

Soling Tuning Tips

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Most of this content was provided by Carl Olbrich. I have added comments in square brackets where I thought it was appropriate. We welcome others to add their comments as well.

[Sailboat tuning *is* a science. But practicing it as a science requires very careful measurement and recording, and most of all, some basis for comparison. These are extremely difficult things to do in this hobby, so any tuning advice must be general in nature. Where you find dimensions and other details in the advice that follows, they should be used as a starting point. In all cases, we have tried to indicate how to correct problems. And don't forget the skipper, who must be "tuned" as well. Go sailing!]

Fore & Aft Trim

The Soling One Meter is sitting correctly if the bottom of the transom just DOES NOT break the surface of the water with everything on board. Adjustment of batteries fore and aft can help give you the desired setting. [Alternatively, if your boat was built under 10 pounds, the corrector weight can be moved to adjust the trim.] Batteries can be split into two units by wiring in series. Then store the batteries with velcro on either side of the keel support. They can be mounted outboard as far as possible as the center of gravity of the batteries will still be over the keel and it (CG) will be much harder to move. The batteries can also be stored forward of the bulkhead if needed for trim.

[This will be moved to the building section.] The lower the center of gravity the better the boat stands up to the wind. Keep all interior weight as low as possible. Glue a narrow board (part of a paint stick) to the hull from the keel support back. The sail winch and rudder servo can be mounted on a narrow board which can be attached to the paint stick with velcro or small screws. Keep as much weight to the center of the boat (fore & aft) as this will make it more maneuverable. Also balance side to side.

Rudder

Set the rod to the servo in the middle of the holes on the arm. Try out the boat for how much movement the rudder has. Adjust this setting depending on how fast you want your boat to respond. Too fast a response will slow the boat down until you become proficient with the controls. On land stand behind the boat and with the radio control on (lever r/h side and spring loaded) check to see if the rudder is centered and aligned with the keel. Using the small trim tab on the radio, check to see if the trim tab moves the rudder equally on both sides. If not loosen the set screw and adjust the setting. This is critical because eventually you will at least sail to windward just using the small trim tab when boat is properly trimmed. [Not all skippers sail with the trim lever, but you want to be able to do it.]

Mast

Use second or third hole for mast at base. Generally forward hole is not used. Set mast straight or slightly aft rake. Set this by using the jib headstay bowsie and backstay bowsie. (@45-3/4 inches above deck on the mast, a line to the bow would be approximately 49 inches long) Deck to jib stay eye attachment no more than 45-3/4 inches (including base jack). Jib forward eye at deck can range from 3-5/8 to 4-7/8 inches from bow. The closer to the bow for the eye will give you a bigger pocket between the jib and mainsail. Then with the backstay loose take up slack in the side shrouds by using the base jack. Do not over tighten the jack - snug side shrouds only. Snug back stay tension. Back stay tension effects how the jib boom lifts in a strong breeze due to the jib headstay being forward of the attachment point to the boat. A tight backstay holds the jib boom down and a loose backstay lets the boom lift up spilling wind.

Sail Shape

Jib setting at the boom should have a generous curve. 1 inch at center of foot. (outhaul tension). Mainsail at the boom should have a generous curve but not quite as much as the jib. (outhaul tension). Reduce the curve in heavy wind. Stretching the sails (jib or main) up toward the top of the mast is not required, they should be snug without wrinkles.

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Sheet Tension - boom alignment

Jib boom should be 10 degrees wider than the mainsail to the centerline of boat. Jib boom should point to the shroud eyes. Mainsail boom should be close to the centerline but don't pull the boom down to kill the leech or completely flatten the sail. Mainsail boom should point to the corner of the intersection where the transom and side meet. Adjust the sheet bowsie on each boom so that the fine adjustment on the radio control is at mid-point on the adjustment with the booms set as suggested. With an Airtronics 94581 winch, the longer arm should be set up for the jib sheet. [Yikes! I have never seen this.] Lay the boat on its side and check to see if the pocket between the jib and the back curve of the mainsail is uniform in clearance from bottom to top.

Boom Vang

In light air the boom vang should be snug but let the boom come up slightly with the sail amidships. In heavy air the boom vang should be looser to permit the boom to lift and spill air.

Other Points

- Mainsail should be loose at the mast, not pinned up against mast.
- Eye hooks on booms for jib and mainsail sheets should be over sheet holes in deck.

The Slot

The space between the aft edge of the jib and the mainsail is called the slot. Moving air through this point makes the sail work.

1. Jib sheet boom angle controls part of it.
2. Backstay tension controls a lot of it.
3. Use only the upper eye hook on the mast (where the jib headstay is attached) don't use the lower eye hook to pull up the sail as it kills the pocket.

[The slot cannot be properly check with the boat lying on its side, because the sails are responding to gravity, not wind. If you can set it up on a stand with a slight heel, you will be able to see how backstay tension affects the slot. I use as little backstay tension as possible, because it seems that the Soling "likes to breathe", which means it sails better when its slot is more open. Don't attempt to get a nice, thin slot like an America's Cup boat. It won't work, and besides, you don't have an overlapping jib.]

[More on Jib/Main Tuning

Pay attention to when your jib luffs relative to your main. You want the main to get "light" first. That will allow you to point as high as possible. Another thing that helps pointing, but seems to hurt everything else, is backstay tension. A higher backstay tension will straighten the forestay, but it will also close the slot. It is a delicate balancing act to find the right compromise. The simplest way to adjust when the jib or main luffs is to adjust the sheet lengths. This is why I recommend running the "dead ends" of the sheets out on deck, for easy adjustment.

When you win a race, don't make any changes in your rig. Wait until you lose to start messing around. I have seen too many winners de-tune their rig right after a win. If it ain't broke, ...]

Troubleshooting

[Problem: Boat consistently loses races.

Solution: Replace skipper with one with more experience. Alternatively, have existing skipper sail more often. These boats are close enough in performance that the skipper is 95% of the sailing equation. Don't underestimate the value of thumb time.]

Problem: Boat rounds up to windward on both tacks. Constant rudder is required to hold course.

Solution: This is called "weather helm". It means the center of the forces on the sails is too far aft, and the boat is acting like a weather vane. Some tendency for weather helm is natural in heavy air; don't be concerned about yaw during gusts. Adjust for the average conditions. Some skippers like having some weather helm; it helps them follow lifts. Don't overdo this, however. There are several solutions to this problem:

1. Rake the mast forward by lengthening the backstay and shortening the forestay. Make sure you have the adjustability on these lines to do this.
2. Change the relative position of the main and jib. For weather helm, either make the jib sheet a little shorter, or make the main sheet a little longer.
3. Loosen the vang on the main boom, increasing the twist and dumping more air out. This solution should generally be a last resort in heavy air.

Problem: Boat falls off to leeward on both tacks.

Solution: This is called "lee helm". It means the center of the forces on the sails is too far forward. Do the opposite of the weather helm case above. Some tendency for lee helm is natural in very light air; don't make adjustments for it unless you are sure it is correctible.

[Problem: Boat rounds up to windward on one tack, and falls off on the other.

Solution: This could be any one of several things, or combinations of things. Go about checking them methodically, constantly re-testing to see if you are making progress.

1. Check the rudder for centering. Sometimes your trim lever can get moved inadvertently. The best test is to remove the rig and push the boat across a pool or other calm surface. If it turns at all, you have a problem. Adjust the trim. If it will only go straight with significant rudder trim, the keel could be on crooked, or there is some other asymmetry, like a leaf stuck on one side (it happens!).
2. Check the mast for port/starboard leaning. There could be some damage that has gone undetected, like a screw-eye partially pulled out.
3. Make sure the keel hangs down in the same plane as the mast, and the deck is level. This problem can't really be corrected, so hope that you don't find anything!

A properly tuned Soling should hold its course sailing to windward in a moderate breeze with no rudder input at all.]

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This page is maintained by Jack Gregory.

