



2. This leaves the bailer unlocked



3. Push down the chute all the way

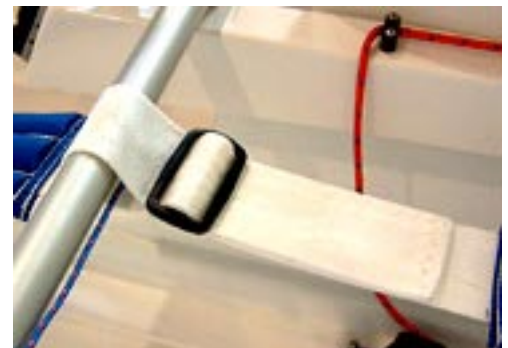
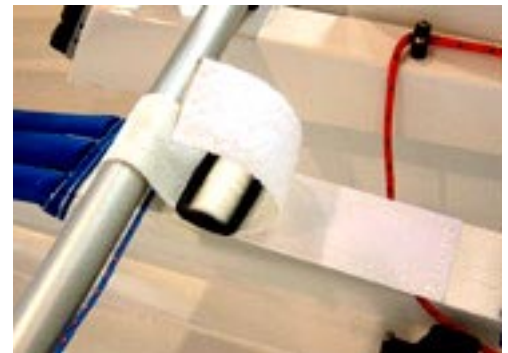


4. Raise by pulling up then push the swinging lock over until it clicks shut

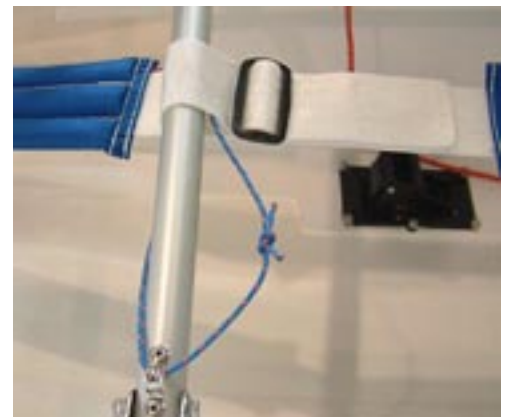


Hiking straps and traveller

The traveller bar has been made round to reduce the bruising resulting from accidental leg, shin contact. The padded hiking straps are held up to the traveller bar by an adjustable strap that is tabbed off on Velcro. This tab can be used to adjust the height of the strap between the bar and the thwart but does not adjust the overall length of the strap. The pictures below show the strap both open for adjustment and tabbed off.



To hold the straps outboard, a line is run from the bridle eyestay, under the traveller, through the webbing loop then knotted. It can be adjusted.





Above, the straps held in place. Below, the simple bridle system. The bridle is attached to a shackle at each end and the shackle is attached to the existing eyestay. The height of the straps is adjusted



by the yellow hiking strap adjuster rope. One end is tied off at the deck strap. The other goes through the loop in the straps, back through the eyestay then is tied off on itself in a bowline. Adjust this end of the line for height because the other has the topping lift shockchord retractor attached to it. See bottom picture.



The straps are kept tensioned and off the floor by a shockchord loop that runs from an eye on the transom down around the adjustment rope assembly and back up to the eye. Extra shockchord is provided so that adjustments can be made.



Rudder Assembly

The rudder blade is assembled to the rudder stock with a pure spectra downhaul and tensioning block already attached. If the assembly is dismantled, make sure upon re-assembly that the tensioning line goes over the plastic bushing at the top of the rudder head and under the one at the bottom in front of the blade. To get the blade completely away from the head, the knot in downhaul (which ends in the rudder blade) or the splice holding the block, must be undone.

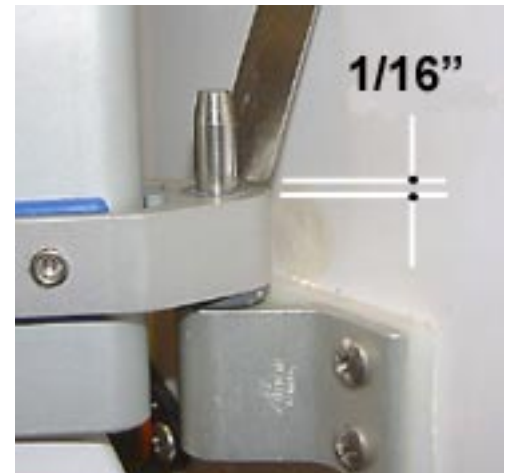
Attach the rudder assembly as



shown. It may be convenient to place the blade in the "up" position and secure there by tightening the black locknut which we have placed on the port side of the rudder head. This may be reversed if the starboard side is found more convenient. Use



this nut to hold the board up while launching and retrieving, loosen to place the board in the fully down position and re-tighten to remove all slack in the assembly. Do not sail with the nut loose. It puts too much strain on the cheeks and the blade and, besides that, you will lose it! Before sailing the boat check that the



rudder retaining tab is properly adjusted. When mounting the rudder onto the lower pintle, the tab should snap over the gudgeon and up against the pin. However, there should be enough space to allow the retaining tab to be pushed forward out of the way, to remove the rudder, without hitting the gudgeon. This space should be about 1/16 in. Adjust using the screws - the holes on the tab are slotted.



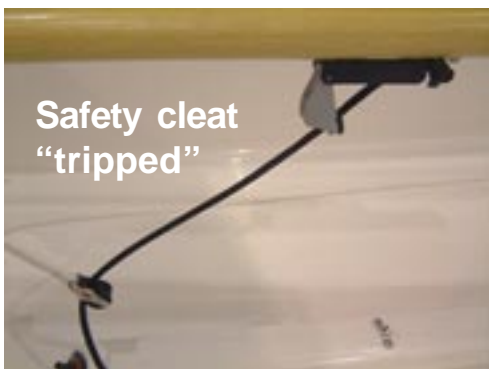
Fit tiller into rudder head and pass the cotter pin through the tiller, making sure that it also goes through the rudder head on the underside.



Pass the line from the cleat through the block and take it back to the cleat. Once the boat is in the water, loosen the lock nut on the rudder head, pull the line firmly tight and



Safety cleat closed



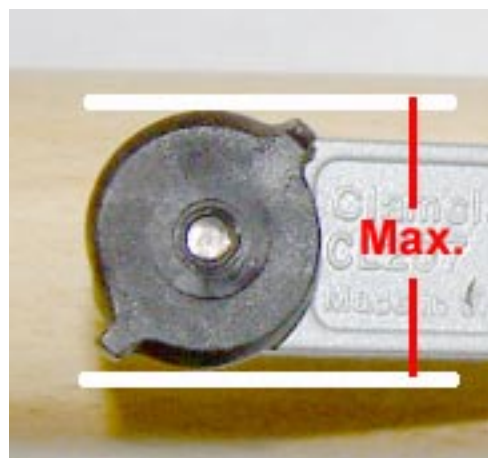
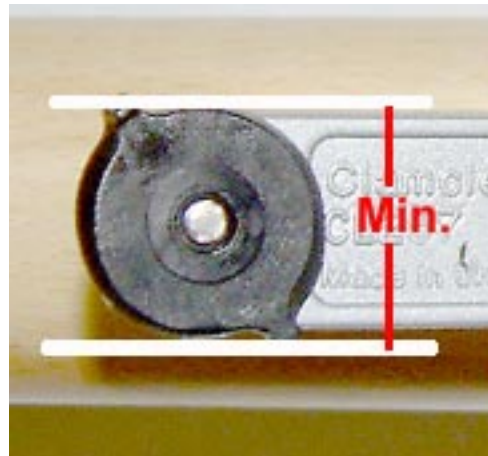
Safety cleat "tripped"

cleat it off. Re-tighten the locknut. If the rudder runs aground or comes in contact with a significant obstacle, the trip cleat will open up as shown in the previous picture.

The trip pressure is adjustable but our experience is that it should remain **at the minimum**. If you wish



to check the operation, gently pry the cleat open with a flat screwdriver and observe the position of the cam. Also check that the set screw is firmly tightened. - the cam must be held from turning when the screw is tightened. Do not over tighten or you will strip it! Snap back into place.



Spinnaker sheets

The white spinnaker sheets are shipped in the spinnaker bag. Most



crews prefer to use a continuous sheet with the two ends tied off at the clews. The only disadvantage is that there is always a sheet across the centre of the boat. The sheet is shipped as a single line allowing for this. It may be cut to provide two individual sheets.



Sail numbers

Sail number "eights" are supplied with the sails and can be cut to form any number. Place on the sail as per the photograph, starting about 1 inch below the second batten pocket, as per Class rules and not closer than 2 1/2" to the leech. They must be 12" high (as supplied).

MAKE SURE THE SAIL IS ABSOLUTELY CLEAN AND DRY BEFORE APPLYING.

Also, try and keep your fingers off the glued surface as much as possible. You must use the sail number allocated to you as it is linked to the Association number of the boat which attached inside the transom.