Headsail Trim Guide

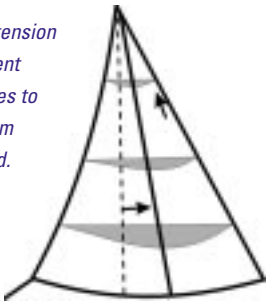
Your new Quantum jib or genoa is designed and engineered to be easy to set and trim. Fundamental principals of headsail trim are outlined in this guide. For more detailed information, contact a Quantum Sail Consultant.

QUANTUM™
SAIL DESIGN GROUP
Where sailmaking is a performing art

Halyard (Luff) Tension

Tension along the luff of the sail is a function of apparent wind velocity. In more wind more tension is needed and vice versa. When you go upwind, you will need more tension than when sailing off the wind.

Hoist or unroll the sail with minimum (hand tight) halyard tension. Sheet the sail appropriately for the point of sail (see section on sheet tension). With the sail now loaded, the tension should be just enough to remove any horizontal wrinkles emanating from the luff. (Wrinkles will be at right angles to the luff.) In light apparent wind velocity you can leave just a hint of wrinkles. As velocity



Add halyard tension as the apparent wind increases to keep maximum curve forward.

increases, wrinkles will reappear and additional halyard tension will be needed. Avoid over-tensioning. A vertical wrinkle or "gutter" parallel to the luff is sign of too much halyard tension.

Beginning of horizontal wrinkles indicate correct halyard tension.

Ease the sheet when adding halyard tension. There is no point in fighting a fully loaded sail. As the luff is tensioned the sail's leech will be pulled in towards the rig, creating an over-sheeted condition and potentially bringing the sail in contact with the spreader tip.

Keep in mind that adding halyard tension pulls sail material (hence draft or camber) forward. This makes the entry rounder, the steering groove wider and more forgiving, and flattens the aft sections of the sail, reducing heel and interference with the mainsail. In windy or wavy conditions this is desirable. Less luff tension (the hint of horizontal wrinkles) creates a flatter entry and more powerful aft sections as fabric is allowed to drift back in the sail. This will help pointing if heel is

not an issue. At the same time it will make keeping the boat in the groove more difficult (i.e., keep the telltales flying). A sign of flat entry exists if both telltales are agitated and seem to go off at the same time with very small changes in sailing angle. This can be an effective shape when trying to sail upwind in smooth water in light to moderate conditions.

For recordkeeping purposes and as an aid in setting initial tension for conditions, mark halyards and use a numbered strip as reference.

Lead Position

Fore and aft lead position controls headsail leech tension and foot depth. As a rough guide, set the lead so that the sheet bisects the clew, applying approximately equal tension to leech and foot. (Imagined a line extending from the sheet up through the sail. This line will hit the middle of the sail's luff). In an overlapping sail, the foot of the genoa will just touch the shrouds at the chainplates when the upper part of the sail is 1-2" off the top spreader. If the foot is still round and well off the chainplates when the sail is sheeted so that the top touches the spreader, the lead is too far forward. Moving it aft will stretch the foot flat and open the leech. Conversely, if the top of the sail is well off the rig when

the foot touches the chainplates, the lead can go forward. This pulls down on the leech (increasing tension and bringing the top of the sail in closer to the rig), and makes the foot rounder. When in doubt, it is better to have the lead too far aft when trying to sail upwind.

Lead aft (shaded grey) flattens foot. Lead forward (black) adds depth to foot.

Another way to look at the problem is to check how evenly the sail luffs as you head up when sailing close-hauled. When the tension on the leech allows it to "twist" open properly, the sail will luff almost simultaneously at every height along the leading edge. If the top telltale luffs more than a split second before the bottom, the lead may be too far aft. The top of the sail should luff a little before the bottom. Move the lead forward to pull down on the clew, increasing leech tension and reducing twist. If the bottom of the sail luffs first, move the lead aft. This eases the tension on the leech, allowing the clew to rise, increasing twist.

To fine tune, keep in mind that within the normal range, moving the lead forward adds power, (full foot, minimal twist) and moving the lead aft de-powers the sail (flat foot, increased twist). As a rule of thumb, the lead moves aft from normal position (4-8") as the sail is sheeted harder with increased wind velocity, and moved forward (1-3") from normal as the sail is eased in light conditions.

Reaching, the lead should follow the clew, moving outboard (assuming the boat has inboard sheeting) and somewhat forward as the sheet is eased. A second sheet led to a block on the rail will do the job. The sail will not break evenly on a reach. The top will luff well before the bottom, and in fact, the bottom telltales may be stalled (hang straight down) much of the time. Set the lead so that the telltales in the middle of the sail break properly.

Headstay Sag (Backstay Tension)

Headstay sag affects the overall depth of the headsail. More sag adds depth and makes the entry of the sail rounder and more powerful. Use sag to create power in light to moderate conditions, when you need heel and are trying to build speed. As the boat begins to heel too much, or when the boat is up to speed and you want to maximize upwind performance, reduce sag.

Headstay sag is controlled by backstay tension on masthead rigs, and by running backstays on fractional rigs with in-line spreaders. On fractional rigs with swept spreaders, overall rig tension on the side shrouds controls headstay sag, and there is not much adjustment "on the fly," (as is

A typical chart looks like:

WIND	0-5 apparent	6-12 apparent	13-17 apparent	17+
BACKSTAY TENSION	0-20%	20-60%	60-90%	90-100%

Headstay sag creates additional depth

Shaded portion represents sail with tight headstay. Unshaded shows increased depth as headstay sags.

the case on masthead rig boats with no backstay adjuster).

To fine-tune, it is helpful to have a system for marking the "throw," or range of your backstay. With a hydraulic system, a numbered batten works well. This is easier and more reliable than using the tension readout on the hydraulic gauge. For split backstays, reference the distance of the squeezer to the stern pulpit.

Sheet Tension

Sheet tension affects every characteristic of the sail. More than any other control, sheet tension will change substantially with changes in wind velocity and sea state.

On a reach the golden rule "when in doubt, let it out" applies. Ease until the sail just begins to luff and trim just enough to stop luffing, or ease until the middle telltales flow straight aft. If the telltales hang down, or if the leeward telltale spins, the sail is over-trimmed. For perfect trim on a reach, ease in every puff. Conversely, the sail will probably need to be trimmed in lulls. If the boat is overpowered (heels too much) in a puff, the sheet can be eased, allowing the sail to luff and spilling excess power.

Upwind the goal is to bring the sail in as close to the rig as possible without slowing the boat down too much. In general, the tighter the sail is sheeted the better it will point (it will sail closer to the wind), but the slower it will go. How far the sail can be trimmed is a function of wind velocity and how fast the boat is going. In more wind the headsail can be trimmed tighter and closer without causing a speed loss, and pointing will

improve. In less breeze, be careful not to over-trim or the boat will not accelerate. Keep in mind another fundamental rule of sail trim, "speed first, and then point." Start relatively eased, and gradually trim harder once the boat is up to speed.

For overlapping headsails, the distance of the sail off the top spreader is a good reference. For non-overlapping headsails install trim stripes at even increments from the tip and then trim the sail inside the spreader tip using the vertical leech and the trim stripes as a reference. Spreader length, genoa track location, and the efficiency of the boat's underbody are all factors in how hard a headsail can be trimmed in a given condition. Typically, on more high performance boats headsails can be trimmed harder without hurting speed. However, for an overlapping headsail, a typical chart for upwind sheet tension would look like:

APPARENT WIND SPEED	0-5	6-12	13-17	17+
DISTANCE OFF TOP SPREADER	6-12"	4-8"	1-4"	2-12"*

**The distance increases in this condition because the lead would be moved aft to allow the top of the sail to twist, spilling air to de-power.*

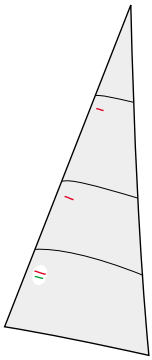
Telltales

Your Quantum headsail is equipped with three sets of telltales, spaced evenly along the leading edge of the sail, as an aid in trimming and driving. As described previously, they help determine lead position. Also, on a reach, they help the trimmer know how far to ease.

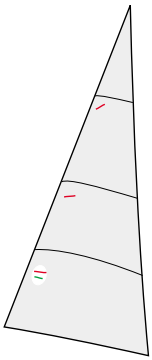
They are also an important reference for steering upwind. Once the sail has been trimmed in as far as conditions

allow, it's up to the helmsperson to keep the boat "in the groove," (at the correct angle to the wind). For maximum power the telltales should stream straight aft. If the outside telltale spins or hangs down, then the helmsperson needs to head up towards the wind. If the inside telltale lifts, they need to bear off slightly, unless the boat is heeling too much.

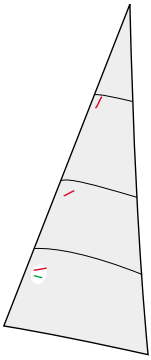
In all but light conditions, the inside telltale should be active, lifting slightly to a 45 degree angle above straight aft. This insures that you are sailing as close to the wind as possible. In more wind velocity, as the boat heels over and generates weather helm (the tendency of the bow to turn into the wind, requiring correction with wheel or tiller), the helmsperson should not fight the helm, but allow the boat to "feather." The inside telltales will lift and stand straight up (hence, "feather"). At this point angle of heel becomes the overriding concern, not the telltales. Keep the boat on its feet, and feather the telltales, don't fight the helm. If the boat is allowed to head up slightly, the heel, and consequently the helm will stay balanced.



Light air telltales straight aft.



Medium air telltales straight aft.

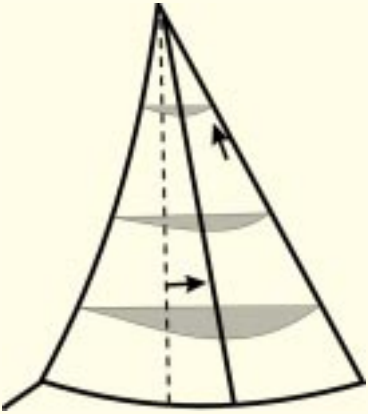


Heavy air telltales lifting (feathering). Sail angle of heel.

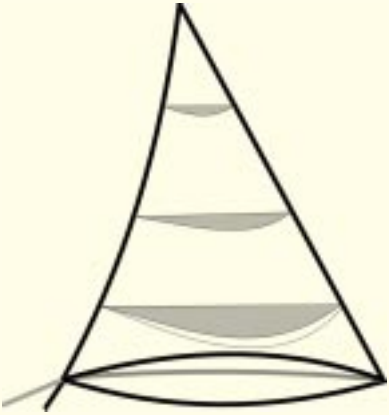
more on back page >

THE HEADSAIL TRIM PROGRESSION

As The Apparent Wind Velocity Increases

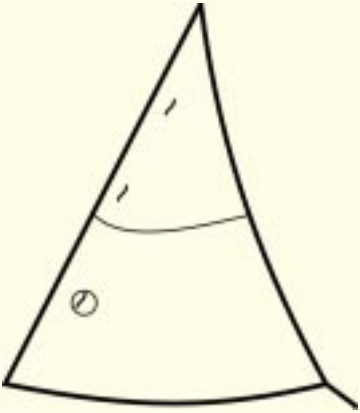


Add Halyard tension as the apparent wind increases to keep maximum curve forward.



Move lead aft as sail is sheeted harder or to depower.

Tighten backstay to reduce headstay sag.



Allow telltales to "feather", don't fight the helm; sail angle of heel.