

DBSC Mermaid

Tuning, Handling and Boat Preparation Guide

Addendum for Swing-Spreader Rig

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Endeavour no. 102

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MERMAID TUNING MEASUREMENTS

FREE SWINGING SPREADER RIG

Endeavour 102 ----- June 1994

<u>Measured from Transom</u>	Imperial
1. Chainplates (middle)	9' 7"
2. Jib Leads fore/aft	9' 9"
3. Spinnaker Sheet Leads	3' 3"
4. Aft Mainsheet Attachments	1' 2"
<u>Other Measurements</u>	
5. Mast Heel from middle of Centre Plate Pin	1' 6"
6. Distance between Jib Leads	3' 8"
<u>Mast Measurements</u>	
7. Mast Rake (Tensioned with Jib Halyard) - From edge of Transom to bottom edge of Top Mast Band	25' 10"
8. Length of Spreaders (from side of mast to shroud)	1' 11"
9. Spreader Deflection - From straight edge across spreader tips to mast track	N/A as it constantly changes
<u>Measured from Mast Tenon</u>	
10. Spinnaker Hoist	21' 8"
11. Upper Shrouds	22' 6"
12. Jib Halyard	17' 10"
13. Spreader Brackets (to middle of bracket)	14' 6"
14. Lower Shrouds	15' 0"
15. Spinnaker Pole Ring	6' 2"

Other Points on Set-up

- 1 to 1 ½ inches or less of pre-bend with maximum rig tension.
- Mast choked firmly, including the sides under maximum rig tension.
- Mainsail Leach Tension controlled by Kicker.
- Main and Lower shrouds attached to same chainplate.
- Lowers are set-up on the water to suit prevailing conditions:
 - i.e. - Tighten or slacken to keep mast straight fore and aft
 - Rig tension determines the extent of mast-tip deflection, more tension to reduce deflection and vice-versa.

Notes to be read in conjunction with Free-Swinging Spreader Rig

The settings set out above provide details of “Endeavour’s” rig when we last used a free-swinging spreader rig in 1994.

This traditional set up has been proven to be fast but suffers from mast inversion when using the spinnaker in windy conditions. It is particularly quick in light/moderate conditions upwind and flat water.

With free swinging spreaders, the length of the spreader determines the fore and aft bend with very little impact on controlling side bend.

The longer the spreader, the more the mast will bend fore and aft. Longer spreaders will also encourage the middle of the mast to sag to leeward as the wind increases.

The crucial tuning set-up is consequently focussed on getting the spreader length correct with the right amount of rig tension. The spreader should be long enough to induce the desired prebend and short enough to avoid the mast sagging to leeward under load. You will see from the attached table that we used the shortest spreader allowed by the rules attached to the mast at exactly the design height on the mast.

In addition it is also important that the lower shrouds are fitted at the maximum height permitted by the rules and attached to the mast above and in front of the spreader bracket. This is to assist prevention of mast inversion by limiting the swing of the spreaders under load when sailing downwind.

Watson and Jameson have refined their sail design to cope very effectively with unique characteristics of the mermaid rig.

The luff round built into the jib and mainsail takes account of the virtual impossibility of keeping both the jib luff and the mast straight.

The mast needs to be set-up with about 2.5 inches of prebend to help keep it in column under load.

The lowers are adjusted before each race to give the desired prebend fore and aft. This is done on the water by changing the leeward lower shroud and then tacking to confirm the impact. The difference with the set-up on the fixed spreader rig is that you are adjusting the lowers to eliminate side bend.

The free swinging spreader rig cannot be set up this way as all that will happen is that you will invert the mast by using too much tension.

The free swinging rig is also much more susceptible to jib halliard tension adjustments than the fixed spreader rig. It is crucial to constantly tweak the tension in response to velocity variations as the bend characteristics of the mast change considerably with small changes in rig load.

Basically what you will be trying to maintain is consistent jib luff sag of 2 inches.

The inherent bend characteristics of the mast are far more critical in the free swinging spreader rig. If you have a soft whippy mast very little can be done with shroud adjustments to make it stiffer and the reciprocal applies to stiff masts.

If you are going to use this rig it is important to have the stiffest mast possible within 5/6 Lbs of the minimum weight.