



## Mirror Tuning Guide

Although the Mirror dinghy is often used as a beginners boat, the rig is less straightforward than many other classes and allows quite a bit of scope for tuning. While individual boats may require some alterations to the following settings, this guide should give you an excellent starting point to set your boat up close to its ideal settings.

### **Mast**

The mast should be stepped as far forward in the boat as possible. The measurement in the class rules is 2160mm +/- 15mm from the centre of the mast step to the forward face of the transom. Ideally the mast should be **2174mm** although it is not worth pushing this to the last mm.

### **Rig Tension**

Rig tension affects power and pointing ability. To measure rig tension you will need a tension gauge. Measure the tension on the side shroud and try to measure from the same height each time e.g. eye level. In the Mirror you should sail with a tension of about **180lbs** (no. 18 on Superspar rig tension gauge).

### **Mast Rake**

There is only one way to measure mast rake accurately and this is with a tape measure from the top of the mast to the transom. To do this in the Mirror you need to tighten the forestay so there is **180lbs** of rig tension. Turn the boat on its side and measure the distance from the pin that holds the main halyard sheave in the top of the mast to the top of the transom (on the outside). This gives the mast rake. Try to sail with a mast rake of between **3540mm** and **3570mm**. To increase the rake move the shrouds down a hole in the chainplates (which gives a smaller number because the mast is raked backwards and the mast top is closer to the transom). To decrease rake move the shrouds up a hole in the side chainplates (this gives a bigger number).

### **Jib Halyard**

The jib halyard should be pulled on just tightly enough so that there are no creases appearing between the hanks. Although you will need slightly more tension to do this in heavier winds you must be careful not to use too much. If this happens you will see a long vertical crease (or bump) in the luff running parallel to the forestay.

### **Jib Sheeting**

The jib should only be pulled in bar tight above 12 knots when both helm and crew are hiking hard. When the crew is just sitting on the windward side but not hiking the jib should be eased about **¼ inch** and this should be increased progressively in lighter airs up to a maximum of **1 inch** when the crew is to leeward. If it is very choppy and light ease the jib a further **¼ inch**.

To be able to reproduce the above settings easily put a mark on the jib sheets (either with waterproof marker or whipping twine) which shows when the jib is in tightly.

## **Jib Fairleads**

We recommend having the jib fairleads on the thwart of the boat with the bearing surface (which is the outside part that the sheet touches) of the fairlead **30mm** from the side-tank. The fairlead should be as far aft as possible on the thwart.

## **Jib Tack**

With the jib fairleads fixed, altering the height of the jib tack has the same effect as moving the fairleads forward and aft. Raising the tack is similar to moving the fairleads forward ie decreases tension in the foot of the sail and increases tension along the leech. This is done if the upper windward telltale is breaking consistently before the bottom one. If the bottom telltale is breaking first, tension needs to be increased in the foot either by moving the fairleads aft or lowering the tack.

However this can be very difficult to spot (unless your fairleads are very much in the wrong position). As a general rule have the jib tack be up to **1 inch** above the bow knees in light winds and decrease this to just **1cm** in strong conditions. Lowering the tack in strong winds opens the upper leech of the jib, helping to prevent the slot getting choked as you play the main upwind to keep the boat flat.

## **Kicker**

The kicker is the most critical sail control when racing. It controls the sail twist in the mainsail and can be used to depower the sail. In very light winds with the crew to leeward or in the middle of the boat, the kicker should only have enough tension to just remove the slack in the system. In these conditions mainsheet tension is sufficient to control the leech profile of the mainsail.

As the wind starts to increase and the crew moves to the windward deck or gunnel, you should aim to have the top leech tell-tale on the mainsail flying approximately 80% of the time i.e. occasionally flicking behind the sail.

Above 15 knots when both the helm and crew are fully hiked the top leech tell-tale will fly no matter how much kicker you put on. In these conditions you should use it as a power control – if you are overpowered put more on, if you are under-powered let some off.

Downwind, the kicker should be eased so that the leech tell-tales are flying continuously. On a run the kicker needs to be let off significantly although not to the extent that the boom ‘skys’ in the gusts.

## **Downhaul**

The downhaul should only be used to pull some of the large creases out of the luff of the mainsail. With the downhaul on, the lacing should be tight enough to hold the luff of the mainsail about **30-40mm** from the mast all the way down.

## **Outhaul**

When sailing upwind, the outhaul should be pulled on so there is approximately **10cm** between the foot of the mainsail and the boom.

On the reaches the outhaul should be eased another **1½ - 2 inches**. In windy conditions, leave the outhaul on when sailing on a close spinnaker reach.

When running the outhaul should only be eased **½ inch** to keep more sail area to the wind.

## Spinnaker

Stopper knots can be placed in the spinnaker sheets so that *in light winds* with the knots behind the reaching hooks the pole is just off the forestay. This acts as a guide for the crew for where to cleat the guy and prevents him letting out the guy too far. You should remember however that in windy conditions the spinnaker pole will bend slightly and the sheets stretch so the guy will have to be cleated further aft to keep the pole off the forestay.

90% of the time, the Spinnaker pole should be set so that the clews are level. However this is difficult to see from within the boat so as a guide you can look at where the spinnaker is breaking when eased (top, middle or bottom). If the spinnaker leech is curling at the top first then the pole needs to be lowered and vice versa.

If the wind drops completely so that you are struggling to get the spinnaker to fly, dropping the pole a few inches can support the spinnaker and help it to set.

Once you have the boat set up it is important not to get overly immersed in boat tune. When you are planing down a reach with the spinnaker up in strong winds, more distance is lost by the crew jumping in to try and adjust the outhaul than is gained from the adjustment. Similarly in light winds when it is important to be as still as possible and not lose momentum by shaking the boat - jumping around trying to adjust the kicker or downhaul is not beneficial. What is critical in all conditions however is having your sails correctly trimmed.

The aim of this guide is to try and show you how the different controls work and what the various settings should be. It is worth spending some time getting these and then marking everything so that it can be reproduced quickly. This will allow you to keep your eyes out of the boat and concentrate on the important things happening on the course.

If you have any further questions please do not hesitate to contact [Speed Sails](http://Speed Sails) on +44 (0)1922 455503 or send us an e-mail: [sails@speedsails.co.uk](mailto:sails@speedsails.co.uk)