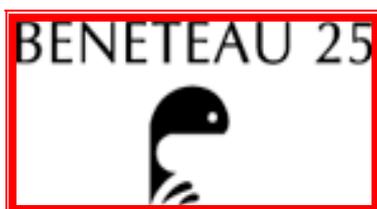




# **NORTH SAILS ITALIA**

## **Bénéteau 25 O.D. Tuning Guide North Sails One Design sails**



### **ONE DESIGN CLASS**



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# **Bénéteau 25 Tuning Guide**

## **North Sails One Design sails**

### **Introduction**

Bénéteau 25 Class Association is a “pure” class, so we recommend you not to modify the boat beyond what is permitted by the class rules (and commonly done on the racing boats, in order to improve the hydrodynamic efficiency and the manoeuvres easiness). The obtainable advantage would be anyway limited, but the damage to the class and the racing people very big. This is the concept inspiring this tuning guide, and this is what we at North Sails believe.

## **1. Boat preparation**

### **Hull**

Class rules don't allow modifications to the hull, above all no lightening is allowed, nor is in the class “spirit” to go to the class rules limit. The year 2000 boats and the following are generally heavier than the previous ones (minimum weight is actually 1240 Kgs), but feature lower positioned weight and seem to have the same speed in all conditions. Here there are anyway some of the interventions that is allowed to do on the boat in order to make her faster.

We all know that a smooth bottom makes every boat faster, and the Bénéteau 25 is no exception to this rule. Make sure that your bottom is always as clean and smooth as possible. We recommend you to make homogeneous the surface filling every hollow. Anyway, the best thing to do is to ask your local class measurer before starting to work on the boat, in order to make sure you are not infringing the rules. When you have finished smoothing the bottom, it is a good idea to polish it using a Teflon cleaner, which is good both for cleaning and to keep the seaweed away when the boat is on the water during a race series. If you need to keep the boat on the water for long periods of time, a carbon or VC System antifouling will be good in order to make your boat fast, if you, after varnishing, use a 1200 waterproof sand paper in order to make totally smooth the surface. The “plug” for the engine propeller can't be totally sealed, because class rules prescribe that it has to remain working; it has anyway to follow perfectly the shape of the bottom and, very important, it has to be closed very strongly with a proper rubber band; if you don't do so, it will open itself during the race causing loss of speed. The engine locker lets also the water coming from the cockpit go out, and this is another reason because it has not to be sealed. It is on the contrary allowed, and good to be done, to seal well the vacuum between the engine locker and the engine rest cocker, making a (very!) light bulkhead between the two. Try to seal as well as possible also the lockers covers using rubber gaskets.



### Keel

The Bénéteau 25 appendages, finished quite roughly by the yard, need some interventions in order to prepare the boat for racing. The class allow any intervention on appendages, with the following limits: you can't take away weight from the original keel (that is anyway difficult for the cast iron), and you have to meet the measures of the patterns – ask your local Class Association for them. You have to align the keel blade with the rudder blade, and to make the keel perfectly symmetrical. The keel weight, certified by the builder, has to be between 520 and 500 Kgs, so it is a good idea to increase the weight in order to meet the maximum of 520 Kgs in order to improve the stability. It is in fact allowed to add weight.

It is important to improve the junction between keel and hull (often very bad) using filler or, even better, gelcoat, watching out not to change the surfaces geometry and not to touch the cast iron. Furthermore, class rules specifically allow trailing edges on keel and rudder, what you have to do bringing the 90° angle to approximately 30°, but only by one side. This will make the keel blade asymmetrical, but will eliminate low speed vibrations. When the boat surfs, anyway, you will anyway feel the boat vibrating.

### Rudder

Class rules don't allow to modify rudder's shape, but only to modify the aft edge in order to eliminate vibrations. You have to intervene exactly as you did on the keel, making the angle approximately 30° instead of 90°, only by one side. The surface has to be as smooth as possible; if the boat is new, it is a good idea to control that the rudder is as light as allowed (7,6 Kgs).

### Deck layout

Since the Bénéteau 25 has to be driven like a true dinghy, the deck layout has to be studied with accuracy. If not, the crew won't have the possibility to move through the deck properly. Anyway, the Bénéteau 25 features a very well studied deck plan, and class rules allow only very little modifications to it.

The goal is to improve the efficiency adapting it to the different characteristics of your crew, in order to maximize the velocity and the easiness of the controls. Class rules allow to use foot straps both for the driver and the mainsail trimmer, indicating also limits to their fixing points. If you do this, you can also lower the lifeline between the aftmost stanchions and their relative pushpits, making the lifeline pass through a padeye fixed in between them on the rail. In this way, both the helmsman and the mainsail trimmer can hike out having the feet fixed to the straps. It is always good to place this system, because the GPR feet supports fit only to short people and make taller people "suffer" too much.

We are convinced that it is good to take advantage of this possibility. There are several reasons in favour of these modifications:

- You can introduce without any damage the character of the mainsail trimmer: the ones hiking on the straps can straighten the boat at least as the ones on the rail. The helmsman, in strong wind conditions, can keep the concentration high on tactics, working together with the mainsail trimmer, as he doesn't have to play on the mainsail sheet.
- The position of the body becomes a lot more comfortable: the footrests on the cockpit fit well only to short legs, while tall people has to "suffer" too much to remain on the windward side in strong winds, as the lifeline prevents your back from straighten. This is mainly true for the foremost liferests, clearly too external. Don't forget that you can place new footrests where you like.
- In light wind conditions, the mainsail trimmer will anyway come right forward the headsail trimmer letting the helmsman play with the mainsail sheet. In these conditions, in fact, his job is a lot easier.

Place therefore (securely, in order to avoid unwanted baths) a padeye half way between the aftmost stanchion and the relative pushpit on the rail, both sides. Rules allow 50 mm tolerance from this so found center, you



have to take advantage of it placing the padeye (and, as a consequence, the weight of helmsman and mainsail trimmer) as forward as possible. Make the lifelines pass through these padeyes, filling the gap to the pushpits using an Aramid or Polyethylene rope (which has to feature a breaking strength at least equal to the one of a 3 mm wire cable (4 mm spectra are perfect). The max length of the strop is 40 cm, but the real limit is given by the lifelines tension: placing 10 Kg weight between the two central stanchions, the lifeline would not get closer than 10 cm to the deck. You obviously have to get close to this limit, avoiding the risk of a disqualification due to a crooked stanchion.

After having finished this job, do some trials in order to place the foot straps, remembering that you can't race if you don't place at least one of them by each side of the cockpit. Here the solution we prefer:

- Place for the helmsman a foot strap above the aftmost external footrest, both sides, and another one above the central footrest, to be used on both tacks.
- Place for the mainsail trimmer a foot strap right above the foremost foot rest, both sides, and another one above two new foot rests to be placed 50 cm inside the named ones, both sides.

A total of seven foot straps and two new footrests, which will allow both to always find the best placement of the weight in the different wind conditions, and to have rest if you don't manage to hike hard all along the race. Keep in mind that concentration is often more important than hiking!

Try to obtain a "clean" zone between the mast and the companionway for the two crewmembers that have to pass there tacking. Cut the exceeding ends of the halyards, by-pass the purchases if you don't need them, but first of all check the class rules before changing blocks, purchases and cleats.

With reference to winches, it is better to use the most powerful and widest mounted by the yard (32:1), in order to reduce the number of turns necessary for holding the sheet in strong wind conditions: it is important to maintain the possibility to tune the jib properly.

Class rules define a minimum lifelines tension, be close to this limit in order to get the best possible advantage by the hiking of the crew.

Materials like aramids and polyethylene are allowed for all the manoeuvres; it is good to use them for halyards and sheets, you can obtain more lightness (important in light wind conditions) and less stretch (important in all conditions) in comparison with polyester.

Put a small batten all along the bow ending approximately 25 cm above it, in order to prevent the spinnaker sheets from falling down the boat and around the keel. Use a small line or a rubber band, using the layout you prefer, and pass it between the aft part of the bow pulpit and the first stanchion, both sides, in order to prevent the genoa leech from falling in the water. It is necessary also to study a system using a rubber band in order to stop the genoa in rest – otherwise it will hoist itself, and the most nervous of your crew will become mad... Put a small line or a short rubber band between the lifeline and the top shrouds, both sides. This way the spinnaker sheets won't remain between the shroud and the stanchion, risking to make the spinnaker break.

## 2. Mast tuning

### **Before stepping the mast**

Preparing the mast for the best boat speed in every condition is quite easy. We tune the mast with the maximum rake allowed by the boat rig supplied by the yard, in order to induce more windward helm in light



wind conditions. So we use the lowest hole in every condition, taking into account that it is not allowed to mount a turnbuckle on the forestay.

First of all, before stepping the mast, you have to check that the spreaders have the correct angle and, above all, are perfectly symmetrical. That is necessary in order to properly control the mast bending. Here you find some stuffs that have to be done before stepping the mast:

1. Set up a dinghy windex on the top of the mast.
2. Set up on the top of the mast a long batten that acts on the backstay in order to keep it away from the mast. The batten hasn't to be too strong, because it is a little work it has to do in order to make the top batten pass the backstay.
3. Measure the transverse position of the mast collar. A lot of mast collars are not perfectly on the centerline, so you have to center the mast while fixing it. This is very important in order to have the mast perfectly straight and the same tension on both lower shrouds.
4. Put 5 marks using tape on the lower spreaders. Measure 25 cm from the point where the upper shrouds meet the spreader and put here the external part of your tape mark. Then make 4 further marks (best using two colours) leaving 7,5 cm from the external part of the one to the external part of the other.

### With the mast up

1. Set up the mast and fix the only the forestay to the maximum length, using the lowest hole. Class rules don't indicate limits to mast rake, but the lowest hole has proved to be the best in every condition. You have to set up the mast step this way: without shroud tension, with the forestay only in, put the mast completely straight and lying on the aft edge of the mast collar and place the mast step in this point. Watch out not to put it inverse-bended, choose if you are between one hole and another the aft one. Normally, if you have a three-holed mast step, the right one is the central one. Now stop the mast in the mast collar: push it completely forward if it was straight and lying on the aft edge of the mast collar, if you had to choose the aft hole of the mast step, so the mast is already bending, you have to push it only partially forward.
2. Center the mast transversally using only the upper shrouds, without tension on the lowers, intermediates and backstay (you have to set up it on the stern only at the end of the mast tuning session, and you have to measure shrouds and forestay tensions always without any tension on the backstay). Pull approximately in the same way the two turnbuckles, with moderate tension in order not to induce errors in measurements due to the top mast moving. Then use both the genoa and the mainsail halyard and measure two identical points on the toerail, both sides, as external as possible (for example, a little bit forward the attachment point of the shrouds on the toerail using the genoa halyard, a little bit aft the attachment point of the shrouds on the toerail using the mainsail halyard). Best thing is to use the measurement tape hoisted instead of the halyards for these measures, above all if they are stretchy. Tighten and loose the upper shrouds in order to make the two measurements even. Since you reach this goal, you have to move the upper shroud turnbuckles in parallel: don't try to straighten the mast moving them differently from one side to the other, you'd loose the correct position of the mast.
3. Now tighten moderately the lower shrouds, checking that the mast is completely straight on a transversal plan, without drawing dangerous "S"s. It is not so easy this kind of check; probably you can obtain the best result looking at the mast from behind the luff groove, both sides of the boom.
4. As final check to this process, measure the tension on your forestay. With the shrouds in **base position (16 uppers-14 lowers)**, the Loos Tension PT-2 tension gauge should begin to mark 5.



5. Now, measure the mast bending using the main halyard stopped on the aft part of the mast at boom height. You should have **6-7 cm prebending**. Remember that main halyard gets out of the mast some centimeters away from the mast aft face, so when you control the bending take it into account. Prebending is basic in mast tuning in order to make your sails offer the best performance, so use the best accuracy in this phase moving the mast in the mast collar, if necessary, in order to obtain these numbers.
6. Finally, with the mast at this base tuning, tighten the intermediate shrouds without really pulling them, exactly in the same way both sides. Check then the mast as you did before from behind the luff groove. The quarter turns too are important!

### Fine mast tuning

It is important to modify shrouds tension in order to change the sails' shape according with the wind. Very often you will have to use mainsail and light genoa, so shrouds tensions are basic in order to make them flatter or deeper. A lot of tension on the shrouds and the backstay reduces the power on the sails delivering a lot of tension to the forestay and a lot of bending to the upper part of the mast; on the contrary, loose shrouds and backstay make the sails more powerful thanks to a loose forestay and a less bended upper part of the mast.

In the Bénéteau 25 shrouds tuning is quite difficult, involving uppers, lowers and intermediates. We think it is more useful to develop a tuning technique that doesn't involve intermediates (not too easy to tune), which you have to fix once while stepping the mast and stop. The lowers tuning will have to follow the varying tension of the intermediates due to the varying tension of the uppers, which, pulled, pull down the spreaders.

Understanding the correlation between the upper, lower and intermediate tension is important. In light to medium winds the uppers should have more tension than the lowers. This allows the middle of the mast to bend forward, flattening the main to keep flow attached and sagging the forestay to increase power in the genoa. *Note: As you increase tension equally on both shrouds, the lowers become tighter relative to the uppers.*

As the breeze increases, the tension on the lowers equals that on the uppers and then in high winds the lowers are tighter than the uppers. This helps stiffen the middle of the mast, which makes the headstay tighter (and jib flatter) and allows us to tighten the backstay very tight without over bending the mast relative to the mainsail.



**SHROUDS TUNING**

<b>Wind (knots)</b>	<b>Tension *</b>		<b>Turns</b>		<b>Headstay</b>
	<b>Uppers</b>	<b>Lowers</b>	<b>Uppers</b>	<b>Lowers</b>	
0-5	8	5	-3,0	-2,5	0
6-8	11	8	-2,0	-1,5	0
8-10	13	11	-1,0	-1,0	0
10-12	15	13	-0,5	-0,5	0
<b>12-14</b>	<b>16</b>	<b>14</b>	<b>0,0</b>	<b>0,0</b>	<b>5</b>
14-16	18,5	15,5	+0,5	+0,5	8
16-18	20	19	+1,0	+1,0	9
18-20	21	20	+1,5	+1,5	10
20-22	22	22	+2,0	+2,0	12
> 23	23	23	+2,5	+2,5	14

\*Measurements done using the Loos Tension PT-2 tension gauge; remember that different gauges show different numbers.

*Note: Before going out, put the uppers at 16 and the lowers at 14, which is your base setting.*

It is important to sight up the back of the mast when sailing upwind to be sure the mast is straight side to side when the boat is powered up with the crew on the rail. This will serve as an ultimate final check to your tuning. *Note that the top of the mast will bend off slightly in heavy air.*

In order to tune your mast easily and quickly on the water, it is a good idea to buy four tools having the same diameter of the shrouds screw ends that go into the turnbuckles (the end that has to be stopped while turning the turnbuckle). These tools have to be fixed one to the other and locked to the upper and lower shrouds ends. Use tape in order to lock them perfectly and prevent them from tearing the spinnaker. This way, you can turn the turnbuckles only, without keeping locked the shrouds ends using another tool. The turnbuckles



have then to be fixed one to the other either using a short line which goes inside the turnbuckles bodies or, even better, a short batten. The above table is a simple tool we use to make tuning the rig on the water easy. Use a Loos Tension Model PT-2 tension gauge for all tuning. Once you have established the base setting on 16/14, you can use this chart to count half turns up or down for the wind speed you are going to be racing in. You should "set up for the lulls." That is, tune your rig for the lightest wind speed you anticipate seeing in the course of the race. **It is much easier to de-power the boat in a puff than power up an over tight rig in a lull.**

*Remember to fix properly your turnbuckles once you have finished your tuning.*

### 3. Sail Trim

Proper sail trim is a vital component of good boat speed in the Bénéteau 25 class As the boats are being sailed more and more like dinghies; aggressive and consistent sail trim is vital in order to keep the boat at maximum speed during constantly changing wind velocity. The following outline of sail trim will get you started towards having good consistent boat speed. Practice is the best way to get better at trimming your sails. Either by racing more or setting up two or three boat tuning sessions you'll find that practice makes perfect. Ideally you will develop a true feeling for the correct trim, it is a good idea both to mark your sheets for reference and to trim sails following the feelings of the helmsman.

Our goal when trimming the sails upwind is to keep the boat as flat and as easy to steer as possible.

Ideally you want to steer the boat using sail trim and weight placement as much as possible. Use the helm as little as possible, thus reducing drag.

For example, if we are fighting a lot of weather helm and are sure we have the rig tuned right and the correct amount of power in the sails, we will want to experiment with trimming the headsail slightly (to pull the bow down) and maybe easing the mainsheet or traveller which will also help to lighten the helm and bring the bow down.

Conversely, if the helm is light and the boat always heels too much in the puffs we will want to look at easing the headsail and trimming the mainsheet. This will bring the bow up a couple of degrees, thus smoothing your steering, which keeps the boat tracking upwind.

Downwind we are looking to also keep the helm neutral. Just like upwind we need to work the sails and crew weight in order to keep steering to a minimum. Watch some of the top boats downwind and you will find that their crews are constantly in motion to keep the boat flat so the skipper does not have to use the tiller.

#### **Mainsail**

The mainsail sheet purchase has to be as powerful as possible (6:1). In order to make the shortest possible the sheet, fix a 40 cm Spectra "core" line 10 mm diameter to the boom and the upper purchase block. Put a ratchet on the lower block, if there is not.

Trim the **mainsheet** in order to make the boom nearly on the centreline, 5-10 cm down in light-medium wind. If the mainsheet is too tight (evidenced by the top batten hooking to weather and too round) you will slow down. In light air and choppy water, the top batten should be parallel or twisted off slightly. Always check the top telltale on the leech of the main. It should be flying 50/60% of the time within 10 knots of wind; above you will use more backstay and the upper part of the sail will get flatter, the top telltale has to be flying 100% of the time.



Pull the **traveller car** to windward until the boom is close to the centreline, 5/10 cm down. Keep the boom close to the centreline up to 10 knots. As the wind increases above 10 knots, first of all pull the backstay and then gradually drop the traveller to keep the helm and heeling under control.

The shelf foot – the mainsail panel closest to the boom – should never be fully open while sailing upwind. The **outhaul** has to be eased so that the clew of the mainsail is approximately 3 cm away from the measurement band at the end of the boom in light winds (0-6 knots), above this wind, the foot has to be completely tightened.

The **cunningham** is used to position the draft in the main. In a new sail, we use no Cunningham up to 12 knots; then enough to remove most of the wrinkles above 12 knots; and then progressively tighter in higher winds so there are no wrinkles. A used sail will need more Cunningham and luff tension in order to move the draft forward.

We use no boom **vang** upwind to 8 knots (just pull tight enough to remove slack). At 9 knots it is snug and gets progressively tighter until at 15 knots it is very tight. The vang tension helps bend the mast down low, which flattens the lower sections of the main. It also allows you to play the mainsheet in strong puffs by maintaining leech tension (be sure you have installed the class legal 10:1 vang).

As the wind increases above 7 knots, we tighten the **backstay** correspondingly. Set up the most multiplied purchase possible (16:1). Pulling on the backstay does two things. First, the mast bends, the upper half of the main flattens and the leech opens up – which relieves the helm and heeling. Second, it makes the forestay tighter, which flattens the entry of the headsail and eases the leech – thus increasing pointing ability and reducing leech tension, whenever you adjust the backstay you should adjust the mainsheet. The limit of the backstay tension is given from the top batten of the mainsail: when it is completely flat, further tension on the backstay is negative making the mast bend not properly and reducing tension on the shrouds (because they are swept aft). The backstay tuning on the puffs and the lulls is essential in order to keep the boat powerful and pointing high.

**Downwind – main:** Ease the sheet until a luff appears, and then trim slightly. Set the vang so the top batten is parallel to the boom. The cunningham, backstay and outhaul should all be eased for maximum power downwind.

### Genoa

The standard method for determining the **genoa lead** position is to head up slowly and watch the genoa luff. The lead will be set properly when the luff breaks evenly from top to bottom. When the top breaks first move the lead forward. Moving the lead forward increases leech tension and makes the bottom of the sail fuller. If the bottom breaks first, move the lead aft. Moving the lead aft flattens the bottom of the sail and decreases leech tension. Remember that every centimetre is important for a correct trim.

Once you have found a correct base trim, you have to trust in the marks on the spreader in order to repeat fast trims in every condition, looking at the position of the leech in comparison to the marks through the window. You will keep the sheets crossed unless you have less than six knots of wind. The standard trim has to be always within the second and the fourth mark on the spreader. Very rarely you will have to position the leech on the most internal mark, only in close duels with other boats. Only in light winds and choppy conditions you will go for the most external mark upwind, in order to make the boat more powerful on the waves.

You will have to pay particular attention to the **barberhauler** trimming, which has always to pull inside the genoa sheet within 5 and 15 centimeters (15 cm only in medium-light wind conditions and low wave). Measure these distances and make marks on the rope, obviously if it is purchased (as recommendable) the marks have to be consequently spaced.



In very light air we are looking for a smooth **luff** to keep the draft forward and make steering easy, and an open leech to reduce stalling. As the breeze increases we trim the sheet harder to power up. We also let some wrinkles show in the luff, which optimizes the genoa entry and enables you to point higher. When we reach maximum genoa conditions, we ease the sheet to open the slot and reducing heeling, and pull the luff smooth to keep the draft forward. The best way to obtain this is pulling and easing genoa Cunningham very frequently, following the wind and the waves.

Some crews have purchased the genoa halyard. We don't suggest it, unless your number 2 (central) hasn't enough strength to tighten properly the halyard, because the fine trim of the luff is done perfectly using the genoa cunningham. Anyway, this is the way to purchase the halyard: place a padeye just underneath the genoa halyard sheave on the mast, under the top of the forestay. Then make the rope coming out of the mast there pass through a small block having a snap shackle to be fixed to the genoa and splice its end to the above padeye. Remember you will need approximately twice the length of the original halyard, but you can reduce the diameter of it. Even the light genoa has no problem to be fully hoisted using this system, as it has enough room from its head to the halyard sheave.

The heavier your crew and the bigger the waves, the longer you can keep the genoa medium-light up. If the apparent wind is above 16-18 knots wind speed, it is time to change to the medium-heavy genoa. You don't have to use other sails on your boat, unless you start in more than 25 knots true wind. That's very rare in the Bénéteau 25 class... Never reef the mainsail. We sail normally 400 Kgs crew weight, try to be always close to this limit.

### **Downwind – Spinnaker**

The spinnaker should be at full hoist at all times. The general rule of trim is to allow 5-10 cm of curl in the luff of the sail. The outboard end of the pole should be even with the free floating clew (move it continuously in order to obtain this result!) and the pole should remain perpendicular to the apparent wind. Use the upper pole ring for most conditions. If you are going slowly, try raising the pole a couple of inches.

**Downwind – light air:** Concentrate on good communication between helmsman and spinnaker trimmer. The goal is to sail as low as possible while still maintaining good pressure in the spinnaker (measured by tension on the sheet). Try not to sail too high which translates into longer distances, but do not sail too low at a slow pace. Do not open too much the outboard end of the pole, it flattens the spinnaker. It is very important to constantly trim both the spinnaker guy and the spinnaker uphaul. Do not mind if you move the pole more than the spinnaker sheet, you are on the right way!

**Downwind – heavy air:** Do not allow the pole to rest on the headstay at any time. Always maintain at least 5-8 cm distance between the headstay and pole. When there are big puffs, ease the sheet 10-15 cm to help the boat accelerate. Trim as the puff subsides. Keep a hand on the vang, ready to release it if the boat starts to spin out. Hike very hard on the reaches.

### **Downwind tips**

1. Pole height is important and changes in increments of 2 cm have a big effect on the spinnaker. The break (or curl) should appear at the front of the first central panel. If the spinnaker breaks higher than this, the pole is too low and should be raised. If the break is lower, the pole is too high and should be lowered.
2. An efficient foreguy system is crucial. Every up and down, or back and forth motion of the pole (and hence the spinnaker) is wasted energy; that energy will not be pulling the boat forward.
3. An efficient system for launching and retrieving the spinnaker is a must. We recommend a deep cockpit launching bag. *Call us if you would like one made for your Bénéteau 25.*



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### **Final Tips**

- Always sail at maximum crew weight
- Keep the boat as flat as possible, apart from very very light wind conditions
- Don't hesitate to change your tunings, if you feel you are slow
- In strong wind conditions, don't worry if the windward genoa telltale is stalling
- Keep weight concentrate and central
- Trim the boat for the lulls you expect to find in the first windward leg
- Go fast and have fun!