

Santana 20 Tuning Guide

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North Sails RESOURCES

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The following tuning guide is meant to be a good starting point in setting up your boat. Depending on your crew weight, strength, sailing style and local conditions, you may have to alter your rig tune slightly. As you read this, write down any questions you may have, and we will be happy to discuss them with you in more detail.

Our main goal is to help you achieve a rig setup that is fast in all conditions; upwind, reaching and running, and is very easy to adjust or change gears while sailing. Your new North sails are designed around this all-purpose philosophy.

It is important to mark all your shrouds, sheets, halyards, tracks, outhaul, backstay, etc. Keep records of your tuning setups, the conditions you sail in, and how your speed is. It is essential to be able to duplicate settings from race to race, and also to know exactly how the boat was set up when you were going fast. Experiment during practice races and clinics.

TUNING AT THE DOCK

Rake Setting: 51"

Once the mast is up, attach your jib or spinnaker halyard to the tack and tighten. Disconnect the forestay and bring back to the mast. Pull the forestay tight along the front of the mast and with a black marker, make a mark on the forestay at the location of the bottom of the black band. This should be 22" above the bottom of the mast. Mark the 22" spot on the



mast if your band isn't in the right place. Re-connect the forestay, apply enough backstay tension to straighten the forestay and measure from the black mark to the center of the forestay pin.

If you are sailing really light on crew weight, and the breeze is up you might want to go around 50"

Why do it this way? Because it's the most accurate way and the measurement is the same for new and old style decks.

Next, make sure the top of the mast is centered in the boat. To do this place a pencil mark on the port and starboard rails at equidistant aft of the tack fitting at about 10" forward of the shrouds. Make sure your lower shrouds and aft lower shrouds are loose. With the upper shrouds hand tight hoist a tape measure on the Genoa halyard and measure from the Genoa halyard block to the pencil marks. Keep measuring side to side and tightening or loosening the upper shrouds until the tip is centered.

Hand tension each forward lower until they are evenly tensioned. Sight up the mast track on the aft side of the mast to see if it's straight from side to side. You'll find it helpful to take the main halyard and hold it stretched tight centered just above the gooseneck in the mainsail track. Use the wire as a straight-line reference with the track. Tighten or loosen the forward lower shrouds until the middle of the mast is in column with the mast tip.

We recommend investing in a Loos Tension Gauge Model PT-1. This gauge can hang on the shroud as it is adjusted and won't stretch out like the Model A gauge.

Using the tension gauge adjust the upper shrouds to the base setting of 25 and the lower shroud to 20. Once the mast is centered it is important to take the same amount of turns on the port and starboard shrouds while adjusting tension in order to keep the mast centered. If the port and starboard spreader tips are at different heights above the deck, the mast will not be straight side to side or the shrouds will have different tension from the port side compared to the starboard side.

The aft lowers should be attached to an adjustable track, because adjustment of these throughout the race is essential. First make sure the backstay is released. If they are attached to a track make sure they are evenly set and when trimmed to maximum tension they invert the mast by at least 3 1/4 to 3 1/2 ".

Rig Settings

Apparent Wind	Uppers	Lowers
0-5	-1*	-1*

5-10		- 1/2*	- 1/2*
10-12	Base Setting	25	20
12-15		+1 1/2*	+2*
15-20	Genoa	+2*	+ 2 1/2*
15-20	Jib	Base	+2*
20-25	Jib	+2*	+2 1/2*

* Denotes one full turn of the turnbuckle barrel using standard open body turnbuckles.

Set up the rig at the base setting before you leave the dock, adjust the rig as conditions change but remember to keep track of any changes. Just to make sure there is no confusion, all the changes reflect turns on or off from the base setting – not from the previous setting. Also, mark your deck with an arrow and a ‘T’ for the tightening direction and replace any cotter rings/pins with turnbuckle nuts – they’re much easier to adjust!

UPWIND TRIM

Light Air (0-5 Knots)

In these conditions keeping the boat moving fast and not worrying about pointing makes bigger gains around the racetrack. Therefore set the boat up to maximize boat speed instead of pointing ability.

The golden rule in all conditions is “If you want to point you have to be going fast first!”. In light air set your sails up for maximum power.

Main

First set the aft lowers at a position so the mast is perfectly straight yet there is enough tension that when the backstay is pulled the mast will not bend down low. Get in a habit of sighting up the backside of the mast to see how the mast is bending. Next, sheet in the main sheet so that the top batten cups slightly to windward. Now pull the backstay until the top of the mast bends enough to allow the top batten to twist to leeward so that it is parallel with the boom. Make sure the telltale on the top batten is not stalled. The small amount of backstay tension will provide the correct amount of headstay sag. The boom vang should be eased all the way and the traveler pulled to weather enough so the lower battens are just

to leeward of the backstay. The outhaul should be 1-2" from maximum. The more chop there is, the looser the outhaul should be set. The cunningham should be pulled on just enough to remove major wrinkles from the luff.

Genoa

Tension the genoa halyard enough to remove the luff wrinkles. This will pull the draft forward and open the leech of the sail. With the draft forward the boat will be easier to steer. The open leech will help air flow across the sail without stalling. The foot of the genoa should be 3-4" from the shroud turnbuckle, and the leech should be 2-3" from the spreader tip. Make sure the leech lines are eased.

Remember in these conditions keep your head out of the boat and sail towards better wind velocity on the course.

Light to Medium Air (6-12 Knots)

These conditions call for a good amount of power as well as the ability to point.

Main

The aft lowers should be set at their medium position which puts 1" – 1 3/4" inverse bend into the lower section of the mast. Determine the medium air backstay setting by using the same technique as described for light air. The traveler should be pulled to weather with the boom on centerline to help the boat point, but eased to leeward if too much weather helm is felt or if the boat starts to heel too much.

The outhaul should be eased 1/2" from the maximum position. The cunningham should be pulled tight enough to remove all wrinkles from the luff. The boom vang should be pulled in just enough to snug up the line (preset for downwind). Start with the main sheet set with the top batten parallel to the boom. If your boat speed is good and you want to point higher, try pulling harder on the mainsheet and stall the top batten telltale 50-80% of the time. Beware, if your speed starts dropping off ease the mainsheet.

Genoa

Set the halyard so some wrinkles show in the luff of the genoa. This will flatten the genoa entry and move the draft aft in the sail, allowing for more power and higher pointing. Set the leads so the foot is 1" – 2" from the shroud turnbuckle and the leech is 2-3" from the spreader tip.

Medium to Heavy Air (13-18 Knots)

Once the wind has reached this level, it is time to start thinking about de-powering the sails to keep the boat from heeling too much.

Main

The aft lowers should be set tighter with 3 ¼" – 3 ½" of inverse bend. This allows more backstay to be pulled on letting the top of the main twist to leeward, while at the same time placing more tension on the forestay which improves pointing and flattens the genoa. In order to determine backstay tension, pull the main sheet in enough so that the top batten twists to windward even while the backstay is at its medium setting. Then pull just enough backstay to let the top batten twist to leeward about 15 degrees. The cunningham should be pulled tight enough to remove all wrinkles from the luff. The boom vang should be tightened enough to hold the boom down at its sheeted height even without mainsheet tension. The outhaul should be at its maximum position.

Genoa

These conditions are at the upper wind range for the genoa. The decision to switch to the small jib will depend on crew weight, consistency of the wind and waves. Choose the size of your headsail based on the strength of the wind during the lulls. The larger the waves the larger a headsail needed to power through them. If the Genoa is used tighten the halyard to move the draft forward and open the leech. Set the leads so the foot is against the shroud turnbuckle and the leech is 4" – 5" from the spreader tip. To de-power twist the Genoa by easing the sheet 1" – 2".

Remember the tighter the aft-lowers and backstay are, the tighter the forestay is and therefore the flatter the Genoa.

Jib

The crossover to using the class jib can be found in this wind range. Lighter crews, or sailing in flatter water can allow you to go to the small jib and still be fast.

Keep the leads forward and don't strap the jib in! The S-20 likes to be rolled up to speed and a strapped headsail won't get you there!

We also recommend a 2:1 jib sheet system. The sheet should be dead-ended at the jib car, go through the jib clew, through the jib block then back to the Genoa ratchet and up to the weather side. This makes adjustments to the jib easy while trimming from the high side.

Note: The 13-18 knot range of apparent wind can really separate the fleet. Make sure the boat is tuned for the conditions and the headsail. The key is to keep the boat moving fast and pointing high, you should roll the boat up to speed and keep the weather tell tales at about 45 degrees for maximum VMG to weather.

Heavy Air (19+ Knots)

In these conditions the sails need to be flattened as much as possible and set up so the boat is as easy as possible to steer.

Main

Pull the aft lowers on to their maximum setting of 4" of inverse bend. Tension the backstay in the same manner as in the 13-18 knot conditions, except that 20 degrees of twist is desired. Begin vang sheeting by pulling the boom vang on hard, which bends the lower section of the mast thereby flattening the lower part of the main. The cunningham should be pulled in enough to remove all wrinkles and move the draft forward. Set the outhaul at its maximum setting. Let the traveler all the way down to the edge of the cockpit.

If the boat is still overpowered with the top batten inverted and the main flogging it's time to go into super twist mode. Pull the traveler all the way up past centerline and ease the mainsheet so the boom is on centerline. Keep the aft lowers, backstay and vang snug. The outhaul can be eased 1/2" for power in the lower section of the main.

Jib

The jib should be sheeted to tracks mounted on the round cabin top inside of the shrouds. The track should have a sheeting angle of 11° off centerline. To find this angle measure horizontally 19 1/2" outboard from centerline behind the mast. This is where the jib track should be installed.

Pull the jib halyard tight enough to remove the wrinkles in the luff. Set the jib so the top tell-tales break slightly before the lower tell-tales. If the boat need a little bit more power, move the jib lead forward to give the bottom of the sail some depth and sheet the sail so the leech is pointing straight aft. To de-power move the lead aft to flatten the bottom of the sail and twist the top off.

The main and headsail need to work together. If the genoa or jib is twisting off at the top, so should the main. If the genoa or jib is sheeted hard, so should the main. When the wind is blowing hard, adding twist to the main and jib will help give the boat a larger groove to steer in.

Aft Lowers

Wind Speed (knots)	0-5	6-12	13-18
19+			
Inches of inverse 4"	Tensioned yet	1-1 3/4"	3-3 1/2"
bend	straight mast		

Outhaul

Wind Speed (knots)	0-5	6-12	13-18
19+			
From black band Max.	1-2"	1/2"	Max.

GENOA TRIMMING GUIDE

Wind Speed (Knots)	0-5	6-12	13-18	19+
Sail from spreader tip	2-3"	2-3"	4-5"	6"
Foot from turnbuckle	3-4"	1-2"	against	against
Luff Tension	smooth——><—slight wrinkle——><——smooth			
Leech Line	<———just tight enough to prevent flutter———>			

Main Trim

Run

Downwind the main should be set at its fullest settings. The backstay should be eased. The jib halyard should be attached to the jib tack hook and tightened. This allows the mast to remain forward and stable at all times. In breeze over 15 knots it is a good idea to keep the backstay tensioned a little to prevent total mast inversion. The aft lowers should be released all the way immediately after the weather rounding. The outhaul should be 2" from maximum tension. The cunningham is always eased all the way on a run. Boom vang should be set so the top batten is parallel with the boom.

Reach

While reaching the main should be powered up most of the time. The backstay should be eased, aft lowers off, cunningham loose and outhaul eased. A little bit of twist in the top of the main is okay. Make sure the top telltale is not stalled. Once the boat starts to be overpowered on the reach it is time to depower the main. Pull the backstay on a little to keep the mast in column. Ease the vang to allow the top of the sail to twist off. Pull the cunningham on to open the leech of the main. Tighten the outhaul.

Spinnaker Trim

North's full radial spinnaker likes to be flown with the spinnaker pole lower to project more area. A good starting point is for the pole to be connected at the mast 44 1/2" up from the deck. The pole should be flown parallel with the horizon. The halyard should be raised as

high as it will go to increase projected area and stabilize the sail. When running, square the pole so it is perpendicular to the apparent wind and make sure the sheet does not go past the headstay.

The trimmer should keep a slight curl in the luff of the sail. Remember that an under trimmed spinnaker is much faster than an over trimmed and stalled spinnaker. Spinnaker trim needs to be constantly adjusted due to the changes in apparent wind caused by velocity changes, steering, waves and changes in boat speed. To help the boat accelerate faster be ready to ease the sheet 5" – 12" when a puff hits. The ease of the sheet will move the driving force of the sail forward instead of healing the boat to leeward. Never let the pole rest on the headstay; it should always be at least 2-3' aft of the headstay.

When running, concentrate on steering your optimum down wind angle. Good drivers are sensitive to small changes in boat speed. When the boat is going slow, head up a little to increase boat speed. If the boat is moving fast or in a puff, bear off to ride the puff longer and use your extra boat speed to sail lower. Good communication between helmsman and trimmer is important.

Make sure one of the team (not the spinnaker trimmer) is constantly watching for puffs and velocity downwind.

If you have any questions, comments or suggestions about your new Santana 20 sails, we will be glad to discuss them with you.

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