

# Deciding where to locate the mast.

The first step in installing a sail rig is deciding where to put the mast. After you decide the location of your mast, everything else falls pretty much into place. There are pros and cons to any location you choose. No location is horrible or perfect or better in all ways than other reasonable locations. If you follow the general guidelines below and give it a few minutes of thought you will be happy with your decision. Do not over think it. It is rare for somebody to feel they are unhappy with their mast location choice.

On occasion people decide they think the instructions below are not good and then move their mast far back to put it in the center of the boat to follow a more conventional sail plan. After kayak sailing and helping over 1,000 people rig every kind of kayak you can think of, we know this is a bad idea. Kayak hulls interact with the water much differently than a conventional sail boat hull does.

To get started, assemble the mast, sail, and boom. Then you can use it to size up some the options.

The general goals in mast placement, in order of importance are below.

#1 have a solid standing geometry so your rig always stays straight up and down.

This is the most important goal and easy to achieve.

#2 Keep the mast, and boom within reach when down for easy folding and securing of the rig.

#3 Allow for the most freedom of paddle strokes as possible. Typically there is some compromise here. It is very rare to have 100% free paddle strokes with any kayak sail location. For most paddle sailors this is a minor issue. If you have 100% paddle stroke freedom, the sail is likely too far away from you.

#4 Keep the mast toward the front of the boat. This is about all you need to know but in case you are wondering why, here are some basic reasons for this. Your goal is to match the center of lateral wind force above the water line with the center of lateral resistance below the water line to prevent the kayak from having a tendency of turning into the wind or down wind. At first glance putting the mast near the front of the boat goes against conventional sail thinking but you must account for the fact that a kayaks center of lateral resistance is forward of the middle of the kayak, and moves forward as speeds and forces of the sail increase.

**On a shorter boat (generally 13 feet and under)** the mast should be roughly 16 inches from the bow. The mast being 16 inches from the bow allows for the forestay line to be at an angle that allows for easy to achieve strong standing rig geometry. You can go less than 16 inches from the bow, but this will require more precise tuning of the standing lines. It is perfectly reasonable to go a little less than 16 inches if necessary to keep it away from a deck obstruction. It is also reasonable to go less than 16 inches just to keep the mast and boom in convenient locations. In general 10 inches is the minimum you want to go. If you have a wide boat, a solid boat, or you will not go out in big winds, or you are the kind of person that likes to adjust lines precisely, this shorter length is perfectly reasonable.

Instructions for adjusting the lines are included as part of the instructions later on. One experienced Falcon Sail owner reported installing the mast 6 inches from the bow and that it worked fine for his paddle sail outings. He rigged a block and tackle system to multiply the force generated when he pulled on the forestay line which could be necessary when pushing the limits like he did.

**On a long boat**, you can take advantage of the length and keep the rig away from the paddler. But still keep it close enough where the paddler can reach the mast and boom when the sail is down. That way you can easily fold and secure the sail when not in use. In addition to the goal of having paddle stroke freedom, you want to keep the mast at least 16 inches away from the bow tip for easy to set up, strong standing line geometry.

The key measurement on a long boat, is the distance from the seat back band to the center of the mast deck plate. That will determine how free your stroke is and how easily the mast and boom can be reached when it is in the lowered position. Here are some rough guideline measurements for longer boats.

18 foot boat - 82 to 89 inches from the seat back band to the center of the mast deck plate.

17 foot boat - 78 to 85 inches from the seat back band to the center of the mast deck plate.

16 foot boat - 74 to 81 inches from the seat back band to the center of the mast deck plate.

15 foot boat - 70 to 78 inches from the seat back band to the center of the mast deck plate.

14 foot boat - 66 to 75 inches from the seat back band to the center of the mast deck plate.

If you are taller and or your main goal is freedom of paddle strokes try to go with the larger distance. Usually only people that consider themselves to be “serious kayakers” care a lot about this.

Another goal is to not go too far with this distance. For example, a paddler 5foot 8inches tall of typical proportions will find a distance beyond 85 inches from the seat back band, to be further away than necessary for complete paddle stroke freedom. Additionally anything further than 85 inches will start to become out of the convenient reach for this paddler. So for this paddler anything more than 85 inches may be counterproductive.

No matter where you put the sail there are pros and cons. If your primary concern is getting from point a to point b as fast as possible, a slight compromise in your paddle stroke is made up for by a factor of 4x or more with the propulsion provided for by the sail. More importantly, you will have more fun than ever once you get into paddle sailing.

A very important step in making the mast placement decision, is to experiment with how the sail will lay down on your deck when it is in the down position. The boom should be easy to reach when the sail is up, and ideally be out of the way of paddle strokes. Ideally the mast will be out of the way of your paddle strokes and be as out of the way as possible when the rig is stowed. Take into consideration that you can remove the top section of the mast when the sail is down for a more compact folding of the sail. That is discussed in the sail tie down kit instructions.

If it is possible, avoid installing the mast on a hatch cover. In the unlikely event the provided guidelines puts the mast on top of a hatch, make adjustments so the mast is not on top of a hatch cover. If this cannot be avoided, make sure your hatch is very secure and will not come off or move as the mast pushes on it. If your kayak is one that appears installing the mast on the hatch is the best option, use a lashing kit to make double sure your hatch cover is extra secure. When your sail rig is being packed at our shop we will provide a deck lashing kit if it appears the best location to install the mast is on a hatch. It is rare that installing a mast on the hatch is the best option. If there is no lashing kit with your sail kit, it means our experience indicates installing the sail on some other surface that is more solid is a better choice.

If the deck of your boat is not flat, where you want to mount the sail, use the provided deck adapter block.

If you need more help or want more detailed opinions on locating the mast read on.

Like is written above, the mast should be 16” or more away from the bow. More important than the distance of the mast from the bow is the actual distance of the mast from the tie down point of the forestay pulley. This is because the forestay pulley location determines the angle not the actual blow tip. The forestay pulley should be tied down as close the bow as can easily be done. Keeping the mast 16 inches or more away from the forestay pulley will keep the forestay line at an angle that will make it easy to have a strong standing mast. Tying the forestay pulley as close as possible to the boat will provide stronger standing geometry than if you do not tie it close to the boat. It is also good for preventing the bow pulley from being banged up as it flops around in the wind while it is on top of your car. It should not be tied loosely to your boat. All excess line should be cut off and the ends melted.

There are exceptions to all the guidelines written here including the 16 inch guideline. If it just does not work, you can easily use a smaller distance. If your boat happens to be wide ( like most sit on top and recreational kayaks ) ,

and or particularly stiff (like a wood boat typically is) then it is more reasonable put the mast close to the bow / forestay pulley if that is what you would like to do.

Your mast can still be very solid with less than 16 inches to the bow pulley, but there is less tolerance for other non-ideal set up factors. By non –ideal set up factors we mean things like a very narrow boat, or very flexible boat, or poorly adjusted standing lines. In any case you can make it work. If your mast does not stand as solidly as you would like make sure to follow the instructions for adjusting of the back and side stay lines. This can make a huge difference.

On a longer boat, (in the 16 plus foot range) you want to place the mast so you can have a minimal impact on your paddle strokes. Ideally you can paddle normally most of the time, and on a small percentage of your strokes accidentally touch the boom with your paddle. If you never touch the boom during your paddle strokes it is too far forward. If you can get away with it, you do not want the sail rig to be in the way of your paddle strokes, but still you want it to be close enough to you, so you can easily grab the mast and boom to tie it down. If it is 100% never in the way of your paddle strokes, it may be too far away to easily control and may be forward of your average center of lateral resistance.

You can cut your boom so it is 2.25 inches shorter and then use the short boom configuration. Sometimes a boom that is 2.25 inches shorter will make a difference in paddle stroke freedom. See instructions for optional short boom configuration.

The least important mast location factor is balancing the lateral wind force above the water line with the center of lateral resistance below the water line. The issue of balancing forces above and below the water line is an extensive issue, almost always miss interpreted when thought about in relation to kayak sailing, and too extensive to go into detail here. Both the center of lateral wind force, and center of lateral resistance below the water line move fore and aft with speed, weight distribution, sail trim, skeg use, leaning, and other factors. Your goal should be to put the mast where the average center of lateral wind force is close to the center of lateral resistance below the water line. If you are anywhere in the ball park that is fine. If you follow these guidelines you will be fairly close to being in balance. You will never be perfectly balanced, and you can adjust the location of both these factors by changing your weight distribution, sail trim, and leaning. If your boat has a skeg or rudder you can also use these to change your center of lateral resistance. You can learn more about this issue on our frequently asked questions where we talk about mounting the sail at the front of your boat.