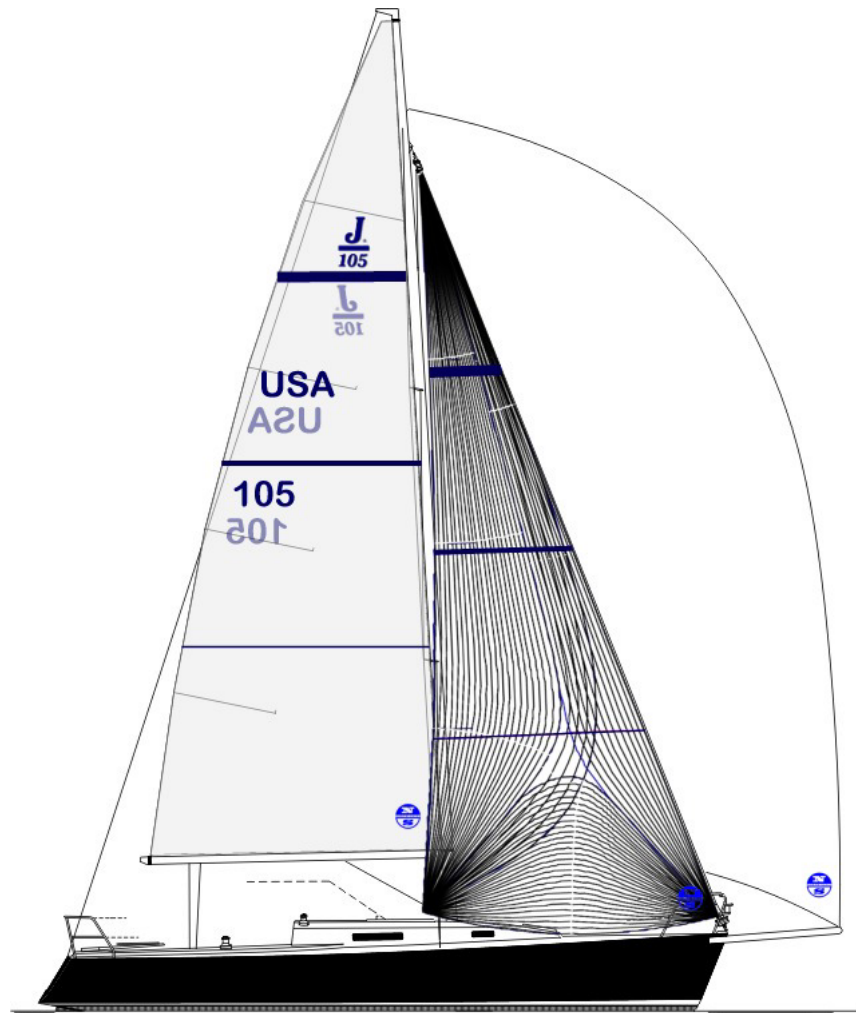


**J<sup>®</sup>**  
**105**

# *Tuning Guide*





## Introduction

The J-105 began what J-Boats describes as the “J/Sprit revolution”. It was the first boat of this kind introduced and has been followed by many models. The class has enjoyed great growth in recent years through the quality of the boat itself and the strong involvement of its’ owners. Its attraction as a one-design race boat is its high performance, strict class rules and limited sail inventory that promotes extremely tight class racing.

The J-105 Class is part of North Sails Class Development Program. The “CDP” is designed to harness and deliver to our Offshore One-Design customers the best sail designs and tuning methods that exist within North Sails globally. We have begun by focusing on the Farr 40, Mumm 30, One-Design 35, J/120, J/105 and Farr 395 classes and plan to expand the Class Development Program to other Offshore One-Design classes as we move forward.

“Through the Class Development Program, North Sails is coordinating sail development and rig tuning like never before,” said North Sails Vice President Ken Read, who is the Director of the CDP. “Dedicated class experts are consulting with our Offshore One Design customers on a regular basis and are distributing the latest rig setups and trim techniques to North Sails lofts worldwide. Offshore One Design sailors can go to any North loft worldwide for sails and tuning advice that is on par with the best in the class.

The three sail inventory creates a challenge for sailmakers to produce fast sails that can perform well throughout the complete range of wind conditions. North has put forth great effort to produce the fastest, most versatile, easiest to use sails. Our constantly updated tuning guide provides “turn key speed” for our clients. With the advent of North’s Offshore One-Design Class Development Program, our J-105 program has seen significant developments over recent months. Class Leaders Tim Dawson and Will Keyworth, with the help of several other North employees, have worked to further refine our products through our class involvement and two boat sail testing sessions.

At North, we look at each sail with from a unique perspective and choose the best construction process that we are able to produce within the class rules. We choose the best fabrics and construction techniques that are commercially available, or develop our own through North Cloth where the proper fabrics are unavailable.

This tuning guide has been developed over years of J-105 sailing and sail development. It is intended to serve as a starting point for new boat owners and new North Sails clients. Once your boat is set up to the basic principles of this tuning guide, you can use our **Quick Tuning Guide** to make on-the-water adjustments to your rig to make adjustments for various wind conditions. This guide is not an absolute truth, but will put you in the ballpark. As you get more advanced, you may find that slight alterations better suit your sailing style.

Feel free to contact Class Leaders Tim Dawson or Will Keyworth if you have any questions or comments about the information in this guide, or if there is any other way that we can help make your J-105 sailing more enjoyable.



# Contents

- ▶ **Part 1 – Rigging Preparation**
- ▶ **Part 2 – Rig Set – Up**
- ▶ **Part 3 – Mainsail Trim**
- ▶ **Part 4 – Jib Trim**
- ▶ **Part 5 – Crew Weight Placement**
- ▶ **Part 6 – Downwind Sailing**
- ▶ **Quick Tuning Guide**



## Part 1 – Rigging Preparation

The following recommendations are small changes that should be made to the stock J-105 to allow you to get the most from your North Sails and make the boat easier to sail and set up.

**Head swivel shackle:** The North Sails jibs come with a webbing loop at the head. It is critical to have a 90-degree “twist” shackle to attach the sail to the swivel. A standard shackle will cause a hard spot at the top of the jib as the sail is torqued.

**Remove backstay toggle:** Many J-105s come with a toggle that rotates the hydraulic cylinder 90-degrees so that the handle faces forward. While it is nice to have the handle forward, this toggle reduces the throw of the backstay adjuster too much so that you are not able to get enough tension in heavy air. Some of the older boats actually need to have the backstay rod shortened to get enough backstay throw.

**Change to 6:1 Cunningham:** The standard Cunningham is 2:1 and led aft to a cabinhouse halyard stopper. This system should be replaced with a 6:1 system with the lower purchase with integral cleating shackled to the ring on the top of the Quik Vang. This allows for easier and more precise Cunningham control by a forward crewmember. Many boats then rig the asymmetrical tack line through the free stopper. The tack line is much easier to work with in this placement than on the side of the cabinhouse.

**Mark the tack line at the cleat:** Put marks on the tack line at the proper range of settings. As you approach the windward mark you can then pre-set the tack line so that when you extend the pole and set the spinnaker the tack will be set properly.

**Move mainsheet swivel base forward of the traveler:** This allows for easier trim of the gross tune by the main trimmer, especially when tacking.

**Tapered Spectra™ spinnaker sheets:** These sheets have a light uncovered portion that attaches to the sail, with a covered portion that goes on the winch. The sheets should be 3/8" Spectra cored line with the cover removed at the sail end of the sheet. These lightweight sheets are used in all conditions and help downwind performance in light air. Heavy sheets pull down on the leech of the spinnaker in light air, closing the leech too much.

**Bypass the jib sheet turning block:** The standard set-up for the jib sheet is to run the sheet from the clew of the jib, through the lead block, through the turning block near the rail, and then to the winch. This set-up makes the lead block lean over to leeward, increasing sheeting angle. In light and moderate air, the jib will sheet tighter to the centerline if you lead the sheet straight to the winch from the jib lead block. In heavy air, it can be faster to use the turning block to sheet the jib outboard slightly.



## Part 2 – Rig Set-Up and Preparation

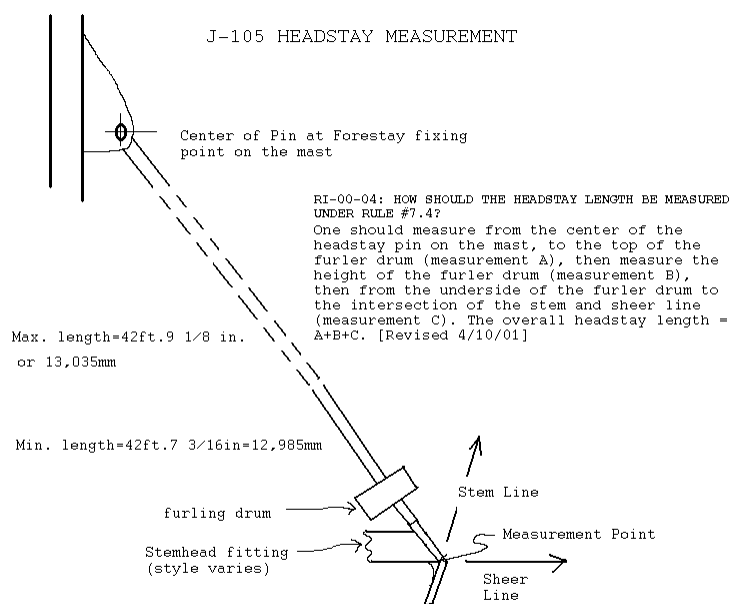
**Tools and items required:** Loos RT 10M Rod Tension Gauge, 2 crescent wrenches, spray lubricant, bosun's chair and 50' metric tape measure.

Part of the success of growth of the J-105 Class is the tight class rules and limited sail inventory. With the J-105s limited sail inventory of only one headsail, aggressive rig tuning is essential for performance throughout the full range of wind conditions. By definition, the North Sails "AP" inventory is optimized for 9 to 12 knots. This is actually the easiest condition to sail in, so the racing tends to be at its tightest. Having really fast sails in this condition is key to gain a slight speed edge and the AP inventory is designed to give you just that. The heavy air "HA" inventory is optimized for 13-20 knots. In the extreme conditions of light and heavy air the rig must be manipulated to enhance the sail shapes for those conditions. The result of proper rig tuning is the correct relationship between mast bend and headstay tension to get fast shapes. The North inventory has been designed to make these transitions easily with the correct tuning to be fast in all conditions.

**Step 1 – Check Mast Butt Position:** The measurement from the front of the forward bulkhead to the aft face of the mast should be 24.46cm (9 5/8"). This is very close to the center of the step. For the HA sails, the mast butt should be 26.00cm from the bulkhead.

**Step 2 - Check J Measurement:** The J measurement is the distance from the headstay intersection to the deck to the forward face of the mast. This should be 4.11m (13'6"). Use mast chocks or SparTite to achieve this position.

**Step 3 – Set Mast Rake:** Rake is controlled by headstay length. The headstay should be set at the class legal maximum rake, 13.035m. Hoist a crewmember up the mast and have them hold the butt of the tape measure at the center of the pin that secures the forestay to the mast. Measure to the top of the furler drum (measurement A), then measure from the top of the furler drum to the bottom of the furler drum (measurement B), then from the underside of the furler drum to the intersection of the stem and sheer line of the boat (measurement C). The overall headstay measurement is then the sum of A+B+C.



**Step 4 – Centering the Spar:** Put a mark on the rail of the boat on one side even with the chainplates. Measure this distance from the headstay attachment on the bow. Put a corresponding mark on the other side, the same distance from the headstay. At this point the Upper Shrouds (Caps) should be hand tight and the Intermediates (D2s) and the Lower (D1s) should be loose. Hoist the tape measure to the top on the centerline jib halyard. Measure to the marks on either side and adjust the Caps until they are equal.

**Step 5 – Tensioning the Shrouds:** Tighten the D2s and D1s to hand tight. Add 8 full turns to the Caps. Then tighten the D2s 6 turns. This should be done incrementally (2-3 turns at a time per side) sighting the mast to be sure that the mast is in column. Add turns to one side and remove turns from the other to bring the mast in column. This added tension that you have applied has probably made the D1s slack, so double check to make sure that they are hand tight.

**Step 6 – Check Shroud Tensions with Loos Gauge:** Put marks on the shrouds 2m up from the deck. Put the top post of the gauge on this mark when measuring tension. Be sure to have the backstay released when measuring tension with the Loos Gauge. For the base setting for 10-14 knots TWS the shrouds should read the following:

	AP Sails	HA Sails
<b>Caps:</b>	<b>35</b>	<b>55</b>
<b>D2s:</b>	<b>10</b>	<b>25</b>
<b>D1s:</b>	<b>0 (10 cm play)</b>	<b>10 (hand tight)</b>

You should double check to be sure that the mast is still in column at the dock when the rig is at full tension. At the base setting, the mast should sit with virtually no pre-bend up to the hounds.

You are now at the “base” setting and ready to go racing.

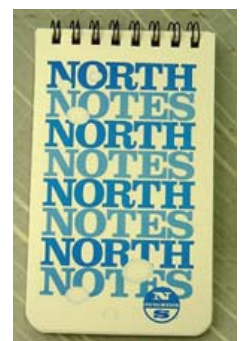
From here follow the **Quick Tuning Guide** to optimize your J-105's performance for various wind conditions.



## Measuring Rig Tension with the RT-10m Gauge

### Advanced Tuning – Beyond the Numbers

The North Sails J-105 Tuning Guide is very refined, and has been used to the letter to win many events. In fact both the 2000 and 2001 North American Champions use the **Quick Tuning Guide** as their bible. However, understanding the fundamental concepts of how tuning affects the rig and sails is important to be able to check that the settings are right for your boat, as well as customizing your own tuning numbers for your sailing style. Keeping good records is the key. Keep a Wet Notes pad on your boat and record your rig settings, wind speed, sea state, and your speed and pointing relative to other boats. This will help you to see what is working best for you and fine tune your own numbers.



**North Wet Notes**

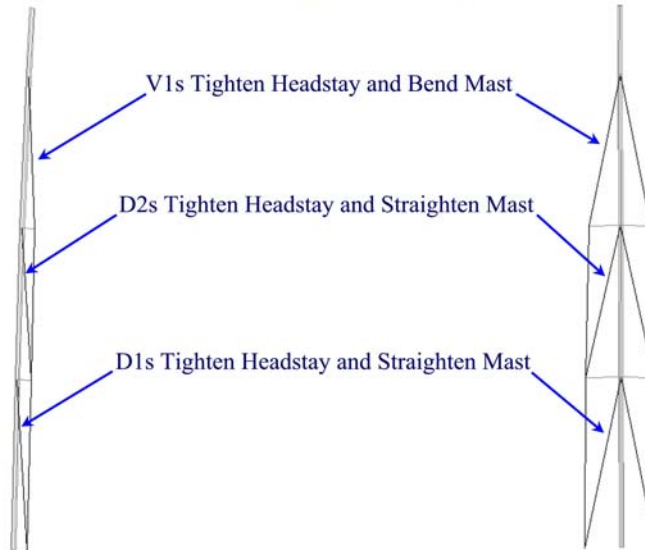
Changes to shroud tension affect the rig in two ways: 1) headstay tension & 2) mast bend. Tighter Cap shrouds generate more headstay tension by pulling back against the headstay. A good guide for Cap (upper) shroud tension is that the leeward Cap shroud should just go slack in all but the heaviest of wind conditions. Tighter D1 (lower) and D2 (intermediate) shrouds generate more headstay tension by reducing mast bend and compression. The important factor of the D1 and D2 adjustment is the relationship to the amount of backstay used in each wind condition, which affects mainsail shape. Tight D1s and D2s will make the mast too straight (main too full and draft forward) when no backstay is used, and conversely



loose D1s and D2s will allow the mast to bend too much (main too flat or even inverted) when a lot of backstay is used. The final D1 and D2 rig tension will be dictated by mainsail shape.

The light air performance of the J-105 can be dramatically improved with leeward mast sag in under 12 knots. This is side-to-side sag from the partners to the hounds. This can only be seen under sail and will not happen at the dock. The settings from the **Quick Tuning Guide** should generate this sag, but all masts are a little different, so you may need to adjust your intermediates and lowers to achieve it. Loosen the intermediates and lowers so that there is 1" of leeward sag halfway to the hounds in under 9 knots and ½" in 9-12 knots. In general the intermediates will need to be eased twice as many turns as the lowers to achieve even sag.

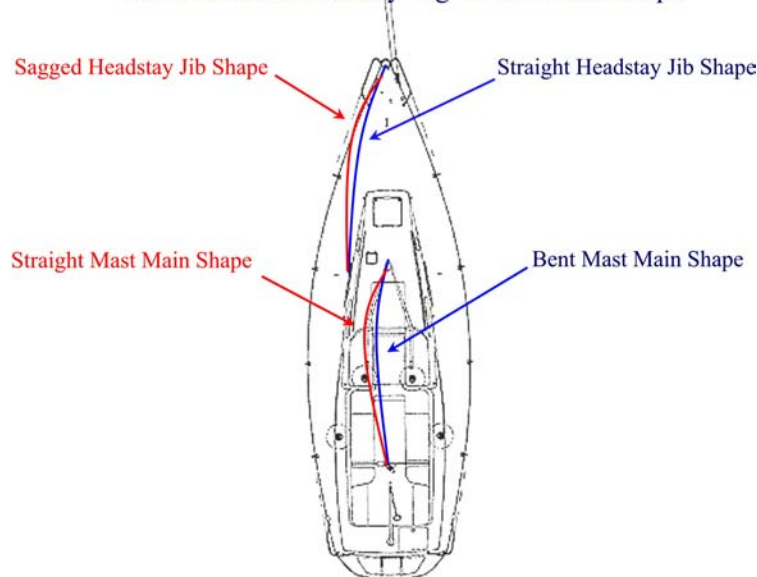
### J/105 Rig Geometry



J-105 Rig Side View

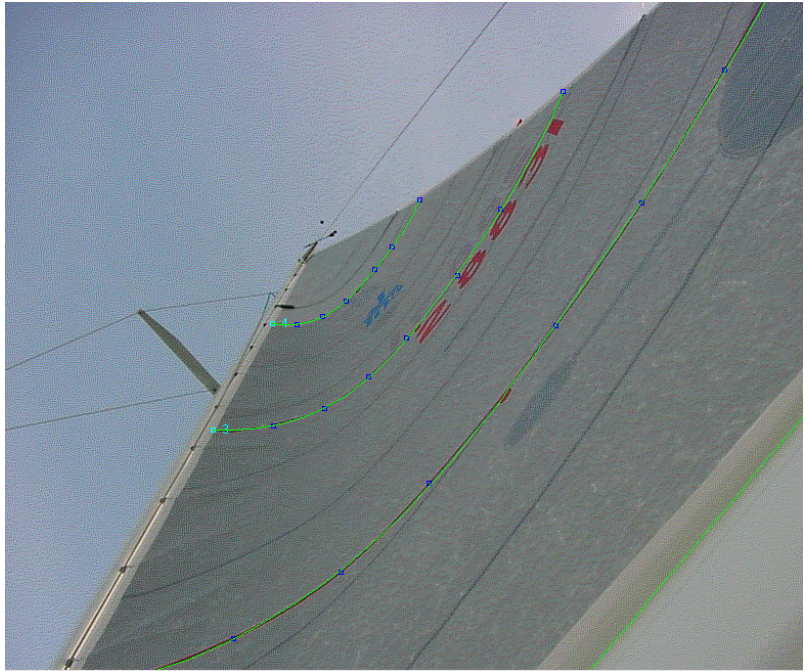
J-105 Rig Aft View

### Mast Bend and Headstay Sag Effect on Sail Shape





The image at the right shows what the mainsail will look like with no backstay if the D1s and D2s are too tight. The sail is too deep and the draft is too far forward. Rig is tuned for 15 knots and there was actually only 8 knots. Mid stripe draft location is at 35% in this photo. Mid stripe target draft position is 42% to 45% when conditions warrant no backstay.



This image shows a mast that is bending too much, D1s and D2s too loose for the amount of backstay being used. The rig is set at the base setting and the backstay is pulled on all the way. The sail is inverting. Note the diagonal wrinkles coming from the clew towards the middle of the mast.





## Part 3 – Mainsail Trim

The J-105 relies on much of its power from the mainsail with the class inventory. The mainsail is very easily adjusted because there are many shape controls including mainsheet, traveler, backstay, cunningham, vang and outhaul. Proper mainsail trim is achieved by balancing the speed and pointing with its twist, angle of attack and overall power. Proper communication with the helmsman for the feel of the boat and performance vs. the boats around you are the key to establishing the correct balance of those three elements.

### Mainsail Twist – The Sheet

The first and most important element of mainsail trim to set is the twist. Twist is primarily controlled by the mainsheet. A tight sheet reduces twist and a loose sheet allows for more twist. Less twist lets the boat point higher, while more twist lets the boat accelerate more easily. **IMPORTANT** – In order to point high, you must be going fast first! By going fast, you increase water flow over the keel, which creates more lift. If you try to point before you are going fast not enough lift will be generated by the keel and there will be too much leeway making the boat actually go sideways. The general rule of thumb for the median setting is to trim the sheet so that the top batten is parallel to the boom. At this setting the tell tale at the top batten will stall about 50% of the time in moderate air. When you need to accelerate, ease the sheet slightly while bearing off. Once you are up to full speed, trim in to the median setting or slightly tighter and start to head up.

The proper amount of twist is dramatically affected by sea state. In flat water, where it is easy to keep constant boat speed, you can sail with less twist. In waves or chop, the boat is in a constant state of accelerating and decelerating and more twist is required in order to maintain speed.



**Untwisted mainsail – top batten parallel**



**Twisted mainsail – top batten open**

### Mainsail Angle of Attack – The Traveler

The traveler controls the boom angle to the centerline of the boat, which is described as angle of attack to the wind. Much like the sheet, a narrow angle of attack (traveler high) is used for pointing and powering up the boat and a wide angle of attack (low traveler) is used for acceleration and depowering the boat. Carry the traveler as high as possible without making the boat heel too much.

In light to moderate conditions the boom should be on centerline or slightly above. In very light air, when the main is twisted, setting the boom actually above centerline will put the lower third of the main parallel to the centerline of the boat. A good gauge for this is to look where the bottom batten is pointing. The bottom batten should point at the backstay in very light air. If it is pointing to windward of the backstay, the traveler is too high.



As the breeze builds, the traveler should be played aggressively to control heel and keep the boat on its feet. If the boat heels too much, the boat will get too much helm and the helmsman will have to use too much rudder angle to keep the boat going straight. The optimum rudder angle to create the most lift is around 4 degrees. There are times when more angle than that is unavoidable, but 5 degrees of rudder angle should be the most that you try to use. Rudder angle can be monitored by putting a tape mark on the top of the wheel when it is perfectly straight. The main trimmer can notice when the helmsman is using too much helm (or not enough) and adjust the traveler appropriately.

### **Mainsheet vs. Traveler for Various Sea States**

One of the more difficult things to determine is how to depower the main in moderate to heavy conditions. As we have learned, you can depower the main by either twisting the main by easing the sheet or letting traveler down. The technique used should be determined by sea state, which will affect how the helmsman has to steer the boat. In flat water, the helmsman should be able to use very subtle steering changes. Hours of on-the-water testing has shown us that depowering by lowering the traveler and keeping a tight, untwisted leech produces the best VMG. You can point reasonably high in flat water without slowing down and the tight leech will help with pointing. We have found that twisting the main in flat water in moderate air only makes you lose height. With this style the traveler is played to maintain the proper angle of heel.

However in waves and chop, the opposite has proven to be faster. In waves and chop the helmsman has to be more aggressive with the helm. With the wider range of steering keeping the traveler higher (with the car near centerline) with a more twisted main allows the helmsman to steer through wider angles and accelerate as needed in the waves. With this style the mainsheet fine tune is played to maintain the correct trim and angle of heel as the helmsman steers through the waves.

### **Overall Power – The Backstay**

The backstay is the most important sail control for setting the overall power of the sail plan. The backstay is the universal control to modify the shape of the main primarily, but also the jib. The North Class Inventory has been carefully designed so that backstay adjustment changes the shape of the main and jib in unison. As backstay is applied the mast bends, flattening the main. It also pulls aft against the headstay, reducing headstay sag, which flattens the jib. By flattening the sails the boat's power is reduced as the boat becomes overpowered and heels too much. Flatter sails can be trimmed harder than full sails so when it is windy it is better to set the sails up flatter and sail with less twist. This will allow you to point higher.

As stated in the tuning section of this guide, having the rig set up properly for the wind conditions will allow you to get the most benefit of adjusting the main and jib together with the backstay, but it is also the control that allows you to set up the sails as best you can when the wind changes and you are no longer tuned correctly.

With a loose rig the main will flatten out faster than the jib. This is because the loose D1s and D2s will allow the mast to bend, which will flatten the main. However, since the mast is bending, the main will get to a point where it over bends before you can bottom out the backstay. By not being able to bottom out the backstay, the jib will still be a bit fuller than is ideal at this point since 1) you can't pull on the full range of backstay and 2) the mast will compress more so the backstay tension will not transfer as well to the headstay.

Conversely, with a tight rig, the main will stay fuller when the backstay is eased, while the overall rig tension will keep the headstay tighter and thus keep the jib a bit flatter. It is important to understand this relationship between how the backstay and rig tuning affects sail shape when you may not be tuned correctly. If your rig is too loose, use more backstay to set the main up flatter, knowing that your jib will be fuller than ideal. If your rig is too tight, use less backstay to set the main up fuller, knowing that your jib will be flatter than ideal. In general, it is better to be set up with a flat main and a full jib so it is better to err on the loose side of the rig tuning matrix if you expect the wind to change. It is much easier to depower the J-105 than it is to power it up, so ALWAYS TUNE FOR THE LULLS!



As the mast bends it has an immediate effect on the luff and leech tension, so other controls must be adjusted in conjunction with the backstay. When you pull the backstay on, the mainsail will twist more so more sheet will have to be pulled on to reset the twist. More backstay will also loosen the luff, so more cunningham will be needed. Don't forget to ease the sheet and the cunningham after you ease the backstay.

### **Other Mainsail Controls**

**Cunningham** – The cunningham controls the luff tension of the mainsail. Luff tension controls the draft position of the mainsail. As backstay tension is applied, the mast compresses and the main appears to fall down a little and the draft will move aft. Pull on the cunningham to move the draft forward to the desired position. As well as moving the draft, luff tension will also make the main somewhat flatter. In light air, you should see slight wrinkles coming from the sail slides. In moderate air the luff should be smooth. In heavy air, the luff should be tensioned past being smooth to set the draft position and flatten the sail.

**Vang** – With the non-overlapping jib, in order for the mainsail to generate enough power in light air, a certain amount of depth has been designed into the lower portion. In over 12 knots begin to pull on the vang to induce low mast bend to flatten the lower third of the main. When it is really windy pull on the vang quite hard to help bend the mast. **BE SURE TO EASE THE VANG AT THE WEATHER MARK!** Before you ease the main, ease the vang to allow the main to twist as you bear off. If the vang stays on too hard, you may not be able to bear away, or worse you could break the boom.

**Outhaul** – The outhaul also controls the sail shape in the lower third of the mainsail. Easing the outhaul makes the lower third of the mainsail fuller and tightening flattens the lower third. In light air the outhaul should be slightly eased and pull it progressively harder as the wind increases, to the point where you should pull it as hard as you can in over 15 knots.

### **Perfect Trim in Ten Knots!**





**Light Air Upwind** – Traveler is high, boom is slightly above centerline. Crew is low and forward. The boat is balanced nicely with a good heel angle.



**Blasting Upwind in San Francisco Bay** – Nice heavy air upwind form here. The traveler car is centered and speed is being controlled with the mainsheet fine tune.



## **Part 4 – Jib Trim**

The J-105 Class Jib has a very tough job. It has to be fast in all wind conditions, where other 35' offshore one-designs allow 3 headsails! The single jib inventory presents a tough challenge for sail designers to create a sail that is versatile enough to cover the entire wind range, while being constructed so that it can be light enough to perform well in light air, yet being strong enough to handle heavy air. The 3DL jib is the ultimate solution to handle this daunting task. The latest design has been refined to be responsive to the few controls that can change the shape. The 3DL process is the only way to create a sail that is minimum weight, yet is strong enough for heavy air.

While the North 3DL jib is refined to a level that makes it very easy to enhance the light shape in light air and a heavy shape in heavy air, it is important for the trimmer to be able to manipulate the sail appropriately. The primary controls that we have to affect the sail shape are the halyard, sheet, jib lead placement and headstay tension.

### **Jib Halyard**

The halyard is the most important sail control for shaping the jib and it has a much greater affect on sail shape than the cunningham on the main. However, just like the cunningham on the mainsail, the halyard controls the entry angle, draft position, and overall depth in the sail. A tighter halyard will produce a more draft forward, rounded entry shape, with less overall depth. A loose halyard will produce a more draft aft, finer entry shape with more overall depth. As a general rule, the halyard should be tensioned to just barely remove the wrinkles in the luff. In lighter air wrinkles can just be visible, in moderate air the luff should be smooth, and in heavy air the halyard should be pulled 1-3" past removing the wrinkles.

In flat water, a looser halyard can improve pointing with a finer entry angle. In waves and chop, a tighter halyard will produce a more rounded entry and more open leech, which will have a wider steering groove and be better for acceleration. If you try the loose halyard and your helmsman seems to be struggling to find the groove, try a slightly tighter halyard.

As sails age, the entry tends to get finer and the draft starts to move aft. An older sail will require more halyard tension to achieve the same shape as a brand new sail with a looser halyard.

### **Jib Sheet**

The sheet is the most important control for adjusting the jib once the draft is set. The general rule is to trim the jib as hard as possible without slowing the boat down too much. The jib needs to be played in conjunction with the main and the helmsman's steering. The sheet tension will change with each change in the wind speed. When a puff hits, the leech will become more open. Be careful not to trim the jib too soon. Allow the leech to stay open to take advantage of the puff to accelerate the boat and then trim in once you have accelerated to increase pointing.

The Class mainsails are fitted with a spreader window so that you can see the jib leech on the lower spreader. Put tape marks on the spreader at 3", 6" and 9" in from the spreader tip. In general you should trim the jib so that it is at the spreader tip in very light air, 3" inside the tip in light air, 6" to 9" inside the tip in moderate air, then back out to 3" in heavy air. These guidelines are subject to change based on sea state. The jib can be sheeted harder in flat water than in waves and chop. Be careful to only make small sheet adjustments. Due to the high aspect nature of the jib, small changes make a big difference.

### **Jib Lead**

The jib lead should be used to control the top and bottom shape of the jib. The middle of the jib is not as affected by lead position as much as it is with sheet. Once the sail is trimmed to the appropriate spot on the lower spreader, adjust the lead to make the top and bottom look right. Moving the lead forward will make the upper





leech more closed and the foot rounder. Moving the lead aft will make the upper leech more open and the foot flatter.

The median jib lead position is slightly aft of the middle of the jib track, which is about 9" aft of the chainplate. This position is also just forward of the window on the side of the cabin house.

### **Median Jib Lead Position**

In light air, move the lead forward up to 3 holes so that the jib foot is close to touching the lifelines.

In heavy air, move the lead aft up to 2 holes to make the foot flat.



**Median Lead Position** – note the slightly rounded foot



**Lead Aft Position** – note the straight foot.





## Headstay Tension

Headstay tension has the most dramatic affect on the overall camber of the jib. Headstay tension affects headstay sag. This is a difficult thing to visualize, but it works much the same as mast bend affects mainsail shape (see "Mast Bend and Headstay Sag Effect on Sail Shape" diagram on page 7). As the headstay sags, it pushes the luff towards the leech, which increases camber. Conversely as the headstay gets tight, it pulls the luff away from the leech, decreasing camber.

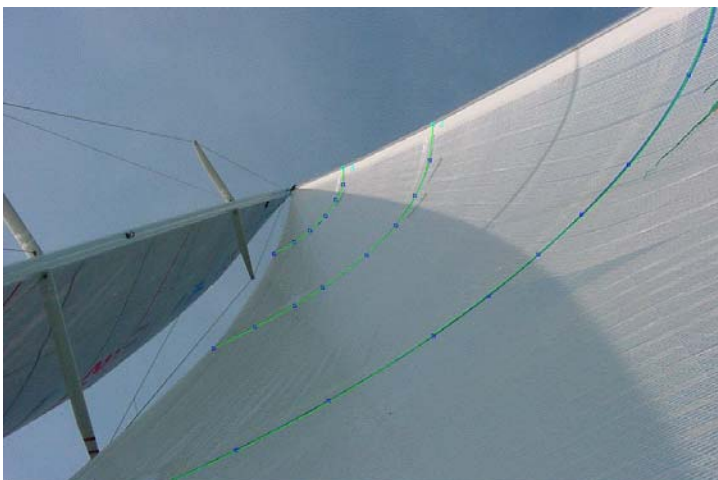
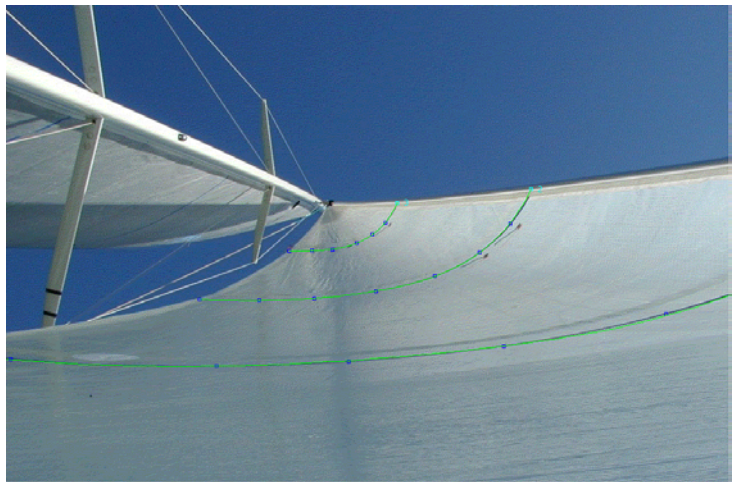
Clearly this is very important, but has been listed last here because it is very dependent upon rig tuning. Headstay tension is achieved by a combination of a tighter rig and a tight backstay. As we have learned in the rig tuning and main trim sections, rig tuning and backstay tension has a great affect on mainsail camber as well. The Class main and jib designs and the tuning guide shroud tensions have been carefully developed to have the backstay control main and jib camber in unison. If you are tuned properly, when the main sets up correctly, the headstay tension will be correct as well. Your headstay tension should be almost self-tending.

During a race, the only way to adjust your headstay tension is with the backstay. Because of this it is important to know how you are tuned and whether you are actually sailing in the right wind speed for your tuning. The backstay will be the key to get the most of the set up that you have when you are not tuned perfectly. Simply, if there is less wind than you are tuned for, use less backstay tension to power up the sails as best you can. If there is more wind than you are tuned for, use more backstay tension.

A good technique is to tape a batten with marks every 1" on it to the backstay cylinder. This will help you to be able to record your settings and duplicate them later.

The image at the right shows the AP jib with moderate headstay sag. The sail is set up perfectly in 9 knots of wind and a little bit of chop. The camber and draft measured by North Sails SailScan program is:

Top Stripe: 17.31% @ 44%  
Mid Stripe: 15.18% @ 42%  
Bot Stripe: 11.53% @ 40%



The image at the left shows the AP jib set up perfectly in 17 knots of wind. The camber and draft measured by North Sails SailScan program is:

Top Stripe: 14.76% @ 41%  
Mid Stripe: 14.45% @ 40%  
Bot Stripe: 11.25% @ 39%



## Part 5 – Crew Weight Placement

With the new “float line” rule, this discussion has become much easier now that we know that all boats should float the same. The goals of weight placement are to 1) control helm and 2) reduce wetted surface in light air.

In light air the crew should be well forward and to leeward both upwind and down. Two crewmembers should be forward of the shrouds to leeward. Remaining crew should be up near the shrouds. There should only be one person in the cockpit other than the helmsman. In really light air the main is not trimmed that often and the helmsman can make small adjustments. Being to leeward helps heel the boat increasing helm giving a better feel and allows for the best pointing and rudder lift. Being forward allows the bow to dig in which also helps pointing as well as reduces wetted surface by getting the transom out of the water.

In moderate air, the crew can begin to slide back as they begin to move to weather. Once anyone goes to weather they should be stacked just behind the shrouds. At this point if you have a dedicated main trimmer, he can slide back to his station upwind. Downwind as soon as there is constant adequate pressure on the sheet and you begin to try to sail low the crew should move to weather to help rotate the spinnaker to windward out from behind the main. This happens at about 10 knots. There is plenty more coming on downwind sailing next.

In heavy air the crew should continue to move aft, especially in waves. If you notice that your helmsman has to steer a lot to keep the boat going straight (dialing for dollars), move aft and as the bow lifts the boat will track straighter. Since crew weight is limited the guys who are on the rail need to hike hard. Remember, sailing is a sport and it's a boat not a couch!

## Part 6 - Downwind Sailing

Sailing the J-105 downwind can be one of the more difficult things to do well. Paying small attention to the minor details can make a huge difference. The key to fast sailing downwind is good communication between the trimmer and the helmsman. The trimmer should constantly be telling the helmsman how much pressure he has in the sheet. This will allow the helmsman to know if he can bear of a little more, but more importantly when he needs to head up a little bit to build pressure.

The J/105 has an asymmetric spinnaker set on a centerline sprit. The goal in downwind sailing is to maximize downwind VMG. This is achieved by sailing a wind angle tight enough to keep speed, but sailing lower towards the mark whenever possible. The North Sails asymmetric has been designed as a running spinnaker for optimum downwind performance at the apparent wind angles that produce the best VMG for the J/105. The sail has been designed to rotate out to windward to project the maximum sail area out from behind the mainsail. Always hoist the sail all the way to the top. Due to the luff length restriction in the rules, the tack of the sail is never set all the way down to the pole. Raising the tack helps the sail to rotate to windward.

### Light Air Sailing (0-9 knots TWS)

In light air, you must sail tighter angles for best VMG. The tack is set 1-2' off the sprit. The crew should be forward and to leeward. Keep the crew weight as low as possible. Steer down in the puffs until the pressure sheet starts to get light and then head up slightly. Communication between the trimmer and the helmsman is key. Try to find the lowest angle you can sail before the speed drops. Don't forget about the main! Proper mainsail trim is essential to good speed. The vang should be set so that the top batten is open by 5 degrees. A good trick to help acceleration out of the jibes is for the main trimmer to hold the sail in a bit after coming out of the jibe. When the asymmetric is jibed, it needs to be overtrimmed to make it “pop” through. When the spinnaker is overtrimmed, it blows air back into the mainsail relieving pressure from it. By keeping the main in, it will keep the main pressurized as well as opening the slot between it and the spinnaker to get the air flowing over it faster. The main trimmer can easily feel if the main is



pressurized by the pull on the sheet. Ease the main out slowly as the pressure on the sheet builds as the spinnaker is eased.

### **Moderate Air Sailing (9-12 knots TWS)**

In moderate air, there is a wide range where you can sail. Lower is best as long as you can maintain your speed. The tack line is eased 2-3' off the sprit. The same principles apply to steering as in light air. Once the boat feels well pressured, the crew should move to the windward side to help rotate the spinnaker. In this range the crew should be very active moving to weather when you head down in the puffs and back to leeward when you head up in the lulls.

### **Heavy Air Sailing (12+ knots TWS)**

In over 12 knots, the boat is well pressured up going downwind. At this point you want to sail as low as possible most of the time. There will almost always be good pressure on the sheet but when you sail too low, the sail will become blanketed behind the main and collapse. The sheet is well eased to get as much of the sail out from behind the main as possible. The crew should be to windward at all times. Heel the boat to windward by as much as 10 degrees. The vang should be set so the top batten is parallel to the boom.

**\*Downwind Notes** – Good coordination between the trimmer and helmsman will result in very subtle changes in the sheet. A properly coordinated team will only adjust the sheet by a couple of feet. If you find yourself constantly trimming and easing more than 3 feet of sheet than your coordination should be improved. Be careful not to try to sail too low and collapse the spinnaker. A collapse will result in around a three-boat length loss!

**89m Asymmetric in 9 knots. Crew is to windward and the tack line is eased 2.5'**



The North Sails J-105 Tuning Guide has been developed by the North Sails Class Development Program. The J-105 Class Leaders are Tim Dawson ([tim@sales.northsails.com](mailto:tim@sales.northsails.com)) and Will Keyworth ([will@sales.northsails.com](mailto:will@sales.northsails.com)). Feel free to contact Tim or Will at any time if you have questions or comments.

