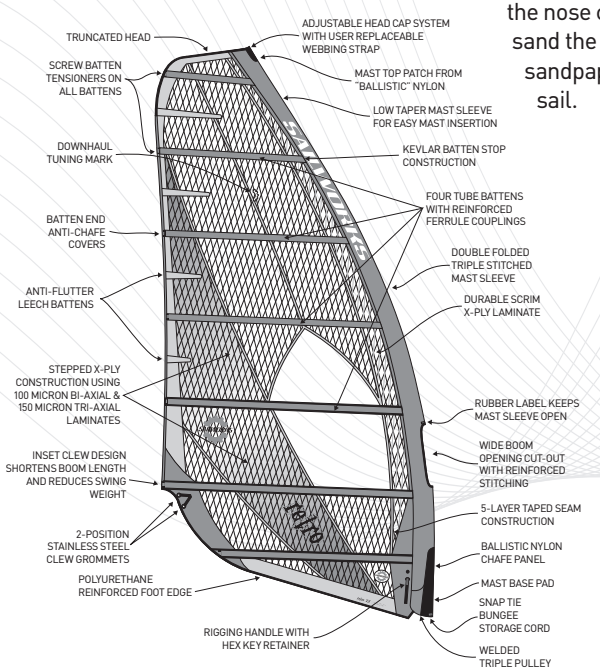
SAIL MAINTENANCE

- Shake the sand off before rolling up your sail at the beach, as this will help keep the monofilm clear. Most scratches are caused by sand and grit abrading the sail while it's rolled up.
- Prevent creases in the monofilm by rolling your sail tightly and using the bungee Snap Tie to keep it rolled tightly and store the sail where it won't get flattened.
- Rinse with fresh water occasionally, including inside the mast sleeve, to avoid salt and sand buildup.
- Avoid rigging on hard or abrasive surfaces.
- If left rigged for extended periods, release the outhaul and downhaul.
- Store your rigged sail out of direct sunlight. Prolonged exposure to the sun's rays will degrade the sailcloth.
- Repair tears promptly through a qualified sail repairperson. Make temporary repairs to the monofilm or X-ply with Mylar packing tape or a sticker on both sides.
- Do not use solvents for cleaning near seams, as this will dissolve the seam tape adhesives. Use water and mild soap. To remove tar spots or sticker adhesive residue use a citrus based cleaner.
- When leaving your sail unattended on the beach, secure it from blowing away.
- Avoid getting sand or dirt inside the mast sleeve and batten pockets. This reduces sail performance by increasing friction and wear on the mast and battens.
- Loosen the batten tension if you are not going to use the sail for an extended period.
- Check the non-skid texture on your board. Very coarse or excessively distributed non-skid on the rails around the mast step and at the nose can badly damage the sail. Lightly sand the texture down with some fine sandpaper so that it is less abrasive to the sail.



Design: Bridgeworks UK
Printed in USA
Photography:
Vlado Sklenar
Bruce Peterson

gear that works

retro

overcoming the
rigours of rigging

SAILWORKS

Thank you for going Retro!

Your new Retro is a simple, yet highly developed camless sail that offers stunning versatility, power and handling. It can be adjusted and tuned to suit a wide variety of conditions, because it has a unique shaping and tension profile. To fully understand and experience the Retro's potential, please take a few minutes to read this rigging guide.

Bruce Peterson
Sailworks R+D

REVOLUTION DIMENSIONS

SIZE m^2	LUFF MED. (cm)	BOOM MED – MAX (cm)	WEIGHT (kg)	# BTNS	MAST SLEEVE	IDEAL MAST	MCS CURVE%	IMCS STIFFNESS
4.5	409	151 – 156	3.7	6	OPEN	400	12	17 - 21
5.0	426	159 – 164	3.9	6	OPEN	430	12	21 - 25
5.5	446	168 – 173	4.1	6	OPEN	430	12	21 - 25
6.0	458	177 – 182	4.3	7	OPEN	430	12	21 - 25
6.5	473	186 – 191	4.5	7	OPEN	460	12	25 - 30
7.0	484	195 – 200	4.7	7	OPEN	460	12	25 - 30
7.5	490	205 – 210	4.9	7	OPEN	460	12	25 - 30
8.0	504	214 – 219	5.1	7	FIXED	490	12	28 - 30
8.5	512	223 – 228	5.3	7	FIXED	490	12	28 - 30
9.0	517	232 – 237	5.5	7	FIXED	490	12	28 - 30
9.5	527	242 – 247	5.7	7	FIXED	490	12	28 - 30
10.0	538	248 – 253	5.8	7	FIXED	520	12	28 - 33

REQUIRED MAST

Primary Mast Alternate Mast

USE THE RIGHT MAST

One of the most important choices you make when rigging a sail is which mast to put in the mast sleeve. Or, more specifically the length, curve and stiffness of the mast, and how closely these parameters match the sail. The mast is quite literally the backbone of the rig and it governs the sail's performance. The mast requirements for the Retro are printed on the sailbag and at the tack of the sail. Your mast should be within this required range, regardless of the brand or model. The Retro sails are designed around "constant curve" masts that exhibit an MCS curve profile of 64% at the base and 76% at the tip.

These masts have been tested and confirmed to be compatible with the Retro sails:

Sailworks: **Speedstick, Joystick, Lipstick, backbone, Lightstick, XR, FR, EPX**
Powerex: Z-Speed, Z-Free, Z-Wave
Fiberspar: 6000, 4800, 4200 Series, Reflex Wave
Pryde: X5, X7 & X9
North: XC 50,Viper 75

The following masts have been tested and proven to be problematic (too flex-top) for Retro sails:
Pryde: Race Pro, Freeride pro (1999 & 2000)
Fiberspar: Reflex 5000 & 4600 Series from the pre "Quicktip" era (1998)

If in doubt about the suitability of your mast, ask your Sailworks dealer, or contact Sailworks directly through feedback at:
www.sailworks.com

Not all sail sizes will work on the same mast. Sailworks sails are designed around an equivalency ratio of static pre-tensioning per square meter. This means larger sails need more pre-tensioning and smaller sails need less. Thus, larger sails need longer and stiffer masts while smaller sails require shorter and softer masts. Two of the most common compatibility problems are:

i) Using too long, or too stiff a mast. This restricts wind range by over-tensioning the sail.

ii) Using too short or too soft a mast. This also restricts wind range by insufficiently stabilizing the sail.

Each Retro size is designed and balanced on a specific Sailworks mast to suit conditions typical for the "average" size sailor (140 - 190 lb/63 - 86 kg). If you are lighter, or prefer a softer handling feel, consider using the next mast softer or shorter listed in the table. Heavier sailors can use a slightly stiffer mast to increase rig tension and stability. Retro 4.5, 6.0, 7.5 and 9.5 m^2, are "cross-over" sizes in that they can be rigged effectively on two different mast lengths, depending on the weight of the rider. Sailors over 90 kilograms (200 lbs) should consider using the longer and stiffer mast option recommended for these sizes.

We highly recommend coating your mast with McLube SailKote™, a dry Teflon marine lubricant. This lubricant will dramatically reduces friction along the mast and makes inserting and removing the mast much easier.

SET THE HEADCAP LENGTH

Retro sizes 8.0 and larger have closed heads, so no adjustment is necessary. Sizes 7.0 and smaller have a double adjustable headcap system that allows you to adjust the length at either end of the strap. This also allows you to replace the strap at the beach if it wears out. A spare strap is included with this rigging guide, and it is long enough for use with a longer mast. The strap installed on the sail is the correct length for the optimum mast length.

Check the luff length of your sail – (printed at the tack and on the sailbag), and compare it to your mast length. If your mast is shorter than the luff length, adjust the headcap strap so the headcap is as close to the top of the mast sleeve as you can set it. If your mast is longer than the luff length, estimate the amount of mast that will extend out the top of the sleeve (mast length minus luff length). Adjust the strap so that the top of the headcap is 1-2 cm shorter than this distance away from the top of the mast sleeve to allow for the headcap strap to cinch tight.

RIG ASSEMBLY

1. INSERT THE MAST

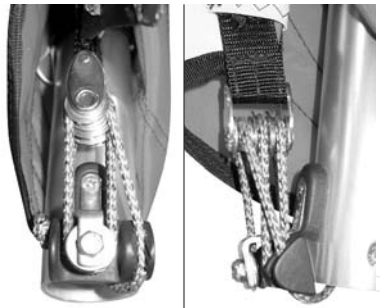
Pull the sail down the mast in sections using first the tack handle and the boom opening to assist you. Work the mast tip to the top of the sleeve before trying to pull the tack all the way down to the base of the mast. To prevent excessive wrinkling and creasing of the luff panel, try to avoid laying the sail down on the ground before the mast is all the way in. Keep the battens all rotated to the under-side of the mast. Check that the headcap is seated completely in the mast cap and that the two-piece coupling of the mast is joined completely before applying downhaul tension.

2. ATTACH THE MAST BASE

If your mast is shorter than the sail's luff length, estimate the amount of mast base extension needed (luff length minus mast length), and adjust your base extension. Your downhaul pulley system should have 6:1 purchase and enough line to make lacing easy. The triple pulley on the Retro works best with 4 or 5 mm line. Lace the downhaul line as shown here.

Do not fully downhaul the sail yet – leave the downhaul just "hand-tight", or at 50% maximum tension.

INLINE PULLEYS ▼



back view | side view

OPPOSED PULLEYS ▼

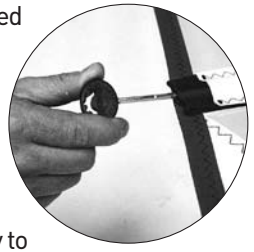
back view | side view

3. ATTACH THE BOOM

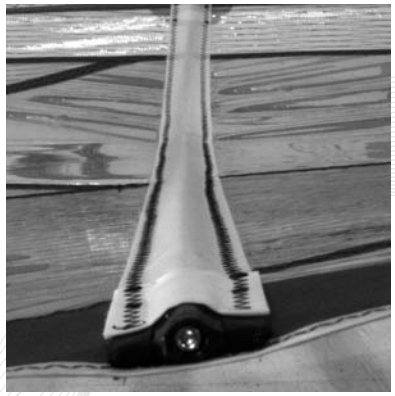
If you plan to use the on-the-fly adjustable outhaul system enclosed, set that up on your boom before attaching the boom to the mast. Follow the instructions enclosed with the adjustable outhaul for setup and use. Visit the video gallery at sailworks.com for more downhaul lacing tips.

Adjust your boom to the length specified for the sail. Attach the boom at your preferred boom height. If in doubt, attach it to the mast at the middle of the boom opening and re-adjust it after the sail is fully rigged. Be careful not to attach it too high in the boom opening, as you must account for the sail to be downhauled further. Also be careful not to pinch the mast sleeve or your uphaul line under the boom clamp. **Do not set the outhaul yet.**

4. TENSION THE STREAMLINED BATTEN TENSIONERS (SBT's)



The battens are tensioned using the hex-key tool found under the Velcro tab above the tack handle. Insert the hex-key into the cap screw at the leech end of each batten. Turn the hex-key to the right (clockwise) to tighten, JUST until the small wrinkles across the batten pockets disappear (see photos). You should see a smooth reflection, with no wrinkles alongside the battens. Batten tension should be tightest on the lower battens and looser on the upper battens.



▲ needs batten tension

▲ perfect batten tension

CAUTION: DO NOT OVER-TENSION THE BATTENS – POOR ROTATION, EXCESSIVE FOIL DEPTH AND DAMAGE TO THE SAIL CAN RESULT.

Replace the hex-key tool back in its pocket above the tack handle. The batten tension will need to be re-tightened after the initial one or two uses as the sail stretches and sets into its final shape. Once the batten tension is set, it's not necessary to release batten tension after each session.

5. TUNING THE DOWNHAUL

There are two key indicators of correct downhaul tension. One is the position of the batten tips (front ends) relative to the mast, particularly the batten just above the boom. The other is profile angle of the upper battens and tension distribution around the head and leech. The downhaul is the primary controller of the sail's shape and performance. With the boom on, but no outhaul pulled, discover the downhaul's effect by slowly pulling and releasing the downhaul line a few times. Watch the change in depth and tension of the leading edge (front 1/3 of the sail), and the flattening and loosening of the head and leech area as more downhaul is pulled. Specifically notice the change in the angles, or twist, of the upper battens. The top batten should twist open to leeward the furthest - called "progressive twist".

5. TUNING THE DOWNHAUL (continued)

Twist is cut into the panel layout and seam shape of the sail, but is ultimately controlled by the downhaul tension. More downhaul induces more twist; less downhaul allows less twist. Twist improves sail efficiency by lowering the center of effort and making the sail easier to control. The head and leech looseness that creates the twist in the sail's shape is a drag-reducing feature that improves the overall aerodynamic efficiency of the sail. Note that it is more significant how far IN from the leech looseness extends, rather than how far DOWN the leech it extends.

To ensure that the sail is tuned properly, you must make a judgment upon the wind conditions you are about to use the sail in, and tune the sail according to your size, skill and abilities to handle those conditions.

The optimum downhaul setting gives a tight luff with a lean entry. The leech area between upper battens should become loose in arced lines from the ends of the battens around the front of the front ends of the mini battens. The Retro has a white half-cog downhaul graphic positioned in front of the 2nd mini battens as a "pull-to" downhaul reference mark. Use this half-cog graphic as a visual reference mark to achieve the desired leech looseness. The target setting for all-around conditions is to pull the downhaul until the leech looseness extends all the way in to the reference mark. See the downhaul settings chart for more detail. The front end of the batten above the boom should be at or very near the back edge of the mast.

Use less downhaul to increase foil depth for more power, to tighten the leech for better pumping; and to reduce twist and increase power in the upper part of the sail. Use more downhaul to tighten and flatten the leading edge of the sail, to lower the center of effort and to induce more twist.

Once you're familiar with the correct downhaul setting, re-check the headcap length vs. mast base height. If necessary, readjust these so that the tack pulley sits very close to the mast base cleat, and the amount of mast extending out the top of the mast sleeve is minimized. Never use both mast base extension AND headcap extension – eliminate one and minimize the other.

If needed, use an easy-rig or downhauling crank so that it is easier to make the correct settings.

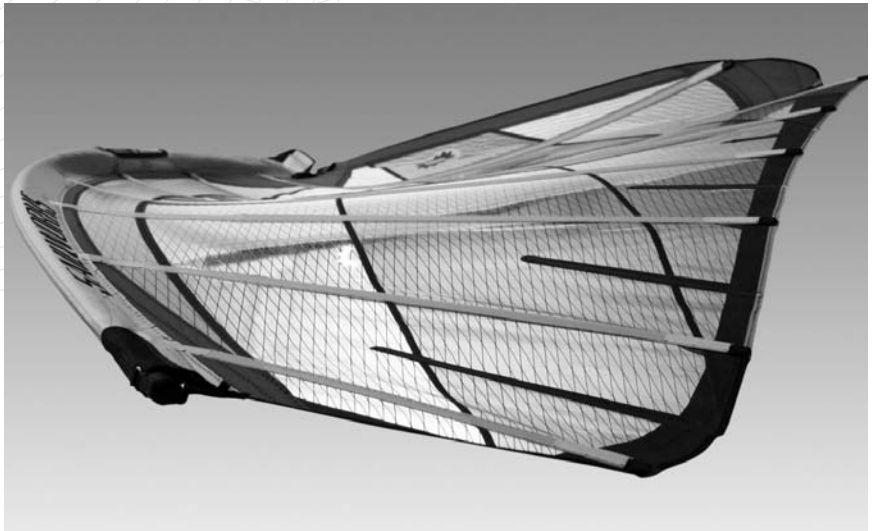
6. BALANCE THE OUTHAUL SETTING

Release any outhaul tension and allow the sail to relax naturally. For reaching conditions at medium downhaul settings, pull the outhaul a minimum of 2.5 cm (1 inch) from this neutral position. Cleat off the outhaul line. Check the foil depth by pushing on the sail area near the front of the boom or standing it up in the wind. Under pressure, the sail will increase in depth as the battens pull back from the mast. When luffing or without pressure, the sail will flatten.

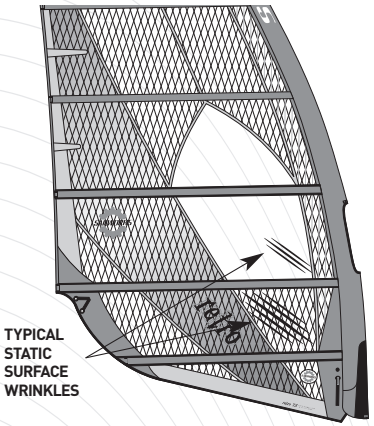
Less outhaul makes the sail fuller, moves the center of effort (power) further back, and creates more power for accelerating and deep reaching. This setting is harder to control when over-powered or sailing upwind.

More outhaul makes the sail flatter, moves the center of effort (power) further forward, and creates a lean, tight foil that is more efficient for upwind sailing or over-powered conditions. Whenever you significantly change downhaul, you will need to adjust the outhaul tension too.

By design, the Retro sails are exceptionally responsive to changes in outhaul settings. Use the outhaul as a throttle control for more or less power. Set the sail fuller with less outhaul for more power. Set the sail flatter with more outhaul for more stability and control in high winds. If you are not using an adjustable outhaul system, you should be. These small outhaul changes can then be made on the fly while sailing to greatly expand the wind range of the sail. Note that having and using an adjustable outhaul system does not replace or negate the importance of proper **downhaul** tuning. Set the downhaul first to match the wind conditions, and then adjust your **outhaul** settings.



Q "Why does my Retro have wrinkles in the foot area?"



A The Retro has some diagonal wrinkles in the foot area that are visible when the sail is static (unloaded). They are associated with the flexible nature of a semi-rigid three-dimension structure and are not indicative of a construction problem or error. They are a by-product of the very deep broadseaming profile and elastic rotation of the foil from static to loaded forms.

These wrinkles will diminish under wind pressure as the sail fills out to its maximum depth.

Q "Why does the draft profile seem to move around a lot?"

A You need more downhaul to stabilize the sail shape better. Increase the downhaul tension, then use the outhaul to create foil depth for power as required.

Q "Why is the downhaul difficult to pull?"

A Make sure your downhaul lines are not crossed through the pulleys, especially the last loop that goes to the cleat. Make sure your line diameter isn't too thick. Use a fresh piece of line. Try using an easy-rig or downhaul crank.

Q "Why don't my battens rotate very easily?"

A Check that the battens are not over tensioned, as excessive batten tension will impede rotation. Increase the downhaul tension. Insufficient downhaul impedes batten rotation.

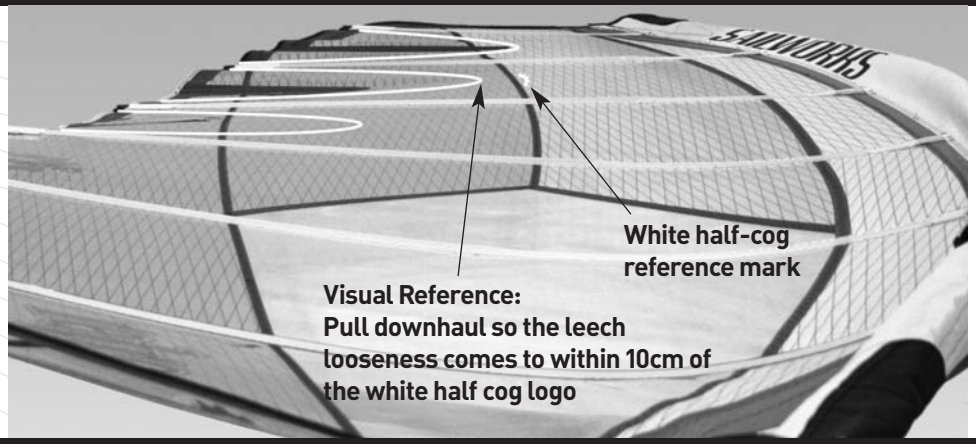
Q "Why can't I get planing when I feel I should be able to?"

A Ease the downhaul slightly. Too much downhaul flattens the foil and excessively loosens the leech, which gives you more control in heavy wind, but less power in light wind. Ease the outhaul to deepen the foil shape. Too much outhaul will also flatten the sail and take power away. Lots of outhaul is good for high wind control but not for light wind power. Use an adjustable outhaul system to be able to make outhaul adjustments on the fly.

- **If it doesn't feel right, it probably isn't. A well-tuned rig should be effortless to sail and control. Take the time to explore different settings and make the changes necessary to balance the aerodynamic forces from the sail.**

- **Once you have found settings (boom length, mast base length, boom height, mast step position, downhaul and outhaul position, harness line position) that feel balanced, record the position of each adjustment so that they are easy to repeat next session. Mark the settings with a waterproof marker right on your equipment.**

light wind settings

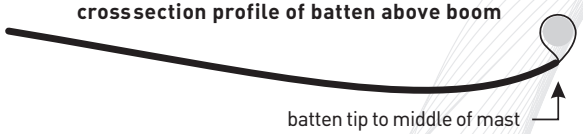


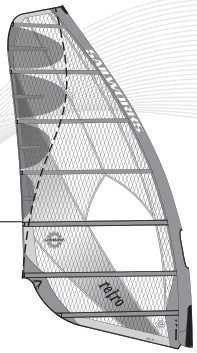
Maximum power in light winds, but less stable and harder to control when overpowered.

Downhaul:
- Leech shows looseness along the edge between battens and extends in to the within 10 cm (4") of the white half cog logo
- Batten tip above boom sits beside mast, but never extends past it
- Deeper foil, less twist

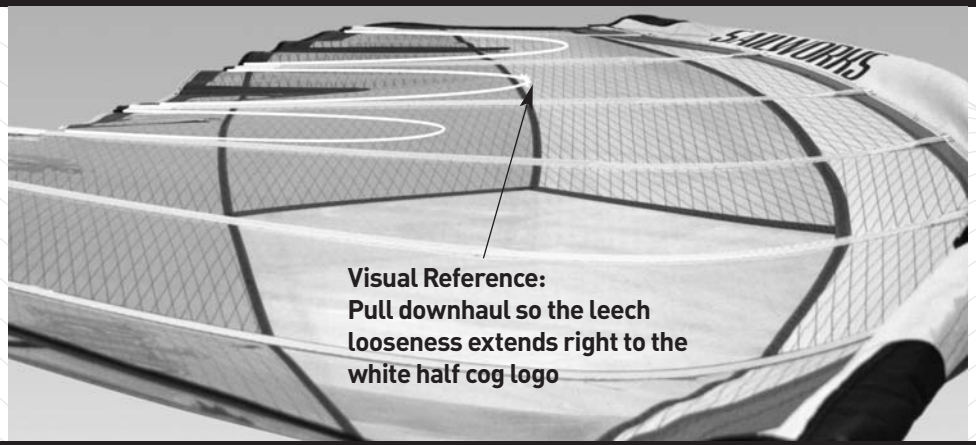
Outhaul:
- Pull the outhaul about 1-2 cm (1/2-1") from neutral position
- Boom length becomes shorter

crosssection profile of batten above boom





mid-range settings

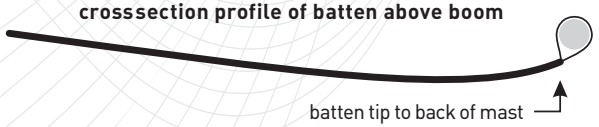


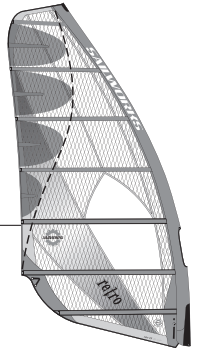
Good all-round settings for maximum power and control.

Downhaul:
- Leech shows looseness extending in right up to the white half cog logo
- Batten tip above boom sits at back edge of mast with slight overlap
- Lean foil, moderate twist

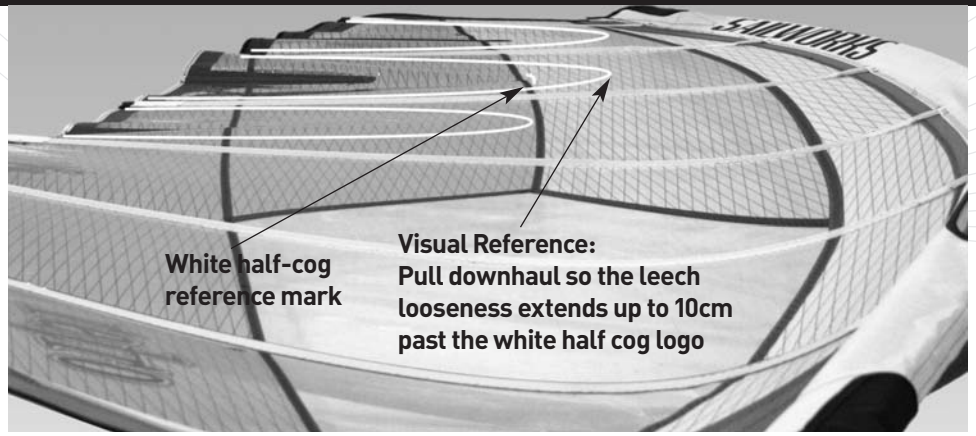
Outhaul:
- Pull the outhaul about 2-3 cm (1") from neutral
- Boom set at medium specified length

crosssection profile of batten above boom





high wind settings



Maximum control and stability in high winds, but not powerful in light winds.

Downhaul:
- Leech shows looseness extending up to 10 cm (4") past the white half cog logo
- Batten tip above boom sits behind mast
- Flatter foil, more twist

Outhaul:
- Pull the outhaul about 4 cm (1 1/2") from neutral
- Boom length becomes longer

crosssection profile of batten above boom