



## Santana 20 Tuning Guide 2024

Thank you for purchasing your Neil Pryde Santana 20 sails. We hope you enjoy the performance your sails provide and the winning performance and craftsmanship which comes with Neil Pryde sails. This is a guide, and as such a set of suggestions which will provide a starting point for general performance. Every boat and crew and slightly different and one set of rules does not apply across the board. Use this to establish the baseline settings for your boat and take the time to adjust your boat to perform at it's maximum potential.

### Rig Tuning based on wind speed

We have used 6-9 knots to represent our base setting. Between races, it is not uncommon to change the rig tune to optimize for wind speed. However, when first learning, we recommend that you set your rig for the expected wind range and only make changes if conditions change drastically.

### NEIL PRYDE SANTANA 20 RIG TENSION CHART

WIND	UPPERS		LOWERS	
	LOOS	LOOS	LOOS	LOOS
	MODEL A	MODEL PT-1	MODEL A	MODEL PT-1
0 to 3kts	33	24	15	7
3 to 6kts	33	24	17	12
6 to 9kts <u>BASE</u>	33	24	22	14
9 to 12kts	33	24	26	16
12 to 15kts	35	26	32	22
15+ Genoa	36	27	34	25
15+ Jib	33	24	32	22

### Trim

Your Neil Pryde Santana 20 Sails are designed to work efficiently through a wide range of wind and water conditions. The shape of the sails has been engineered to be extremely sensitive to changes in rig tension, which has already been discussed, and, more importantly, to sail trim.

## Basics of Upwind Sail Trim...

The premise of trim and tune is to start with a full and powerful setup for light wind. Then, as the wind builds, progressively de-power your sails by using controls that adjust flatness and twist.

### Key Trim Controls

**Backstay:** Controls the mid to upper main flatness through mast bend, affects the flatness of the jib through control of forestay sag.

**Aft-lowers:** Affects jib flatness by control of fore stay sag and increases the depth in the main.

**Jib Sheet Tension:** Controls jib flatness

**Jib Car Position:** Controls jib leach twist

**Main Outhaul:** Controls flatness of lower main

**Main Sheet Tension:** Affects Mainsail Twist

**Main Traveler:** Also affects main twist.

### **Additional controls to consider**

**Jib Halyard:** Affects jib draft position

**Main Cunningham:** Affects main draft position

The jib halyard and the main cunningham are not listed as primary sail controls because over tensioning of the jib halyard, the cunningham, or both, is a common problem. This leads to a situation where the other trim controls become less effective because it inhibits the sails' ability to freely adjust the shape. For most conditions, the jib halyard and the main cunningham should be tightened just enough to remove the major wrinkles in the front of the sails, and no tighter. In general, it is safer to be too loose than too tight. Leaving a hint of wrinkles is usually a safe way to guarantee that the halyard or cunningham is not over tensioned. The only exception to this rule is during conditions when the boat is difficult to control such as in heavy chop or heavy, puffy air. In these conditions the cunningham and halyard should be tensioned until all wrinkles just disappear.

### **Light Air, 0-5 Knots.**

The key to light air is to keep your sails as full as possible without stalling the airflow. Keep the mast straight and the fore stay sagged by releasing aft-lowers and backstay. Ease the Genoa sheets so that the sail can breath and so the foot is not strapped against the shrouds. In very light air, the foot can be from 6 to 12 inches

out from the shrouds. As the wind increases, sheet tension can be increased and the foot brought closer to the shrouds. Trim in small increments and avoid strapping the head sail. Adjust the genoa cars so that the top of the sail (near the spreaders) is about the same distance from the shrouds as the foot. Move the cars forward if the top is too wide, move them back if it is too close. The general rule is to move the cars forward as the wind lightens, but be careful. If the cars are moved too far forward, the upper leech will close and stall the sail. Ease the main out haul until it is essentially loose and the clew is at least 2" from the black band on the back of the boom. Pull the main traveler about 2 inches above center line, then tension the main sheet until the boom is on the center line of the boat. If the telltale on the top main batten is not flowing freely, keep the boom on center line while pulling up the traveler and easing the sheet to increase twist. As the wind speed increases use more sheet and less traveler.

### **Medium Air, 6 – 12kts.**

In these conditions worry about stalling the sails takes a back seat to maximizing power and increasing point. The mast should still be kept straight and the forestay fairly loose, so use only enough backstay to keep the rig and the forestay from bouncing. Aft-lowers should still be loose or just pulled snug if the conditions are choppy. Tension the genoa sheet until the sail is 1-2 inches from the shrouds at the foot. Adjust the cars until the sail is 1-3 inches from the shrouds at the spreader tip. During puffs, increase the genoa sheet tension for point. During lulls, decrease sheet tension for power.

Pull the main outhaul out until it is within about ½ inch of the black band. To increase point, ease the traveler and pull on more main sheet until the upper main tell tale stalls about 50% of the time. During puffs and lulls, play the mainsheet, not the traveler. During lulls, ease the sheet until the top tell tail flies, during puffs, increase sheet tension until it stalls.

### **Upper Genoa Conditions, 13 to somewhere between 16 and 20 knots.**

In these conditions the boat is overpowered with the Genoa but it is still faster to keep the larger headsail as opposed to dropping down to the jib. The point at which to step down to the jib depends on crew weight and water conditions. At one extreme, if you have a light crew and the water is flat, you may be better off changing to jib at wind speeds as low as 16 knots. Alternatively, if you have a heavy crew and the water is choppy, holding the Genoa in up to 20 knots may be optimal.

In any case, when holding the genoa in overpowering conditions, some steps must be taken to significantly de-power the sail plan. Tension the genoa sheet until the foot is tight against the shrouds but not stretched. Set the genoa cars so the upper leech is 2-4 inches from the spreaders. Pull the main outhaul all the way to the

black band. Tension the backstay until the main becomes board flat, and just shows a hint of over-bend wrinkles (wrinkles leading from the clew to the mast). Snug up the Aft-lowers until the wrinkles disappear. Set the main traveler at centerline and ease the main sheet until the upper leech twists off by 10-15 degrees. To keep the boat flat in the puffs, ease both the main and genoa sheets slightly. Bring them back in during the lulls. The idea behind this set up is board out the main and play the sheets to reduce heeling, while keeping the genoa fairly powerful to keep the boat driving.

If you have done all of the above and are still overpowered, you must begin to really flatten the genoa as well. Move the genoa cars increasingly farther aft twist the leech as much as 6" or more off the spreaders, or until the upper part of the genoa is actually luffing. Tighten the forestay by increasing aft-lower and backstay tension in tandem. They must be tightened in tandem because each time you tighten the aft lowers you decrease mast bend and power up the main. Therefore, the backstay tension must also be increased to keep the mast bent and the main flat. Continue this process until you are under control or you are sure that one more pound of backstay tension will pull the rig apart. Continue to ease the sheets in the puffs, sometimes drastically.

### **Jib Conditions, somewhere between 16 and 20 knot and up.**

Right on the break where you change to your jib, whether it is 16 knots or 20 knots, you are going to have to make some adjustments or risk being underpowered. Set the jib cars at their farthest forward position. Trim the jib hard until the leech stands straight up from the clew, but does not close at the top. Set the aft-lowers so that they are about 75% as far back as they were with the genoa, which may induce over bend wrinkles. Ease the backstay until the wrinkles disappear. Set the main traveler at centerline and trim the main hard until the upper telltale just begins to want to stall.

If still underpowered, ease the aft-lowers and backstay. If overpowered, or if the wind continues to build, tighten the aft-lowers and backstay in tandem as described above and move the jib cars back. As usual, play both the main and jib sheets. If you are still overpowered and the backstay is as tight as you can stand it, drop the main traveler 4-6 inches and continue to play the sheets. If at, at any time, more than 50% of the main is luffing, it will be faster ease the jib and foot.

### **Downwind**

#### **Basic Spinnaker Trim**

There are lots of sources for spinnaker trim, so we will only touch on basic trim briefly.

Set the pole fore and aft so that the leading edge stands as vertical (straight-up) as possible. If the edge is leaning toward the bow, ease the pole forward. If the edge is leaning aft or outboard, move the pole back. In general, farther aft is faster than farther forward, so if in doubt, try moving the pole back and see what happens.

Set the pole height so that, when you ease the sheet, the leading edge begins to break at about 60% of the way up from the clew. If the pole is too low, the leading edge will break near the top making it impossible to keep the shoulders open and leading to a pinched look in the top of the sail. If the pole is too high, the lower edge will break first and entire sail will tend to easily collapse making it difficult to trim.

**Light Air, 0-5 knots**

In these conditions, the boat cannot be sailed on a dead run and you will produce much better VMG if you come up to slight reach. How far to come up varies drastically with wind speed but a good rule of thumb is to sail as low as can so long as the spinnaker constantly stays full. If the spinnaker is difficult to trim, or if it keeps collapsing, you need to come up. Remember that you will constantly have to trim and ease the main as you change course. Ease the backstay and aft-lowers completely. Set the head of the chute so that it is about 6 inches from full hoist. Position crew weight so that it is centered, forward and low. The skipper should be in front of the traveler and the forward crewmember near, or in front, of the shrouds.

**Lower Medium Air, 6-10 knots**

In these conditions the S20 should can be sailed within about 5 degrees of DDW. Move the pole back to within about 6-8 inches of the shrouds. The main should be all the way out with just enough vang to keep the upper leech closed. Keep the crew weight low, forward and roll the boat about 5 degrees to weather. When a puff hits, allow the boat to roll further to weather and head deeper. When a lull arrives, allow the boat to roll back up and head up.

**Upper Medium Air, 10-15 knots.**

In these conditions the spinnaker should still be set for full power and the boat can be driven DDW at all times. In order to add a bit of stability, make sure the spinnaker halyard is at full hoist and center the crew weight. Move the skipper just behind the traveler and the forward crewperson to the hole.

**Heavy Air, 15 knots and Greater.**

In these conditions it becomes much more difficult to keep the boat under control and stability becomes a major concern. To keep the shoulders of the Spinnaker from bouncing from side to side, choke it down by lowering the pole, pulling on the leeward twing and over-sheeting until the foot until it is just touching the

headstay. The pole may be let slightly forward, but not much. Letting the pole too far forward will add too much depth to the chute making it unstable and the boat prone to roll. For safety, keep some tension on both the aft lowers and the backstay. Continue to drive DDW and balance the helm with crew weight, this typically means moving weight to the side of the boat away from the pole (the main side). The skipper can slide back until he or she is comfortable, but the rest of the crew should try to stay forward because moving weight back makes it much harder to steer. When the boat begins to achieve such speeds that it is actually catching and plowing into waves, then the crew must move their weight drastically back. When this happens, hang on and pray you don't have to gybe.



## **Rigging the Santana 20**

### **Preparations for stepping your mast**

Wipe down the shrouds and spars with a cleaner such as Bio Green Clean, while visually checking all sheaves and fittings for excess wear or other signs of potential breakdown. If you find tang holes, spreader end fittings, etc., that have elongated, now is the time to replace those parts as they may fail or create issues with performance. Do all your maintenance while the mast is down to ensure reliable sailing. We recommend a dry lubricant such as McLube to maintain sheaves, blocks and hardware. Never use oil based

products which will create a buildup. After completing your mast maintenance, measure the distance from the upper shroud tang bolt to the spreader pulling the shroud tight and make sure they're even. If you can see the inside of the mast from the base, check for debris. Birds love to nest inside Santana 20 masts.

## Stepping the Mast

First and foremost, make sure your trailer is supported at the rear of the trailer so your trailer will not wheelie with weight on the stern of the boat. If you have removed your upper and lower shrouds at the chain plate, equal out the turns of the upper and lower shroud turnbuckles on the shroud studs and attach the toggles to the chain plates. The end of each t-bolt should be showing a few threads through the inside of the turnbuckle. Next pick up your mast in the horizontal position and carefully ease the mast to the aft and insert the bolt at the step. If hoisting with the head stay to the stern, have one person grab the fore stay and get another person pull up the mast and hoist it. Once the stick is up, attach the fore stay. After the fore stay is attached have a crew member hold the mast in place at the cabin top and attach the back stay. If hoisting from with the head stay positioned forward of the box, the process is the same with one exception. When hoisting from the front, attach the head stay before lifting the mast and have a crew member attach the back stay while you hold the mast in place after lifting. Leave the lower shrouds slack and hand tighten the uppers. At this point, we recommend that you take some time to relax, before finalize the tune.

*Note that some will adjust their shroud tensions to the final specification and not slack the shrouds when lowering or raising the mast. This is a common occurrence, however it is good practice to double check your settings before sailing.*

## Rig Tuning

### Mast Rake:

To induce weather helm while steering upwind, the mast rake must be set correctly. First, measure the distance from the mast butt to the top edge of the lower black band to assure that it is a class required 22" to the top of the band. Now, supporting the mast with the spinnaker halyard, disconnect the fore stay and bring the fore stay back to the mast and lay flush against the forward face of the mast. Put a mark on the fore stay that corresponds with the top of the black band and the 22" measurement. Now, reattach the fore stay and ease the spinnaker halyard. Finally measure from the center of the fore stay clevis pin to the mark you've made on the fore stay.

The Recommended Rake Setting = 51"-52" from the center of the fore stay pin to the mark.

If your combined crew weight is <450 lbs. 51" is the preferred measurement. If your combined crew weight is >450 lbs. the 52" measurement is preferred. When the rake setting is finalized, make sure the bottom of your mast is sitting flush in the mast base so as not to rock while sailing. You may need to file the base of your mast to achieve the correct angle.

## **Centering the Mast:**

The technical idea behind centering the mast is to align the mast with the keel so that they are on the same plane. Measure 7-8 feet back from the fore stay pin along the shearline of the deck and make a mark on either side of the boat on the rail. These marks are forward of the shrouds, and being equal, allow for accurate side-to-side measuring. Hoist a measuring tape up the jib halyard, leaving the knot or shackle approximately four inches shy of full hoist. The jib halyard should be used as opposed to the main halyard, because, on a fractional rig, you only have side to side (centering) control of the mast from the upper hounds down. The halyard is left four inches shy of being two-blocked to prevent twisting the tape toward one side or the other. Next, alternately measure down to each black mark and adjust the upper turnbuckles until the distances are equal. Leave the tape hoisted.

## **Rig Tension:**

From each of the four turnbuckles attached to the main chain plates, measure up four feet and mark each shroud with a small piece of tape. The purpose of the tape is to mark spots to attach the Loos Tension Gage for consistent measurements. Then slowly tighten the uppers, one half turn at a time, until you reach a base setting of 22 on the Loos Gauge. Using alternate half turns is critical to keep the mast centered and to prevent locking in a lateral bow. Once the uppers are at 22, use the same method to bring the lowers up to a setting of 10. During this process, periodically check that the mast is centered, using the still hoisted tape.

Next, sight up the mast groove looking for any waivers or a lateral bow. Most discrepancies can be tuned out by adjusting the lowers in half turn increments. Once the mast is straight, bring the lowers up to a setting of 15, again by using half turns. Finally, check the mast one more time to assure that it is both centered and straight. If things are not as desired, a couple of problems may have developed. You may have miscounted your turns or your spreaders may not be even. The latter reinforces the need to measure the spreaders against the shrouds prior to stepping the mast.