



# Trimguide 2.4m R

Norlin MKIII

version En 1.0 - 030121

## ***Introduction***

The tuning guide is written to give you the best performance from your North sails. The preparations and settings are those we have found to give the best VMG on a Norlin MKIII. However, there is a lot of useful information even for those sailing another design.

There is an infinite variety of sailing conditions and a tuning guide like this can help you to a good base tuning, which will make it easier for you to find the optimal tuning in the actual situation. We hope this will give you successful and fun sailing.

The tuning guide is written by Stellan Berlin, North Sails Sweden One Design.

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Updates will be available on [www.northsails.se](http://www.northsails.se)

# Preparations

## Our philosophy

A 2.4 has the same tuning possibilities as a large keelboat. The difference is that everything including steering and tactical decisions has to be done by one person. The sailor can not waste attention on controls that don't make a significant difference on speed or ability to point. We have systematically tested which controls do make a difference and removed those that do not. This makes it easier to focus. We have also designed the sails to be forgiving in the sense that a slight mistake or a wiggle by the helmsman will not give a drastic change of boat speed.

## Tools

Norht Sails smallest tuning scales (stickers) are used in several places to make a good tuning repeatable. (One unit on the tuning scale is 12,5 mm).

Shroud tension is measured with a "Tension Gauge" from Loos & Co. It comes in two base models and for different shroud dimensions (Figure 1). Note that the gauges are individual and readings may differ +/- 2 units between them.



Figure 1 model A



model PT-1

## Mast

The masts from Vene Björndahl are excellent. A softer mast does not work as well and indications are that an even stiffer mast would be an advantage.

## Headstay

The headstay shall have the same length regardless of weather conditions. That gives a number of advantages and we have not found any disadvantage. We have systematically tested mast rake in the interval 5500-5600 cm without noting any difference in VMG.

The largest advantage with a permanent mast rake is that a mark on the mainsheet will make tuning of the main exact. This is important as an adjustment of 1 cm on the mainsheet will make a significant difference on speed and ability to point. The permanent headstay also makes the marks on the backstay more meaningful and it makes it easier to move the headstay forward on the bow.

## Rig position

The headstay shall be mounted as much forward as possible. The mast is thereafter placed to use maximal J (1560 mm). It is necessary to move the shrouds forward on older boats when the mast is moved forward. It will otherwise be difficult to push the mast forward on downwind legs. Moving the shrouds forward often requires some work.

I do not think that it is a good idea to move the mast forward without moving the headstay. That will narrow the slot between main and jib and make it difficult to make the main work correctly in strong winds.

Use lower and upper shrouds and spreaders from Vene Björndahl. They will make the distance from the mast to the center of the shroud 295 mm. Lower and upper shrouds shall go through deck at the same point. A straight line drawn between the port and starboard deck through point will cross the mast 10 mm forward from the aft edge of the mast. The distance between the port and starboard deck through points for the shrouds are 490 mm.

As a stiff mast is an advantage we do not recommend sailing without lower shrouds. In strong winds the pressure on the mast in the mast hole at deck level will increase substantially and several masts have actually snapped there.

## **Mastrake**

The mastrake shall be 5570 mm.

We measure mastrake from the lower edge of the upper measurement mark on the mast to the aftmost point of the hull (Figure 2, Figure 3). To make the measurement band stay close to the mast when hoisted, a traveller is introduced in the mast track and tied to the measurement band. The backstay shall be tightened only to prevent it from sagging. Tighten it hard and then ease it again before measurement to make sure that the headstay is stretched. The length of the headstay is fixed to make the rake 5570 mm.



**Figure 2**



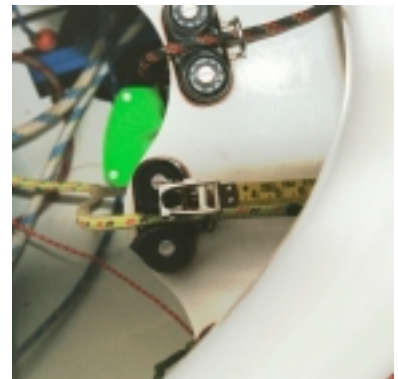
**Figure 3**

## **Shroud Tension**

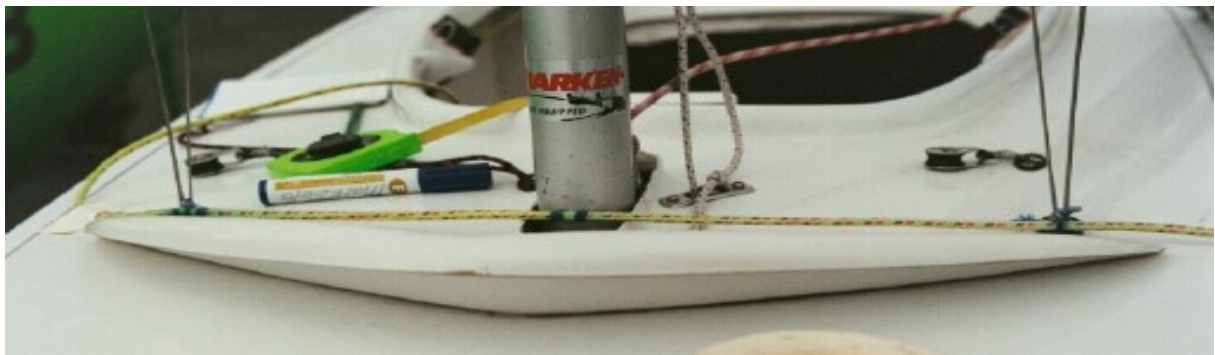
The upper and lower shrouds are tightened such that the reading with tension gauge model A is 21 and 9 respectively and 15 and 9 respectively with gauge model PT-1. Observe that these readings are valid for rod. Other types of shrouds will give different readings.

## **Backstay**

A 4:1 purchase for the backstay is fine and we use 3 marks on the trimline. Take the slack out of the backstay in same manner as when you measure mast rake. Put the first mark on the 55 mm from the centre of the cleat (Figure 4). The third mark is placed 490 mm from the first and the second half way between the first and third mark. When we further on write that the backstay shall be on 1,25 or 1,75, we mean positions between mark 1 and 2. If you follow the recommendation for distance between the deck trough positions for the shrouds is that the same as the distance between mark 1 and 3 on the backstay trimline (Figure 5).



**Figure 4**



**Figure 5**

### Mastbend inducer and restrictor

These are not used for trimming but the mastbend inducer is used to hold the mast forward downwind.

### Main sheet

As mentioned earlier, 1 cm adjustment of the main sheet gives a significant change in speed and ability to point. Hence, tying the mainsheet with a knot is not accurate enough. Sew and eye on the permanent end of the mainsheet and bring the sheet through a hole behind the hatch on aftdeck. Mount a shackle in the support for the rudder shaft and fasten the mainsheet eye in the shackle. A traveller is not used and observe that they normally flex substantially on the standard boat.

The main sheet shall be 1:1 without purchase. That reduces the sheet that has to be taken in to half when rounding the leeward mark.

Put a trimscale on the aftside of the mast above deck (Figure 6). Put 1 at the top and mark the main sheet such that the mark is at 3 when the main is trimmed in 3-5m/s. This means that the upper batten is parallel with the boom and that the top tell tail flies 60-70% of the time.



Figure 6

### Main Tack

The mainsail tack should be fixed in a way to make sure it stays in the same position with different outhaul tension. At the same time it is an advantage if the tack can move an inch or so along the mast. The best way to achieve this is to have a slug slide sewn to the tack of the sail. If the opening in the mast track is extended all the way down to the boom, you can't use a slide. Instead a thin rope with low friction is tied through the tack grommet and around the mast. Make sure the tack of the sail is close to the mast to prevent the clew to go beyond the black band when the outhaul is pulled tight.

### Outhaul

Make a mark on the trimline for the outhaul and stick a trim scale such that the mark is on 1 when the clew is at the measurement band on the boom. Let the reading increase as the outhaul is eased. We use 2:1 purchase for the outhaul. Figure 7



Figure 7

### Main halyard

To make the sheeting of the main exact it is equally important to hoist the main to the same point each time as is the permanent length of the headstay and avoiding tying the main sheet with a knot. This is simple to arrange either with a halyard lock in the top of the mast (best solution) or a hook at the mast foot where an eye on the halyard can be fasten (Figure 8). It is impossible to hoist to the same height with an ordinary cleat.

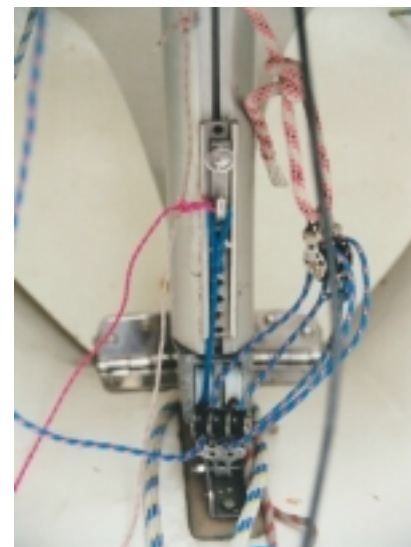


Figure 8

### Spreader Reference for Jib Leech

The sheeting of the jib is described as the distance between the spreader tip and the leech of the jib. A small North trim scale on the spreader helps to judge the distance (Figure 9). The measurements later described is valid for the standard 295 mm spreaders. If you have different length spreaders you have to compensate for the difference.



Figure 9

### Footcamber Jib

The depth of the jib at deck level is described as the distance between the point where the jib meets the rail. The distance is measured 850 mm back from the headstay. A small trim scale is put at right angle to the rail with the "0" at the rail (Figure 10)

In case you find it difficult to read the scale from the cockpit put a mark corresponding to 3 on the scale.

### Sheeting Angle Jib

The holes in deck for the jib barberhaulers shall be 120 mm behind the aft edge of the mast and the distance between them shall be 465 mm.



Figure 10

### Whisker pole height

The eyestay holding a 100 mm long rope and a block for the whisker pole line shall be mounted 210 mm above the lower measurement band. Check that the line pulling the whisker pole to the boom is long enough to allow the whisker pole to come all the way up to the block (Figure 11).

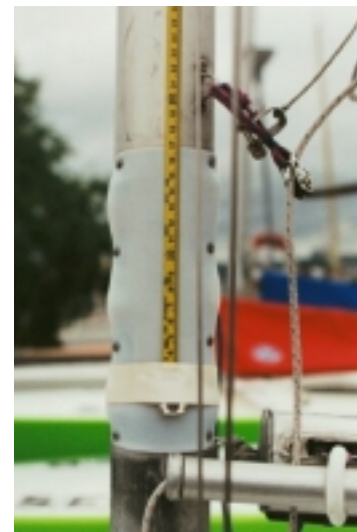


Figure 11

# Sail Trim

Observe that the trim given below is valid for "normal" sea conditions. In choppy sea controls shall be eased and in flat water tighter/flatter trimming is possible.

## *Sail fast and point*

Most important for good speed and height upwind is to find the right balance through good trimming and concentrated steering. Right balance is equivalent to the right rudder pressure. You achieve this by trimming main and backstay and in stronger winds by pointing to reduce the pressure on the sailplane. I often sail with the jib slightly luffing. In flat water a stronger rudder pressure can be allowed as choppy seas require an almost neutral rudder to facilitate easy steering. The rudder easily turns into a brake.

Start by sheeting your main to the proper mark then trim the backstay for right balance. If extra power is needed the jib may be trimmed fuller.

## *Main*

### **Sheeting**

In 3-5 m/s the mark on the main sheet is on 3. The top batten is then parallel to the boom and the top tell tail flies 60-70% of the time. This is the reference trim for the main and the starting point for the readings below.

In very light wind the top tell tail shall be visible as much as possible. The top batten will then point leeward. This can be difficult to achieve with an older main which batten row may tend to fall in. The mark on the main sheet is in very light conditions above the scale and in 2 m/s on 2. 3-5 m/s is the reference wind. In 7-9 m/s breeze the mark shall be on 5 and in 10-12 m/s on 6. The whole leech shall always fill.

If you have an old and soft mast the main may get overbend wrinkles from the clew to the mast when the backstay is pulled very hard. These can be reduced by tightening the cunningham. However, it is better to have a well balanced boat than a good looking main.

### **Backstay**

The backstay is only used to stabilize the headstay in 0-2 m/s wind and is not even pulled to the first mark. In 3-5 m/s it will be trimmed between 1,25 and 1,75. In 6-8 it will be on 2-2,5 and it will be trimmed to 3,25 as a maximum when the wind increases above 10 m/s. If you manage to steer more into the wind without losing speed less backstay tension is needed. Consequently, the backstay has to be pulled harder in choppy conditions as more active steering is required then.

### **Cunningham**

Cunningham affects the camber position. In light winds the mast is relatively straight and therefore the main has enough draft forward without using cunningham tension. The camber position is moved backwards as soon as the backstay bends the mast and short horizontal wrinkles is seen at the luff. Pull Cunningham until the wrinkles disappear. I rather pull Cunningham too hard than the opposite.

### **Outhaul**

The outhaul is on 7-8 in 0-2 m/s and on 3 in 4-6 m/s. It is on 1 in stronger winds, which means that the clew is at the measurement band on the boom.

# *Jib*

## **Introduction**

Marks are not used on the lines used for trimming the jib. Instead trim scales are in two places that give a well defined shape of the sail. That is at the spreader and at on the rail.

The jib Cunningham is pulled harder when the wind increases. To avoid that the foot is resting too much on deck in strong winds and to make sure that there is no gap between deck and skirt in light winds the jib is hoisted to different heights.

Sheet and barberhauler effects the shape of the jib in a way that it is often nessecary to adjust both at the same time.

## **Spreader Reference**

The jib is sheeted to 5 units outside the spreader in 0-2 m/s and it is sheeted to 2-3 units outside in 3-5 m/s. It is then gradually opened to be 9-10 units outside in winds above 10 m/s. The main sails from North have a window allowing you to see the distance between the jib and the spreader having your head on the windward side of the sail. It is always better to sail with a too open jib than a too closed one, which can be very stopping.

## **Foot Camber**

The jib is sheeted 2 units outside the rail in 0-2 m/s wind (let us call that -2 units). The foot is sheeted to 3 in 3-6 m/s and in 7 m/s and above it is sheeted to 5. A fuller jib is needed in choppy conditions a flatter one is better on a flat sea.

## **Jib Cunningham**

The jib Cunningham is always pulled just enough to remove the sag between the luff buttons.

## **Hedstay sag**

Hedstay sag is set by the backstay and is hard to control without changing the balance of the boat. However, a very flat jib (too little sag) is often an indication that the backstay should be eased.

# *Downwind Trim*

## **Mast Rake**

The mast shall be pushed as much forward as possible downwind. Let the backstay out and pull the mastbend inducer to keep the mast forward. The headstay will be loos and allow the jib to be spinnaker like. When the apparent wind is 70 degrees from behind or more the backstay is tightened to give 10-15 cm sag.

## **Main**

The main shall have much draft and the chamber position should be close to the centre of the cord. This is achieved by letting cunningham and outhaul loose. The vang is adjusted such that the top batten is parallel to the boom. Let the boom out to 90 degrees with the wind from the stern. With a wind angle sheet such that the top tell tail flies but is slightly irritated.

## **Jib**

The full length of the whisker pole shall be used and cunningham shall be loose to create clear bows between the luff buttons

## **Sailing angles**

In very light conditions a shy wind angle is necessary to make the jib fly. In other conditions angles between 0-20 degrees form a dead run give the same VMG and you can let tactical decisions decide the angle. If you have options chose the one closest to the mark.

# Trim Table

Take the table below with you in the boat as a helper finding the right base trim.

Wind (m/s)	Mai Sheet (units)	Backstay (units)	Outhaul. (units)	Spreader (units)	Jib Foot (cm)	Jib
1				5	-2	
2	2	0	7	4	-1	
3		1,25	5		2	KCC
4	3		3	3	2	DF1
5		1,5	3		3	
6	4	2	2	4	3	
7		2,25				KCH HA
8	5	2,5	1	8	4	
9		3				
10->	6	3,25	1	9	5	



Stellan Berlin finishes as World Champion  
Miami 2002