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P Class Tuning Guide

Thank you for choosing a North Sails P Class Sail

Your North Sails P Class sail has been designed to be easy to use and fast in a full range of conditions. If you look after your sail and set it up correctly, it will give you good boatspeed for all conditions.



We have done a lot of work to develop a full range of sails to suit all mast types and the size and weight of the skippers. Some of our base designs have the option of two luff curves depending on which type of spar you are using so if you are ordering a sail be sure to specify which type of mast you have. The difference between the curves is small so either luff curve will work well but for optimum performance it is best to have the correct luff curve for your spar.

T.Y.P.B.C.

Tauranga
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Club

For the latest news from North Sails New Zealand including current price and product information, don't forget to check out our website at :

www.nz.northsails.com

P

North Sails

There is a difference

Sail Care:

Your Sail is made from a fabric called Contender 2.6oz Polykote. This is a very high tech cloth in the way that it has been woven together.

Do the best you can to make sure that the sail does not get unnecessarily creased. Creases are sail killers and are the primary reason for sails not lasting as long as they should. The worst time for getting creases is during hoisting and lowering your sail as the sail catches on sidestays and other fittings.

- Always roll your sail and keep it in its bag when not in use.
- Ideally remove the battens after use. If you don't want to do this, then release the battens from the pocket elastic and roll the sail parallel to the pockets. If you are rolling onto a tube, tie the clew first and roll the sail a couple of turns before attaching the tack. This will allow you to roll the sail parallel to the batten pockets on the tube.
- Wash the salt from the sail every 3-6 weeks depending on how often it gets wet. Do this on a light day by hosing the sail while rigged, and leaving to dry.

Setting up:

Hoist: Make sure the sail is right up to the top black band when hoisted.

Tack: sails are fitted with a tack strap and an eyelet so you can have a choice of how you wish to set the tack of your sail up. Remember you aren't allowed to adjust this while racing. When you have your sail hoisted and fitted along the boom, adjust the strap or whatever method you are using to fix this area in place, so that the tack area is smooth. The idea of this area is that the strap around the mast takes the outhaul load and the cunningham takes any up / down load. You may wish to have a separate piece of rope (or shockcord) tied loosely around the gooseneck area just to prevent the tack riding up the mast when the cunningham is released.

Foot: Check that the black band is in exactly the right position on the boom, as you will need every millimeter of outhaul in the breeze. For really heavy conditions when the tack setting up smoothly is less important as you will be using quite a bit of cunningham load, you may want to use the strap to pull the tack forward toward the mast and give you more outhaul travel.

Battens:

Your sail will come with a 2 top battens and four shorter battens. The four lower battens are interchangeable and are numbered 1 to 4. 1 is the softest and 4 the stiffest. We suggest using (from bottom to top) 3, 2, 1 for light to moderate airs and 4,3,2 for heavier airs. Use the lighter top batten up to 15-18 knots and then begin using the stiffer one.

While these options will give you a full range of performance, we don't want to discourage you from trying other options.

Experiment yourself. To test batten stiffness, use a set of kitchen scales and holding the batten vertically, push down. You will see that after a while the scale doesn't change any more- even if you push harder. This is the 'stiffness' of the batten. You can write this on each batten along with it's draft position as a reference if you are testing various options. E.g. one batten might have 0.75kg @ 45% on it and another 0.75kg @ 50%

Once you are used to looking at the shape of your sail and the feel of it over a range of conditions, try experimenting with different batten options and see what happens.

Remember..... The stiff end of the batten is the back. Bendy end forward!!!

Outhaul:

Hopefully you will have an outhaul fitted to your boat. Make sure that this works. There is no point having all the fancy bits, if when you let off the outhaul, nothing moves!. We suggest 4:1 purchase inside the boom, so you can make small repeatable adjustments. Make sure you have a system of marks so you can repeat you fast settings from upwind to downwind- or when the breeze changes.

Don't ease the foot too much. If you are getting vertical wrinkles off the boom, then you have gone too far.

As a basic rule, easing the outhaul will help you point higher- but may make you a little slower sometimes. Tightening the foot will help the boat go forward easier, but over-tightening may hurt you height or power.

Use the other boats around you as a guide as to what you should try. While training, try a few variations so you get the feel for how the outhaul really affects your performance.

Rake:

The correct rake for your weight and the conditions is one of the primary factors in good performance.

Because there is a variation in the hulls, there is no correct rake to suit all boats so we cannot provide a standard rake to work from in this guide. There is a correct rake for your individual boat and you should have a record of this and of the rakes you try. At the back of this tuning guide is a formula for working out the correct mast. Another way to find a starting rake is to level your hull alongside a top boat with a skipper of similar weight. Then sight the masts and set your mast up to the same angle. Measure this from a mark permanently etched on your mast to a mark on the stern. This is your rake. Generally as you get bigger and better you will be able to increase that measurement. ie. rake it further forward. Note: we now measure up the mast 2.8m, and then back to the center of the transom to aft deck join.

Remember – you don't learn if you don't try so use the rakes suggested as a starting point, and try experimenting with different rakes. Keep a good record of what works and what doesn't. You may find that you come up with something that works better than what we suggest.

Use our suggested rake as a point to start from!!!

Sail Shape:

Your sail comes with 3 camber stripes. It is a good idea to glance up at your sail occasionally especially when you are going fast- (or really slow) to see what your rig looks like and therefore be able to eventually memorise these shapes and settings. The concept of the sail is that it is very easy to trim. To do this it is made with a very open leech. This means that you don't have to be so careful not to over-sheet in the light, and should be able to sail with a more constant sheet tension through the range. Compared to other sails you have used, you may find you need to use a little more sheet tension with your North sail.

Rig Tension:

Tight v's loose. I prefer a firm rig. The tension should be so that by pulling forward on the mast you can just do up a shackle on the forestay. Any tighter than this is unnecessary. My reasoning is purely practical.

There are pro's and con's for the 2 extremes. If you have a loose rig, it will give you more optimal fore and aft rake upwind and downwind, whereas a tight rig can't move. However a loose rig also means it falls away sideways which isn't desirable. I think that this is why the 2 styles ultimately perform equally. Of course what the top skipper is using will always appear fastest!!- but look carefully at what else he/she is doing.

My practical reasoning is simple. A loose rig is more susceptible to wear and therefore failure. The movement also makes it more prone to shackles etc working their way loose.

If you are a methodical type of person and check your gear often, then by all means go for a loose rig if you believe it to be the way to go.

Remember: The class rules say that you can't change anything on the masts. Don't drill any holes, change any fittings or do any painting without contacting the manufacturer to make sure it is allowed.

Booms:

A small amount of boom bend is desirable. This should be mostly in the back part of the boom and should be in unison with the mast. As a gust hits, the boom should help the lower leech flick open and flatten just the same way the top of the mast works. For heavier skippers, it may be impractical to find a boom section which is stiff and strong enough for everyday sailing and which also bends as desired.

For skippers under 55kg, we recommend the triangular extruded section. For heavier skippers the StarlingF4 section is better.

Vang:

Your vang is there to control leech tension once you run out of width on your traveler. If the breeze is light and you aren't having to ease the main in gusts, then you don't need any vang. In these conditions you should have it just eased, so that it isn't taking any load. However, you don't really want it too loose or else it will take too long to pull on should the breeze increase.

In the lighter breezes you are quite often sheeting quite loosely, so make sure there is no tension on the vang.

As soon as you find yourself easing the main in the gusts, you should have vang on. This should mean that as you ease the main in the gust, the boom moves outwards only- not upwards. This is a similar motion as in a keelboat, where the mainsheet is cleated and the traveller is moved in and out in the gusts.

Remember vang bends the mast and flattens the sail a lot, so if you are hunting for power, make sure you don't have too much vang on.

Be sure your rig and fittings are strong enough, so that you aren't afraid to use a lot of vang when the wind increases.

Reaching is similar in trim to upwind. In the light you will have to be careful not to close the leech too much, however as the breeze increases, you will need to slowly increase the amount of vang to keep the leech under control and keep powered up. Again too much vang will bend the mast too much and lose power.

Downwind you will need less tension than you have had upwind or on the reach. Ease vang as you go around the mark.

If you can imagine looking along the boom, the 'twist' or amount the leech opens, should be nearly the same on all points of sail, in all conditions.

For this reason it is a good idea to get used to looking up at how open the top batten is and try to adjust the vang to keep it looking the same as the wind changes.

Cunningham.

Cunningham does two things. It moves the shape forward in the sail, and then as you use more, it bends the top of the mast and opens the leech in the head.

Use very little cunningham until you are very overpowered. You may want to use up to 25mm or so to remove wrinkles. (the sail is cut about 25mm longer than the mast to add extra depth downwind)

When you are over powered start using more and more. When it is really windy, pull on as much as you can.

Centerboard.

Your centerboard is another very important control to how the boat sails. The rake and positioning of the centerboard changes the balance of the boat and makes it easier or harder to sail.

Test this in moderate conditions to learn for yourself how important it is. You should feel a big difference in how heavy the helm is if you test the extremes of board forward and then board aft in your case.

Basically the further forward and further down the board is, the more power you will have. You may even try raking it forward a little in the light. As the breeze increases you will begin getting overpowered and the helm will start getting heavier. A heavy helm is slow, as you are holding the rudder against the water flow and creating drag just like a big brake. Therefore as it starts getting noticeably heavier, it is time to start moving the board back. Firstly do this by raking the board. Leave the top at the front of the case, and let the bottom move as far aft as possible. You will probably find it faster if you begin doing this a little earlier in choppy conditions.

As it gets windier still, you can begin moving the whole board aft in the case, until you are hard up against the back of the case. If you are still overpowered, you can now start lifting the board. Don't be afraid to sail around with 150mm of board up if it is windy.

This will allow the boat to sail flatter, especially through the gusts, and to move faster through the water. Be aware to begin putting it down again if it lightens, or else you will find yourself not pointing.

Rudder.

The rudder is one of the more important items to get right in the P Class. This is because of the angle it is on and how heavy this makes the helm. A heavy helm is slow, so anything you can do to help this is good.

Make sure your rudder is as vertical as possible within the rules. Ask the measurer to check it, and watch carefully to see if there is any way you can rake it further forward- even another 5mm is very important.

Mast Rake Formula and Mast Bend Measurement Instructions

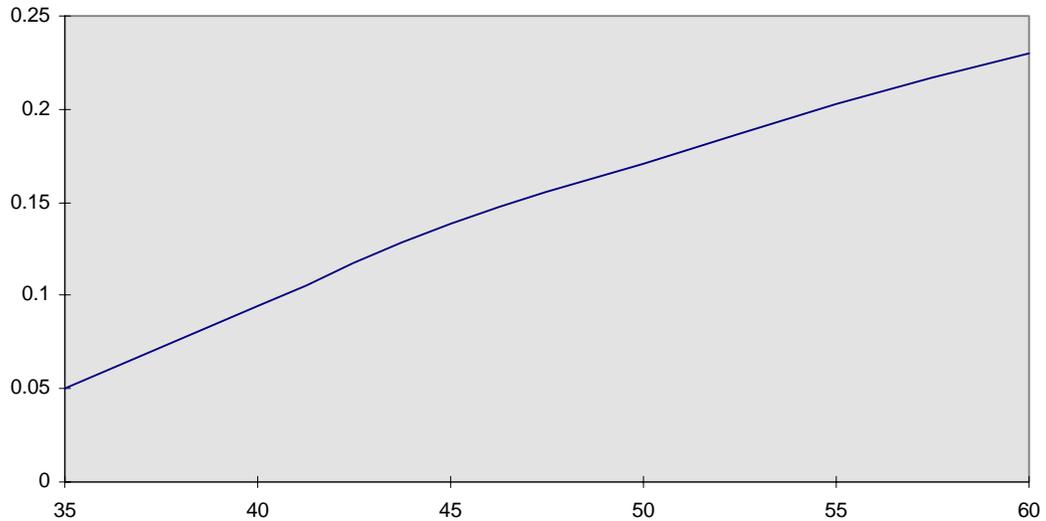
Mast Rakes:

We don't give fixed mast rake numbers in our tuning guide. This is because hulls vary so much that the current way of measuring the rake is only accurate to around 30mm!!

We have come up with the following method which will eliminate the hull variable, and hopefully create a standard metric rake system.

- 1) Measure up 2.8m from the deck and mark the back of the mast -(not the back of the track)- this is the new rake measuring point.
- 2) Measure up 100mm from the deck on the back face of the mast. Measure from this point to the stern and mark the stern point. The distance is '**deck**' in the formula.
- 3) Calculate the correct rake for your hull using the **Fctr** that corresponds closest to your body weight. Use the table or graph below to get the correct factor (Fctr) for your weight. Use metres in the formula.

$$\text{Formula} = \sqrt{(7.29 + \text{deck}^2 + (\text{Fctr} \times \text{deck}))}$$



| Skippers Weight (kg) | 35 | 40 | 45 | 50 | 55 | 60 |
|----------------------|------|-------|-------|-------|-------|------|
| Fctr for formula | 0.05 | 0.094 | 0.139 | 0.171 | 0.203 | 0.23 |

Mast Bend Measurement System. (for alloy rigs)

The bend test is done with the mast supported at the top and bottom, and a weight hung from the middle.

The top should be supported at the black band, with the bottom resting on the butt.

The mast should be marked at 1003, 2006 & 3009mm from the butt. These are the ¼, ½ & ¾ points.

Also mark 2150mm and hang a 15kg weight from this point.

Attach a thin string line at the top and bottom. It is important that this begins and ends hard against the aft face of the mast- not the back of the track.

Measurements can then be taken at the ¼ points from the inside of the track to the string line. This should be done sideways also, making sure the string line is at the center of the mast at the top and bottom, and then measuring to the center of the track.

The more accurately everything is done, the more you can believe your result.

Pre-bends are a little tricky.

Take a note of it, but I think it is best to ignore it in the initial analysis. This is because the actual bend amount is what the sail will see and is the best explanation as to how powerful the rig is going to be for a standard type of sail.

However if the sail is recut to allow for the prebend, then you will need to work out the actual prebend amount and add or subtract it (depending on whether it is fore or aft prebend) from the test result.

We have an XL spreadsheet which will analyse these numbers. You can either send us your numbers, or we can E-mail you the spreadsheet so you can input the numbers yourself. This spreadsheet will tell you if the mast suits your weight, and if the mast is bending in the right proportions.

We also now have on-line calculator at our website – www.nz.northsails.com