



GO BEYOND™



TUNE YOUR SAILS FOR OUTRIGHT SPEED

Mast Tuning

Tuning Guide for the Carbon Mast

SET SPREADER ANGLE

Check spreader angle by placing a straightedge or string from shroud to shroud at the spreaders. Measure from the middle of the straightedge to the back of the sail track. We prefer to have this less than 310 mm (12 1/4"). Ideally set it at 290 mm (11 3/8"). We recommend having the overall spreader length set to 26 7/8". This is measured from the mast to the tip of the spreader when the spreader is attached to the mast. You can slide the end fitting in or out on your spreader tip to achieve this measurement

MEASURE YOUR HEADSTAY

Set your headstay to maximum length. From the lower side of the 'T' fitting to the center of the pin this measurement is 7588 mm (24' 10 3/4"). As a secondary method for setting your headstay, you can put a mark on the front of your mast 2 ft (24 in") up from the base of the mast. Then swing the headstay to the mast and mark it

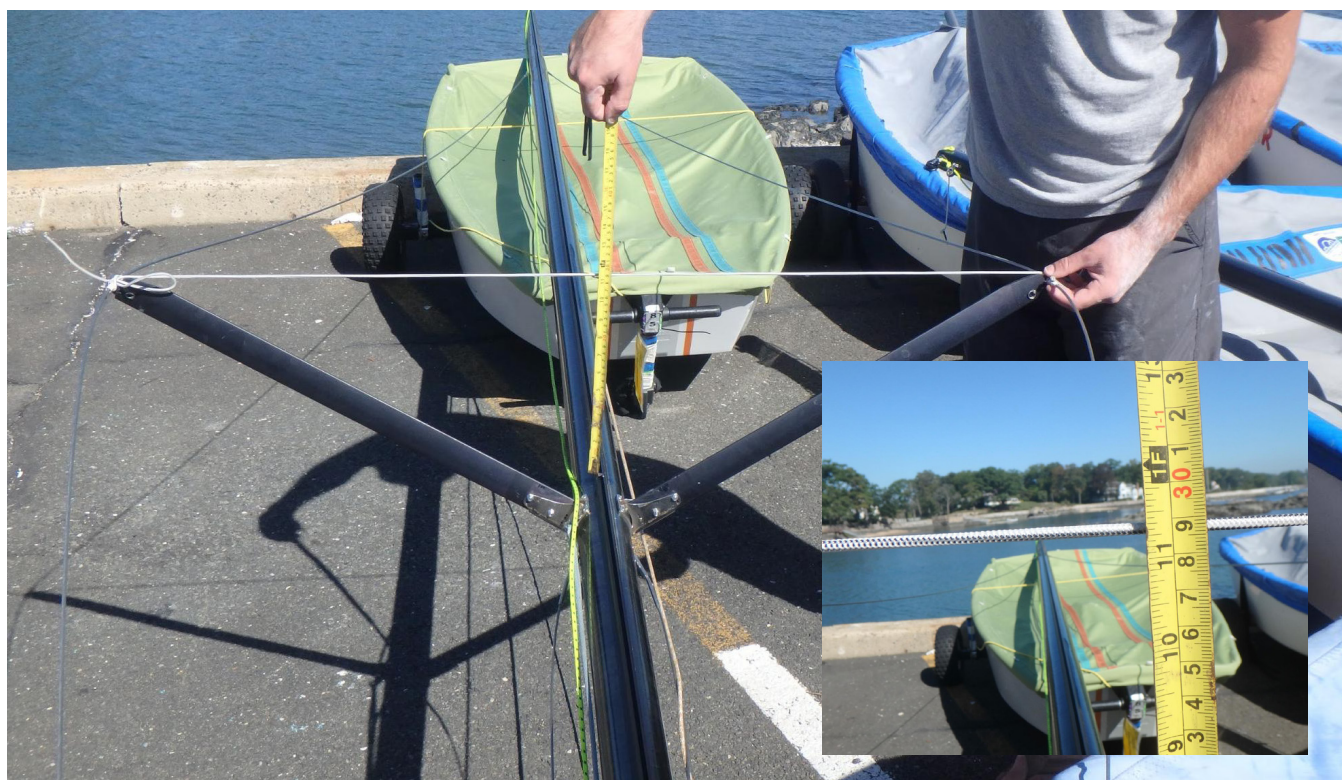
where the headstay meets the mark on your mast. Re-attach the headstay and measure from the mark to the center of the pin. This measurement should be 31 inches. This method makes it possible to check your headstay length while the mast is still up.

MAST STEP POSITION

Check which hole in the step to place the aft pin by measuring from the intersection of the rudder pylon and cockpit floor forward to the step. To the aft side of the mast this measurement should be 3710 mm (12' 2 1/6") for the new inset style of transom or 3730 mm (12' 2 3/4") for the old style of transom. This is often the aftermost hole in the step.

MAST PARTNERS

In order to best tune your Viper, it is necessary to restrict the forward mast movement in the partners. You can do this with the line and cleat that comes with the boat. We recommend using mast blocks in front of the mast in order to solidly control mast bend. Adding blocks provides greater headstay tension to keep the jib flat and twisted



as the breeze increases. It also helps control the depth in the lower part of your main sail. The aft block which fits against the front of the mast needs to be filed away to accommodate the angle from the rake and curve of the mast. This will help keep the blocks from climbing up.

We recommend a "base" tune with 2 ¾" of blocks (measured from the front of the mast). If you are sailing in less than 6 knots, you may want to remove ¼" - ½" of blocks (having 2 ¼" - 2 ½" total) from "base" to induce pre-bend in the mast and slack in the headstay. Once the crew is fulling hiking, you will want to add ¼" of blocks to "base" (having 3" total) to keep the pre-bend and headstay targets. When you are fully de-powered and using heavy vang, you will want to add another ¼" of blocks (having 3 ¼" total). Your boat may require a different amount of blocking. See the tuning chart below.

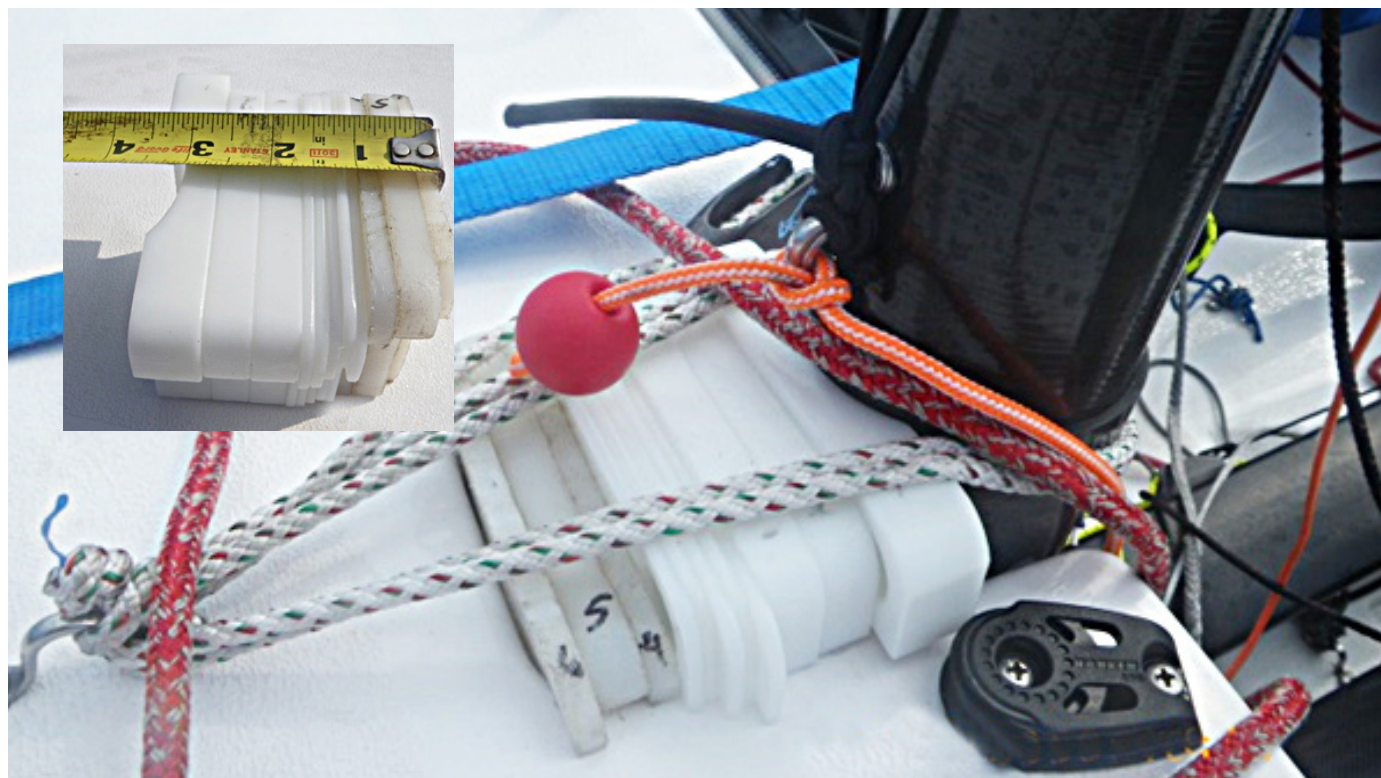
Use a line to hold the mast forward against the blocks and keep the blocks from climbing up. This is absolutely necessary to prevent the mast from inverting when sailing downwind in heavy air. Also remember that as you increase blocks, it is important to increase the amount of vang tension you carry downwind to avoid inversion.

UPPER SHROUD TENSION

Put sufficient tension on the upper shrouds with the lowers completely slack to register 10-15 on the PTI gauge. Check side to side using the jib halyard to center the mast by measuring to the rail on each side of the boat.



Once you have your mast centered, tighten the upper shrouds evenly to get to 26 on the PTI gauge. Insert 2 ¾" of mast blocks in front of the mast. Your headstay tension should read about 15 on the PTI gauge. Check pre bend by pulling the main halyard down to the goose neck against the back of the mast. Judge distance between the halyard and the back of the sail track at the max distance. This is usually just above the spreaders. You can use a bend checker



pulled up on the spinnaker halyard. Picture example shows how it works. The yellow line is the main halyard pulled straight to the gooseneck.

For a base setting you would like to attain 2 ¼" of pre bend with headstay 15 and uppers 26 on the PT1 Loos gauge. This is a good base setting for 7 to 10 knots. How much and how soon you need to increase rig tension to de-power and control headstay sag is dependent largely on crew weight and to some degree on sailing style and wave conditions. The chart below represents a guide for roughly 560 lbs of crew weight and the spreader sweep as outlined above.

The number of turns will likely vary from boat to boat:

Wind (TWS)	Inches of Blocks	Turns from Base	Shroud tension	Headstay Tension
0-4	2 1/4"	-2.5	19	9
5-7	2 1/2"	-1.5	24	12
7-10	2 3/4"	BASE	26	15
10-13	2 3/4"	1.5	30	19
12-14	3"	1.5	32	22
14-16	3"	4	35	25
15-18	3 1/4"	4	37	27
18+	3 1/4"	6.5	39	30

Spreader Aft Tuning Guide:

Wind (TWS)	Uppers PT1 #	Number of Turns	Pre Bend Measurement
0-6	23	-1	2 1/4"
6-8	24	0	2.5"
8-11	26	+2	2 7/8"
11-15	29	+4	3.5"
15-20	31	+8	4 1/8"
18-25	33	+10	4.5"

LOWER SHROUDS TENSION

To find "base" for your lowers, put a mark on each lower shroud and each upper shroud that measures 4ft up from the deck on each shroud. Now pull the lower shroud towards the upper shroud just barely finger tight and measure the distance between the two marks. This measurement should be about 5 ½". This technique gets you in the ball park, but the tension on the lowers need to be adjusted precisely under load while sailing. For this reason we recommend putting turnbuckles on the lowers. In under 8 knots, your lowers should be set such that when you sight up the mast while sailing, you notice about ¼" of leeward "sag" at the spreaders. Once your crew is on the rail, you want to tension your lowers until the mast

looks very straight when sighting up from the bottom. As you go through the rig tune as the breeze comes up, adjust the lowers to maintain a straight mast. If you are over-powered and trying to execute a “bow down” mode in big breeze, you might tension the lowers enough to see about ¼” of mast “poke” (poking to windward) at the spreaders. The entire range of turns on the lowers should not be more than 3 full turns.

Note: It is critical to not over tension the lower shrouds in heavy air. If the lower shrouds are too tight, it could contribute to inverting the mast while sailing downwind and causing breakage. The more tension you carry on the lowers, the more vang tension you should carry downwind.

Sail Trim

JIB LEAD POSITION

Generally the jib lead should be set more forward in light air to allow the foot to have 6” of round in it. This will have 8 or 9 holes showing behind the jib lead. As soon as the breeze is strong enough to justify hiking, the lead should come aft as much as needed to flatten the foot nearly to a straight line when the leech is properly trimmed. This setting typically has 6 or 7 holes showing behind the jib lead.

JIB SHEET TENSION

Your North jib has a leech telltale ¾ of the way up the leech. This telltale can be observed by the jib trimmer from the leeward side in light air. In any hiking breeze it can be observed through the luff window in the main. This is to use in judging sheet tension. In most conditions trim the jib in until this telltale no longer streams aft, then ease it out until it just streams aft.

Generally the middle batten in the jib will point straight aft when it is properly trimmed.

The top jib batten is full length. In under 6 knots, use the soft batten provided. As soon as the breeze is over 6 knots it is important to change to the stiffer top batten. This helps keep the leech open as the wind increases. Once you are fully de-powered, go to the stiffest batten you have, and you might consider putting the light air batten AND the heavy air batten in at the same time!

MAINSAIL OUTHAUL

Easing the outhaul in light air powers up the main. Judge the outhaul tension at the mid-point of the boom. Look at the distance between the side of the boom and the foot of the sail. In rough water light air conditions easing the outhaul to open the foot as much as 3-5” can be fast. In smoother water generally keep it tighter. As soon as there is enough wind to hike, tighten so the sail lays against the side of the boom.

MAINSHEET TENSION

In light and moderate conditions when heeling can be controlled with hiking, the aft end of the upper battens (on either side of the Viper insignia) should be parallel to the boom. This may require quite a lot of sheet tension. In stronger breeze applying vang and a couple of inches of sheet ease will allow you to keep the jib pressed, and the bow down with the boat moving forward. The goal here is to find the angle of heel that allows the boat to sail with as little helm as possible. Use vang adjustments, mainsheet adjustments, and feathering to keep that angle of heel as consistent as possible. Remember that the mainsheet is the biggest controller of your head stay tension. If you need to ease your main sheet to keep the boat flat, be sure you have adequate mast blocks and lower shroud tension. If the head stay still looks too “saggy,” ease the jib sheet an inch or two to de-power the jib and straighten the head stay.

GNAV (Reckik in Britain, or vang)

Under 10 knots make sure the gnav isn’t applying any downward pressure on the boom. This applies for both upwind and downwind. As the wind becomes stronger, apply progressively more tension to keep the boom down as the mainsheet is eased in the puffs. Not only does the Gnav help keep leech tension when easing the main, it bends the middle and bottom of the mast which flattens the main and de-powers it. It is only necessary to pull max vang tension on if it is choppy enough that you need to use the “bow down” mode to power through the chop. It is essential to have the appropriate amount of blocks in front of the mast to ensure the headstay stays tight.

Contact Us

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