



*One Design*

For any question you may have on tuning your Highlander for speed, contact our Highlander expert listed below:

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## Highlander Tuning Guide

# NORTH SAILS

Congratulations on your purchase of North Highlander sails. We have worked hard to design and produce the fastest sails available. We are confident you will find superior speed over all conditions. Our sails are designed to be fast, easy to handle and trim.

Ask us about our latest research and development details.

If you have any questions or problems, please do not hesitate to call. We are anxious to help you go faster and win races!

Thanks for joining the North Team.

**Good luck and good sailing!**

## Boat Preparation

The following measurements are those we have found to be the fastest settings for your new North sails. After experimenting, you may find that a slightly different setting may mean even better boat speed for you. If you have any questions or problems, please don't hesitate to call. We are anxious to help you go faster and win races!

### J MEASUREMENTS

The J measurement (the measurement from the forestay to the front of the mast) should be a minimum of 67"

### RAKE OF THE MAST

To measure the mast rake on the

Highlander, hoist a 50 foot tape to the top of the mast and measure the distance to the intersection of the transom and the back deck. With the rig set to the proper tension (very tight), this rake measurement, with the tape on the main halyard, should be 30'5" to 30'7".

### RIG TENSION

To help control the rig and reduce jib luff sag, we suggest you set the rig up very tight. A good gauge for this is that the leeward shroud should not go slack until all three people are on the high side and starting to hike. If you have a tension gauge (we suggest the Loos, Model A Tension Gauge), it should be set at 25 to 32 on the forestay.

### DIAMOND TENSION ON THE MAST

We suggest you set your lower diamond tension very tight. It should be possible to squeeze the diamonds to touch the mast no further away than 4" from the attachment points to the mast. We suggest setting the upper diamonds so you can squeeze them 8" from the attachment points. When using the Loos tension gauge, the number should be 15 to 18 for the lower two diamonds and 4 to 6 for the higher one. On the older gold aluminum masts and wood masts, set the diamond tension slightly lower (about 4 to 5 numbers lower on the Loos gauge).

### SHIM THE BACK EDGE OF THE BUTT OF YOUR MAST

We suggest placing a 3/16" to 1/4" spacer under the back of your aluminum butt casting. This will help reduce the usual reverse bend common in light winds and it

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will allow the mast to bend more easily in heavy winds.

## Rig Tuning & Sail Trim

### JIB CLOTH AND MAIN CUNNINGHAM ADJUSTMENTS

In both of these adjustments, just enough tension should be applied to barely remove the wrinkles. In fact, it is best to leave very slight wrinkles along the luffs of your sails to be sure they are not too tight. On the jib, we watch for slight "crow's feet" from the hanks, on the main we watch for slight horizontal wrinkles from the luff on the lower quarter of the sail.

### JIB LEAD - STANDARD INBOARD

For the standard jib (not clewboard) the lead position should be placed 15" to 16" off centerline. For a rough set of the fore and aft placement of your leads, measure from the jib luff wire attachment point at the stem plate to where the sheet, if extended through the jib lead block, would intersect the seat. This measurement should be close to 9'4" at the intersection of the sheet and the seat. In heavier winds of 15 to 18 mph, move your jib lead back 1". In winds above 18 mph move your jib lead back 2" from the standard position. In the standard position, the luff of your jib should break just a little bit earlier up high than the lower section of the jib. As the lead is moved farther aft, the upper sections of the jib will become flatter and the luff will break slightly earlier than the lower sections.

### JIB LEAD TRIM LINE

Your North standard inboard jib is built

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with a "trim line" penciled in from the clew grommet out towards the body of the sail. As a final check (and most accurate) when your leads are positioned properly, your jib sheet should appear as an exact extension of the trim line. In heavy winds with your leads aft, your sheet should angle aft slightly off the trim line.

### JIB LEAD – CLEWBOARD

On the clewboard jib, a good starting point is to place your sheet in the middle clewboard hole. Move the shackle forward to flatten out the foot of the jib and open the upper leech. Move the shackle aft to tighten the leech up top and make the bottom of the jib fuller. As with the standard jib, you want to set your clewboard so the jib luff breaks slightly earlier up top as the boat is luffed into the wind. In heavy air, it is best to see more break up high, so move the jib sheet forward on the clewboard as the breeze picks up. Laterally, the clewboard lead position should (where the sheet turns through the sheave of the block) be 16 1/2" to 17" off centerline.

### JIB SHEET TRIM

The spreader window allows the skipper to line up the leech of the jib with the lower spreader for use as a trimming guide. The upper batten should be positioned out from the centerline approximately 5 to 10 degrees. The jib sheet will have to be altered constantly to adjust to the puffs and lulls, and to keep the correct twist. In light to medium winds, with the leads and sheet trimmed correctly, you should experience very little to no backwind in your main. In heavy winds,

slight "breathing" of the lower 1/3 of the mainsail luff is not unusual.

### MAINSHEET TRIM

An excellent guide to trimming your North Highlander main is to line up the upper batten parallel to the boom. This is viewed by sighting directly underneath the boom. Use this upper batten setting in all conditions, except in very light or very heavy air. In light air, the upper batten may hook due to the weight of the boom. Pulling the traveler to weather and easing the sheet helps to reduce this problem. We are, however, still trying to reach the position in which the upper batten is parallel to the boom. In very heavy winds, it is necessary to ease the sheet to keep the boat balanced and tracking well. It may be eased out past parallel by as much as 20 degrees.

### THE BRIDLE TRAVELER

Play bridle traveler, easing it down in puffs and back up in the lulls to keep the boat balanced. The bridle height, measured to the top of the block from the back deck is 22". If your bridle is easily adjusted in height, ideally the bridle height should be 26" in very light winds and 20" in very heavy winds. However, if the bridle height is fixed, again 22" is the best all-around position. If you need further information on rigging the bridle traveler, please contact us here at the loft.

### OUTHHAUL TENSION

Your North mainsail is constructed with a shelf foot so it is possible to make the lower half of the main deeper when sailing downwind. Usually the outhaul is tight

enough upwind so that there will be only a 1 1/2" to 2" gap between the side of the boom and the shelf foot seam in the middle of the foot. In heavy winds, pull the outhaul tighter to close the shelf and flatten the main. In extremely heavy winds, above 18 mph, the outhaul should be tight enough so there is a hard crease from the tack to the clew. In lighter winds or choppy seas, ease the outhaul until the gap between the side of the boom and the shelf seam is 2 1/2". When going downwind, ease the outhaul until the gap is a full 5" and the shelf is open.

### BOOMVANG

The boomvang is used downwind to keep the upper batten parallel to the boom. In puffs, when the boat is overpowered and heeling, the vang is "dumped" to keep the end of the boom from hitting the water. Upwind, the vang is also used in moderate to heavy winds to keep the boom and leech controlled while easing the sheet in puffs. Heavy vang tension upwind will also bend the mast and flatten the sail, which will help keep the boat under control in heavy breezes.

### SPINNAKER TRIM

Always sail your North spinnaker with a 6" to 12" curl in the luff. Careful concentration is necessary. Use short 2" "ins and outs" on the sheet to keep the spinnaker trimmed correctly. Keep the clews even at all times through adjustments to your pole topping lift. Another guide is to adjust your pole height, keeping the center vertical seam in your spinnaker parallel to the mast.

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**Note:** Skipper/crew teamwork is important for good downwind speed. It is important that the crew ease the spinnaker sheet as much as 3" in a puff, so that the skipper can bear off and keep the boat under the chute. Of course in lulls, the spinnaker must be retrimmed quickly.

**Note:** At times it is difficult to fly the spinnaker when the wind comes forward of the beam. If in doubt, don't fly it.

### Sail Care

Your North Sails are constructed out of the best materials on the market today. We make sure of this by testing every roll of cloth we use. Through proper care and maintenance your sails will give you the performance you have come to expect from a North sail.

The most important factor for a long life for your sails is to watch them for signs of wear and tear in high load and chafe areas. Be sure to wash the sails off with fresh water and dry the sails thoroughly before storing. A dry, mild climate is best. Excessive heat can cause problems with the sails due to the possibility of shrinkage. It is best to roll the mainsail and jib.

### MAINSAIL

When hoisting and lowering the sail try to minimize the amount of creasing or wrinkling of the sail. Every time the sail gains a crease the cloth breaks down that much faster. Always have someone contain the leech and luff during these procedures. The battens can be left in the sail without

any problems. Be sure to roll the sail down the leech so that the battens will not twist. This could cause damage to the battens.

### JIB

When rolling the jib keep the battens perpendicular to the leech. Pay special attention to the battens and batten pockets for wear and tear. Since this sail is manufactured from yarn tempered Dacron, problems can arise due to mishandling.

### Racing Clinics

This tuning guide only begins to cover all there is to know about racing the Highlander. The Highlander team at North One Design has prepared a professional, in depth Highlander racing clinic that you and your fleet will be interested in learning more about. In the course of a evening or weekend you will learn more about racing your Highlander than you could possibly learn in a season of racing on your own. Please call you nearest North Sails One Design loft for complete details!

At North Sails we are constantly striving to make our products better. If you have any comments on this tuning guide and how it could be improved for your purposes we'd love to hear from you. Please give us a call or drop us a line.

### Contact North Sails

For tuning information and complete details on how to setup your Highlander sails contact the North Highlander experts listed on the front cover of this guide.

### TENSION GAUGE CONVERSION CHART

Over the past few year Loos Co. has introduced it's new style PT-1, 2 and 3 professional tension gauges to the market. Since many of us are replacing our older model A and B gauges with these new models we are posting the following conversion chart for your convenience.

MODEL A	MODEL PT-1		
	3/32	1/8	5/32
5	6		
10	9		
15	12	14	
20	16	16	
25	20	19	
28	23	21	
30		22	
35		27	25
38		30	28
40		33	30
42			33
44			36
45			38
46			39
47			40

Model B	Model PT-2			PT-3
	3/16	7/32	1/4	
10	11			
15	13			
18	15			
20	16	18		
22	18	20		
24	19	22		
26	21	24		
28	23	25		
30	25	27	25	
32	27	29	27	
34	29	31	29	
		33	31	
		36	33	6
		37	36	7
			37	9
				10
				11
				12
				14
				16
				18
				20
				25



**NORTH SAILS ONE DESIGN  
QUALITY CONTROL CHECK**

**Highlander**

MAINSAIL		JIB		SPINNAKER	
Corners		Corners		Corners	
Cunningham		Battens		Numbers (one side)	
Royalty		Spreader chafe patch		Royalty (signed)	
Numbers		Telltales		North Logo	
Battens		Leech telltales		Bag	
Leech Telltales		Wire			
Tack slug		Luff tabs			
Clew slug		Royalty			
Chafe Patch		North Logo			
Insignia		Bag			
North Logo					
Bag					

Checked by: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_