

# C22 Tuning Guide

By Pete Harper

These adjustments are intended as a guide. With over 15000 boats produced with four hull versions, three different keel types, and two mast sections there is significant boat to boat variations. I have assumed the old boat style with a swing keel and new mast section for this guide and will try to note variations were required.

## Tuning at the Dock

**Tools Required** - 50 foot tape measure, Model A Loos tension gauge, and tools to adjust turnbuckles.

**Mast Side to Side** – Using the main halyard run the 50 foot tape from the top of the mast. With the lower shrouds loose, measure to the same point on the toe rail on both the Port and Starboard sides, make adjustments to the upper shrouds as necessary until the measurements are equal on both the Port and Starboard side. Tension the upper shrouds equally until the tension reads 25 on the Loos gauge.

**Mast Rake** – With the main boom in position and just enough backstay tension to take all the slack out of the forestay measure the distance from the top of the mast to the outboard edge of the rudder cut out in the transom. Including the main halyard shackle the overall distance should be 29' 4".

**Mast Tuning** - Tension the forward lowers so that the mast remains straight in column side ways and both forward lowers read 15 on the Loos gauge. To check the mast for being in column sight up the main sail track and make the necessary adjustments so that the mast is not out of column at the spreaders. Next tension the aft lowers until the Loos gauge reads 10. Using the main halyard stretched tight from the mast head to the gooseneck on the boom at the mast, sight the pre-bend in the mast at the spreaders. You should have ½ - 1" of pre-bend at the spreaders. Make adjustments as necessary to the fore and aft lowers until you achieve the correct bend. The old mast will require less tension on the foreward lowers to achieve the same amount of pre-bend. Write down the final Loos gauge setting you will need to remember them as you base setup.

**Deck Reinforcement for Lowers** - This is highly recommended. To minimize shroud flex due to deck flexing it is advisable to reinforce the forward and aft lowers at the deck. One way to accomplish this is to run supports from the bottom of the shroud bolts to the bulkhead. Both forward and aft supports are fastened through the bulkhead

## Tuning Under Sail

**Fine Tuning the Mast** - At the dock count the number of turns required to take you from the base to the desired setting. On the water you will be able to quickly change the setup by making the same number of turns to the turnbuckles on either side.

Wind Conditions	Uppers	Forward Lowers	Aft Lowers
Light	25	15 (or Base)	10 (or Base)
Medium	25	17 (or Base +2)	10 (or Base)
Heavy	30 ( base +5)	20 (base +5)	10 (or Base)

**Headstay Sag** - To measure the sag in the headstay use the spinnaker halyard or spare jib halyard and pull it tight from the mast head to the tack of the genoa. The amount of sag is measured halfway up the luff of the genoa horizontally to the spare halyard. When sailing, check the tune in different wind ranges. In light air (0-7 knots) the forestay should be allowed to sag six to eight inches with the

backstay eased. In medium air (8-15) the backstay should be applied to reduce the sag to three to four inches. In heavy air (15+) the sag should be as little as possible.

## Sail Trim

### Light Air (0-7 knots)

The mainsail traveler should be pulled to windward with the sheet eased so that the boom is on the centerline and the second batten from the top is parallel to the boom. The cunningham should be eased so that horizontal wrinkles (speed wrinkles) begin to appear along the luff of the main and the outhaul eased so that the shelf foot fills out. Have telltales on the top two batten aft tips. With the traveler to windward and no boom vang; sheet the main until the telltales start to curl; ease the sheet back out until they just fly again.

The genoa lead should be set approximately equal to the back of the windows. Fine tune the block position so that the luff breaks evenly top to bottom. The genoa should be sheeted so that the foot at the midpoint is directly over the edge of the deck and the leech is four to six inches off the spreader tip. The halyard should be tensioned just enough to remove the horizontal wrinkle along the luff and the backstay eased to allow six inches of headstay sag.

### Medium Air (8-15)

Center the traveler and use the boomvang to control leach tension. Increase vang tension as the wind builds, again use the leach telltales to control the mainsail trim. Keep them flying at all times. The outhaul should be adjusted for the amount of power needed (pull until the shelf foot folds on the boom if overpowered). Adjust the cunningham to remove all horizontal wrinkles along the luff. The backstay should be tensioned to remove as much headstay sag as possible without de-powering the boat too much.

### Heavy Air (15+)

Center the traveler and increase vang tension until the boom doesn't raise when you let the main out in a puff (i.e. vang sheeting). Play the mainsheet in and out to control the heel of the boat. Don't be afraid to completely luff the sail in the puffs. Don't let the boat roll up as you will only go side sideways. Adjust the cunningham to remove all wrinkles along the luff and pull the outhaul so that the shelf foot is folded tightly along the boom. Tensioning the backstay will open the leach and de-power the rig as well as giving additional headstay tension. Move the genoa block back one notch if you are still overpowered.

**Spinnaker** - The best indicator for adjusting pole height is to keep the clews level. This will mean keeping it low in light air and raising it as the wind increases. When broad reaching and running, set the guy so that the pole is perpendicular to the wind and continually ease the sheet so that the luff curls slightly. Remember that over-trimming can slow the boat radically. "When in doubt let it out." The genoa should be dropped when using the spinnaker, but the class jib may remain up when reaching.