

Steve Haarstick was kind enough to put together for us the following guide on Freedom sail trim:

The most important point to remember when trimming Freedom mains is that these boats, for the most part, are underpowered in any wind less than 12 knots. Proper mainsail trim is important, as it is the "power" sail. The goal when trimming the main in winds of 12 knots and under is to generate as much power as possible without stalling the sail:

To determine when the sail is at full power, you have to know when it begins to "stall".

Put telltales (if you don't already have them) on the leech just above each batten, and one extra half way between the top batten and the headboard. These will tell you when you have over trimmed the mainsheet, as they will stop streaming out from the leech, and disappear to leeward. When this happens, the mainsheet is too tight, and the air flow around the back side of the sail has separated from the surface of the sail. Flow separation, or "stall", reduces lift and increases drag, resulting in a loss of upwind performance. This will happen first at the top of the sail. The trick in light to moderate air upwind is to trim the mainsheet until the top two telltales just start to "flicker" and disappear behind the leech. This is the maximum trim point. More trim will stall the sail, and the boat will feel "dead". Less trim will either allow the sail to luff high, or simply not get the boat moving.

The problem with over trimming is most noticeable after a tack. You HAVE to ease the mainsheet until the boat gets up to speed and back on the wind. This can take some time. Watch the speedometer, and don't trim the mainsheet all the way in until you have reached the same speed as before the tack. Then SLOWLY trim the mainsheet to its final trim as you bring the boat up the last few degrees onto the wind.

Traveller position is also important in powering up the main. If you are sailing a Cat rig with no jib or staysail in front, you will have to keep the boom off centerline somewhat, as there is no sail out in front to keep the main from stalling. Again, watch the telltales on the leech.

With a foresail, you can bring the traveler to centerline, and, on occasion, even to weather of centerline. The jib or staysail will make a big difference in how close to centerline you can trim the boom. Again, watch the leech telltales on the main.

In light to moderate conditions it is ok to sail with some horizontal wrinkles in the luff area. As the wind increases and the mast bends more, flattening the main, you need to tighten the cunningham. Increasing leech loading in heavier air, combined with increasing mast bend, together move the position of the draft aft in the sail. To counter this, and keep the draft from sliding aft to the leech, more cunningham tension is necessary.

As the wind increases above 12 knots, it becomes time to depower the main. Depending on the size and model, Freedoms are generally more tender than other similar sized boats with conventional rigs. This is due to two factors. The big main with its large roach and a small jib has a higher center of effort than conventional "small" mains and large genoas or jibs. The second factor is that Freedoms are

primarily cruising boats and don't have the deep keels and a high ballast to displacement ratio.

The first step to depowering the sail is to flatten the foot area with the outhaul. Keeping the foot area flat will require a low stretch line and plenty of power. Leading the outhaul to a winch is necessary for all but the smallest Freedoms.

The second step is somewhat automatic. Trimming the mainsheet will bend the mast, both fore and aft, but also sideways. Mast bend moves the luff away from the leech, resulting in a flatter cross section and less power.

With a sloop rig, you have some control over the fore and aft bend with adjustment of the forestay. When you loosen the forestay by backing a few turns off the turnbuckle, it allows the mast to deflect aft further when the mainsheet is trimmed, and the mast bend will be increased, which will flatten the main. If the main is too flat, tightening the forestay will reduce bend.

Once the foot is flat, and the mainsheet trim, and the forestay adjustments have flattened the main as much as possible, the traveller position needs attention. Notice that I have put traveller adjustment after the other sail adjustments. You will not keep your boat "on its feet" and driving in a breeze if the main is too full, even with the traveller eased. A flat Freedom main is essential in a big breeze!

How far to ease the traveller to leeward is dependant on the stability of your Freedom, but is also a function of the sea conditions. With less waves than wind (offshore breeze), it is possible to "feather" the boat in the puffs, and keep the traveller further inboard. When it is rough, you have to keep the boat moving through the waves, and you will have to keep the traveller to leeward, and easing it even more in the puffs. In the extreme puffs, you should only ease the mainsheet (assuming it is not over trimmed) after you've run out of traveller. Why? Unlike other boats with backstays, the only way to keep a Freedom mast bent is through mainsheet tension. When you ease the mainsheet, the mast bend is reduced and the sail gets fuller.

Finally, Cat Ketch rigged Freedoms have the same general trimming rules as the sloop rigs with one important difference: without a forestay, the mast bends as a "cantilever". That is, it is unsupported after it exits the deck, and the amount of mast bend is strictly a function of the wind velocity and the mainsheet tension. The shape of the bend from the bottom to the top is determined only by the taper in the mast section. In this case, the design of the main must match the bend of the mast, and flatten automatically as the sheet tension increases.

I realize that the above guidelines are not specific to any particular model, but I hope they are helpful in any event. The key to sailing in any breeze is a critical eye to judge the shape of the main, and the "feel" of the boat.

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