

# HOW

# TO...

Getting your head round tuning a dinghy can seem impossible if you're a beginner - particularly if you don't understand the lingo or know your spreaders from your shrouds. **Vyv Townend** guides you through the basic process of tweaking...

# TUNE



PHOTO - CHAMPION

## TUNE

**A**rticles on boat tuning tend to assume you already have a certain level of knowledge – but that's no help if you've never done it before. So, in this article I will strip away the jargon and give you a simple step-by-step guide on tuning a dinghy, so that by the end you'll understand how to set up your boat with a basic rig configuration. It is about 'how' and not 'why' – think of it as tuning by numbers.

I want to start by exploding two commonly held myths. First is that the only reason to tune your boat is to make it go faster. While it's true that tuning your boat will make you go faster, a properly tuned boat will also be better balanced, more forgiving in the gusts and generally easier and more pleasurable to sail, particularly in stronger winds. Go to any sailing club on a moderately windy afternoon and you will see many sailors struggling to stay in control of their boats. More often than not, a badly tuned boat is the main reason for this, not poor sailing skills.

Myth two is that tuning is a complicated and intuitive process. The best kept secret about tuning is that there is no secret. Strip away the jargon and it is simply the application of some standard measurements to the rig and its position in the boat – any idiot can do it! The basic process is much the same whether you sail a GP 14, 505, Fireball, Laser 4000 or RS400. If you tune your rig to some readily available measurements, you're 95 per cent of the way there. The more accomplished sailor just gets that extra five per cent by understanding how and when to make subtle changes to the basic set up depending on conditions.

All the measurements you need will be detailed in a tuning guide. These can be obtained quite easily from the sailmaker who made your sails, the manufacturer or dealer for one-design classes, your class

association, or by ordering a relevant back issue of *Yachts and Yachting*. In some cases the tuning guide might just be a short list of the magic numbers you need, or it might be more detailed to give you a bit more help and guidance.

At its simplest level, tuning is setting a rig up to the optimum combination of three basic measurements:

1. **Rig tension.** This is the tension in your standing rigging. It is measured on either the jib luff wire or on the shroud – your tuning guide should tell you the appropriate measurement point.
2. **Mast rake.** With rig tension pulled on, mast rake is the distance from the tip of the mast to a fixed point at the transom of the boat. This fixed point differs from class to class, some measure to the top of the transom while others measure to the join of the floor and the transom – the exact point should be detailed on your tuning guide.
3. **Pre-bend.** With rig tension on, your pre-bend is the distance between the rear of the mast at the spreader bracket and the main halyard – when this is stretched taut to the gooseneck. Some classes use a slightly different measurement here called 'deflection' which is measured from the back of the mast at spreader level but out to a line drawn across the spreader ends (using a top batten or rope tied between the spreader ends). In all cases, your specific tuning guide will again tell you which is appropriate.

A tuning guide will usually give you three combinations of these measurements for light, medium and heavy conditions. Unless it gives advice to the contrary, first set the boat up to the medium setting – this is normally the best starting point. There are three basic stages in the process of tuning your rig which I'll take you through step by step: first there's a general coarse tuning, then you have to get the rig symmetrical in the boat and, finally, there's fine tuning the rig to the exact measurements you want.

Before you get down to the nitty gritty of physically tuning the boat, check that you have everything you need:

- Obtain a tuning guide.
- Get a helping hand, this is a two-man job.
- Give yourself a bit of space – at some point you will need to turn the boat over to adjust the spreaders.
- Set aside a little time – one to two hours should be adequate if you haven't done this before (although it

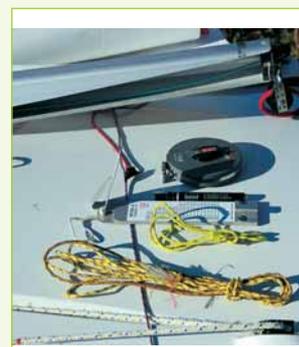
could take less).

- Make sure you have the right tools. You will need to adjust the angles of your spreaders and, depending on your spreader bracket fittings, this will normally require pliers/spanner and screwdriver. If the spreaders have not been touched for sometime the adjustment system may have corroded up. Some WD40 could be useful here. You should also have a tape measure long enough to measure mast rake (normally somewhere between 20-25ft depending on the class), plus two bits of thin rope (max 4mm diameter) – one long enough to tie across your shrouds at deck level and the other long enough to tie across the spreader tips. Then you'll need a rig tension meter and a waterproof marker pen. Fig 2.

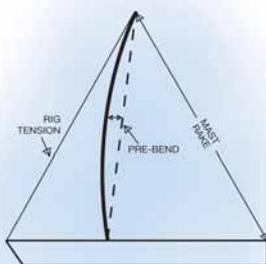
## COARSE TUNING

This is the first part of the tuning process, which roughly sets up the rig in the boat.

1. **First measure the mast heel position.** In most classes the mast heel needs to be as far forward in its rack as possible but this may be governed by class rules. Your tuning guide should help you here. If it does not, give your sailmaker or class manufacturer a call and they should be able to tell you.
2. **Next adjust the spreader length.** Measure the length of the spreaders from the side of the mast to the shroud and adjust to the length shown in your tuning guide. If there is a range, the general rule ▶



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is to go for the shorter end if you are light and the longer end if you are a bit porkier. Fig 3.

**3.** Step the mast and pull the jib up.

**4.** Ensure any mast retainer is off – i.e. uncleat your strut/ram or take out chocks etc – so that the mast is free to move at deck level. Make sure that the fit is not so tight in the gate that your mast cannot move freely fore and aft – we want the mast to hold its natural line as influenced by the stays not by friction in the mast gate. Fig 4.

**5.** Now slowly pull on the rig tension. As one person does this, the other should be measuring the tension with the tension meter. When the target tension (as shown by the tuning guide) is achieved, cleat the rig tension. Fig 5.

**6.** Pull the tape measure to the top of the mast on the main halyard and cleat it.

**7.** Measure the mast rake. This is where the tuning (and the fun) really starts. If your rake measurement is larger than the measurement you are trying to achieve from the tuning guide, the mast is too upright and needs to be angled (raked) back by moving the pins down on the shroud plate. Conversely, if your measurement is less, you are angled too far back and will need to move the pins up. As a general rule of thumb moving the pins up or down one hole on the shroud plates changes the mast rake. See Fig 6.

**8.** Pull the rig tension back on and repeat steps five to seven until you get to a position where at the target tension the rake is within one to two inches of what

you are trying to achieve on your guide. Once you have achieved this, make a rough note of the rig tension position by putting a small mark on the mast against a reference point on the jib halyard. It is normal to use the ferrule of the splice or the hook of the tension tackle that goes into the splice.

### MAKING THE RIG SYMMETRICAL

Having got the rig roughly set up, we now need to ensure that it is set up symmetrically in the boat. So, first pull the rig tension back onto your approximate mark. Next tie one of your pieces of rope across the shroud plates – when doing this, make sure it is taut and not being pulled out of its natural lie by the boom or trapeze wires etc. Fig 7.

Now turn the boat on its side. Tie in your boom before you do this or better still remove it completely.

Check the spreaders are at an equal height on the shrouds. Cleat the main halyard and pull it taut down to one spreader end. Grip the halyard tight between thumb and forefinger at this position and arc it across to the other shroud. This will show you if the spreader heights are different. Move one or both spreader ends up or down the shrouds until they are at equal heights. Fig 8 and 9

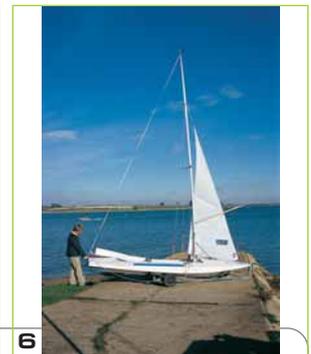
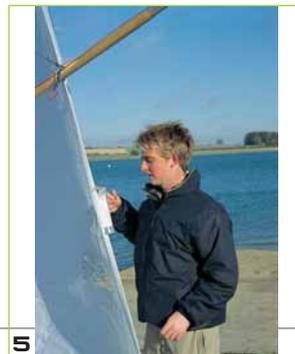
Tie the other piece of rope across the spreaders. We now want to ensure that both spreaders are at equal angles. To do this, look down the mast from the mast tip to see how the rope across the shroud base lines up against the rope across the

spreaders. If the spreaders are at equal angles the ropes will be parallel to each other. If they are not parallel one spreader will need to be angled further forward or one angled further back using the adjustment system at the spreader bracket until the ropes are parallel. Fig 10.

To decide which spreader to move and in which direction, first measure the pre-bend. This is done by pulling the main halyard to the gooseneck and pulling it tight and then measuring the distance from the halyard to the rear of the mast at spreader bracket level. If your tuning guide specifies that you should be measuring deflection, you can measure out to the rope tied across the spreaders. If the measurement you have is less than the measurement on the tuning guide, you will need to move the spreader that is angled further forward back and vice versa. To adjust the spreaders you might need to ease the rig tension but remember to pull it back on again before you re-sight down the mast. Fig 11.

Now check that the mast is in column – i.e. it is not bending off to one side. To do this put the boat upright on its trolley again and sight up the mast track. If it does not bend off to one side, great. If it does, we need to correct this. The easiest way is to pack out the side of the mast gate with something thin like a lolly stick or old credit card. If the mast bends off to the left, pack out the right-hand side of the mast gate and vice versa. If the mast is already tight in the gate this isn't an option. In this case correct the

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bend by lowering or raising the shroud on one side. Don't worry if the shroud pins are in different holes on both sides. Fig 12.

### FINE TUNING

To fine tune the rig, all you do is make small incremental adjustments to rake and spreader angles until, at the prescribed rig tension, you have the right rake and pre bend measurements.

**1.** First pull on the rig tension until you get the correct rig tension. Then measure both rake and pre bend. Once you have measured these, consider what you need to adjust in terms of spreader angles and shroud pin adjustment to get the desired pre bend and rake. Unfortunately, as you change one variable you also change the other. Use the guide below to help you decide what to move:

- **Angle spreaders back** – increases pre bend and decreases rake measurement
- **Angle spreaders forward** – decreases pre bend and increases mast rake measurement
- **Pull shrouds down** – decreases rake measurement and increases pre bend
- **Raise shrouds up** – increases rake measurement and decreases pre bend

Only make small changes at a time and after each change re-measure pre bend and rake. Unfortunately this part of the process does involve pulling the tape measure to the top of the mast and then dropping it and turning the boat over to measure pre bend several times, but through an iterative process you should

quickly get closer to your desired measurements. You should be able to get to within a millimetre of your desired pre bend but be happy if you get to within 1/2 an inch of the right rake measurement.

**2.** Adjust your mast retaining system to the position as indicated by the tuning guide. This will normally be a neutral position – neither pulling nor pushing the mast in the gate. If the guide makes no reference assume it's a neutral position. If you have a strut or ram gently pull it on until you have taken up the slack. If you have chocks you might need to build up any small gaps between chock sizes with credit cards etc. Don't be tempted to stick in a larger chock or leave a gap – you will lose that pre bend measurement you have spent so long trying to achieve.

**3.** Finally mark everything off with your marker pen so that you can replicate those magic settings you've worked so hard to find: mark off the rig tension position on the mast; mark the shroud pin position on the chain plate; and put a mark on your foredeck/mast for the position of your strut or the mark the chocks you need to use. Fig 13.

**4.** Once you have got your boat set-up with this medium setting it is quite easy to find your heavy and light wind settings by repeating steps one to three. As a general rule you will be just raking the mast back (pulling the shrouds down a pin) to achieve the heavy wind setting and putting the mast more upright for the light stuff. It is rare to have to adjust the spreaders, but your tuning guide should

tell you about this. Once you have these additional settings, again mark everything off. If you do have to adjust the spreaders, make sure you make a note of how many turns on the adjuster system you have to make between the various settings. Keep a note book in your toolbox with all your settings listed for easy reference at each wind range.

### EXTRA HELP

This article is deliberately brief and will help you tune your boat to a basic set-up. This may be as far as you need to go, but if you want to know more about how to adapt this basic set-up or need further assistance, then there are plenty of books which go into greater detail. One particularly recommended is Lawrie Smith's 'Tuning your dinghy' published by Fernhurst Books. Alternatively, if there is someone at your club who is active on the open meeting circuit, even if it isn't in your class, they will be an invaluable source of help. Likewise, if you call one of the popular sailmakers in your class you'll find they're generally a friendly bunch.

Make sure you join your class association – they are definitely not just there to organise open meetings. Most will publish a tuning guide specific to the class which will help you get to grips with its particular quirks. Some classes also have a technical officer so you could give them a quick call and to pick up some helpful advice. Similarly, the class website might have class specific tuning information and tips. ●



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