

**Laser** 

**VAGO**



# **RIGGING MANUAL**

# Safety Afloat

This instruction manual is not a guide to sailing your craft and it should not be considered suitable for the task of learning to sail a boat. Please read the manual before rigging and sailing your Laser Vago.

## Before you go sailing:

- Check you are wearing suitable clothing and safety equipment for the conditions and time of year.
- Always wear a buoyancy aid or life jacket
- Make sure a third party knows where you are sailing and how many there are of you.
- Check the weather forecast
- Check the time of high and low tides if applicable.
- Seek advise of local conditions if sailing in a new area.
- Always check the condition of your craft before setting off.
- A sailors safety knife should be carried on board.
- **Check for overhead cables when rigging, launching and recovering.**

## On the water:

- Conform to the sailing rules of the road.
- Look out for changing weather conditions.
- Never sail beyond your ability or that of your crew. Ensure that you and your crew can cope with any changes in the wind conditions
- Understand and be competent in the sailing skills and righting techniques.

## **Vago Rigging Instructions**

The Vago rigging instructions are a guide to rigging your boat. Due to production supplies certain parts may be different from those shown in description, colour, and specification. Performance Sailcraft Europe reserves the right to change specifications without prior notification.

### **LASER CENTRE**

Options, accessories and spares are available from Laser Direct +44 (0)1327 841610

[www.lasersailing.com](http://www.lasersailing.com)

The Laser Centre  
Station Works  
Long Buckby  
Northampton  
NN6 7PF  
UK



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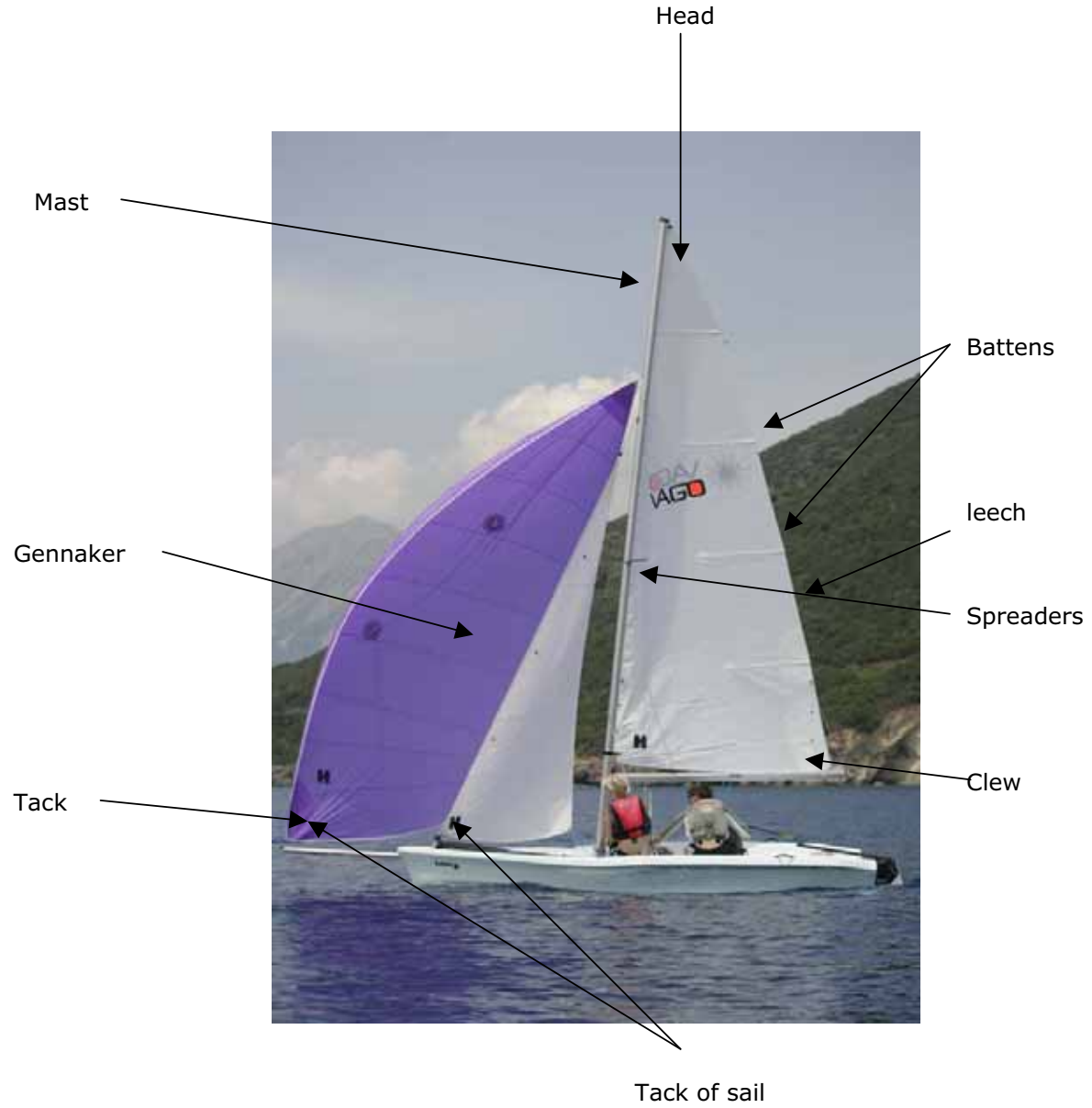
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**Customer Help Line: Please contact Customer Services on Tel: 00 44 (0) 1327 841608.**

## Glossary

**Aft:** Back of the boat  
**Bow:** Front of the boat  
**Burgee:** Wind indicator usually a flag  
**Batten:** A thin stiffening strip in the sail to support the leech  
**Boom:** A spar at the foot of the mainsail  
**Cleat:** A fitting used for holding / securing ropes  
**Clew:** Back lower corner of a sail  
**Cunningham:** an eye in the sail above the tack of the sail  
**Foot:** Bottom of the sail  
**Forestay:** The wire supporting the mast at the bow of the boat  
**Gennaker:** Isometric sail hoisted when sailing downwind  
**Gennaker pole;** the Pole, which extends to fly the gennaker tack from.  
**Gunwale:** The outermost edge of the boat  
**Gudgeon:** Fitting on the transom and rudder used to hang rudder  
**Gnav:** Used to control the leech twist and shape of the sails can be referred to as Vang.  
**Head:** Top of sail  
**Halyard:** A rope or wire used to lower or hoist sails  
**Jib:** Front sail  
**Jib Sheet:** Control rope for the jib  
**Leech:** Trailing edge of the sail  
**Luff:** The front edge of the sail  
**Mast Heel:** The fitting at the base of the mast  
**Mast step;** The fitting on the boat where the mast heel is located  
**Shrouds:** Wires that hold mast in boat and supporting the mast from  $\frac{3}{4}$  up and out to hull side. Attached with shroud adjuster to shroud anchor point.  
**Lower shrouds:** Wires that tie off  $\frac{1}{4}$  up mast and shackle to shroud anchor points.  
**Spreaders;** Metal struts placed in pairs to support the mast side ways and control the bend in the mast.  
**Stern:** Back of the boat  
**Stem fitting:** Stainless fitting at the bow which the forestay attaches.  
**Tack:** Forward lower corner of the sail  
**Traveller:** The track that runs side to side that controls the mainsail side ways in the boat. Used in conjunction with the mainsheet.  
**Vang:** Otherwise known as the Kicking strap, Gnav.

## Useful Boat Terminology



## **Maintenance and Service**

- Keep the equipment clean by frequently flushing with fresh water. In corrosive atmospheres stainless parts may show discoloration/brown staining around screw holes and rivets, this is not serious and can be removed with a fine abrasive.
- Excess water should be removed from the hull.
- Ropes, rigging and fittings should be checked at regular intervals for wear and tear.
- All moving parts should be lightly lubricated to avoid jamming, i.e., McLube, Dry Teflon or a dry silicone based spray. Do not use Oil.
- Inspect shackles, pins and fittings – tape up to stop snagging, coming undone.
- When refastening screws do not re – use Nylock nuts more than three times.
- Do not leave the rig under tension in storage.
- Damaged or worn parts should be replaced.
- Sails should be thoroughly washed down with fresh water, dried and stored in a dry place.
- Trailers should be rinsed with fresh water and checked at regular intervals. It is recommended that the trailer be serviced annually.
- Repairs to the polyethylene hull should be undertaken by people with the relevant equipment and skills. Contact Laser Centre for advice.
- UV light will cause fading to some components and fittings, a cover is recommended to reduce the UV degradation.
- The hull should not be left on a pebble beach, as the polyethylene will dent. The hull is best supported by a gunwale hung Launching trolley.
- Care must be taken if storing the hull on racking or similar, to support the hull adequately. Any sustained point loads could distort the hull.

## Sail number positioning

It is advised to apply the sail numbers in a dry, clean and wind free environment.

### Standard sail



1. Lay the sail on a flat surface starboard side up.
2. The numbers on the starboard side are always higher than the port side.
3. Measure 60mm down, from the seam directly below the logo.
4. Mark a line, parallel to the seam.
5. Measure 100mm in from the leech on this line.
6. The first number is positioned 100mm in from the leech and with the top of the number on the line parallel to the seam.
7. The numbers are 60mm apart.
8. Turn over the sail and position the port numbers 60mm below the top seam of the panel below. The numbers are parallel to the seam.

### XD Race sail

1. Lay the sail on a flat surface starboard side up.
2. The numbers on the starboard side are always higher than the port side.
3. Measure 200mm down, from the second batten pocket from the **bottom** of the sail.
4. Mark a line parallel to the batten pocket. Use tape
5. Measure 100mm in from the leech on this line.
6. The first number is positioned 100mm in from the leech and with the top of the number on this tape line
7. The numbers are 60mm apart.
8. Turn over the sail and position the port numbers 60mm below the starboard numbers and parallel to them.



## **Rigging and raising the mast.**

1. Unwrap the mast.



2. Ensure all the halyards are led to the base of the mast and each halyard rope end has a knot tied in it.



3. Insert blanking plugs, (tight fit to produce seal) a medium size screwdriver may be required to fit.



4. Fit trapeze wires and plugs if applicable. In the top terminal positions on the mast. Trapeze kit is an option on the standard rig and is included in the XD rig

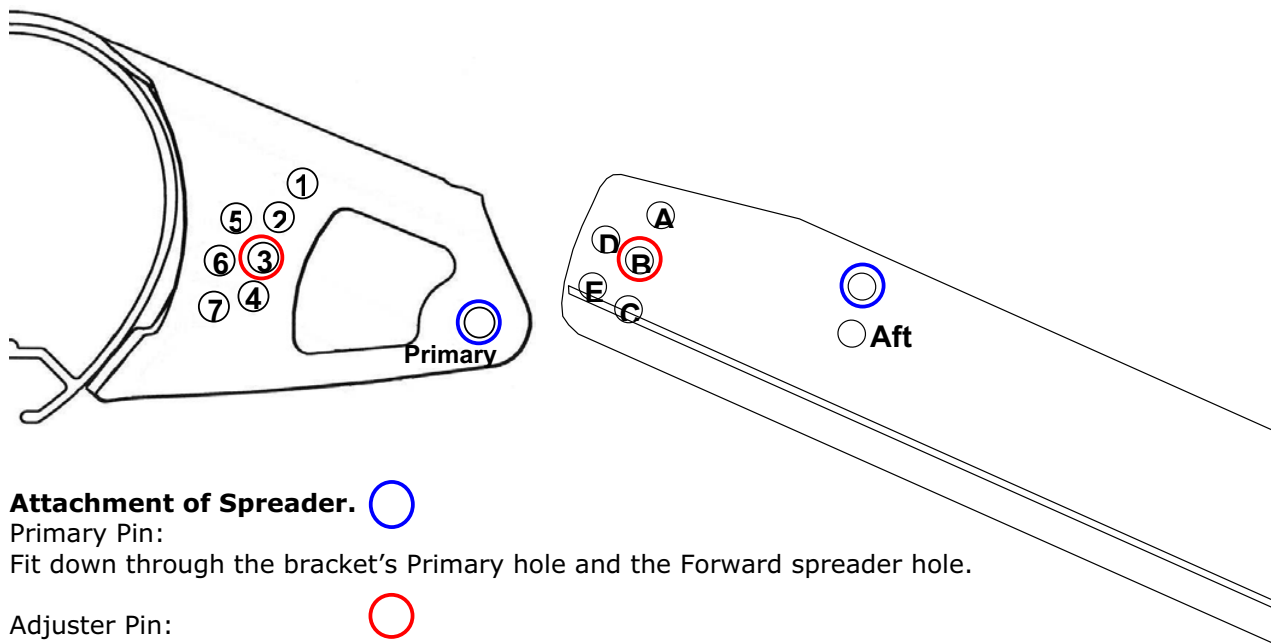
5. Fitting the spreaders  
(See next page for diagram)



Ensure that all the spreader pins and rings are taped up or serious damage could occur to the sails.







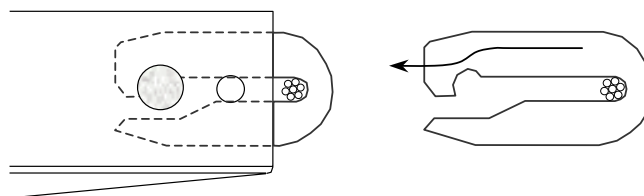
**Attachment of Spreader.** ○

Primary Pin:

Fit down through the bracket's Primary hole and the Forward spreader hole.

Adjuster Pin:

Fit down through bracket adjuster hole 3, and through spreader adjuster hole B.



**Spreader Ends**

Remove the clevis pin and slide out the spreader end hook.  
 Slide the hook over the shroud, and slide back into the spreader.  
 Refit the clevis pin and split ring.

**Security**

All clevis pins must be fitted with the flat head on top, and locked with a split ring.  
 Tape all split rings, pins and the outboard end of the spreader extrusion. This will  
 reduce chafe on the mainsail and prevent flailing sails/halyards becoming damaged.  
 Self-amalgamating tape is best, but pvc electrical tape is an adequate alternative.

Class	Bracket Connection Pin	
	Primary	Adjuster
Laser Vago	Fwd	3B



6. Raise the mast and position the mast heel on the mast step, with the mast heel recess over the bolt in the mast step.

**(Ensure that there are no overhead power cables)**



7. Attach the shrouds with the shroud pin position in the 4th hole down on the back of the vernier adjuster. This is a two person operation as someone will need to hold the mast upright.



8. Temporarily attach forestay around the gennaker bar. (not the furling drum)

9. Shackle lower shrouds to the shroud anchor point. The shackle goes in between the vernier adjuster and ratchet block. The ratchet block is always at the front.



10. Loosely tie the other end of the lower shroud to front of mast. The lower shroud tension is adjusted after the jib halyard has been tensioned.





11. Fit the trapeze gear XD version (optional with standard rig)  
Feed the elastic loop through the ring at the bottom of the pulley.

12. Place the Loop of elastic shockcord over the metal trapeze ring and pull tight.



## Boom and Gnav

1. Unpack the boom and Gnav tackle (the gnav does come pre rigged)
2. Attach the Gnav bar by sliding the Gnav car in through the slot in the top of the boom.
3. The Bar and pulley in the car should be facing the gooseneck end of the boom



4. Take the Gnav control line,  
Fold the rope in half to form a loop. Push the loop through the eye on the top of the boom.



5. Place both of the ends back through the rope loop to form a securing on the eye.





6. Adjust the lengths of the rope tails so that one end measures 70cm. The length of the tail can be adjusted and fine tuned at the anchor point if required.

7. Take the 70cm length pass it through the pulley block on the gnav slider and then tie the single bullet block on to the end with a bowline.



8. Take the other end of the Gnav line, pass it through the block that you have just fitted. Then feed the end of the line around the pulley in the middle of the gooseneck and down through a hole in the gooseneck toggle.

9. Attach the boom to the mast with the pin and spit ring.



10. Tie the Gnav control line from the boom to the double block and becket at the base of the mast in the boat.



11. Attach the gnava strut to the gnava anchor point on the back of the mast using the drop nose pin. Please note the orientation of the gnava strut toggle must be as shown



12. Thread the mainsheet through the centre of the block attached to the bridle rope and anchor to this block with a bowline.



13. Feed the mainsheet through the blocks and to the mainsheet jammer as shown.



## Sails

### Jib



1. Ensure furling drum line is fully wound onto furling drum before you attach the jib.

2. Unroll the jib and attach jib tack to furling drum. Tape up pins on jib tack.



3. Attach Jib head to furling swivel on jib halyard. Tape up before hoisting.

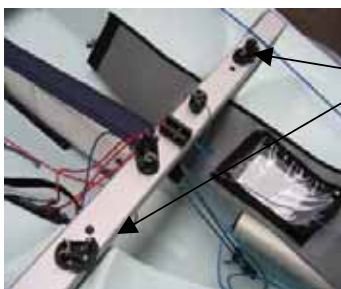
4. Hoist jib and pull halyard wire out of aft face of mast

5. Hook jib halyard purchase system onto jib Halyard wire with hook facing aft.

6. Tension purchase system so the jib luff wire is taught. Cleat the rope and tidy the rope end into the pocket under the gennaker sock.



7. Attach the centre of the jib sheet to the jib clew.



8. Thread the free ends of the jib sheet through the swivel jib fairlead cleats on the outer ends of the front beam and tie ends together.



9. Furl the jib by pulling on the furling line and cleat. The Furling line cleat is on the front beam.



10. Remove the forestay from the gennaker bar and tie back to the P clip at the bottom of the mast on the starboard side.



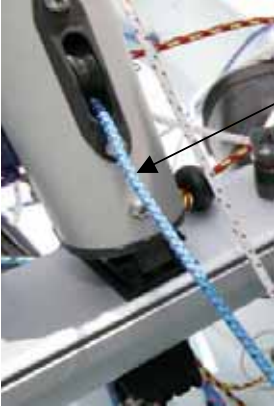
### **Lower shroud tensioning.**

- After tensioning the jib halyard re-adjust the lower shrouds so that they are just tight. It is **essential that the mast is straight** (with the mainsail not hoisted) fore and aft and side to side. The tension should be adjusted accordingly.



## Gennaker

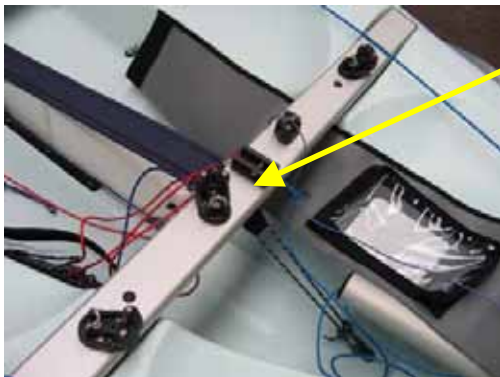
1. Temporarily tie gennaker halyard to lower shroud. (Blue halyard taken from  $\frac{3}{4}$  height up mast exiting from the front above the jib halyard box)



2. Ensure that the end of the gennaker halyard taken from the front of the mast at the base is free of knots and tangles.



3. Thread the end of the gennaker halyard from the base of the mast forward and under the gennaker sock and through the gennaker pole outhaul block (which is attached to the pole shown in the picture).



4. Thread the halyard aft and through the gennaker halyard cleat on the starboard side of the front beam.



5. Take the halyard to the port side of the boat and pass it through the block at the aft end of the gennaker sock.
6. Tie the end of the halyard to something such as a batten, tiller extension and carefully pass the end of the halyard up the sock until you can grasp it from the front end of the sock opening.
7. Tie this end temporarily around the furling spar and remove the batten/extension from the sock.



8. Unfold the gennaker,
  - a. Identify the Tack. (written on the sail)
  - b. Secure to the gennaker pole tack line with a bowline. (The tack line comes out of the front of the Gennaker pole.)
  - c. The plastic bobble should be between the sail and the pole end.



- Untie the downhaul end of the gennaker halyard from the gennaker bar (this you previously passed through the sock.)



- Pass the Halyard through the lower downhaul patch ring on the port side of the sail

- Secure to the upper downhaul patch with a bowline.



- Attach the centre of the gennaker sheet to the tack of the gennaker.

- Pass the free ends of the gennaker sheets aft and through the ratchet blocks attached to the shroud anchor points. There are arrows on the ratchet block to indicate which way the rope should pass. When under load the ratchet will engage. Please note:- the sheets must pass forward of the shrouds at all times.



12. Tie the free ends of the gennaker sheet together.



13. Untie the gennaker halyard from the lower shroud and secure to the Head of the gennaker with a bowline.

14. Ensure the boat is pointing directly into the wind and hoist the gennaker. Take great care to ensure that the gennaker does not get snagged around the trolley, a second person should help with this to ensure it is not snagged anywhere. Check the gennaker is not twisted and the Sheets are not tangled with the halyard. **ALWAYS TAKE GREAT CARE TO PULL UP THE GENNAKER SLOWLY AND DO NOT KEEP PULLING IF IT BECOMES TANGLED OR TIGHT.**



15. Uncleat the halyard and gently pull the gennaker into the sock by pulling the Halyard through the block at the aft end of the sock. It is recommended that a crew member is positioned at the front of the boat to ensure that the gennaker does not get snagged.

## Mainsail – XD and Standard sail



1. Remove the mainsail from the bag and unroll.

2. Ensure that all the battens are securely in place. The Velcro tab on the pocket must be securely in place. To remove the batten simply pull the string tab to break open the Velcro.



3. Place the mainsail into the hull with the bolt rope/luff towards the front of the boat and the leach to the back of the boat.
4. Position the boat so that it is head to wind – bow into the wind



5. Take the main halyard
  - a. Ensure there is no twists in the halyard and it is clear of the spreaders.
  - b. Form a loop in the end of the halyard, pass the loop through the eye in the head of the mainsail.
  - c. Pass the bobble through this loop and pull tight to secure.



6. Feed the main sail into the mast track. The GNAV bar must be on the starboard side of the sail. Ensure that the sail and halyard is on the port side of the GNAV bar before hoisting.
7. Hoist the sail from the halyard which exits the mast on the port side

8. Keep feeding the sail into the track whilst hoisting to prevent the sail pulling out of the track and jamming.



9. When the mainsail is fully hoisted, coil the halyard and store in the bag on the gennaker bag.



10. Secure the Velcro tack strap around the mast.



11. The plastic slug on the clew of the sail is fed into the cut out on the top of the boom.



12. The outhaul line (blue in the picture) is passed through the eye in the sail and anchored at the boom end with a simple knot located in a slot at the boom end.





13. The Cunningham line is fed through the eye at the front of the sail and the line is anchored below the gooseneck by placing the knot in the mast track groove.

14. The Cunningham is controlled by the cleat on the top of the centreboard case on the starboard side of the boat.



**Single line reefing** (Standard sail only)

If the reefing system is not used there is a pocket on the mainsails to store the excess rope in the system.



a. The cleat should be released. (ensure there is a knot in the end of the rope)



b. The outhaul leech line is fed from the boom to the top eye in the leech of the sail.  
 c. The line is then led through the second eye down, back through the third eye and anchored at the boom with a bowline.

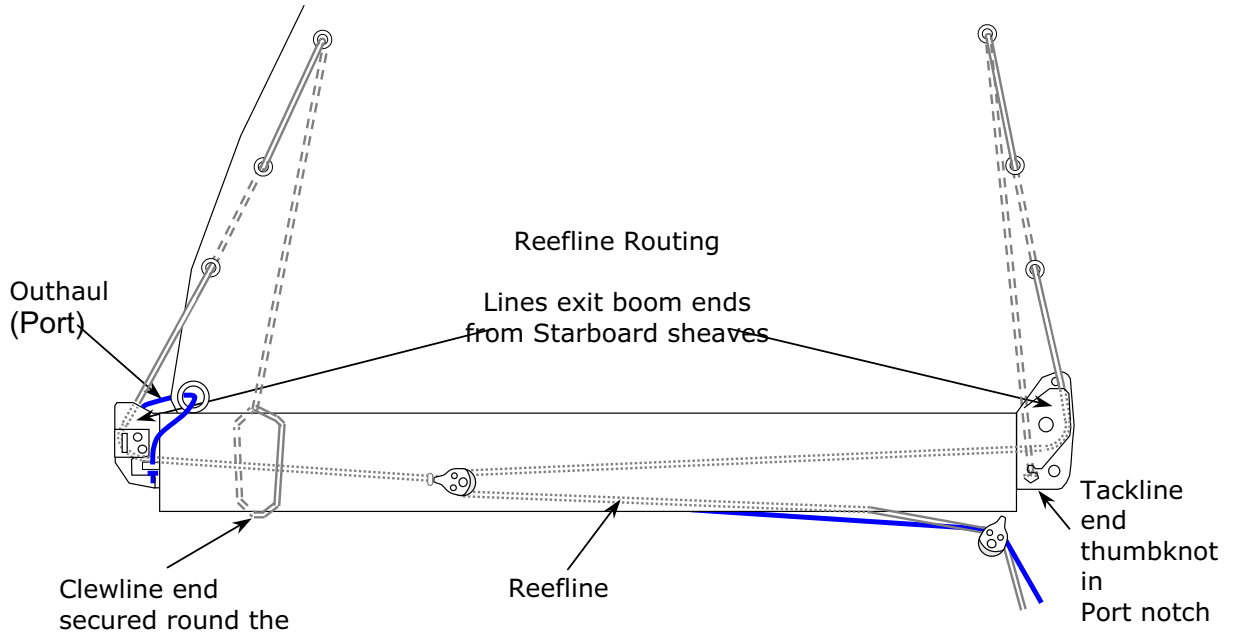


d. The luff of the sail is rigged by taking the reefing line from the starboard side of the boom, up through the sail cringles. The line does not pass through the Cunningham eye.

e. The reef line is threaded through the top cringle and back to the anchor point on the port side of the boom gooseneck.

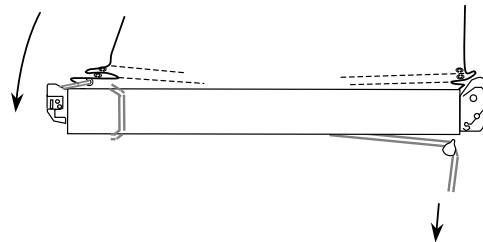
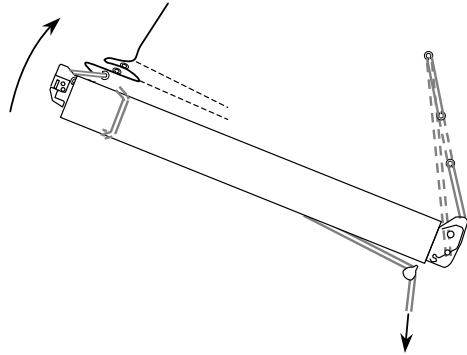


## Single Line Reefing Instructions



### Method

1. Ease sheet & GNAV.
2. Pull the reefline. The boom will angle up until the all of the aft reefline (clewline)slack is taken in or GNAV travel limit is reached.
3. Ease the halyard, and continue pulling the reefline. The boom outer end will move down towards horizontal.
4. When the reefline has pulled the clew and tack down hard, jam it off.
5. Re-tension the halyard and adjust the GNAV & sheet.



## Rudder

1. Attach the rudder assembly to the transom – **Fit the rudder retaining split rings to the holes in both pins.**



Ensure that the transom drain bung is in position and hand tight.

The boat is now ready for launching.

Note: the picture shows the gennaker raised, which would normally be stowed for launching.





## Launching and basic safety on the water.

### Before you go sailing:

- Check you are wearing suitable clothing and safety equipment for the conditions and time of year.
- Always wear a buoyancy aid or life jacket
- Make sure a third party knows where you are sailing and how many there are of you.
- Check the weather forecast
- Check the time of high and low tides if applicable.
- Seek advise of local conditions if sailing in anew area.
- Always check the condition of your craft before setting off.
- **Check for overhead cables when rigging, launching and recovering.**

### **Launching**

- Raise the mainsail with the boat facing into the wind.



- Launch the boat using the appropriate launching trolley.
- Take the boat into the water with the bow facing into the wind.

- Ensure that there is enough water to float the boat off the trolley.
- One person should hold the boat whilst the other gets in and prepares to set off.





- When there is enough water below you, lower the centreboard and rudder fully.
- Cleat the rudder downhaul in the cleat on the tiller and ensure that the wing nut on the side of the rudder stock is tight.

- The hook at the back of the centreboard case should be attached to the centreboard handle when sailing.
- The centreboard hook should be removed before coming ashore.



**The rudder and centreboard should be in the fully down position at all times when sailing and isometric boat.**

#### **On the water:**

- Conform to the sailing rules of the road.
- Look out for changing weather conditions.
- Never sail beyond your ability or that of your crew.
- Understand and be competent in the sailing skills and righting techniques.



**WARNING :** Avoid climbing on the back of the centreboard (trailing edge) wearing a trapeze harness as the hook could damage the trailing edge of the centreboard.

***HAPPY SAILING***

