Dan Van Kerckof - Rigging and Tuning 4.9 Sloop

Dan is the 2009 4.9 Sloop Champion

4.9 Sloop Rigging and Tuning - Dan Van Kerckhof (AUS114)

There has been a fair bit of detail written over the years on how to tune your boat and get the best performance out of your craft to help give you an edge at a regatta. This has been compiled by some great sailors, sailmakers and folk who just know stuff about stuff.

During the last couple of years our class has undergone the biggest change in how we sail the boat and how we tune the boat since we started going 'wild' downwind way back in 97.This change was brought on by the introduction of the 'big head' main sail.

This is a bit of a narrative on my transition to this rig and how I approach setting up my boats whether they be taipans or other genres of cat (god forbid). Please note this is not a hard and fast set of rules, there are many, many ways to skin a cat, these are just how I prefer to skin mine.

I purchased my boat (114 yet to be named) in early November leaving me with a couple of months to prepare myself, my crew and the boat for the nationals in January. The boat was well maintained and structurally sound, I know that sounds like common sense when purchasing, but always check the fundamentals for damage and or bad repairs.

The first thing I do after purchasing a boat is to go through all the rigging thoroughly checking for undue wear and tear, corrosion on swages, broken strands of wire and kinks. Any thing I feel to be a bit suspect I replace (thank fully nothing on my new purchase was).

The second thing I look at is all of the systems used to sail the boat. It is important when sailing your boat that the systems are easy to use for both the skipper and crew as well as fool proof and break proof. One of my major mottos with systems is the less ropes I have to pull the more time I can get my head out of the boat and concentrate on sailing. This has led to very clean minimalistic set ups. I always start with stripping the boat of any excess ropes and rope length. The first rope I always pull off a taipan is the over rotation system. Since sailing the boats from 94 to present I have never ever used this feature and don't know of anyone that does.

Main Sheet System

The most important rope/system on the boat is the main sheet. I have used many main sheet systems in the past always trying to find a 'cheaper' option. After many failures and a lot of excess grunt being wasted I finally one day bit the bullet and brought a harken 57mm carbo ratchamatic bottom block and 57mm carbo quad top block. Now I know this system is expensive but after sailing with one you will never use anything else. It actually makes hauling the sheet on pleasurable! I have never heard of one breaking one so longevity is great. They are also an 8 to 1 system so 'pulling on' and being able to 'play' the sheet is easier, this point is extremely important when sailing a 10 race series as it helps the gorilla arm you seem to suffer towards the end. But the most important feature of all is the ratchamatic block. A lot of companies have tried to emulate this feature but I feel none have it as right as harken yet. The ease at which this 8-1 releases thanks to the ratchets ability to turn on and off under load and load release is the key to this blocks pleasurable use. This greatly helps your downwind pace going wild when sheet needs to move quickly out and back in. This is a block system that you can keep for a long time so maybe think about not selling it when upgrading your boat for better financial reward. For the record I also use a 8mm main sheet which runs very well and is not too bad with good gloves but if your a wuss I suppose you can go bigger.

Jib Sheet System

The second most important rope is the jib sheet. Coming from NSW I use cleats on the actual ratchet block. A lot of guys from other states use cleats on the stay. Both I have found to be very effective and I feel the decision on what is to be used should be left up to the crew and what they feel comfortable using. I also use harken 40mm carbo ratchets for these, mainly because of size and weight, but they also look dead sexy which is also very important. This expense is not necessary just a block with a good ratchet will do, but remember the bigger the block the more likely it is to get caught in the crews sailing gear, especially if your crew has a big bum.

The problem area I have found with the jib has always been getting the blocks around the mast and diamonds quickly and cleanly through tacks and gybes. Shackling the jib to the blocks is nearly the worst thing you can do. Over the years we have settled on two simple bowlines to secure the jib eye to the blocks but if you are handy with whipping ask Steve Kiely for a cooler way to fasten them.

The other problem I see here is the size of the blocks people use. Generally speaking most use blocks better suited to sheeting the main sail! The jib sheet is generally static with not much block rotation meaning I have been able to scale my blocks down to ronstan high load with 20mm sheaves. I have NEVER had one fail and they never get caught because of there small size.

Another problem I always encounter here is the size of the sheet used. I have seen some sailors use 10mm sheet!! This is jam waiting to happen and as my dad would say big enough to hold down the queen Mary. Most jib sheets (whether or not it is good sailing) spend most of there upwind sailing (high load) time in a cleat. To this effect the crew only really deals with the loads for a very short period of time. We use a 6mm FSE robline dinghy sheet. This freely flows through the block and is fairly soft. I sail with my betrothed and sister who both feel this is comfortable enough not to beat me around the head.

Barber Hauler System

Sticking with the jib systems I use a double sided barber hauler with a bobble stopping the sheets pulling to the beam. They end up about 250mm away from beam fully pulled down. I find this the best sheeting angle for the jib off the breeze in all conditions.

A lot of crews in recent years have changed to the single line system pulling from (usually) just starboard of the mast on the front beam.
The single line system is good if you sail with an inexperienced crew. Less ropes to think about.

Here are the reasons I still use the double sided system.
1) When rounding the top mark the crew can always be to windward to pull the barber hauler on.
2) Less blocks and turns in rope means less friction which means quicker and easier to pull on.
3) About 1m to 1.5m less jib sheet on the boat (I hate messy boats) due to less distance sheet travels.
4) Quicker to gybe. Now a lot of people will debate this but here is my reasoning which is based on sailing with two of the best crews alive (I am sucking up now) Aimee and Liese. I let the bauber hauler off for the crew as we enter the gybe, this instantly releases the sheet so it springs back to the mast on a 1-1 it does not need the actual jib sheet to flow through a 2-1 system to get back to the mast (double the rope to let go). When the crew then pulls the new line this instantly pulls it out to the beam on a 1-1 meaning the crew has to pull a lot less sheet than the 2-1 system on the sheeting system to get it to sheet on the new leeward side. When you have this system down pat with a good crew there is no doubt in my mind it is quicker.
5) It is a crap load easier to set up- one line, no whipping, extra pulleys, holes in beams, torches, clothes hangers, grey hairs and long nights in the shed!

The double system does relies on an experienced crew and there is no doubt in my mind the single line is quicker with an inexperienced crew.

Jib Luff Tension

Again with the jib another important system often over looked is the luff tension. I usually set the tension on this before the start of every race. It varies quite a bit depending on the conditions. I use a simple loop creating a 2-1 through the tack to a turning block on the bridle chain plate (near hull) which then goes to a simple jam cleat on the beam near the hull. Set and forget is no good for this control.

Outhaul

The out haul is a standard 3-1 on the rear of the boom simple but effective and can be controlled by either crew or skipper depending on who forgets or remembers it first.

This leaves just two ropes, down haul and rotator. These are the two major controls apart from the sheets. Generally speaking most crews on a taipan are smaller than the skipper, with this in mind they need to be set up for someone with less strength than the skipper.
Both of these very important systems should be handled by the crew. When they are most often changed is usually when the skipper has the most on his plate. The bear away and the bottom mark rounding. The skipper concentrating on letting off the downhaul or tweaking the spanner whilst careering around a top mark in a fleet with 20kts is not a pretty sight. Make these systems so the crew can use them. Use the crew that is what they are for!

Down Haul

My crews don't quite have the pulling power I do, so I up the down haul by adding an extra pulley in on the mast, doubling the standard purchase I think? If you have the newer and a lot better cascading system it should be okay as standard as it is a lot more efficient. My downhaul 'tail' runs from my mast around a pulley on the chainplate and retracts on bungy in to the beam. This keeps any excess rope sucked into the beam as well as giving the crew a good deal of line that is always in the same place to grab quickly. It is neat and effective with no tangles.

Rotator (Spanner)

The rotator on my 'new' boat is off the deck and through the tramp. This is the first boat I have had with this system and it works well. I have always had the standard one off the mast to boom and have found this works well too. Personal preference for the crew is the name of the game here I feel

Enough about rigging and now to set up

Tunning

Nathan my younger brother had been sailing with the new 'big head' for quite a while before I purchased mine. This was great as he gave me a lot of detailed feed back about how the boat was performing. When initially changing Nathan left his rig exactly the same as the standard sail set up so this helped me isolate the changes I thought I needed to make.

I approached Andrew Landenberger to cut my sails. It is important to have good contact with your sailmaker and discuss what you want as well as what they recommend. I had a good idea of what I wanted and again Nathan was already using Andrew's sails so I had a good look at what was coming out of the loft plus Andrew makes the quickest sails around wink wink.
Without giving Andrew's secrets away what I was impressed about was the versatility of shape I could achieve over a range of conditions with Andrew's base seam shape to luff curve balance. When talking with your chosen sail maker, make sure you discuss body weight you expect to sail at, age of the mast, as this affects its bending characteristics (what batch it came from etc) and most importantly what type of base pre-bend he or she recommends. This recommendation should be fairly close to right if the sail is made with the balance of the above mentioned things in mind.

Mast Pre-Bend

Andrew's sails work well with 38mm of spreader rake (measured with no diamond tension applied) and approximately ..... on the loos gage. My crew weight for the record is 121kg. Nathan has the same (within a couple of mm) set up and tops the scales at around 135kg. Andrew recommends 35mm pre-bend which is probably conducive to a slightly porkier crew!

Mast Rake

The next big thing I discussed with both Nathan and Andrew was mast rake. I felt after looking at the new sail plan and talking with Nath that this is where the biggest changes where going to happen, Andrew agreed. So much more sail area so high up meant a lot more pressure on the bows which are very fine compared to more modern designs of boat.

Before the nationals I got on the water as much as possible because of the limited time I had to get up to speed. It was very beneficial to have a great training partner in my Bro and his crew Adam. We measure rake by using the trap wire. Measure the height of the trap ring off the centre line of the deck at the front chainplate and then take the trap towards the stern. When the height of the trap ring is the same off the deck at the stern as it was at the bow then this is the rake. On our first 'trial' run with the new sail plan we lined up with Nath and Adam. Nath kept his mast rake as he would for the standard sail plans (about 80mm behind rear beam using the above method of measurement). I set my boat up with about 230mm rake. We sailed in a beautiful 15-18kts Nor east breeze. The first run we did was off shore at Newcastle harbour so there was plenty of swell as well as a short sharp 1ft chop on top of the swell. Going to windward we where the same pace but I felt I had a couple of degrees more height than Nath, so no real big difference we concluded. The big difference came when we 'turned the corner', I had much more control over the bows and could drive the boat a lot harder meaning my apparent was better allowing me to go lower and quicker. The difference was astounding over a short leg of around 700mtrs I was putting 50-70mtrs on Nath and Adam.

After a few more runs to conclude our findings we headed for the flat water inshore of the harbour mouth. Again beating the boats where very similar but I thought I had a minimal speed edge on the flat water rather than the height edge I had offshore.
Off the breeze it was impossible to separate the boats. They performed at exactly the same pace no matter how much sledging we threw at each other! The big difference we did notice though was to keep my boat trim correct I had to place my crew well forward of where I would usually sail and we had to move our body weight a little more than usual.

So to conclude the mast rake I used at the nationals was 230mm behind the beam using the above measuring system. The extra rake allows me to really keep driving the boat hard whilst going wild. I feel that I could even take this back a little more and not sacrifice anything but have not done this yet.

Rig Tension

The amount of tension I use is a little more than I used to with the standard sail. As a standard set up I used around 65kgs to tension the rig now I am using around 70-75kgs. I feel this helps the luff sag on the jib and again reduces the pitching off the breeze.

Rotation (Spanner) Angles and Cunningham (Downhaul)

Whilst training the other big difference I noticed with the big head sail was its susceptibility to mast rotation. Using the standard sail plan I would frequently pull the spanner in to as close to 0 degrees as possible and focus a lot more on cunningham pressure and sheet pressure to control leech twist and power needs.
The big head sail does not like being pulled in too far. As soon as the spanner is pulled in too close the extra sail area in the head pushes the tip of the mast to leeward very quickly making the leech of the sail twist too quickly resulting in a lack of leech pressure, and therefore lift and height.
I found the back of the mast pointing to the back of the centre board case to the edge of the rear beam was where the sail performed the best. Dependent on sea state this would change a little.
If I felt the boat was 'jamming' a little too much in the chop I would use a little less rotation (closer to the rear beam) allowing the head (leech) to twist off and the boat to punch a little more through the swell with out so much heeling moment.
In flatter water I leave the spanner rotated more (towards the back of centreboard case) and start pulling cunningham first. This flattens the sail but still allows the leech to 'stand' up a little more. This gives me good height but allows me to 'get rid' of some that excess power in the sail.