

**NORTH SAILS FOGH LTD. 2242 LAKESHORE BLVD. WEST
TORONTO ONTARIO CANADA M8V 1A5
(416) 259-9644 FAX (416) 259-0825**



TRIM GUIDE FOR RACING SAILS

Our commitment to building fast sails of the highest quality is well known. Innovative computer design programs, computer cutting tables and experienced sailmakers are part of what makes the speed potential of North Sails possible. To achieve this potential correct sail-setting is important. For you to attain the best performance from your new racing sails, we have prepared the following tuning guide.

Mast Tuning

A well tuned mast increases speed by allowing you to better control the shape of your sails. Ensure that the mast does not lean sideways by measuring with the main halyard from gunwale to gunwale. Most, if not all boats, whether dinghy or keel, are better balanced with aft rake (6" to 12" for offshore keel boats). This moves the sailplan aft which puts sufficient feel (3 degrees weather helm) into the tiller or wheel in light to medium air.

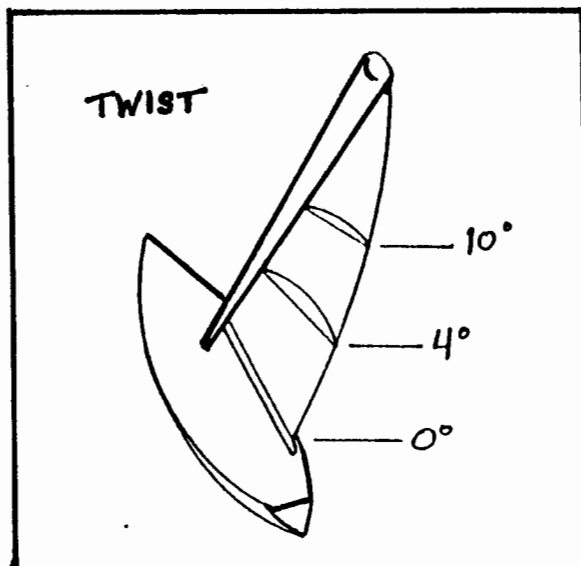
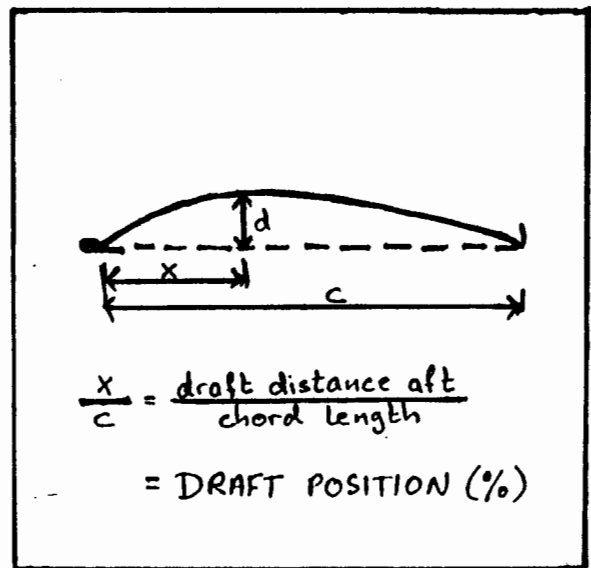
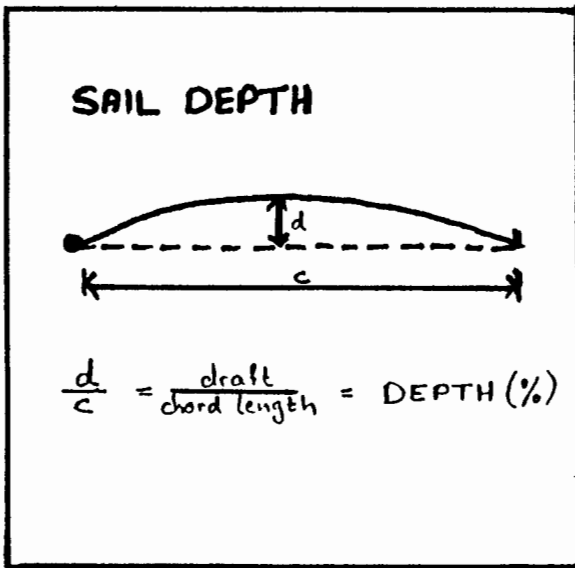
Without an adjustable backstay it is important to keep the forestay tight to prevent sag in heavy air. Do this by tensioning the backstay and keeping the upper shrouds tight. On fractional rig boats, mast tuning is more complicated because of the difficulty in tensioning the forestay. Running backstays are a great help.

The function of the lowers and intermediates is to keep the mast from bending sideways. Adjust by sighting up the mast.

Sail Trim

The function of the sails is to bend or change the direction of the wind smoothly and without disturbance of the flow. Hence, the smooth curve of sails. Correct sail trim, therefore, involves adjusting the curve to changing wind conditions and positioning that curve relative to the wind. Reaching and running are relatively easy. By keeping the leech firm (not twisted), the curve deep and the sail at right angles to the apparent wind direction, your sails are set correctly.

Proper trim upwind, however, is more complicated. First, an understanding of what you are looking for helps. Below are diagrams from the North U. "Fast Course."



The Mainsail Upwind

Correct mainsail trim influences pointing ability, balance and therefore speed. Your North Fogh main is equipped with every possible means to adjust and alter shape when needed. These are:

- a) **Cunningham** - Tension will pull draft forward and will twist or ease the top third of the leech.
- b) **Racing Footshelf** - This soft cloth footshelf gives added area and speed for reaching and downwind sailing and is easily pulled out by the outhaul for upwind sailing.
- c) **Flattening Reef** - When the boom is pulled to this press ring, the footshelf is taken out and the bottom third of the sail is flattened. This is desirable upwind in medium to heavy air because it eases the bottom leech thus reducing the weather helm.
- d) **Leechline** - This is not to be used to adjust shape and should be off in light air. It's only function is to prevent the tape on the leech from fluttering in heavy air.
- e) **Tapered racing battens in the top two batten pockets** - By inserting the thin or tapered end first, the draft or curve of the sail is allowed to bend smoothly. Stiffer battens are better in the two bottom pockets where the leech is straight (i.e. little or no curve over the length of the batten). It is best to have two sets of battens - one set more flexible for lighter air, the second stiffer for heavy air. Make sure the battens are in the right way - tapered end first.

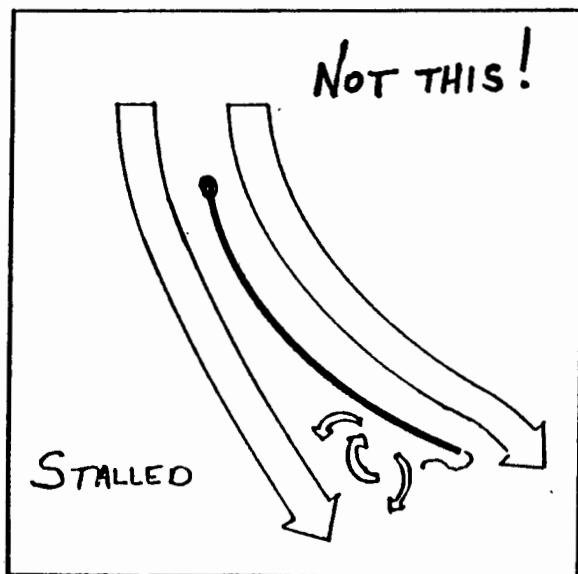
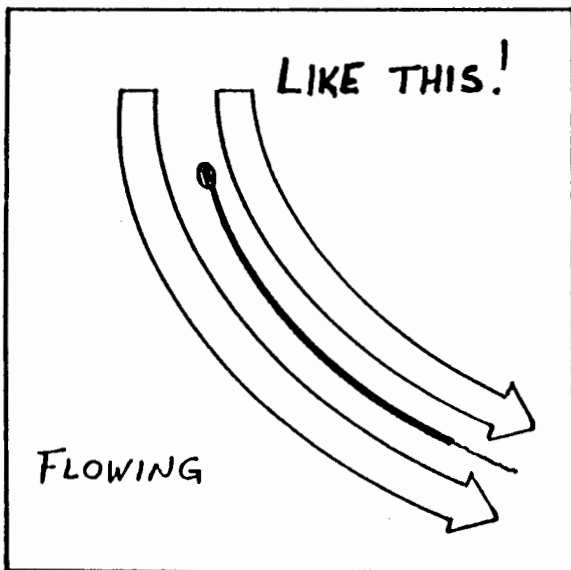
Note: Battens will slightly warp from improper folding of the main on the boom but this won't affect sail shape.

Ticklers - The strands of wool we put on your sails are your only means to see the wind. The three sets on the genoa are for steering (i.e. to show when you are luffing or when the wind flow is stalling on the leeward side), and to help you set your genoa lead correctly. The object is to have all the ticklers flowing aft. The most important ticklers on the main are those on the leech, especially the ticklers at the top batten. They indicate when the leech is tight or hooked by showing a stalled air flow (i.e. the wool lies limp or may even flow forward).

Your North Fogh main is designed with maximum draft 45% to 50% back from the luff. As wind increased, tension cunningham and outhaul to keep draft from moving aft and reduce excess fullness. More importantly, ensure that the leech is correctly twisted. The rule of thumb is to keep the top batten parallel with the boom. This is done with a combination of luff (cunningham), foot (outhaul), and primarily mainsheet tension. The following is a general guide for different wind conditions upwind:

Light Air (0 - 6 Knots)

- open leech, lots of twist to allow unstable wind flow to pass with minimum drag
- keep boom in centre of the boat and ease sheet
- ease outhaul from max. about 1"



Medium Air (7 - 14 knots)

- as wind increased, reduce twist with mainsheet
- sheet so that top batten stays parallel to boom
- tension cunningham only to take out wrinkles along luff
- tension outhaul to take out footshelf
- keep boom centres to improve pointing until heeling increases over 25 degrees
- on fractional rigs, the mast should be bent with the backstay to flatten the sail slightly to remove backwind

Heavy Air (15 knots and up)

- as heeling increases, twist top batten to leeward by tensioning cunningham
- take up flattening reef after 14 knots apparent
- bend mast if possible with backstay and babystay and boomvang tension on smaller boats (boomvang tension has the added advantage of preventing pumping of the mast)
- to prevent the boat from heeling past 25 degrees, ease traveller to leeward (i.e. reduce angle of sail to the wind) ease mainsheet slightly to increase twist or reef main if necessary. Do not hesitate to reduce sail area or pinch upwind to avoid heeling. Both speed and control suffer past 25 degrees of heel

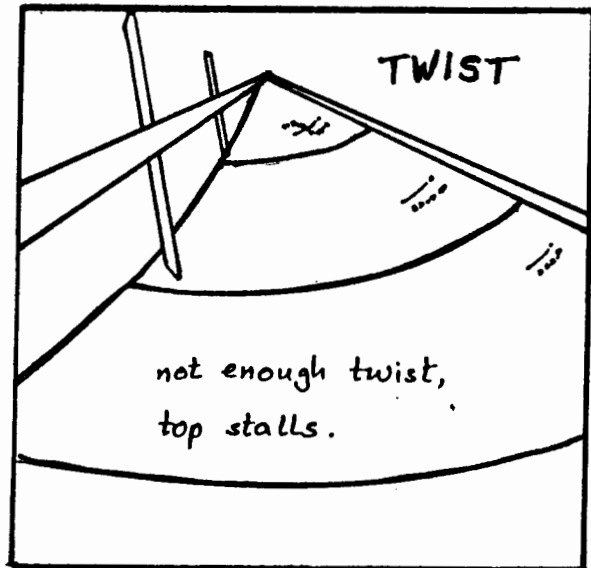
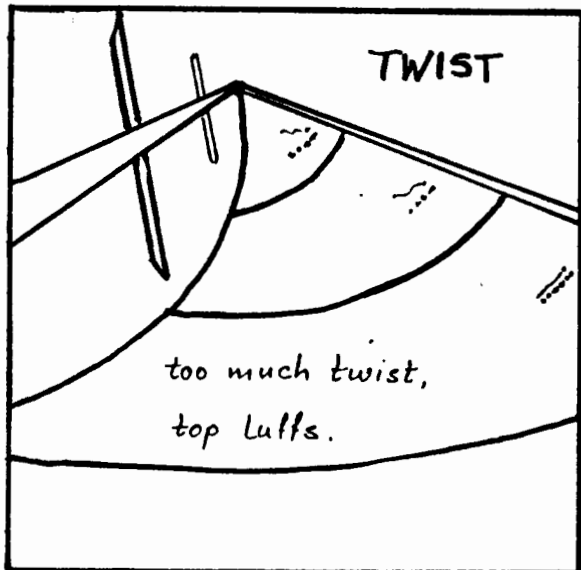
Jibs and Genoas

Today's fast racing sails are leech cut Mylar. Hence most pointers on genoa sail trim will be directed toward mylar rather than dacron.

It is critical on mylar sails not to overtension the halyard. You may stretch the luff beyond its yield point causing permanent stretch. In most conditions simply pull out luff wrinkles with the halyard. In the heavy range of the sail tension the halyard another 1 to 3" but never more.

Shape your genoa by sheet tension (the most important) and forestay sag. Sag causes the entry to become fuller, best in light air or choppy wave conditions. A straight forestay (meaning about 3-6" of sag) is best for pointing conditions, especially in flat water. Don't forget that forestay tension is directly proportional to back-stay tension. Obviously a backstay adjuster is a must.

Sheet tension determines twist and depth. Twist, the relation between the exit angle of the top of the sail compared to that of the bottom occurs when the sheet is eased. A one-inch change is noticeable! Illustrations B and C show examples of too little or too much twist. Sheet tension also affects depth. The tighter the sheet the flatter the sail. Both twist and depth are judged by viewing the speed stripes and the distance from the spreader(s) to the leech.



Sheet Lead Position

The tension on the foot and leech of the sail should be equal. To determine the correct sheet lead location, sight from halfway between tack and head through the clew to the tack or toerail. That point is where the lead block should be. Fine tuning is done by determining the amount of twist desired. Having all three sets of ticklers break at the same time indicates the lead is set correctly.

Sheet Tension

The same principle of leech twist on the main is used for genoas. Easing the sheet a few inches creates large amounts of twist. To determine the correct leech twist, try to match the genoa with the main and judge by the distance from the sail to the spreader. The distance between the sail and the spreader tip is a good trimming indicator. Be careful not to choke the sail.

In light air (0-10 knots), stay 4" to 8" off the spreader. From 10-15 knots, the sail can be within 4" of the spreader, however be sure to bread the sail on time when tacking. From 15 knots and up, a little more twist is necessary to keep the boat from heeling. Obviously flatter sails will help in reducing heeling moment.

As in the main, leech and foot lines are designed only to stop fluttering.

Spinnakers

The spinnaker is the largest, lightest and most exciting sail in your inventory but it is also the most temperamental. The key to controlled spinnaker flying is to keep the spinnaker as far in front of the boat as possible. This is accomplished by keeping the pole at right angles to the apparent wind (a tickler on the pole can help here).

Take care not to choke the powerful shoulders of the spinnaker by keeping the pole end even with the sheet end. You will find that as you go from downwind to close reaching, the pole will move higher and higher. In heavy air close reaching, slightly raising the pole end will tend to free the leeches. In heavy downwind, it is often advantageous to lead both sheet and guy amidships to prevent the spinnaker from rolling in the waves. Oversheeting in puffs is necessary to hide the spinnaker behind the main reducing the force and heel. If you feel you are fighting the spinnaker on a close reach, you can often obtain the same or greater speed by changing to a headsail.

Balance and Control

The helm of a sailboat is balanced when the centre of effort above the water (i.e. the sails) is balanced with the centre of effort below (i.e. the keel rudder and underbody). Since most boats have fixed keels, balance must be achieved by changes in the sail plan. If the centre of effort is moved aft (i.e. by raking the mast aft or sailing only on the main), the boat tends to pivot into the wind, thus weather helm. With the mast forward or only a genoa flying, the bow is pushing away from the wind, hence leeward helm. The object is to maintain a slight pressure on the helm upwind (i.e. approximately 3 degrees rudder angle). This provides feel and forces the helmsman to stay close to the wind. Downwind, as neutral a helm as possible is preferred for control purposes. Remember as well, the greater the heel and the farther forward the crew weight, the greater the weather helm. Therefore, in very light air when it is difficult to develop feel in the rudder, heel the boat about 10 degrees to leeward and move the crew weight forward. Then in heavy air downwind, when excessive weather helm is a problem, moving all the crew aft is necessary to maintain control.

Main leech tension has a direct bearing on weather helm, and therefore balance. Some boats require a firmer leech (i.e. more mainsheet) than others, to keep feel in the tiller or rudder. This is why constant adjustment of the mainsheet is so important.

Sausage Bags

If you have a grooved headstay system we automatically supply you with a sausage bag, with the exception of boats under 25'. This long, zippered bag works well for headsail changing. The bag is designed to keep the sail in the bag until needed. The zipper should not be pulled off the track end until the sail is hooked up and ready for hoisting. Once the car is pulled free the zipper will open up automatically. When the sail is hoisted, the foredeck crew should pull the zipper car to the clew end ready for zippering. Flake the sail (along the weather rail) and zip up full length sausage bag from clew. The fold bag in half or thirds for storage down below. Always keep the clew at one end and the entire luff tape, tack and head at the other.

At North Sails Fogh we have the tools to produce the fastest sail available. To Hans Fogh's 20 years of sailmaking experience we have added an innovative computer program for design and, as important, a computer cutter to precisely draw and cut the curves generated by the designer.

This is the industry's first innovation for custom sails and one that ensures North's position as the dominant racing sailmaker. Hopefully this trim guide will help you achieve the full potential of these sails.

If, at any time, you have questions about your sails, or require information, please do not hesitate to call or write us at the loft.



North Sails Fogh
2242 Lakeshore Blvd. W.
Toronto, Ontario
M8V 1A5