



Viper 640 Tuning Guide

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Tuning Guide for the Carbon Mast

Mast Tuning

1. Set spreader angle

Place the pins in the bracket to put the spreaders in the after most position. The outer tabs have two or three different positions. Measure from the side of the mast to the shroud along the spreader. Set the end tab so this measures 685cm. Place a batten across the shrouds from one spreader to the other. Measure from the batten to the back side of the mast. We used the spreaders set at 29cm.

2. Mark your headstay

Lay the forestay along the front of the mast and mark where it is even with the top of the mast band at the gooseneck. This can be accomplished with the mast on the ground or stepped with the uppers attached. Set Forestay by measuring from the mark along the forestay to the pin in the stem fitting. We have used 52".

3. Mast step position

Use the middle of the three positions. Measure from the top of the lip where the transom meets the cockpit floor next to the rudder pylon. Measure to the aft face of the mast at the top of the step. This should measure

4. Upper Shroud Tension

Find your base setting. Use a PT1 Loos tension gauge. Tension 36.

5. Mast Partners

In order to best tune your Viper, it is necessary to restrict the 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 for setting up for over 8 knot in order to solidly restrict mast bend. This provides greater headstay tension to keep the jib flat and twisted as the breeze increases. The aft block which fits against the front of the mast needs to be filed away to accommodate the angle from the rake of the mast. Properly done this keeps the blocks from climbing up.





In this case we are using 1 $\frac{3}{4}$ " thick block, 1 $\frac{1}{2}$ " and 2 $\frac{1}{4}$ " thick blocks. This is what worked in this case to achieve 3 $\frac{1}{4}$ " of pre bend. The $\frac{3}{4}$ " block has been filed out on the underside to accommodate the rake and spread the load on the front of the mast.

The use of the line led to hold the mast forward serves as a safety precaution in heavy air. (over 20 knts) It will keep the mast from inverting and possibly breaking.

6. Lower Shrouds

In less than 8 knots the lower shrouds should be set to be slack when sailing. Above 8 knots the tension on the lower shrouds becomes critical to control Fore and aft mast bend, side band and to some degree the headstay tension. Because the tension needs to be adjusted precisely under load on the water we recommend putting turnbuckles on the lowers. The tension setting in the 8-16Knot range is barely sufficient to register 5 on the Loos gauge. (model PT1) Only 1 more turn should be sufficient tension for stronger wind.

NB: It is critical to not overtension 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.

Upwind sail trim

1. Jib Lead Position

Your North jib is marked with a trim line near the clew drawn from the clew grommet toward the body of the sail. Your lead should be positioned so that the sheet is a direct extension of this trim line. In stronger breeze move it aft a hole or two, or move the sail lower to the deck by using a shorter shackle at the tack.

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 3 or 4 holes showing in front of the jib lead. As soon as the breeze is strong enough to justify hiking, the lead should come aft as much to flatten the foot nearly to a straight line when the leech is properly trimmed.

2. Jib Sheet Tension

Your North jib has a leech telltale $\frac{3}{4}$ 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 and upper battens in the jib will point straight aft when it is properly trimmed.

The top jib batten is full length. In light air removing this batten helps the jib to be more powerful. As soon as the breeze is over 8 knots it is important to have the full length batten in. This helps the leech to stay open while trimming the sail hard.

Mainsail Trim

1. The main bridle

We prefer the using the bridle in the back of the boat. Set it so the top of the block is ___" above the cockpit floor.

2. 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 10-12" 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.

3. 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

4. Gnav (rekcik)

Under 12 knots make sure the gnav isn't applying any downward pressure on the boom. 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. The Gnav bends the mast to flatten the main and tensions the headstay as long as the lowers are properly adjusted and the mast is firmly blocked aft at the deck.

Windstrength	0-8	8-16
Headstay length	52"	52"
Upper shroud tension	-10	35 on Loos Mdel "A"

Lower shroud tension	-7 turns	5 on Loos
Pre bend	1"	3 to 3-1/2"
Mast partner	pulled forward producing 1/2- 1" prebend	blocked back to restrict pre-bend
Jib lead	2 holes showin behind	2 holes showing behind
Jib inhaul w/ weather sheet	over deck joint	
Headstay tension	Slack hangs with 2" of sag	26 on Loos
Jib Sheet	Leech telltale just flowing	Leech telltale just flowing
Outhaul	6"	2"- 0"
Jib Tack	twist shackle plus shackle	just 1 short shackle

	Viper640	Targets					
TWS	Upwind	Tack>	Downwind	AWA	Jibe>	TWA	
6	4.5	90	4.4	90	90	135	
8	5.3	85	5	110	70	145	
10	5.6	80	5.8	125	60	150	
12	5.8	78	6.2	130	40	160	
14	5.9	78	9	85	100	130	
16	6	79	10.5	90	90	135	
18	6.1	80	12	93	85	138	
20	6.2	82	14	95	80	140	

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