

Note:

The information presented here should work for all DF95 boats but exact settings and measurements must be treated as generic. Boats and rigs can be quite different. Therefore, your boat may need slightly modified measurements to get it balanced and make it fast. It is suggested that the measurements presented here are used as a starting point for further refinement by the sailor.

To aid understanding of the terminology used, please refer to Image 23, which shows the Head, Tack, Clew and position of luff ties 1, 2 and 3.

Materials required

It is recommended to use a mix of 80lbs, 50lbs and 20lbs braid in place of the manufacturer's supplied line e.g.:



Image 1

Thin braid can be used for all applications if preferred and will be strong enough when new. However, service life of thin line may be short due to chafing and sharp edges, hence the recommendation to go slightly heavier than may be ultimately necessary for the higher loaded lines.

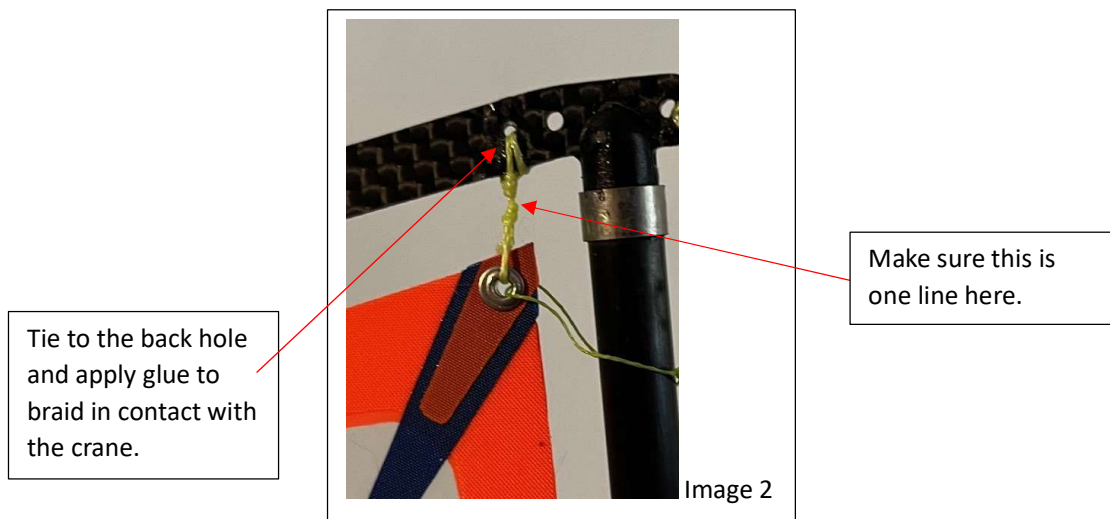
Always apply supa glue (or similar e.g. lacquer) to each knot, especially when the knot is not a braid-specific knot, e.g. on a bowline or reef knot, otherwise the knot will fail under load. Research the Palomar knot and Uni knot, use where you can. They are braid-specific and mostly secure under load, even without supa glue.

Rigging the sails onto the spars:

1. Rigging up the mainsail:

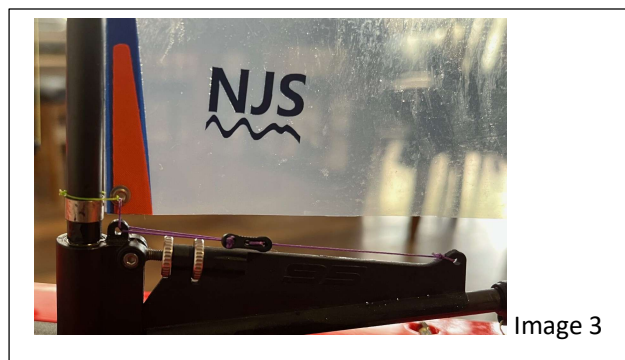
Consider adding a second hole in the mast crane to tie the mainsail to, this will help prevent the luff of the sail catching on the back of the mast and bunching up, especially when sailing downwind. Refer to Image 2.

I drill a hole approximately 3.5 mm to 4 mm back from the original.



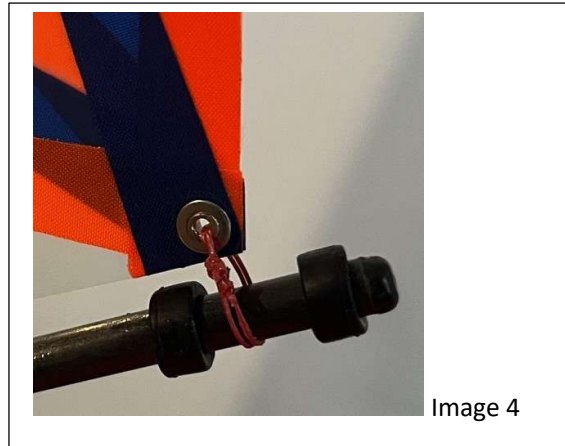
Start by securing the mainsail to the masthead crane with 80lbs braid. Use knots that you are familiar with but make sure there is only one line (no loop) between the sail and the crane, to allow the sail to swivel freely. Tie the sail to the back hole in the crane applying glue to the braid in contact with the crane. This stops it chafing and breaking.

The height of the sail is important. Set the sail as low as possible on the mast, allowing just enough space at the tack attachment point to allow the sail luff to be tensioned without running out of cunningham adjustment. Refer to Image 3:



Tie the cunningham bowsie as shown in the DF rigging manual using 50lbs braid.

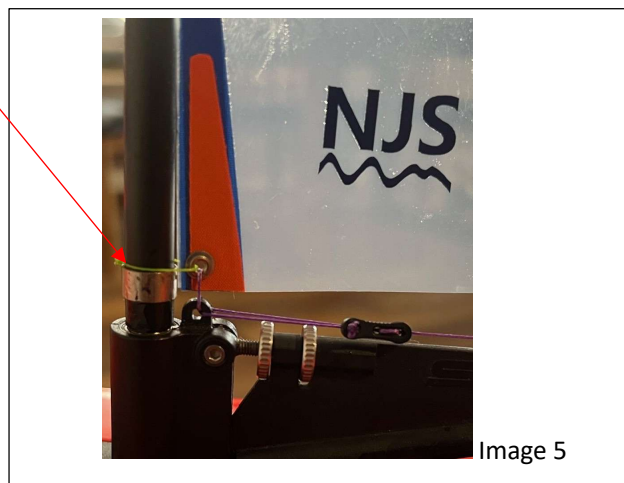
Attach the clew of the sail to the boom with a double loop of 80lbs braid and a reef knot. Before application of supa glue, the length of the loop can be easily adjusted by pulling on the loop, e.g. place a needle or similar object between the knotted loop, just the one strand with the knot in it, and the boom. Pull on it gentle to make the knot slip a little to make it longer. Be careful not to crush the sail when doing this. To make the loop shorter, pull on the ends of the line and make the knot slip a little thereby tightening it a little. Set the length of the loop so that the bottom edge of the sail does not contact the rubber stoppers, as shown in Image 4:



Once the length is set, tie an overhand stopper knot in each of the two tails (pulling them hard up against the reef knot) and apply supa glue to permanently set the knot and prevent it slipping, then cut the ends suitably short.

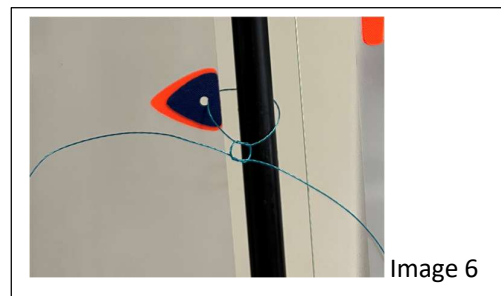
Next step is to make the luff ties.

Firstly, tie the tack close to the mast using one loop of 20lbs braid and a reef knot, the gap between the sail and the mast should be approx 1 mm. This is shown in Image 5 as the yellow tie:

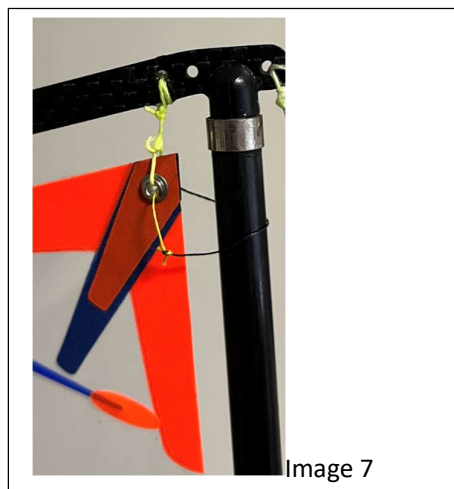


The tack tie can be set permanently with supa glue and the ends cut off.

Then for luff tie 1, use a loop of 20lbs braid to make the luff tie, but this time leave the knot loose, unglued and ends uncut, as shown in Image 6:

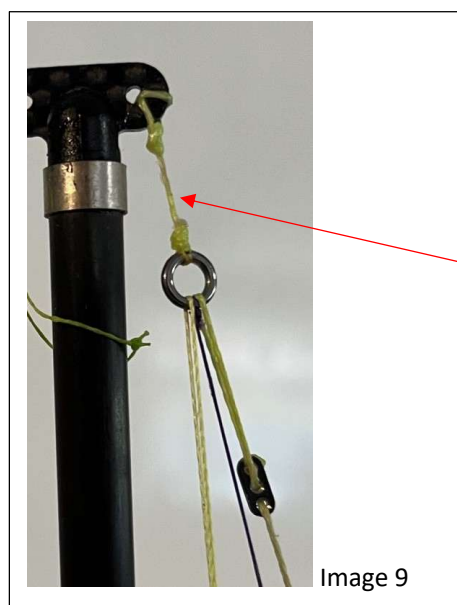


Do the same for luff tie 2,3 and 4. The head of the sail should have the luff tie set very loose, too loose to have any effect on the sail. It is not required for performance but is required to satisfy Class Rules. Tie it very loose so that there is no risk of the luff tie taking any tension, as shown in Images 7.



2. Rigging up the jib:

Make sure there is a metal ring tied to the hole in the mast head meant for the jib attachment:



Make sure this is one line here.

Similar to the mainsail attachment, the ring needs to be attached to the mast by one strand of 80lbs braid so that it can swivel easily. The distance between the ring and the hole in the crane should be close to 15 mm. To stop the lines moving, chafing, and ultimately breaking, apply supa glue to the braid running through the holes in the masthead fitting so that the braid is glued to the mast crane.

Tie 300 mm of 80lbs braid to the jib luff wire using a Uni knot, (Image 10).



Image 10

Connect the 80lbs braid at the top of the jib luff wire to the metal ring using a bowsie. Do not tie the stopper knot or cut the line to length yet. I use the micro metal type bowsie for this, but the Joysway plastic ones are OK if that is what you have. To set the height of the jib without cutting the line or tying the stopper knot I wrap the uncut end around the mast crane multiple times to stop it slipping. This allows the length to be set accurately later in the rigging process.

Slide the jib boom counterweight through the bottom eye in the jib luff wire and into its normal position in the jib boom.

Thread the jib boom uphaul line through the ring and behind the line that holds the jib luff wire up and behind the line that will support the jib by the head. So, the 80lbs braid is frontmost, a length of 50lbs braid tied to the ring for the jib head eyelet is the next one back and the jib boom uphaul sits rearmost through the ring. Fit a bowsie to the line that supports the head of the jib, pass it through the eyelet in the head of the jib and back to the bowsie. Set the bowsie in the center of the line between the head of the jib and the metal ring attached to the crane with the height of the jib set approximately as shown in image 12.

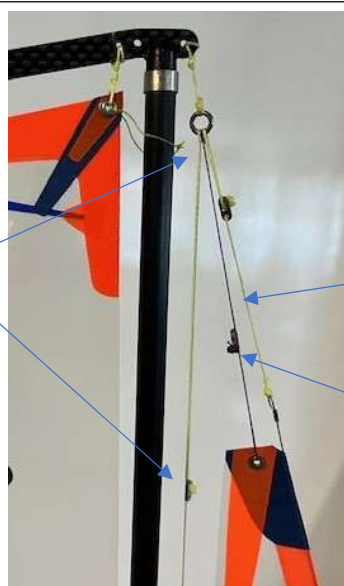


Image 11

The boom uphaul (lift line) is run through the ring at the top, with the bowsie also toward the top.

This image shows the stopper knots tied and ends cut, but yours should not be at this point in time.

When rigging the jib, tie this line first with bowsie in the middle, rig tension on and mast rake at 1130 mm

Jib luff adjustment line tied to the ring and through the eyelet in the head of the jib

Now tie the jib clew to the jib boom in exactly the same way as the main clew is tied to the main boom, see Image 4.

The jib boom tie down attachment line must be rigged as shown in the rigging manual. Make sure it can be adjusted so that it can be let off for storage and tightened down fully for sailing. The jib boom must be kept as low as possible to the deck when sailing.

Tie the jib tack using a loop of 20lbs braid to the front hole in the jib boom front end fitting so that the jib is always as low as practical but high enough to prevent the foot of the jib jamming up on the jib boom centre fitting during tacks in light wind. Refer to Image 12.

Jib height to be set with the tack tie so that the jib is low as practical when sailing

Use the option in the rule to adjust jib luff from the head so there is only one bowsie here under the boom



Image 12

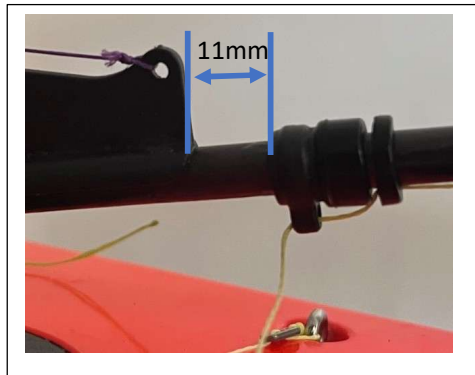
Keep the jib boom as low as possible when sailing.

Now set the length of the line that holds the jib up. First set the line attached to the jib luff wire, set it so that the bowsie is halfway between the two ends of the braid, refer to Image 11. The mast rake should be 1130 mm measured from the top of the deck the intersection of the bow bumper and the deck, to the hole in the front of the masthead fitting. It is difficult to set this accurately but take your time and be careful to get this right. An inaccurately set line could result in the adjustment running out to one end while racing without achieving the required mast rake. Once the length of this line is set, i.e. stopper knot for the line at the bowsie cut and glued, then set the length of the jib luff adjustment line so that the bowsie is normally at the centre point between the jib head and the metal ring attached to the front hole in the mast crane. This allows for the maximum amount of adjust in both directions should the jib luff tension, and or mast rake need to be changed at any time. The tack of the jib is to be set at the lowest desirable position, see image 12, and held there by the jib tack tie. Set the jib luff tension only tight enough to remove the wrinkles in the luff. Make sure that the rig tension is being taken up entirely by the jib luff wire before putting any tension at all in the jib luff, i.e. the luff tape and sail film.

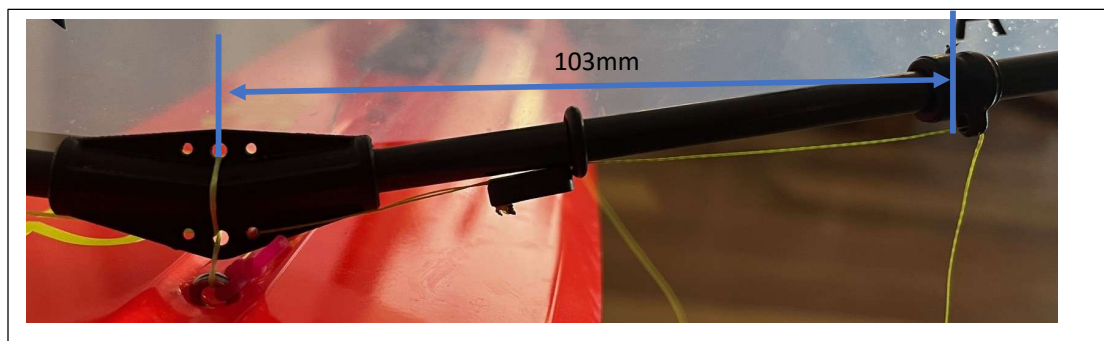
Jib and Main Sheeting Attachment Points

These are important and often not set well. Problems can arise when they are left free to slide on the booms, problems include jamming to one side so the boom position is not even on both tacks, as well as sliding fore and aft which affect both the fully in and fully out sheeting position. For these reasons I glue both the main and jib sheet slider to the boom in their optimum positions. When doing this, make sure the sliders are absolutely centered vertically on their booms. Otherwise, the sheeting position can be different on each tack.

The front edge of the main boom slider should be 11mm back from the back edge of the vang fitting.

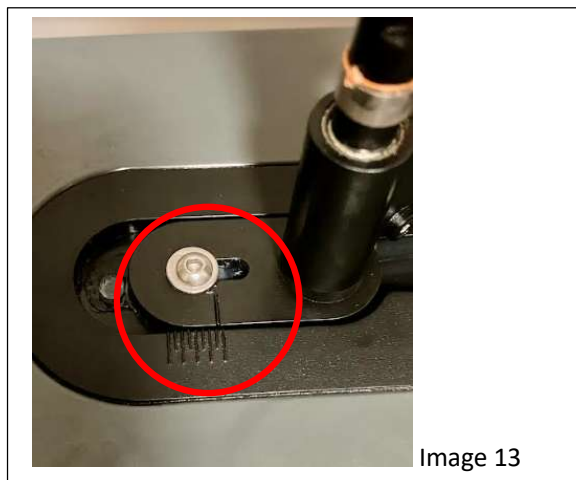


The jib boom slider should be 103mm back from the centre of the jib boom centre fitting.



These positions for the sheeting sliders should allow full range of adjustment for booms fully in for upwind and fully out for downwind when racing. If full range of movement is still not available then make suitable adjustments to the end points in your transmitter setup to get that full range.

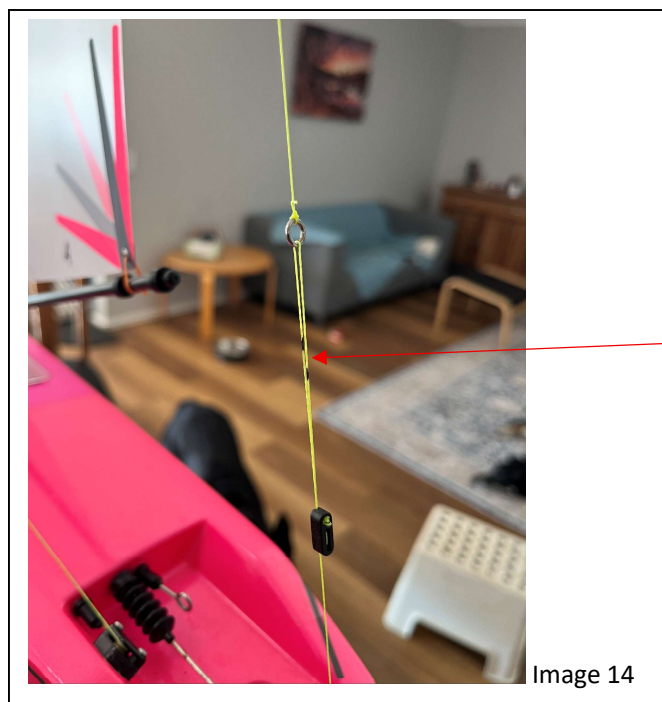
Check that the mast foot slide is set in your normal racing position, which I find is somewhere near the back of its adjustment for the DF95 (see Image 13), (the DF65 is different). Setting it back will produce a stiff mast and high forestay tension for a specific amount of mast bend. Conversely, setting the slider forward produces a setup with looser forestay tension for the same mast bend.



Mast stiffness can vary a lot so the optimum mast foot slider position may be different for each boat, so you may need to try a few different positions to find what works best for your boat. Start at the back and work forward from there. If this search for the optimum position is problematic then don't stress, just set the mast adjuster fully back, it will be close to ideal.

Now we need to get the mainsail luff ties set with the backstay tension applied, remembering that the knots in the ties that need to be set are still loose and adjustable.

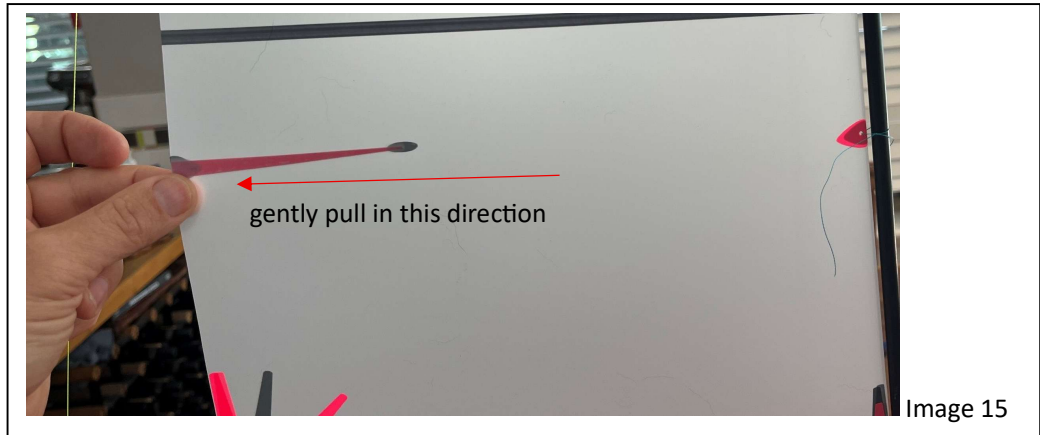
Set the backstay tension and mast rake to the setting you use when racing. Then tension up the backstay a little more to bend the mast just a little more. Do not overdo this, applying too much tension can overstress the hull of the boat, but you do want to bend the mast just a little more than you do when the boat is racing. For reference see the photo below. The black dots on the backstay adjuster are aligned for my race settings, but in the photo the adjuster is pulled on more and the dots misaligned by about 1cm in order to conduct this setup of the luff ties.



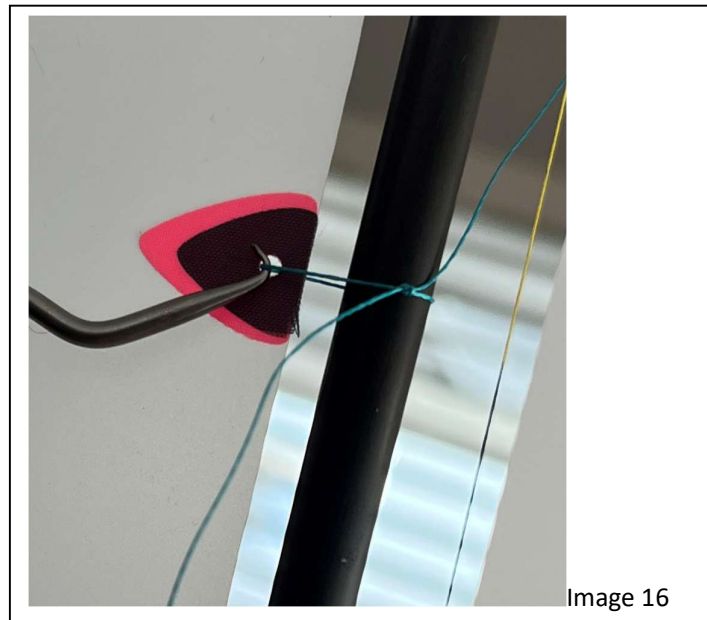
Pull on backstay so the race calibration marks misalign by 1cm in order to setup luff ties.

Now tension up the cunningham to apply a bit of luff tension. There must be no slack in the mainsail luff. Take out all foot round by sliding the clew adjustment rubber rings on the outboard end of the boom as far back as possible.

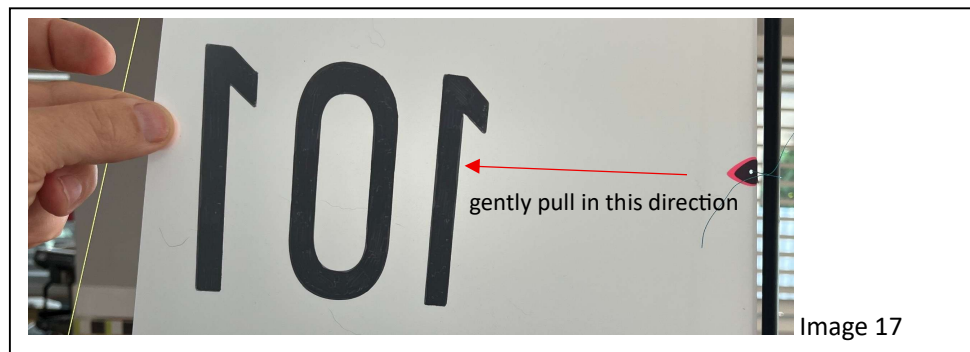
Start with luff tie 1, snug up the knot in the luff tie so that the tie is still just loose when you hold and gently pull the mainsail backward from the leach. Only pull back hard enough on the leach to remove any slack and find the point at which the sail sits behind the mast when under the slightest bit of load. See image 15 as follows:



The correct luff tie length can be checked by hooking into the luff tie and pulling it back while also pulling gently back on the mainsail leach. The tie should pull back to about the centre or back of the hole in the luff tie patch, see below:



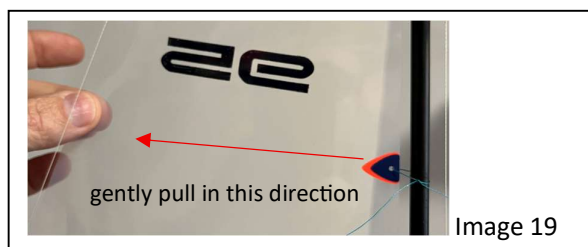
When this is done repeat the procedure for luff tie 2.



Then luff tie 3.



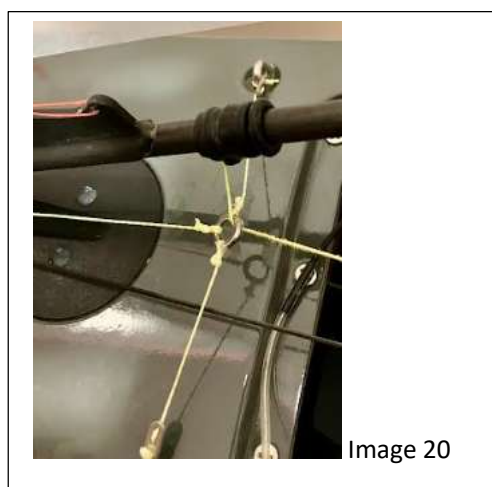
Finally luff tie 4.



If luff tie 4 creates any issues when racing, i.e. seems too tight, then just cut it and tie it again as a very loose “do nothing” tie, similar to the luff tie at the head.

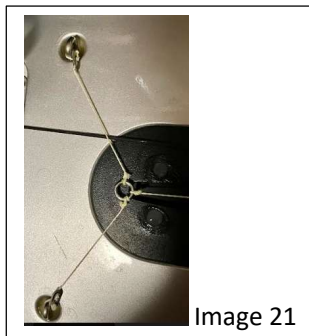
Now set a generous amount of depth in the mainsail foot by sliding the clew adjustment rubber rings in toward the mast. Exact depth is not important at this stage but it should be ample at around 35 mm measured at the mainsheet attachment point.

Set the mainsheet adjustment (winch) to your typical upwind setting. The image below shows about 8 mm of mainsheet between the boom and the metal eye in the bridle. As shown in image 20 as follows:

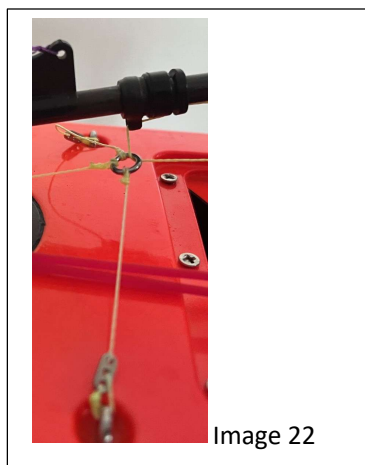


Make sure the bridle adjustment is not tight (holding the metal ring close to the deck). The bridle should always be set as high as practical, so the metal eye of the bridle hits the

mainsheet slider on the boom just before the main comes to centerline (as the mainsheet is pulled in). A good guide for bridle adjustment is that when the rig is off the boat, pull the bridle eye forward along the deck and it should sit in the centre of the boat and close to the very back of the recess for the keel fin slot, as shown in Image 21:



The bridle fore/aft restraint line needs to be set so that the metal ring is positioned directly under the front edge of the main boom slider when the main is sheeted into the fully in position, (as in Image 22). Bridle setup is important, as your boat will be slow if it is set too low, too far back or too far forward.

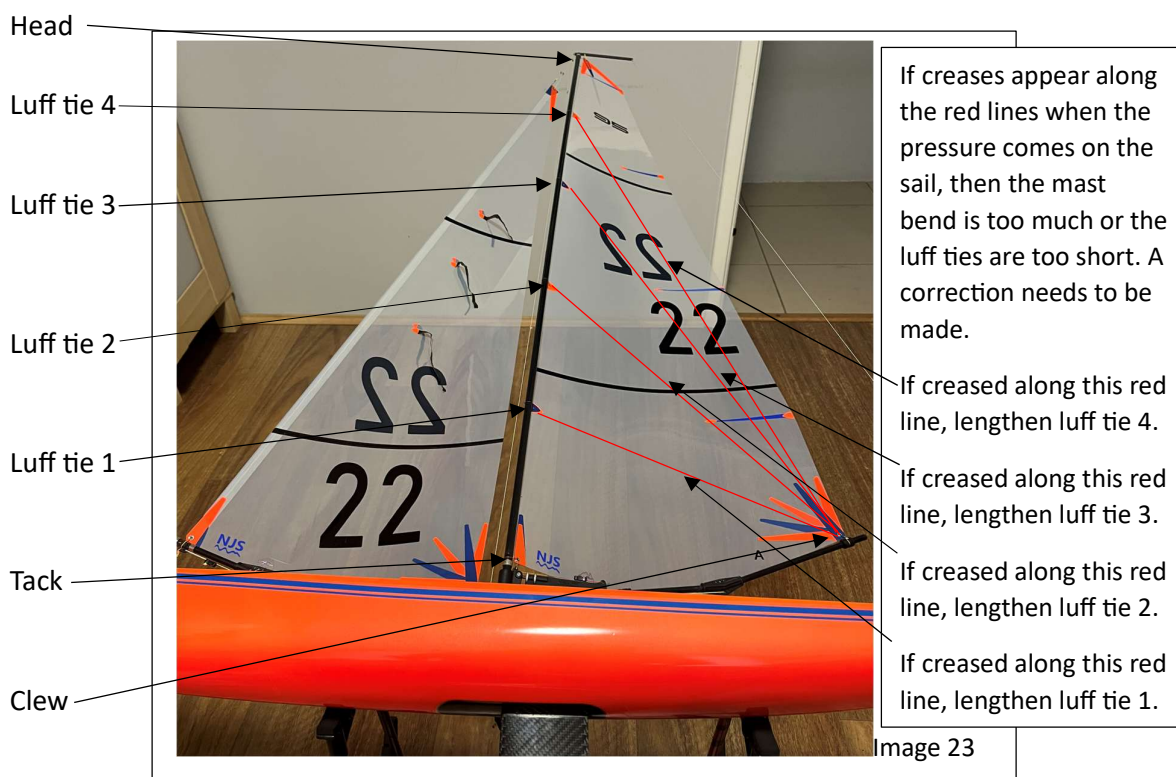


Now pick up the boat by the keel and hold it horizontally, refer to Image 23. Tension the backstay until the curve in the mast is matching (as closely as you can make out) the curve in the mainsail luff. This should be close to the rig tension you like to sail with. I recommend a reasonably tight jib luff when racing, although rig tension should be less in light wind to make it easier to wing the jib when sailing downwind.

If the rig seems really loose and the mast very bendy, then slide the mast step slider back a bit and try again. Conversely, if the rig seems very tight, to get the required mast bend to match the mainsail luff set the slider further forward to soften the rig.

(It's much easier to move the mast step slider with the back stay loose, then retightened afterwards.)

The sail should sit in line behind the mast.

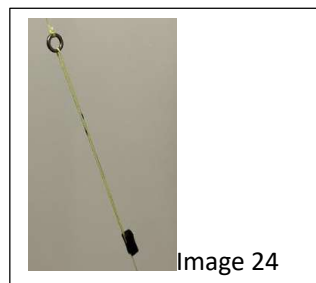


Now set the vang so the main has some twist. The main leach must not be under tension from the vang at this point. My routine to set the vang at the base setting is as follows:
 With rig tension on, back off the front vang locking wheel so the vang is unlocked.
 With the vang initially set completely loose, wind on the vang using the back adjuster wheel until the leach of the main is just taut, all the twist is removed and the back edge of the sail has just become tight between the outboard end of the boom and the mast head. The main leach should not be so tight as the sail inverts and the leach falls away, but you should just feel the adjuster wheel tighten up as the leach becomes fully tight. This is a reference point so be careful to get it right, it is the point where the leach just becomes tight, zero twist.
 Then, with that reference found, wind the vang off using the back adjuster wheel, turn it at least a $\frac{1}{2}$ turn in the “vang off” direction, or as much as a $\frac{3}{4}$ turn but no more. Then lock the vang in position with the front locking wheel. This should set the vang to within $\frac{1}{4}$ of a turn of its optimum setting when racing. The optimum setting will need to be determined by going for a sail but this initial setting needs to be close to optimum and this is the best way I have found to achieve that.

Hold the keel and fairly vigorously but carefully (so as not to hit anything in the vicinity) wave the boat and sails from side to side through the air. Watch the shape in the main and make sure no wrinkles (inversion in the curve of the main) occur between the clew and the luff of the main. Refer to Image 23, when a luff tie is too tight, wrinkles will run from the clew to the luff tie that is too tight. If wrinkles appear then firstly double-check to make sure there is not too much rig tension on the backstay. If there is, loosen it a bit and check again. If there isn't, then loosen the problematic luff tie a little and try again. It should be possible

to reach a point where no wrinkles (commonly called overbend creases, or starvation creases) occur in the main when there is pressure on it from the air.

When happy with the luff tie lengths, glue the knot to make it permanent and cut the ends short. Mark black dots on your backstay adjuster so that backstay setting can be repeated consistently. It is sensible to apply calibration marks to everything you can so that settings can be reproduced, such as in Image 24.



Now the rig is ready for fine setup.

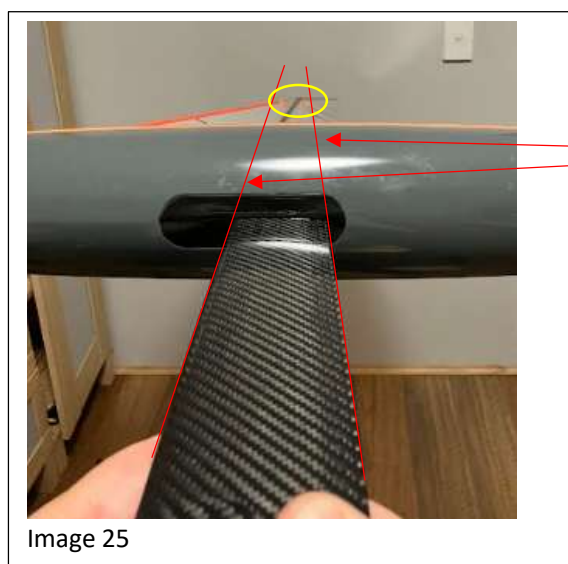
3. **Setting the main controls:**

When adjusting the sail controls for racing, it can be done in many different ways. This is my way, which I hope is helpful.

Set the depth of the mainsail and the depth in the jib foot to 35 mm measured at about 1/3rd from the front of the sail. Less depth is set if it is a windier day, down to 15 mm minimum when it is on the limit for the A rig.

Then set the backstay tension to the calibration marks.

Check the mast rake with rig tension on. It should measure 1130 mm (1135mm for light wind sailing) from the intersection of the bow bumper and the deck up to the centre of the hole in the front of the masthead fitting. Sight from the bottom of the keel, along the keel and up to the masthead. The masthead should sit somewhere near the middle of the keel (Image 25).



Look along the red lines (which are aligned with the front and back edges of the keel) to make sure the masthead falls in between the two. This is with the measurement of 1130 mm bow to hole in jib attachment point

While making sure the mainsheet or jib sheet do not pull taut while doing so (or the turning block at the back of the boat may get pulled out of the hull), pull the sails fully in with the

sail winch. Set the mainsheet to have 5 mm of line between the bridle eye and boom slider, refer to Image 20.

This should set the main boom end in a position approximately above the middle of the raised back deck on either side of the boat, as in Image 26. Check the position is equal on both sides (either tack).

Align the backstay with the middle of the boat to align and standardise your viewpoint



Image 26

When your viewpoint is aligned, check the boom position with the main pulled in fully. It should be close to here as a first try (base) position.

Set the jib boom position to just inside the shearline (gunwale edge), as image 27.

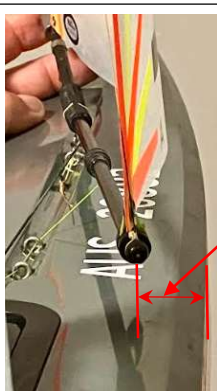


Image 27

Never set this more than 10 mm from the gunwale. When it is windy be happy to set the jib boom out to the gunwale edge

Then set the mainsail vang as described in previous sections, the mainsail twist should be approx. 45 to 50 mm when measured between the backstay and the second batten down from the head. Measurement is taken with the boat set on it's side but without distorting the sail shape, as in Image 28.

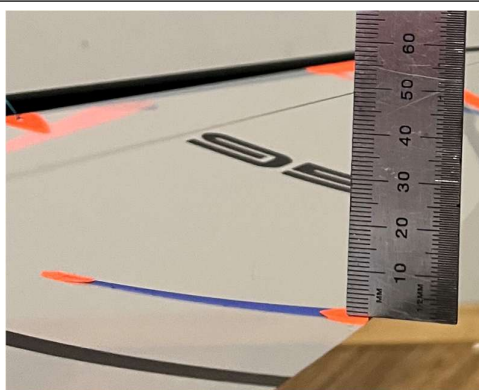
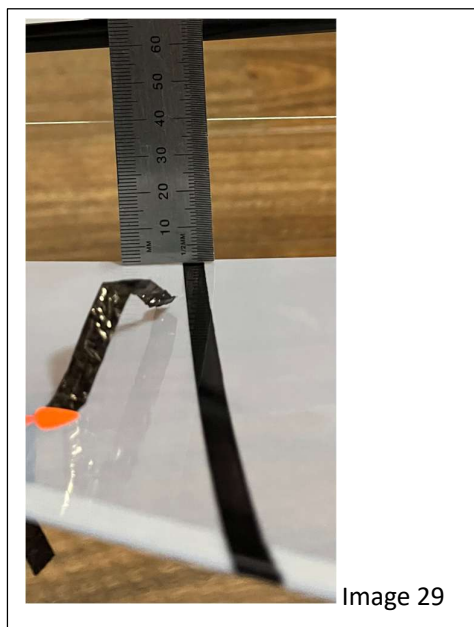


Image 28

Then set the jib boom uphaul to provide ample twist in the jib leach. Measure from the boom uphaul line to the jib leach at the mid height (approx.) of the jib. This should be 40 to 45 mm, as in Image 29.



The mainsail cunningham should be snug, not slack but not tight.

Jib luff tension should be snug, not tight and definitely no wrinkles in the front of the jib. If the jib luff is too tight there will be a nasty looking wobble in the leach towards the head. Don't let that happen, it is slow.

Now wave the boat and sails through the air as before and check there are no overbend creases generated. If there are, loosen the backstay until they disappear and note the distance the calibration marks are apart for future reference.

When looking from astern at the boat as it is waved through the air, it should be possible to see depth in the mainsail from top to bottom. There should be twist easily visible in the mainsail leach and jib leach. The twist in the jib should allow the jib leach to sit a consistent distance away from the belly in the main. This keeps the slot open and parallel to the mainsail.

Then go back over the settings again. They do interact, so one setting can change when a different sail control is adjusted (e.g. vang and backstay) so keep cycling through the settings until they are all to your liking.

Then go for a sail. The boat should sail upwind in steady conditions without any input from the sailor. If it tends to point into the wind too much, then loosen the vang and consider tightening the jib leach, and letting off the jib boom uphaul a small amount.

If it tends to turn away from the wind, or does not respond well to a gust (it should gently head up into the wind as it accelerates, it should not round up abruptly and stop) then do the opposite.

When judging the boat's setup while sailing upwind be careful to do it in as steady a wind as you can find. A boat will always tend to round up when hit by a strong gust, so do not consider that as bad tuning, but instead ease the sails as the stronger gusts hit to allow the boat to accelerate and sail straight on instead of rounding up.

When sailing downwind it must be possible to set the booms out to 90 degrees to the centre line. If this is not possible, then consider making adjustments to the proportion control on your radio set, or end stops to increase the winch range of movement. If it is still not possible to get to 90 degrees then consider moving the main and jib sheet sliders forward on the respective booms (if they are not already glued to the booms).

B Rig and the smaller C and D rigs

There is little difference when rigging up and tuning your smaller rigs. The rigging and tuning principals are the same as set out for the A rig. I do not alter the mast foot slider between rigs, but if you find the B rig too bendy, or too stiff, you may have to. Remembering that the rigs are all so different each boat will have its own optimum setup.

Telltale

Whether or not to use them.....? It is personal choice. Sometimes they are hard or impossible to see, but occasionally they are easy to see and provide valuable information. This is why I use them but only on the jib.

It is recommended to use three pairs on the jib, placed 1/3rd the way back from the front of the jib (the luff). The lowest pair at 300 mm from the tack, the highest pair at 300mm from the head and the middle pair halfway between the two others. Place the starboard side telltale just above the port side one.

If the sail is trimmed too tight, or the boat is sailing too low off the wind then the leeward side (back) telltale will fly upwards or forward. The windward one flying up or forwards indicates that the boat is sailing too close to the wind or the sail is not trimmed in enough.

The miniDV magnetic tape that I use must be distorted or bent/crunched up, otherwise it will have a strong tendency to stick to the sail rather than set to the wind.

Sailing technique, some tips:

1. We sail in very shifty conditions, so priority is to sail fast upwind rather than to point high. So do not be afraid to ease the sails when sailing upwind. This accelerates the boat,

which does many good things, too many to go into depth about here. But for certain, never try to sail high in a big lift, ease sheets and sail fast when lifted.

2. Overuse of the rudder, steering too much is very slow. Both upwind and down, only steer if you have to. The boat will go faster and faster and faster if the sails are set correctly and the rudder is left set on the centreline. Move the rudder and the boat will slow.
3. If you want to turn the boat, never do it without making a complementary sail adjustment. In fact, because the winches are a little slow it helps to make the sail adjustment first, then move the rudder. This is never more the case than when the boat needs to do a big bear away e.g. at the top mark and spacer, or to dip another boat's stern. If there is time, always ease the main first, then steer down.

Good luck! If you have questions then please come have a chat. Happy Sailing.

Nick Jerwood