

Sailing with a Wing Mast

Article courtesy of Australian High Performance Catamarans.

Welcome to the world of the wingmast rig.

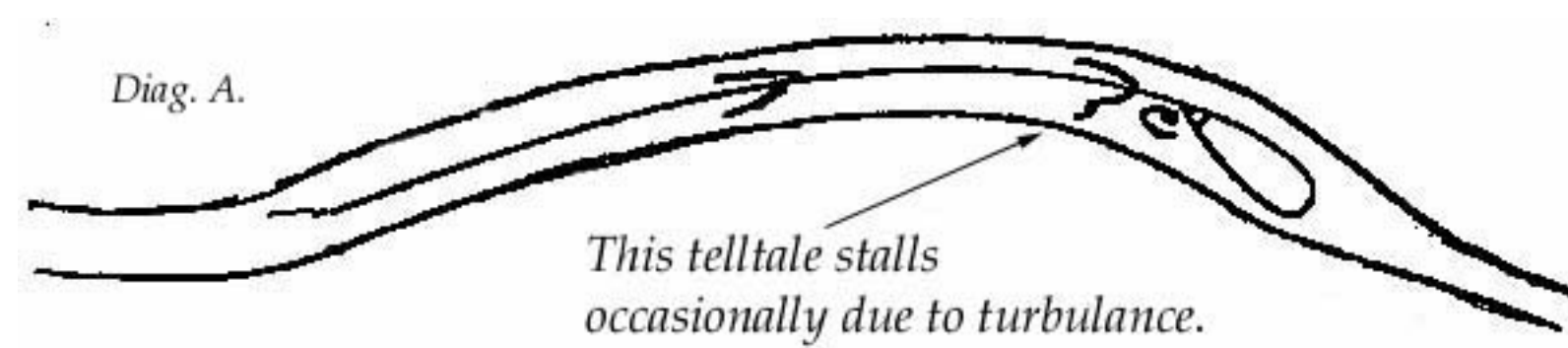
This type of rig offers many performance advantages compared to a 'pear' section mast. Such as: better boat speed, better pointing ability and more sophisticated sail control. The end result is a faster boat which is easier to sail.

WARNING: The mast on a wingmasted boat is active sail area both when the sail is up and when it is lowered. For this reason the mast should never be left standing while the boat is unattended and unsecured. eg. overnight - lest it blow over in a wind squall and injure someone or damage itself or damage other boats.

This information sheet is primarily aimed at windward sailing but these principles can also be applied to reaching and running. I might also add that there are no hard and fast rules in boat tuning but this is the method that has worked well for me.

1. The Basic Concept.

The idea when trimming a wing mast rig is to effectively make the mast part of the sail. To do this the leeward side of the mast is faired into the shape of the sail. (Diag.- A)

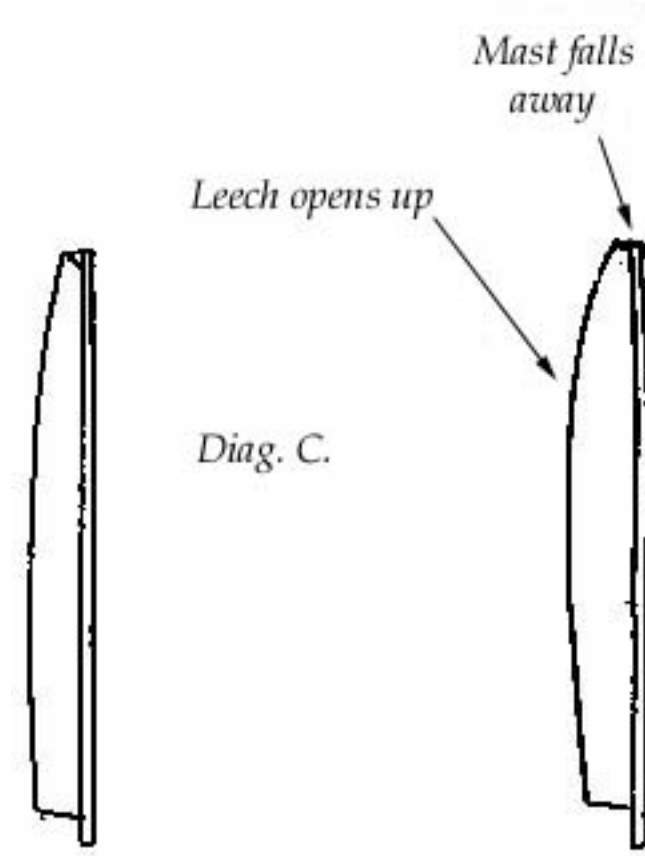


2. Use of telltales.

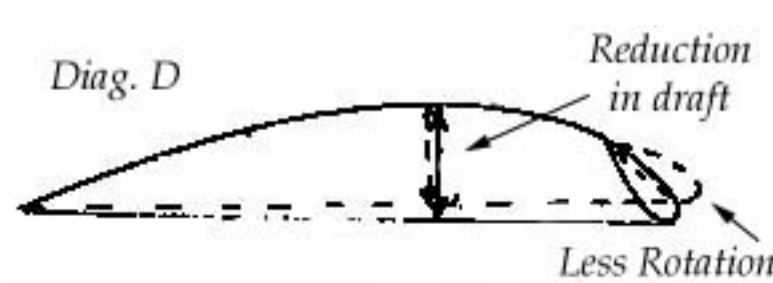
You will notice that your sail has an extra set of telltales down the luff. These are to indicate if you have the correct amount of mast rotation compared to the sail. A good starting point is with the leeward telltale streaming freely and the windward telltales stalling intermittently. All the other telltales on the sail should still flow freely. (Diag. A.)

3. Effect of Less Mast Rotation

Reducing the mast rotation has the effect of allowing the top of the mast to fall away, causing the leech of the sail to open up, reducing the power and hence heeling moment. (Diag. C.)



The reduction of rotation also lessens the effective draft of the sail, reducing both power and drag. (Diag.D)



Note: More rotation above the optimum described above increases both heeling moment and drag so you need to be very mindful of increased drag in this situation.

4. Effect of Increased Luff Tension.

This prebends the mast flattening the sail while at the same time the tip of the mast moves back, shortening the distance between the clew and the head, hence loosening the leech and allowing the leech to fall away. The effect is less power and less drag

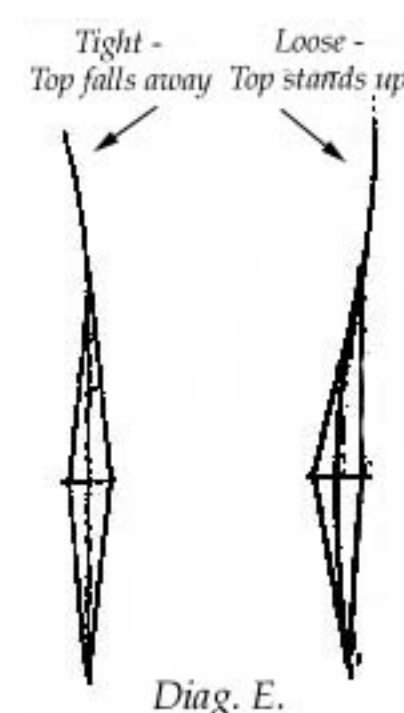
5. Effect of Heavier Top Battens .

This flattens the top section of the sail slightly, reducing the heeling moment in the most critical part of the sail.(Many skippers change these 3 battens for very windy conditions.)

6. Effect of Sheet Tension.

The main effect of sheet tension is to control the twist of the sail. As on other boats the mainsheet is used for most of the fine adjustments when sailing.

7. Effect of Diamond Tension



Tight Diamonds = Less Power = Less Drag

This is due to:

1. The extra prebend flattens the sail
2. The middle of the mast stands up straight, which allows the top to fall away, taking the leech with it.

Loose Diamonds = More Power = More Drag

This is due to:

1. The sail becomes fuller because of the luff curve.
2. The middle of the mast bows away causing the top of the mast to stand up straight, bringing with it the leech. (Diag.E)

We recommend that you sail for your first half season before attempting to adjust the diamond tension. This is because many apparent diamond tune problems are simply skipper inexperience problems. If you loose your factory settings learning to sail with the wing mast and learning to tune it at the same time is quite difficult. Before attempting any change to diamond tension mark and record your factory settings for future reference.

One way to check your diamond tension is to sail in conditions where you are comfortably on trapeze - if you sheet on harder the leech should stand up. If your diamonds are too tight then the sail will flatten before the leech stands up. A bit of fiddling in these conditions should produce a diamond setting you are happy with. This setting should work. in all conditions and no further adjustment should be necessary. If you are still unsure, use the factory settings.

The diamond tension is very high on these rigs and must be released before adjustment can be effected. This is done by pulling the wires out of the cross arms. Note: Care must be taken not to put a point load on the mast during this process.

8. Trouble shooting

1. Boat is overpowered and flighty in strong winds.

Try: More Luff tension Less Rotation, Point up and Sheet on.

(The sail is too full due to lack of luff tension - you are overpowered so you drop sheet. Because the leech is no longer controlled, and is tight as well it will not open at all in the gusts so you are blown over in the gusts and you fall in the water in the lulls.)

2. Boat heels instead of accelerating in medium conditions.

Try: More Luff tension.

(This will free the leech and reduce drag.)