



# Tuning Guide

## MAST SET UP

Mast set up is critically important to the performance of the boat.

Firstly set the **spreader rake** to suit your crew weight. Spreader Rake is measured between a line between the tips of the spreaders and the back edge of the mast (as shown diagram 1).

Spreader rake that is perfectly suited to you can only be determined by practice and experiencing different conditions however this is what I go by as a rough guide:

- ◆ 40 – 54mm Spreader Rake For Medium Heavy Crews (155 – 170kg)
- ◆ 55 – 64mm Spreader Rake for Moderate Crews (141 – 154kg)
- ◆ Over 65mm Spreader rake for light crews (under 140kg)

The principle is to increase spreader rake for lighter crews and reduce for heavier crews between this basic range.

Once deciding upon a suitable spreader rake **tension the diamond wires**. The diamond wires can be adjusted to suit the conditions. The method I use to measure the tension is using a Wire Tension Gauge which you can obtain from a local yacht shop. Measuring the pre-bend is preferred by some people but if you adjust the tension between races it is impossible to measure the pre-bend. This is where the tension gauge comes in handy.

The settings I usually follow are:

- ◆ Under 36 for light wind (under 8 knots)
- ◆ 36 – 38 for medium wind (8 – 18 knots)
- ◆ 39 – 42 for strong wind (over 18 knots)

Basically I wind the diamond wires up to de-power (increases mast bend) and reduce diamond wire tension to power up (reducing mast bend).

To test whether I have the correct mast set up I go sailing against another boat or boats and go testing. I look for height, speed and power against the other boat. I find if I am slower than the other boat, possibly struggling to hold the boat flat and having to point very high (assuming the other variables are eliminated) the sail is too full. Increasing Cunningham and reducing rotation comes to a limit and if I reach the limit before reaching the same speed I increase the diamond tension to further bend the mast. If still we are slow after reaching maximum diamond wire tension I then adjust the spreader rake, which of course can only be done on the beach.

This then works in reverse also. If I find the boat is underpowered, maybe not flying a hull when the other boats are, or feels sluggish and does not accelerate when even without Cunningham and maximum rotation reducing the diamond wire tension will

help. But this also can only go so far and if the diamond wires become too loose you risk damaging your mast so then reducing spreader rake is the go. This will straighten the mast and increase sail depth and therefore power.

## BATTENS

I recommend using the battens supplied with the sail. The top two really should only need to be adjusted with slightly lighter or heavier battens depending on crew weight and conditions. Again it is the same, more power needed – use softer battens, too much power – use harder battens.

The batten tension although not super critical should be done with some care. I simply start at the top and pull the wrinkles out and then pull some more tension. Pulling the batten tension too tight is not necessary.

## JIB

Once hoisting the jib attach the tack as low as possible on the bridle fitting then look for the sheeting angle from the clew to the track. I find an angle slightly higher the 45° works . Then I estimate where on the Clew plate (where the sheet attaches).

After positioning the Jib correctly adjust the luff tension to suit the conditions. This works same as the Cunningham on the Mainsail. Increase the tension in strong wind conditions, and reduce tension in light conditions. In strong wind simply increase tension to remove wrinkles then pull a little more till the luff is flat and firm.

Do not worry about having small wrinkles in the luff of the sail in light wind, it is not a problem.....Don't forget that you can adjust the luff tension of the jib between races if you are not happy!

## SPINNAKER

One of the most important things with the spinnaker is to ensure that it won't have a problem being hoisted, gybed or dropped. Ensure the all sharp edges, rings etc are well taped and over the turnbuckles and anything that sticks out of the mast.

Attach the spinnaker lines and hoist it to ensure that everything is correct before starting the race. The spinnaker can increase power by moving the block forward or using a deflector block to change the sheeting angle. The further forward the more power is generated. This can be adjusted for wind conditions.

## RIG TENSION

A lot of people set the rig tension the same for all conditions. On a rotating rig it is important to remember that as the mast rotates the leeward shroud is bearing against the leeward side of the mast. This can create problems when you try to over rotate downwind and in particular in light wind when there is no assistance from the sail to push the mast. We all know that the leeward shroud goes slack while going upwind even in moderate wind so all rig tension is doing is holding the mast slightly more

vertical. I recommend very loose rig tension in light winds under 8 knots and slowly increasing as the wind does (loose means that the wire is straight not flopping while on the beach).

## MAST RAKE

The mast rake using the trapeze measurement method (taking the trapeze to the forstay bridle fitting and then swinging it aft to a point on the rear deck) . The range is somewhere between the from of the inspection hatch and 10 cm down the transom. For light winds further forward and heavier wind more aft. The crew weight is also a factor and for light crews further aft and heavier crews generally a little forward.

## RUDDER ALIGNMENT

Most common advice is to set the rudders up parallel however this may not be the fastest. Most boats sail with some weather helm on the rudders and subsequently you have to pull on the tiller slightly to keep the boat in a straight line going upwind, this means you could have a few degrees of turn on the leeward rudder that is fully loaded, however the windward rudder that has very little load will only cause drag if it is not in line with the windward centerboard. The best way to assess what amount of toe in you require is to sail upwind double trapeze under maximum load and watch the water flow around the windward rudder.

When toeing in any rudders keep in mind that it should be the bare minimum as excessive toe in will harm downwind performance when both rudders are not loaded and close to parallel is fastest (see diagram 3).

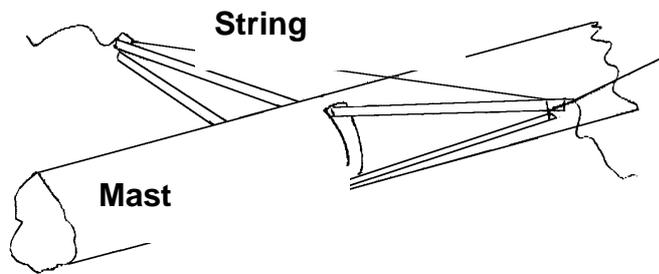
Helm is directly related to rudder rake and if you have too much weather helm (pull on the tiller) then the rudder may have to be kicked under the boat more and if you have neutral helm it may need to be raked aft.

Attached diagrams:

2 – Rudder set up

1 – Mast spreader rake

## Mast Spreader Rake



## Rudder set-up

