



## IF

### TUNING

### ON THE WATER

### ASK THE EXPERTS

## Introduction

North Sails tuning guide is written to help you get the best performance from your North Sails. The measurements and settings included in this guide are the ones that we have found to be the fastest settings for the IF-Boat. Since crew, wind and sailing conditions vary, you may find slightly different settings are better for you. However, by following these instructions, you can be confident that you are well set up to win at any level. We believe this guide will make your sailing experience simpler, more successful and most of all more fun.

The tuning guide was written by Björn Österberg at North Sails One Design.

## Preparation

This chapter explains rig tuning and the trim control systems required to be able to get full potential from your North Sails. Always consult the Class Rules while working with your boat and equipment.

### Mast Rake

The IF-Boat has relatively little helm and is, unlike most boats, even more neutral when heeled. To get enough helm for good pointing ability upwind the mast is raked aft. The length of the headstay determines the amount of rake. We recommend a total headstay length of 8400mm. You will most likely need to add one or two toggles to the original headstay to bring it up to this length. A popular alternative is to get a new headstay without turnbuckle made to the total length of 8400mm.

While measuring the rig you can also check other measurements including J-measurement an spinnaker pole length to make sure they are on maximum and according to the class rule.

### Rig Tension

IF-boats are typically 20 –30 years old and therefore checking points that effects rig tension can be worth while. The cabin top underneath the mast step and the hull around the chainplates are the most critical areas. A "knee", which strengthens the hull and deck at the chainplates, is allowed. This procedure is described in the class rules.

The settings for rig tension and prebend should be taken with no load on the backstay. Using a tension gauge helps finding and repeating a desired rig trim. We use the Loos Tension Gauge mod. B rig. The base setting is 22 (220kg) headstay tension. To achieve that the values for the upper and lower shrouds are 37 and 20. In certain conditions, when the boat needs a lot of power, a looser rig set-up with a headstay tension of 18, can be worth trying. A looser headstay adds power to the genoa, making it easier to build and maintain bosppeed.

### Prebend

The tension of the lowers affects two things. Adding tension to the lowers increases tension in the forstay. It also affects the amount of prebend in the mast. The amount of prebend determines the amount of camber in the mainsail. Your North manisail is designed to a prebend of 20 mm. Setting your rig with a greater prebend will flatten your mainsail. Setting the mast with less prebend, a straight mast, will add more power to the mainsail.

### Spreader sweep

According to the class rule the spreaders has to be able to move for and aft in the spreader brackets. Reducing the aft movement of the spreaders creates a better support for the mast. Using a string, tie the shrouds to pull the spreaders back as far as they will go. Then measure 280 mm from the string to the aft face of the mast to get the recommended sweep.

### Trim Decals

Your sail is delivered with 4 small and 6 large trim decals. The small decals can be used for outhaul and other small range adjustments. We use the large decals for genoa halyard, genoa cunningham, genoa- and main tracks. Cutting the decals into "loose" numbers allows you to match the numbers to positions

on genoa track.

#### **Mainsheet Traveler**

The main traveler has to be easy adjustable. A low friction traveler car with a 2:1 purchase will ensure that adjustments can be made even in heavy conditions.

#### **Outhaul**

With eased outhaul the elliptical foot panel gives the mainsail a deep and smooth shape. When tensioned for upwind sailing the lower half of the mainsail is flattened. The purchase of the outhaul should be at least 6:1. The tailing end can either stop underneath the boom (as shown) or be lead to the cabin top.

#### **Cunningham**

Cunningham adjustment affects draft position. With loose cunningham the draft will be further aft. When the cunningham is tensioned the draft will move forward and open the leech of the mainsail. A 3:1 purchase lead back to a cleat on the cabin top ensures easy adjustment.

#### **Vang**

We use the vang mainly to adjust mainsail twist on downwind legs. The vang can also be used to help the mast bend in the lower sections on a heavy air beat. Using a tight vang while manoeuvring in the pre-start will make the boat accelerate faster. An 8:1 purchase with an easy to reach cleat is recommended.

#### **Backstay**

The backstay is the key to balance and speed in medium and heavy air. It has to be easy adjustable even when the crew is hiking from the windward side of the cockpit. The backstay can either be lead to both sides of the cockpit or to a center cleat with the line lead underneath the hatch (as shown). We recommend minimum 16:1 purchase.

#### **Inner Genoa tracks**

The genoa has a flat leech section that allows us to sheet the genoa on an inner track in all conditions. The position of the track is 100 to 150 mm inboard of the standard track. The aft end of the track is 600 mm forward of the cut-out in the gunwale. The track is 500 mm long. Because of the low clew of the genoa it is important to have the spacing of the trim positions tight enough. Drilling an extra hole between factory holes, bringing the spacing down to about 50 mm will do the job.

#### **Genoa sheeting winches**

Sheeting the genoa from winches on the cabin top gives the trimmer a better position. Further forward and facing in to the slot between genoa and main it is easier to get the right genoa trim. With low handle winches, such as Andersen, the handle can be left in the winch while tacking.

#### **Genoa halyard**

Put a mark on the genoa halyard in front of the cleat. A "North Sails Trim Decal" underneath the mark helps keeping track of the hoist. Adjusting luff tension can be done with either halyard tension or a genoa cunningham.

The cunningham alternative has the advantage of not affecting the head of the sail and therefore leaving the sheeting position unaffected. It is easy to underestimate the force in the cunningham and use a too stretchy rope. We use a 6mm spectra core with a 6:1 purchase arrangement on the aft starboard side of the cabin. Since the tack of the genoa is about 200 mm above deck it is important to keep the sail forward towards the forstay. If this is not done properly the sheet tension will pull the tack of the genoa aft, causing a wrinkle from the first luff hank. If you use a rigging screw at the lower end of the forstay, just tie a 4mm spectra loop twice around the rigging screw and the trough the tack ring. If you are using a cunningham you might want to put a thin aluminium pipe around the rigging screw to reduce friction. Having a full-length forstay use the extra luff hank right close to the tack ring.

#### **Tweakers**

Tweakers (twing lines) serve many purposes: they keep the afterguy out of the way of the crew on reaches. They reduce the need a forguy and keep the spinnaker more stable in manoeuvres making it easier for the bowman. We put the tweaker blocks at the forward end of the standard genoa tracks where the boat is at maximum width.

## Sailtrim

The IF sails well unreefed even in heavy air. Using the jib in winds above 18 knots will make both manoeuvres and keeping boatspeed easier. Because the centre of effort moves forward with the jib, pointing is the critical thing with the jib. The confident crew will therefore use the genoa in all windstrengths because of the importance of good pointing, especially in bigger fleets. We recommend using the inner genoa track in all conditions.

A good way to move quickly up the learning curve is to mark all trim control lines and positions. This will enable you to copy a trim you have found fast in the past, giving you confidence in boatspeed and allowing you to concentrate more fully on tactics.

## Mainsail

In very light air the mainsail should be trimmed with an open leech to allow the windflow to follow the sail. The traveler is kept about 300 mm to windward of the centerline with the sheet tensioned to position the boom about 200 mm to leeward of the centerline. Check that the top telltales flow to make sure the leech has enough twist.

Keeping the crew weight to leeward in these conditions helps opening the leeches of the sails. The

outhaul is set at #3 on the small trim decal on the boom. When the breeze builds to about 6 knots the sail can take more sheeting while still maintaining good windflow. The traveler is dropped to about 100 mm to windward and the sheet is pulled to centre the boom. In light air when the mast is straight the cunningham should be slack and small horizontal "sped wrinkles" should be seen in the luff of the sail.

#### Light air

In the 6 to 12 knots wind range the mainsail can be sheeted tight, letting the top telltale stall at about 50% of the time. A closed leech puts priority on pointing whereas a more open leech gives extra speed. In choppy conditions it pays to ease a few inches in the sheet after tacking to help acceleration. When the boat is up to speed the sheet is pulled tight and the focus is back on pointing. At 10 knots you can start flattening the main by pulling the slack out of the backstay and tightening the outhaul. [mi:1758 p=s mw=400]

#### Medium air

In about 14 knots of wind the boat will start to heel with the trim described above. The solution is to tighten the backstay. This will depower the main and twist its upper part. The boom can still be held on the centreline to match the overlap of the genoa. To keep the draft position in the middle when bending the mast you need to pull the cunningham. A new sail needs only little cunningham tension whereas an older sail requires relatively more luff tension.

#### Heavy air

In winds above 16 knots the mainsail is depowered and used mainly for controlling helm. Controlling the power with backstay works well in steady wind conditions. In gusty conditions this method is too slow and we have to work the traveler instead. Make sure the boat is well-balanced in heavy seas. With the right trim the boat should flow naturally through the waves. If the boat feels "sluggish" it can be a sign that the main is giving too much power. With the right, open-leech, trim the boat will be easy to steer and accelerate quickly after big waves.

## Genoa

To get the right clew height you need to set the tack about 150 to 200 mm above deck. Regardless if you use cunningham or not, it is important to make sure the tack does not move aft with increased sheet tension. If you use a rigging screw at the lower end of the forstay, tie a 4mm spectra loop twice around the rigging screw and the trough the tack ring. With a full-length forstay use the extra luff hank right close to the tack ring. The best reference for genoa trim is the distance between the leech and the spreader tip. The following measurements refer to spreaders with reduced sweep (as described earlier). For standard swept spreaders add 50 mm to the measurements below.

#### Light and medium air

The right genoa lead for light and medium wind is set when the luff of the genoa breaks evenly from top to bottom. If the top luff breaks earlier the lead is too far aft. In light air the luff should be tensioned so that a few wrinkles remain. Under 6 knots the distance between the leech and spreader tip is 100 mm. When the breeze builds to 8 knots the luff is tightened to remove wrinkles and the genoa is sheeted to 20-30 mm from the spreader tip. In flat water the sail can be sheeted all the way in to the spreader. With tighter sheeting the car has to be moved aft about 50 mm to ensure an even break in the luff.

#### Heavy air

As with the mainsail the genoa should be flattened and twisted in heavy air. The luff is tensioned and the lead is moved another 50 – 100 mm aft. The upper part of the luff will now break earlier than the bottom part. The foot of the sail is sheeted tight around the chainplates and the leech is further away from the spreader. In 14 knots the distance is 100 mm. With winds above 20 knots the lead is moved further aft and the distance from leech to spreader is 250 mm. This allows the mainsail traveler to be dropped without closing the slot too much. The harmony between main and genoa is important. An adjustment in the genoa is normally followed by a matching adjustment in the main. In stronger winds the amount of backwind in the main will give a hint about the relative trim of the sails. Compared to other boats the IF can be sailed very close to the wind (with a considerable break in the genoa luff) in strong breeze and flat water.

## Downwind Sailtrim

Because we no longer sail reaching legs this part only describes downwind (VMG) sailing. The rule-of-thumb for spinnaker trim is to keep both clews on the same height and the spinnaker boom in right angle to the apparent wind. In light winds this will mean a lower boom and for heavy air the boom can be carried higher. If the spinnaker boom is on an adjustable track on the mast, keep the boom horizontal to get maximum effect. The afterguy (brace) should be set with a tight tweaker. The exception is when the boat is sailed on very deep angles where the tweaker should be eased 500 mm to avoid a sharp bend at the tweaker block.

The spinnaker sheet is eased just to get a slight curl in the luff of the spinnaker. In light airs sailing higher angles even on downwind legs can use the effect of the apparent wind. The angle determines by the spinnaker sheet pressure. Communication between spinnaker trimmer and helmsman is the key. When the pressure builds the trimmer tells the helmsman to bear off and when pressure drops the trimmer tells the helmsman to luff up.

In winds above 10 knots the main is eased all the way to the shrouds. In lighter winds when steering higher angles the main is sheeted tighter to provide a slot between spinnaker and main. To give the mainsail powerful and even camber, make sure the outhaul is eased to #5 and the cunningham and backstay is slack. The vang should be tensioned just enough to keep the top batten parallel with the boom.

Spinnaker sailing is easier if you get rid of the genoa. Roll the genoa parallel to the headstay. Start with the clew and roll the sail vertical behind the headstay. Have a 500 mm rope and tie it around the sail and headstay. When the genoa is not furled make sure the genoa sheet is loose. An overtrimmed genoa will create turbulent air for the spinnaker, making it unstable and hard to trim.

## Crew Work

The IF is normally raced with 3 persons. It is not possible to describe the "perfect" crew organisation for all boats. The knowledge, experience and the ambitions of the crew should determine who does what. The idea with the following chart is to present a proposal and an inspiration to make your own chart for your boat. By making a chart you have to think and talk through the crew work. By assigning a job description to each position, a new crew member can be easily integrated into your boat handling team.

In organising the crew of your boat your goals should be to:

- Involve all crew members in each manoeuvre
- Avoid having crew members cross paths with each other
- Talk about and decide tactical matters to involve the whole crew

### Spinnaker handling

We hoist and retrieve the spinnaker through the foredeck hatch. We like this method because the spinnaker has a shorter distance to get from stored to set, especially at gybe sets. With the traditional way of hoisting from the cabin hatch the spinnaker has to be led past the boom, vang and shrouds before getting in position. Another advantage is to have the bowman work from a position around the mast. This will make the cockpit less crowded and keep the crew weight well forward.

A short description:

To allow the spinnaker to be hoisted from the mast, exit the spinnaker halyard 2000 mm above deck on starboard side. Mount a cleat 400 mm underneath the exit. The forward closing fittings of the foredeck hatch can be removed while racing. The hatch is heavy enough to keep the water out even in rough conditions.

Store the spinnaker in the foredeck hatch. Have the head and clews sticking out a few inches. The halyard is led forward to the forestay to keep it out of the way of the genoa. Use the gunwhale fairlead or a hook mounted close to the headstay.

Organisation	Helmsman	Cockpit	Bowman
Before the start	Steering, strategy	Sailtrim, strategy	Wind observations, compass, bearings, strategy
Start	Steering, strategy	Genoasheet, leeward lookout, tactics	Compass, time, flags
Upwind	Steering, boat to boat tactics, mainsheet	Tactics, genoa trim	Wind and boat observations, compass bearings
Tacking	Steering, tactics, mainsheet	Genoasheets, both in light air, new sheet only in heavy air	Release old sheet in heavy air
Preparing top rounding	Steering, mainsheet traveler	Toppinglift and forguy (bearaway set), set tweekers	Pole on
Bearaway set	Steering, boat to boat tactics, mainsheet	Spinnaker sheets. Pay out spinnaker if cabinhatch hoist	Hoist spinnaker, roll genoa, release outhaul and main cunningham
Jibe set	Steering, boat to boat tactics, mainsheet, jibe main	Pull around genoa sheets, trim spinnaker sheets, pull topping lift	Hoist spinnaker, pole on, roll genoa, release outhaul and main cunningham
Downwind leg	Steering, boat to boat tactics	Trim spinnaker sheets	Wind and boat observations, compass bearings, tactics, clear halyards, fine tune vang
Jibe	Steering, boat to boat tactics, mainsheet, jibe main	Trim spinnaker sheets, jibe tweekers	Jibe pole, adjust forguy (if in use)
Preparing leeward rounding	Steering, pre-set main traveler and backstay	Trim spinnaker sheets, jibe tweekers	Stretch cunningham and outhaul, remove spinnakerboom
Takedown	Steering, mainsheet	Spinnaker sheets, genoasheet	Remove spinnaker
Leeward rounding	Steering, mainsheet	Genoasheet	Fasten spinnakerfall

If you have any questions regarding trim or IF-Boat sailing in general, please contact [Theis Palm](#).

Good luck on the water!

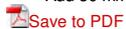




## IF

TUNING	ON THE WATER	ASK THE EXPERTS	
<b>IF On the Water</b>			
<b>Wind (knots)</b>	<b>0-6</b>	<b>8-14</b>	<b>16+</b>
<b>Rig tension, Headstay</b>	18-22	22	22
<b>Mainsheet Traveler</b>	300 mm to windward	200-100 to windward	Centre-100 mm leeward
<b>Mainsheet</b>	Top telltale flowing	Top telltale 50% flowing	Top telltale flowing
<b>Backstay</b>	Slack	Pulled to remove slack	Tight
<b>Cunningham Main</b>	Slack	Slack - remove wrinkles	Tight
<b>Outhaul</b>	#3 on trim decal	2-0 on trim decal	0 on decal (to band)
<b>Vang</b>	Slack	Slack	Tight with sheeting
<b>Genoa lead position</b>	Even break from top to bottom	Even break from top to bottom	Earlier break in top
<b>Genoa sheeting*</b>	100 mm from spreader	20-50 mm from spreader	100-300 mm from spreader
<b>Genoa lufftension</b>	Small wrinkles	No wrinkles	Tight

\* Add 50 mm for spreaders with unrestricted sweep



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