

Matching “Luff Hollow” to Forestay Sag.

Why doesn't my boat 'point', it just heels over and skids off to leeward?

When a sailmaker designs a headsail that's either attached to a foil or is attached by hanks, the sailmaker 'assumes' that the rigging is at normal tension (usually about 12-15% of the breaking strength of the wire). Unless specified otherwise a 'cruising' sail will be designed for ~15kts. of wind and the sailmaker will expect that headstay to 'stretch' a wee little bit when the sail is wind-loaded at the design windstrength. When beating, the stay will also begin to 'sag' off to the lee-side of the boat ... usually quite predictably. This expected sag is 'compensated for' by the sailmaker cutting a smooth curved amount of sail material from the luff section of the sail - called "luff hollow" (fig 1). If the hollow isn't cut to this shape and when the headstay does sag all that material at the midsection of the luff would be 'pushed' towards the center of the sail and the designed point of maximum draft - wide grey line D1 in fig 1.- would move aft to D2 in fig.2 (increasing weather helm) and the amount of draft would get much deeper causing the boat to heel more ... sometimes causing even more apparent weather helm. Also, since the center of effort of the sail is now moved/sagged off to leeward ... its like someone moved that headstay several feet to leeward or radically somehow changed the sail's angle of attack: the boat ... heels over, slows down, can't point, and starts to 'skid' off to leeward and all because the headstay sag no longer matches the luff hollow that the sailmaker designed into the sail !!!! Its all action and reaction.

How to increase headstay sag (and make pointing 'worse'): loosen the backstay; apply too much winch tension to a sheet (all that applied load to the jibsheet eventually 'distributes' to the *headstay* which increases the sag); sail in wind well beyond what was the target design wind-loading for the sail.

How to know when the luff hollow shape is matching the normal sag in the headstay

1. Ask the sailmaker how much luff hollow was cut into the sail, and where on the luff up from the tack is that maximum amount. When on a hard beat and with a Mark 1 eyeball near the tack, look up along the luff and simply estimate that the 'sag' you see is approximating that value that the sailmaker gave. If too much sag, tighten the backstay or release some sheet tension; if too little sag, loosen the backstay or increase sheet tension.

If this is too approximate, there is a more precise way

2. Take the jib/genoa and lay it FLAT on FLAT clean ground or floor and make an 'acordian fold' about 2 ft. back from the luff (Fig. 3). The acordian fold will allow the 'curved' 3D shape of the luff of the sail to lay FLAT on the ground. Work out ALL wrinkles from the luff section - you want the luff to be absolutely FLAT. Then take a string and pull tight along the curved luff shape what is 'missing' between that tight string and the sail is the 'luff hollow' that the sailmaker cut from the luff edge of the sail. Measure and record or REMEMBER that 'hollow' shape if you want that sail to take the 'shape' as was designed.

For easy bombproof 'precision', take that taught string and move it a few inches across the luff and so that its parallel to the 'first' string position but now laying over sail material. Then get some 3/8" or 1/2" wide adhesive backed 'draft stripe' material and apply 'straight as an arrow' just behind the leading edge of the FLAT sail luff on the ground. When sailing and having 'pointing problems with increased weather helm' ... just take a walk forward and 'see' if that vertical stripe along the luff is dead-straight (headstay sag now *exactly* matching the 'luff hollow in the sail'). Do any adjustment necessary (backstay tension, jibsheet tension, running backstay, etc.) to keep that stripe 'straight' and your boat will now 'point like a banshee', with less heel, and wont be skidding off to leeward (and with the helmsman erroneously blaming 'weather-helm', etc.). Its very easy to overload a jibsheet on a large genoa ... and totally destroy the critical forward leading edge shape of the luff.

Want to race, quickly move to the side of a squall, point higher, or get to your far destination faster?

... ****match**** the headstay sag to the "luff hollow"



