



## J 24 Boat Speed Guide

I hope you enjoy this third edition of the Shore Sails J 24 tuning guide. A lot has changed since the last printing. Some of the changes are minor, but the way we sail J 24 's has evolved steadily over the last two and a half decades. It's my belief that this evolution has not stopped, or even diminished. The next quarter century will bring even more talented sailors to the J 24 . These creative minds will forever push our knowledge and technology forward. The moment we become complacent is when we begin to lose ground.

Sailboats are marvelously sophisticated machines. They are conceived, constructed and utilized by human beings, but their grace and beauty is a reflection of nature. Sailing is challenging because nature is so magnificently complex. I can think of no other endeavor that brings people closer to the natural world than that of sailboat racing. Therein lies the beauty of sail. By advancing our knowledge we move closer to understanding the perfection of nature.

Art is the application of knowledge and skill.

Science alone will not result in faster J 24 sails. Technology, experience, and human intuition, are what make Shore J 24 Sails as close to perfection as humanly possible.

We didn't create that burning desire to succeed ... we just show you how to do satiate it.

Geoff Moore, Shore Sails Ltd.

Boat speed is not everything. To win against good competition, you need good starts, good strategy, good crew-work, good mark roundings, and always a measure of luck, but boat speed sure helps; it does wonders for everything else. This guide was written to help you get maximum boat speed from your J 24 using Shore Sails.

**Shore Sails** are fast, but like any sails, they can provide the optimum performance you want only when your J 24 is properly prepared, the rig properly tuned, and the sails properly trimmed. This guide provides the essential information that you will need regarding

- [Boat Preparation](#)
- [Rig Tuning](#)
- [Deck Layout and Interior](#)
- [Sail Trim](#)
- [Trouble Shooting, Diagnoses and Cures for Common Boat Speed Ailments](#)

J 24s exhibit subtle but important individual differences that affect each of these three components, so rather than simply offering a set of simple recipes for maximizing your boat speed, this guide also explains why we make the recommendations that we do, so that you'll know how to adjust our recommendations to fit your J 24 .

## Boat Preparation

Boat preparation focuses on the bottom, the rig, the deck layout, and the interior. The aim is to optimize the dynamic balance of the lifting surfaces (keel, rudder, hull, and sails); and the distribution of weight.

### Bottom Preparation

Bottom preparation is toilsome work. If you do it yourself, you feel it in the lower back and arms; if you have it done professionally, you feel it in your wallet. Either way it is costly. But the investment in bottom preparation, especially in the keel, is essential for optimum performance: if you don't have a well-prepared bottom, you will not be fast.

Keel preparation is especially critical (and difficult). Optimum performance from the J 24 , both up wind and downwind, requires that your keel have an efficient profile that conforms closely to the minimum thickness and maximum depth allowed by J 24 Class Rules. To achieve the desired profile, you (or the professional who does the fairing) will have to have a set of rigid templates to work from; An epoxy-based fairing compound should be used. J 24s have a notorious "lee helm". This lee helm problem can be significantly reduced by fairing the keel in such a way as to shift its lateral resistance forward.

The keel should be faired so that:

- the trailing edge of the keel is at the maximum forward position permitted by Class Rule 3.3.3
- the chord section lengths are the maximum permitted by Plan C of the Class Rules

This generally requires shaving the trailing edge of the keel and then building up its leading edge.

### Rudders

J 24 rudders belong to one of four generations, depending on their date of manufacturer. If your boat is equipped with one of the newer rudders (boats numbered 4200 and above will have them), nothing much needs to be done. These rudders come from the factory faired to the desired minimum thickness specified by Class Rules (Plan D). About the only thing these rudders need is a bit of sanding to remove minor surface imperfections.

If, on the other hand, your boat is equipped with any of the older especially the first generation rudder, these rudders will be considerably thicker than the desired Class minimums, especially in its aft sections, with the consequence that the rudder will develop more drag. The fiberglass skin on these balsa-cored rudders is too thin to permit the grinding down necessary to achieve the desired minimum thickness and doing so will dangerously weaken the rudder. Your only option here is to buy a newer generation replacement. New rudders have to be bought from a licensed builder. The best way to determine whether you need a new rudder is to measure your rudder with a class template. You will also want to make sure the rudder is mounted at the minimum depth as per class rules Plan D. This further helps to move the center of lateral resistance forward.

## **Hull Preparation**

J 24 hulls generally come from the factory with characteristic hollows located aft of the keel along the center seam. As these boats age they sometimes develop hollows fore and aft of the hull cross-section where the bulkheads join the hull. These and any other hollows should be filled and faired, as permitted by Class Rules (3.2.1). You should also fill and fair the sink drain through-hull. Once the bottom fairing is complete, faired areas should be covered with an epoxy barrier coat to prevent the hull from absorbing any water. If the boat is to be dry-sailed, the entire epoxy bottom should be wet sanded to 600 grit. If the boat is to be wet-sailed, the bottom should be painted with a very hard anti-fouling paint and then wet sanded.

## **Rig Preparation**

The primary goal is to further combat the "lee helm problem" by moving the sail plan as far aft as Class Rules allow. This is achieved by ensuring that mast length is at class minimum, head stay length at class maximum, and J dimension at class maximum. (Minimum mast height and maximum head stay length enable us to rake the mast back while at the same time preserving the headstay sag necessary for optimum performance.)

## **Headstay Length**

Maximize your headstay. Class Rules (3.5.3c) require that the distance between the center of the fixing point of the forestay on the mast and the intersection of the stem line and sheer-line be no more than 8670 mm (341.34 in). This is equivalent to a forestay length of 8605 mm (338.78 in), measured between the center of the holes in the fittings at either end of the forestay. You may need to add a toggle to achieve the class maximum.

## **Spreader Sweep-Back**

Spreader sweep-back has a significant effect on the amount of mast bend (and hence on forestay tension) generated under different shroud tensions. Too little sweep-back makes it difficult to achieve the needed pre-bend for light air without over tensioning the forestay; too much sweep-back makes it difficult to achieve the needed forestay tension without inducing too much mast bend.

Before adjusting the sweep-back, be sure to check the length of each spreader. They should both be the same, about 770 mm (30.31 in).

Achieving the desired sweep-back is relatively easy if your spreaders are attached to the mast by means of a "through-bar" passing through the mast that fits into the extruded interior section of newer spreaders: Through-bar spreader brackets are not adjustable. They come from the factory with the correct spreader angle. However the spreader bracket or the spreaders may need to be replaced as the aluminum wears away and the spreaders migrate aft. Older spreader-mast attachment schemes are more troublesome. Take some time to examine the plastic spreader tips. A minor failure in them has been known to cause catastrophic mast failures. File the lip of each of these spreader caps flush with the spreader and then tape them. This will prevent the spinnaker halyard from snagging between the spreader and the mainsail.

Spreader sweep-back is measured as follows: tie a string between the two upper shrouds where they pass through their respective spreader tips; draw the string tight, pulling the spreaders back as far as possible; spreader sweep-back is the perpendicular distance from the string to the aft face of the mast. The optimum sweepback is 155-165 mm.

## **Running Rigging**

Our recommended lengths for running rigging are: (Fiber technology is moving very fast. It seems like every time I replace a halyard there is something newer and better available, so check with a good rigger on the latest high-tech fiber lines )

- main halyard, 65 ft
- spinnaker halyard, 55 ft
- mainsheet, 60 ft
- spinnaker sheets, 55 ft

Rather than splicing, I like to tie the shackles on with secure knots. When they start to age, I can cut a few inches from the working end and extend the life of the halyard.

### **Mast Length**

The class measurement of mast length requires a special jig, so it is best to let your local class measurer measure the mast and tell you how much can be cut off the base. The measurement jig is rather crude, so cut the mast 3-4 mm longer than the minimum. That way you won't find yourself shimming the mast step when the next class measurer finds the mast too short. Be aware that if you do cut your mast down to minimum you may have to shorten the backstay and shrouds as well!

### **J-Dimension**

Block your mast at the class maximum J-dimension, 2910 mm (114.57 in), measured from the front of the mast to the intersection of the stemline and sheerline. Besides shaping the blocks to achieve the maximum J-dimension, you should also make sure that the blocks hold the mast securely in column side-to-side: (refer to Rig Tuning, To Center The Rig) the blocks should not permit any appreciable movement of the mast at the partners. Lubricate the aluminum mast bearing beam so the mast can be adjusted later.

### **Other Helpful Tips**

- If you have an older mast, remove the spare genoa halyard.
- Exit the main halyard through the upper slot on the port side of the mast, the topping lift through the lowest slot on the starboard side, the genoa halyard through the lower slot on the port side, and the spinnaker through a slot located about 7 ft above the deck on the starboard side. Mount Harken Camatic 150 cleats on a pad just below each slot. Use two cleats in a row for the jib halyard. Use a small horn cleat for the main halyard. Cover any vacant slots with sticky-back sail repair cloth.
- Replace the outhaul system in the boom with a 6:1 system using Harken micro-blocks (you'll need a double with becket and a triple) . Use 1/4" low-stretch line.
- If you have not already done so, take advantage of the change in Class Rules and modify your boom vang to achieve an 8:1 purchase. The simplest way to do this is to attach a single (swivel) block to the vang fitting on the boom and run a 8 mm high tech line from the top block of the vang, through the new block on the boom, and back to the vang fitting on the mast.
- Install a 10" dinghy Windex at the back of the masthead crane.
- Replace the standard 4:1 backstay adjuster with a 2:1 system. The 4:1 system is too cumbersome to play quickly, and you don't need the added purchase.

- Cut the tack-pin tangs off the gooseneck. All new J 24 mainsails have floating tacks, so you don't need them.

## Deck Layout and Interior

Over the years, a fairly standard J 24 deck layout has evolved that is efficient for a crew of five weighing close to the maximum permissible crew-weight of 882 pounds. Sail controls should minimize crew movement and leave the cabin top clear. Halyards should be cleated on the mast, with the spinnaker halyard exiting high enough on the mast that it can be jumped on the hoist but not so high that the exit can't be reached in case of a snarl in the halyard. The jib and main cunninghams should be positioned so that they can be adjusted from either rail on upwind legs. The topping lift should be led from the mast to a swivel cam unit located on the cabin top, a foot or so aft of the mast, where it is easily accessible from the rail, companionway, or from beside the mast. The cam-cleats and bull's eyes for the twings should be located so that they can be easily reached during jibes while still forward enough to maintaining pole stability.

There is, of course, nothing sacra sanctum about any specific layout. If there is a layout that would work better for your crew, use it. Don't be afraid to experiment. You can often get some good ideas by checking out the layouts of the top boats at a major regatta.

A few helpful hints

- Most of the top boats sail without secondary winches
- Twings are almost always used in lieu of a foreguy, except in very light and/or sloppy conditions when a foreguy will help stabilize the pole. A knot should be tied in the topping lift about 11 ft above the clip, so that if the topping lift gets free during a maneuver it cannot be raised out of reach of the foredeck person.
- The two jib tack horns on the stem head should be removed and two 1/4" holes drilled in the forward end of the centerline brace of the stem fitting, the forward hole to take a turning block for the jib cunningham pennant, the aft hole to take a snap shackle for the headsail tack. The jib cunningham should have the maximum legal purchase of 6:1. When tensioned, it should exert a pull parallel to the headstay, not aft.
- Two holes, evenly spaced, should be drilled between each factory hole on the genoa and jib tracks. These holes should be numbered, using model paint or nail polish. (Before drilling and numbering the holes, verify that the tracks are equidistant from the stemfitting.)
- The choice and layout of the helmsman's sail controls deserve careful consideration. The traveler may be equipped with a Harken windward sheeting car; the traveler bar it self should be equipped with a comfortable foot rest. The backstay should cross the cockpit forward of the traveler, and lead to where it is easily accessible from the helmsman's upwind position.
- Pass the backstay adjustment lines through two bullet blocks tied close together on the stern pulpit. This will keep the backstay lines clear of the tiller extension.
- A mast-mounted digital compass is a very useful piece of equipment that most J 24 sailors would not do without. Many boats have dual displays
- Take advantage of the change in Class Rule 3.2.5, which lowers the minimum height of lifelines to 500 mm above the shear line. The lower

lifelines allow the genoa to slip over the forward stantion easier, however many crews find it more comfortable to leave the aft stantion at full height. Cutting and retapping the bases of the stanchions is a simple task. You should also drill a weep hole in each base.

- Finally, if you launch/haul your boat frequently, it's a good idea to install an exit port for the lifting strap at the aft end of the cabin top.

## **Interior**

The interior of the J 24 do one thing well: they collect all sorts of junk. Interior preparation consists primarily of exercising weight discipline. Your boat should be sailed as close to the class minimum all-up racing weight of 1375 kg as possible. To the extent permitted by the Class Rules, this weight should be concentrated low and amidships to minimize the boat's pitching moment. This means, among other things, emphasizing to all the crew the importance of carrying aboard only such gear as they genuinely need: there is little point fretting about the odd tool or mooring line, if each of your crew comes aboard with an overstuffed sea bag. The lazarettes should be kept free of gear, and securely latched (J 24 's have been known to sink when a lazarette opens during a capsize) . Make full use of the locker under the sink and the big locker on the port side. Sails and crew gear should be clustered aft in the V-berth, or up against the main bulkhead. Do not use cushions as optional weight. They absorb water, grow mildew, and take up too much room.

On newer J 24s , the mast step bearing beam is bolted to the main bulk head (by means of a short L-section) to prevent any downward movement or pumping of the beam under compression loading of the mast. If you have an older J 24 whose bearing beam is not bolted to the main bulkhead, then you should effect this very simple modification, using a 3" length of 1/4 x 2" stainless L-section.

## **Rig Tuning**

There is a lot of mysticism about "tuning" the rig. You know the scene: Some rock-star magician steps aboard your boat, twangs the wires while listening intently to the tone, then proceeds to tell your fortune, mumbling something about "sags," "bends" and "butts." There is nothing magical about rig tuning, but it is not something that can be reduced to a cookbook recipe either. The basic ideas are really quite simple. In order for your main and genoa (or jib) to perform optimally, you must have the rig tuned in such a way as to induce the appropriate mast bend and forestay sag.

### **Why Adjust the Rig?**

Mast bend and forestay sag are controlled by; shroud tension, mast butt position, spreader sweep back, and backstay tension (and to a lesser degree by mainsheet and vang tension).

In order to understand what we have to achieve by rig tuning, let us begin by thinking about masts. In general, masts are too bendy in heavy air and they are too stiff in light air. In heavy air it is impossible to pull the headstay tight if the mast keeps bending, and in light air the mast tries to spring up too straight. For these reasons, it is faster to make adjustments to the rigging. But there are still a couple of things that we need to consider: for instance, the arcane matter of mast butt placement, and the matter of getting the mast centered and in column in the boat.

### **To Center the Rig**

- Tighten the uppers to approximately 500lbs (20 on a Loos gauge) and leave the lowers slack. Measure back 10 ft from the stem fitting to the rail on both sides, making permanent marks on the rails.
- Hold the cleated genoa halyard with two fingers and using maximum downward pressure touch the mark on the rail with the halyard shackle.
- Repeat the process on the other side.
- Adjust the uppers until the top of the mast is centered.
- Slide the mast side-to-side at the partners until the lower mast lines up perfectly straight with the upper mast. When sighting the mast, place your eye close to the sail track, and as low as possible. Use the sail track as an indicator of the side-to-side bend. You may find that the mast has a lateral S-shape that you are unable to tune out. This is probably caused either by an asymmetry in the spreaders (different length, sweep-back, or inclination) or, more likely, by a lateral force that is being exerted on the mast at deck level (either because the mast chocks do not center the mast in the hole or because the hole itself is not centered with respect to the chainplates). The problem can usually be rectified simply by shaving and shimming the sides of the mast chocks appropriately.)
- Be careful to maintain maximum J dimension. Tension the lowers equally to 15 on a Loos gauge. Be careful to keep the mast straight side to side. This is your light air setting. Follow the rig tuning chart for all other conditions.

### **Mast Butt Placement**

Good boat speed in all wind and sea conditions depends on proper mast butt placement. Moving the mast butt forward straightens the mast, and tightens the forestay. Moving the mast butt aft has just the opposite effect.

If the mast butt is positioned too far forward, the mast will have too little pre-bend resulting in a main that is too full and susceptible to backwinding. The headstay will be too tight resulting in a genoa that is under-powered.

If the mast butt is positioned too far aft, the mast will have too much pre-bend resulting in a main that is too flat and susceptible to "over-bending". The forestay will be too loose resulting in a genoa that is overpowered.

The goal of mast butt placement is to position the mast butt at a point on the bearing beam so that a suitable choice of shroud tensions will achieve good performance through the widest possible range of wind conditions!

The proper position of the mast butt for **Shore Sails** is specified by one of the following two measurements:

- The straight line distance (in the V-berth) from the aft, lower edge of the nut that secures lowest bolt of the vertical face of the stem-fitting to the forward face of the mast where it meets the "I" beam. The correct distance is 2830 mm (111.42 in).
- Or, you can measure 45mm aft of the "neutral position".

### **To Find the Neutral Position**

Lube the I beam before you step the mast. Step the mast and attach the headstay. Block the mast at max J. Center the rig. Tension the uppers until the headstay reads 5 on a Loos

gauge. Sight up the aft surface of the mast to make sure it is absolutely straight fore and aft. If it is not straight, slide the mast fore or aft on the I beam until it is. The mast is now in the neutral position. Permanently mark the I beam on the forward edge of the mast step. Pull the mast aft on the I beam 45 mm and pin it.

### **Backstay**

Depth in both sails can be incrementally adjusted by pulling on the backstay. The point where the mainsail starts to turn "inside out" (diagonal wrinkles) is a great visual aide to maximum backstay tension. Any bend beyond that point is detrimental to overall performance. In heavy air, we use very tight lower shrouds to restrict the mast bend. We can then add additional tension on the backstay without over-bending the mainsail. This additional tension is transmitted to the headstay where it serves to flatten the headsail.

### **Prebend Light Air**

The exact opposite to overbending can happen in light air. The luff curve in the sail has too much curve in it relative to the mast, or, the mast is too straight. This is much harder to detect than an overbend wrinkle, but it is every bit as disastrous to performance. The visual indicator of this problem is simply a mainsail with too much draft, too far forward, or a knuckle right around the spreader window area. While we want the sails to be full and powerful, we don't want them to be too full, because an overly full sail creates too much drag. So we have to flatten them a bit.

We could flatten the sail by tensioning the backstay, but we would pull the headstay too tight in the process. We solve this dilemma by pre-bending the mast: we induce the needed mast bend by tensioning the uppers. Tensioning the upper shrouds pulls the top of the mast aft, inducing mast bend, but because the compression force exerted by the uppers pulls mostly down rather than back, the forestay is not significantly tensioned. This is creating the effect that we are inducing bend by blocking the mast relatively forward at the deck level while pushing against the upper shrouds.

### **Prebend Heavy Air**

Just as we used the shrouds to pre-bend the mast, we can also pre-tension the forestay. By properly tensioning both the uppers and the lowers, we are able to pull the mast back, and tension the forestay. We are still going to need some pre-bend, but the amount of pre-bend is going to be considerably less than that needed for light air. This is because we will add plenty of mast bend when the backstay is pulled on hard.

We have seen that shroud tension is important only insofar as it affects forestay tension and mast bend, and we have seen that by suitably tensioning the uppers and lowers we can induce the appropriate amount of mast pre-bend and forestay pre-tension for arbitrary wind and sea conditions.

### **Forestay Tension & Mast Prebend for Shore Sails**

True Wind Speed-knots	0-4	5-8	9-12	13-16	17+
Forestay Tension	-20	-15	-5/0	10+	20+
Mast Prebend	2.5"	2"	1.75"	1"	.75"

All tensions are measured with a Model B Loos Gauge, without sails rigged and with the backstay slack (i.e., the car riding about 8 inches below the bridle).



The negative numbers are simply an extrapolation of the gauge's scale. Mast pre-bend is the chord depth, measured at the point of maximum chord depth, of the chord formed by the mast luff groove and the main halyard tensioned and held tight against the luff groove just above the boom gooseneck. The obvious question, here, is what shroud tensions generate the foregoing numbers. There is no cookbook recipe for this, every boat and mast will require slightly different shroud tensions. However, if your rig preparation follows our recommendations, then the following numbers should be fairly close.

### Recommended Shroud Tensions for Shore Sails

True Wind Speed-knots	0-4	5-8	9-12	13-16	17+
Upper Shrouds	19	23	26	29	30
Lower Shrouds	13	18	25	29	31

All tensions are measured with a Model "B" Loos Gauge

Customizing the foregoing shroud tensions is quite easy: Dial in each of the pairs of shroud tensions and check the induced forestay tension and mast pre-bend. If they do not induce the right numbers, play around with the shroud tensions, bearing in mind that the mast butt placement has a dramatic impact on these tensions: If you have trouble inducing the right numbers, check your setup. Repositioning the mast butt slightly aft generates more pre-bend and higher shroud tensions with less forestay tension, moving it forward has the opposite effect. Once you've worked out your numbers, write them on the deck next to the chain-plates or post them on the bulkhead next to the companionway where you can find them when you need them.

The recommended forestay tension for very light air (0-4 knots) is very loose. You definitely do not want to be any looser than this, or you will be very slow. By the same token, you don't want to be caught with this loose a forestay in a freshening breeze; otherwise, you will find yourself both slow and unable to point. If you are starting in very light air and there is any chance that the wind may build, then tune the rig for the next wind range (5-8 knots).

### Helpful hints

- Once the rig has been tuned for the prevailing wind and sea conditions, the backstay turnbuckles should be adjusted so that when the backstay is completely slack, the car hangs 6-8 inches below the bridle, except in heavy air when the turnbuckles should be adjusted so that when the backstay is slack the car rides firmly against the bridle. (Incidentally, when tuning the rig, make sure the backstay is completely slack; otherwise forestay and shroud readings will not be accurate.)
- An important precaution: The forestays on some boats simply won't generate the recommended heavy air tension of 20+, regardless of how much you crank down on the shrouds, in which case you'll have to live with what you can get. You can determine the maximum headstay tension on any boat by progressively increasing shroud tension while monitoring forestay tension. If you reach a point at which increasing shroud tension results in no further increase in forestay tension, this will be all you get. Higher shroud tensions risk damage to the boat, with no improvement in performance.

### Sail Trim

Sail trim is the third and final ingredient in the quest for optimum boat speed. This section of the guide provides information on trimming your **Shore** sails that should help you get the most speed from them.

### **Mainsail Trim**

The main halyard should be cleated with the headboard at the black-band and checked routinely for stretch. In 5-12 knot range, in smooth water, the traveler should be positioned well-to-windward to keep the boom on centerline and the top batten parallel or slightly to windward. (It is helpful to have the centerline marked on the stern pulpit so that a crew member can check the boom's position from time-to-time.)

As the wind builds, you will eventually reach a point at which even with maximum sail controls, you find that you must feather the boat up too high into the wind to keep the boat sailing flat (less than 12 degrees of heel). At this point the traveler might be eased, permitting the boom to move below centerline and thus reducing heeling moment. You may have to increase vang tension so that when you ease in the puffs the boom does not rise too much.

In very light air (less than 5 knots), the traveler should be positioned all the way to windward. In very light air and/or choppy water, the mainsheet should be adjusted to keep the top batten twisted off slightly.

In the 5-12 knot range, especially in flat water, the main can carry up to 3-5 degrees of windward hook in the top batten, stalling the top telltale about 50% of the time. (You can judge the angle of the top batten by comparing it against the masthead crane.) The basic idea is to sail with a tight leech in flat water conditions. Open, twisted leeches work better in conditions where there is pitching and yawing, or when the boat is overpowered.

In heavy air the mainsheet must be used for gust control: "ease, hike, trim," as they say in dinghies. In heavy air with smooth water, a closed, straighter leech with the boom to leeward is faster and points better than a more twisted main.

The outhaul controls only the lower third of the mainsail. On upwind legs, in less than 5 knots of wind, the outhaul should be positioned about 2" from the black band; in 5-12 knots, about 1.5-1"; and above 12 knots, right at the black band. In waves and chop, the outhaul should be eased about 1.5" relative to its flat water setting, thereby making the mainsail deeper and more powerful in its lower section. The outhaul should be eased about 3" when rounding the windward mark and then tensioned again when approaching (before) the leeward mark.

Tensioning the vang flattens the lower part of the mainsail, and prevents the upper leech from twisting off too much. No vang tension is necessary in light to moderate airs, but once the wind builds above 13 knots or so, and the traveler has been eased to leeward, so-called "vang sheeting" becomes essential. The vang should be tensioned sufficiently to keep the upper batten almost parallel to the boom.

Tensioning the main cunningham moves the draft in the mainsail forward. Tensioning the backstay moves the draft aft. The main cunningham should be adjusted with the backstay to maintain the position of maximum draft at an optimal 45%.

### **Backstay**

J 24s are somewhat temperamental: they are easily overpowered and just as easily power starved. It takes considerable skill to sail the narrow range between these two extremes. The backstay functions as the boat's gearshift, allowing us to power up or down as the situation

demands. Tensioning the backstay increases both mast bend and forestay tension, flattening both the main and genoa. Easing the backstay has just the opposite effect. Most upwind legs are sailed with the backstay all the way on, or all the way off; however, in gusty conditions the backstay must be played constantly. Depower before the gusts hit and power up again as you enter the lulls. The backstay should be eased somewhat during the start and at other times when the boat needs power.

Because changes in backstay tension effect both mainsail and genoa trim, both sails must be re-trimmed whenever the backstay is tensioned or eased. Whenever the backstay is tensioned, main cunningham must be applied to return the point of maximum draft to its proper position. The mainsheet must be tensioned to return the leech to its proper twist. When the backstay is eased, both the mainsheet and the main cunningham must be eased.

The backstay should not be tensioned until the wind strength reaches about 12 knots; thereafter it should be tensioned just enough to maintain control of the boat but with sufficient power to be able to drive through any waves and chop.

### **Helpful Hints**

- You can tell if your boom is centered by looking at the part of your mainsheet leaving the ratchet block. When it is straight up, the boom is centered. You can see it from the rail.
- The best way to check your top batten angle is to compare it to the mast head crane. Since the crane is always pointed straight back you don't have get under the boom to sight it. Never completely stall the top batten telltale. In most conditions the best performance is realized when the top of the sail is on the verge of stall, of stalling only part of the time.

### **Genoa Trim**

Halyard tension is used, along with the jib cunningham, to control the optimal position of maximum draft of 35%. In light airs of less than 8 knots, you will need some wrinkles in the luff to get the point of maximum draft back to its optimum position (the scallops in the luff should be about 3/4" deep). As the wind builds above 8 knots, you should progressively tension the halyard, until by 13 knots, you have a smooth luff without wrinkles. The jib cunningham basically serves to fine-tune halyard tension. In chop and waves when steering is difficult, pulling the draft forward with a bit of jib cunningham can make steering easier. In flat water, easing the jib cunningham (or maybe even the halyard) a bit, will provide a flatter entry that will permit you to point a little higher.

In winds above 8 knots, you will be moving at close to maximum boat speed, so pointing well becomes the overriding consideration. In moderate to heavy air, the boat can be pointed high enough to put a significant bubble in the luff of the jib and genoa. This only works if the boat is at full speed. Any sudden reduction in speed, such as a bad wave, will require you to head off and sheet out, and build speed before pointing high again.

In moderate winds (5-12 knots), the Shore genoa performs optimally when it is trimmed about 2-4" off the spreader and touching the chainplates. As the wind builds and you begin to have to feather the boat to windward to keep the boat flat, the fairleads need to be moved progressively aft to flatten the genoa. The heavy air position of the fairleads will be about 4-6" aft of the light air position. At the top end of the genoa's range (16-20 knots), the genoa will be trimmed some 8-12" off the spreader! If the genoa is over-trimmed (sheeted in too tight) or not sufficiently twisted off (fairleads too far forward), the boat will stall or the main will backwind. If the main has too much backwind or is hard to trim, then ease the jib sheet .

**Remember the slogan: "if in doubt, ease it out."**

### **Jib Trim**

When you can no longer keep the boat on its feet or keep the main from back winding, it's time to go to the jib. For a crew weighing close to the class maximum of 880 lbs, you will want to go to the jib in anything over 17-20 knots. Tension the halyard so that the luff is smooth with no scallops. Position the fair leads on the jib track so that when the jib sheet is tensioned sufficiently to bring the leech inside the spreader tip about 2-4", the jib foot should be tight. Generally, this fairlead position will be about 1" aft of the shrouds. The jib sheet must be played constantly, out in the puffs, in during the lulls. Because the sheeting angle is almost vertical, slight changes in sheet tension will have a dramatic effect on leech twist.

### **Spinnaker**

**Pole Height.** The pole height controls the curvature of the leading edge of your spinnaker. When broad reaching or running the pole should be set higher so that the spinnaker leech leaves the pole end vertically; when running in winds above 12 knots, the pole should be set on the upper bale to keep the pole's "reach" as long as possible. On very tight reaches, especially if it is quite windy, carry the pole lower to open up the leeward leech. Changes in pole height act like a cunningham: lowering the pole moves the draft forward and opens the leech. In big waves and surfing conditions it might pay to keep the pole lower so that when you head up to catch a wave the extra depth in the luff will generate more power making it easier to start planning.

**Sheet Tension.** As a general rule, there should be about 6" of curl in the shoulder of the spinnaker luff. The sheet should be worked continually (in-and-out) to achieve this curl. In heavy air and waves, the sheet should be pumped vigorously (consistent with sailing rules) in coordination with pumping of mainsheet (again, consistent with sailing rules) to initiate surfing on waves. Finally, in very light air, the crucial thing is to keep the boat moving, never letting it die. Don't jibe any more than is absolutely necessary, and don't try to sail dead downwind; you have got to keep the sail drawing, and that requires sailing the angles. Learning the proper downwind sailing angle for various wind and sea conditions is a matter of experience, but a good rule of thumb is to sail only as high as is necessary to maintain what your spinnaker trimmer considers adequate pressure on the spinnaker sheet. He or she will be able to tell you when should go up or come down as a function of small changes in wind velocity and angle.

### **Notes On Boat Trim**

- It is hard to overemphasize the importance of sailing the J 24 flat upwind, except in the lightest of airs when leeward heel must be induced to help the sails assume a proper shape.
- Hiking hard pays big dividends in moderate to heavy air. It is important that the crew not leave the rail early in anticipation of tacks or mark roundings. To the extent possible, all sail trim should be done from the rail.
- It is important, especially in chop and waves, to keep all movable weight, especially crew weight, out of the ends of the boat. Pitching or hobby-horsing is very slow.
- Crew weight should be concentrated ahead of the aft stanchion at the beamiest part of the boat; the helmsman should sit well forward of the traveler bar, and as far outboard as possible.

- On downwind legs, the helm should be balanced by shifting crew from side to side. In light air, roll tacking and jibing is very effective in preserving boat speed through the maneuver.

## **Trouble Shooting, Diagnoses and Cures for Common Boat Speed Ailments**

J 24 sailors, especially those new to the Class, experience certain fairly standard boat speed problems. Here are some probable diagnoses and remedies for these problems. Our diagnoses and remedies assume that the boat has been prepared and the rig tuned according to our recommendations. If you are having problems, verify these rig tuning assumptions first.

### **Poor Upwind Boat Speed**

- Shrouds improperly tuned for prevailing wind and sea conditions. Retune for conditions, remembering that there is a fine line between being overtuned (and underpowered) and being undertuned (and overpowered). Unless you are sure that the wind is going to increase, it is better to be undertuned, as there are other ways of depowering. Consult our Table of Recommended Shroud Tensions.
- Sails improperly trimmed. Helmsman should focus on mainsheet, traveler, backstay, and main cunningham, in that order. Genoa trimmer should focus on fairlead position, jib sheet tension, and jib cunningham, in that order. Overtrimming the genoa is often the culprit, especially in very light air. Overtrimming can choke the slot even when it doesn't visibly backwind the main. Consult our Sail Trim Summary.
- Pinching or excessive feathering. This is often caused by being overpowered. Depower the sail by retuning the shrouds (if you are not already racing) or by flattening the main using backstay and outhaul, dropping the traveler, moving the genoa fairleads aft and easing the jib sheet.

### **Poor Pointing**

- Too much forestay sag for the prevailing wind and sea conditions. Retune for conditions. Consult our Table of Recommended Shroud Tensions.
- Sails, especially mainsail, improperly trimmed. Traveler (and hence boom) too low; mainsheet not tensioned sufficiently (leech has too much twist); too little outhaul; too much cunningham. Jib sheet under trimmed, opening slot too much; too much jib halyard or cunningham tension, resulting in too rounded an entry. Consult our Sail Trim Summary.

### **Poor Boat Speed (and Pointing) in Chop**

- Shrouds over tensioned for conditions. Sail plane too flat and underpowered. Ease mainsheet and jib sheet to induce some twist in the leech of both sails. Ease outhaul to power up lower third of the mainsail. Sail lower, concentrating on maintaining boat speed through the chop. Entries of mainsail and/or genoa could be too fine, making it difficult to sail in the groove while steering through waves and chop. Tension the halyards and/or cunninghams to achieve more rounded entries.

### **Poor Boat Speed (and Pointing) in Flat Water**

- Sails too full: not enough pre-bend, genoa halyard too tight (entry too knuckle forward).
- Boom not on center line.

#### **Poor Boat Speed (and Pointing) Off the Starting Line**

- Improper starting tactics: failure to protect sufficient room to leeward necessary to drive off and develop boat speed needed for pointing; failure to maintain boat speed during 20-30 seconds before the start; failure to stay with boat to windward Sails not properly powered-up for starting. Sails over or under trimmed. Don't try to shift from powered up starting gear to pointing gear until the boat is up to almost maximum speed. Remember: you can't point without confidence in boat-speed and clear air.

For more information, contact [Geoff Moore, Shore Sails](#)