

Re rigging an Alberg 30

How to Measure & What to Buy

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Before the Mast Comes Down

Prior to getting the mast down, there are a few things that need to be done. First get your mast tuned up. This is probably most important with respect to the fore and aft settings for the forestay and the backstay. With respect to the shrouds, the mast only needs to be up straight. The goal of this exercise is to be able to measure the new standing rigging from the old ones. My masthead prior to the 09 was about a foot too far forward as measured in the length of the back stay. If I had simply taken the mast down and replaced the fore and aft stays, I would have been very disappointed when I had to lengthen the forestay.

Tuning the Rig

First get the mast in the right place. When the mast goes back up, we will tune more extensively. This exercise is just to make sure that you copy cables that are set at the correct length to begin with.

- Start with everything loose.
- Get the bottom of the mast to the right place. From the forward stem pin to the fwd edge of the mast (the J dimension) should be 10' 8". The mast step should be all the way forward on the step, which may require trimming the washers. Not only is this likely needed to get the J dimension right, but this better places the mast over the main beam, better distributing loads.
- Get the top of the mast to the right place, by setting the backstay to the correct length – adjust the forestay as required. If you attach a tape to the main halyard, and haul it to the top of the mast as far as it will go, the measurement should be 39' 5" from main halyard to the backstay chainplate pin.
- Verify the measurement is the same from the mast top to both port & starboard chainplates (i.e. mast is plumb)
- Use the fwd lowers to insert mast pre-bend. How much you want will depend on the main sail shape. A plumb line hanging from the top of the mast should be about 4" aft of center.
- The aft lowers should have almost no tension on them. However, tighten them so that they are not flopping around.
- Use backstay to further adjust mast bend if needed; whether you need to do this will depend on the luff curve of your mainsail.
- Set tension to the rig. For the purposes of this exercise, you simply have to get the forestay tight enough so that the jib does not sag under load

If you are lucky the above exercise has not shifted the mast much. I took pictures of the turnbuckles at this stage. Some things to note:

Non Symmetrical boats. There have been reports of boats that are not symmetrical. The chainplates have not been the same distance from the water on both sides. If this is the case, you will need to pick a calm day, and measure the distance from the top of the mast all the way down to the waterline to ensure the mast is up straight. As you might imagine, this is a bit of a pain to do.

The fore and aft position of the mast. The measurements provided above are based on measurements provided by Reid Beigel. Exactly where the mast should be should really be based on how the boat sails given the sails being used.

Once the Mast is Down

Remove the stays, and make sure everything is labeled. Measure each piece of rigging from top pin to the lower clevis pin that goes into the chainplate. If you have toggles on the bottom of the turnbuckles remember to include them in the measurement.

Make all of the measurements listed in the table below. Mine are included below. These are measurements of the mast with rigging loose enough to release the clevis pins.

A good rigging catalogue will provide the reference information that you need. The one at http://www.sailingservices.com/catalog_online.htm provides all the information that you need.

Wire Size	Location	Upper Terminal	Length	Lower Terminal	Turnbuckle	Pin Size	Quantity
1/4	Forestay	1/4" Marine Eye 316SS	38	1/4 Sta Lok Stud; 1/2 thread	NA	NA	1
1/4	Backstay	1/4 Sta Lok Eye	NA	NA	NA	NA	1
1/4	Upper Shrouds	1/4" Marine Eye Toggle 1/2 Pin 316SS	37	1/4 Sta Lok Stud; 1/2 thread	NA	NA	2
3/16	Lower Forward	3/16" Marine Eye 316SS	20	3/16" StaLok Stud Terminal; 3/8" Pin	NA	NA	2
3/16	Lower Aft	3/16" Marine Eye 316SS	20	3/16" StaLok Stud Terminal; 3/8" Pin	NA	NA	2

- (1) The tangs on my mast had 1/2" holes.

Some things to think about:

- If you know where you are going to get your rigging from, ask them how they want you to measure the rigging. Many times they want you to measure from the top eye to the end of the stud at the turnbuckle end. This only works if you do not have any toggles on the bottom of the turnbuckle that you will be removing.
- Remember to measure the hole in the mast tang or chainplate. It is not uncommon for wire fittings to contain a clevis pin that is not the correct fit – they shouldn't, but... On Laughing Gull, the top tang for the upper shrouds was a 1/2" pin. However, the Norsman for was 7/16". This had elongated the 1/2" hole in the tang.
- Clevis pins are usually twice the size of the wire, BUT other sizes are available, and may have been used, so do not assume that the clevis pin hole is simply twice the size of the wire.
- If you are replacing swage fittings with a mechanical fittings (Sta Lok or Norseman type), it is important to note the space between mast tang and mast. The dimensions of mechanical

fittings are generally more bulky than a swage, and you will need to research the appropriate replacement part.

- I am not sure that this applies to the Alberg mast, but if there is very little room between the mast tang and the mast, and you decide to go with a swage, determine whether or not the swage that is on is a marine or aircraft fitting. The aircraft ones take up less room. Consult your rigging book to understand the difference). If you can fit a marine swage, this is preferable.

Total Wire:

1/4 SS 316 1x19 Wire	150'
3/16 SS 316 1x19 Wire	80'

Mechanical or Swage?

There are two kinds of wire terminals: swages and mechanical terminals. Swages are wire terminals that are pressed or hammered around the wire to lock them together. Mechanical fittings generally create a “bulge” in the wire so that it cannot be pulled through the smaller hole in the fitting.

The consensus amongst riggers is that the mechanical fittings are superior to swages. When new a swage is as strong as a mechanical fitting – both are 100% of the strength of the wire. However, swages age less well. This is especially the case for boats that are in salt water, and in warmer climes.

Swages Fittings – Advantages / Disadvantages

The advantages of swage fittings is that they are cheap and effective. Most swages for Alberg 30s are going to be under \$10 / fitting, and riggers will charge between \$20 and \$30 to attach. In many instances, this will make them cheaper than the cost of a mechanical fitting.

The disadvantages of the swage fittings are that they need to be installed by a professional. They have less bulk therefore there is less room for rust expansion, and will crack more quickly. Additionally, the “hard” spot (the place where the wire is compressed) is just inside the shank. If the swage has been attached incorrectly, and is bent, this creates an area of additional fatigue.

Swages that are installed on the lower end of terminals are more prone to failure than those at the upper ends. This is because the water rolls down the wire, and if there is a way for it to get inside the fitting, it will. Over time this causes a problem.

A note on the kinds of swages. There are two ways to attach a swage. The Kearny press is a way of compressing the wire using dies. I have only ever seen these as hand operated presses. However, I assume that powered ones exist. The wire is run through once, and then rotated 90 degrees and run through again. This method has two negative characteristics:

1. It is very easy to bend the fitting as you are running it through. This exacerbates the hard spot issue mentioned above.

2. Because the press often does not compress evenly all the way around, there is room for water and salt to enter; thus reducing the strength and life of the fitting.

The Kearny press is used primarily for lifelines.

The rotary press essentially hammers the fitting from all angles. It compresses the wire more evenly, and there is less likelihood of bending the fitting. If you are going to use swages make sure that they are attached with a rotary press. If you are looking at your current fittings, the Kearney swages will often have ridges running the length of them.

Mechanical Fittings – Advantages / Disadvantages

The advantage of mechanical fittings is that they last longer and age more predictably. This is because they tend to be larger fittings with greater room of rust expansion. Additionally, they are installed with sealant to slow the ingress of water. Their construction also places the “hard” spot inside the fitting which reduces the fatigue on the cable. Another key advantage is that they can be installed while the mast is up, and can be installed by a capable boat owner.

So which Do I Go With?

For boats that stay in the Chesapeake or the Great Lakes where the water is at worst no saltier than the average person’s tears, swage fittings are probably better value for money. HOWEVER, only under the following conditions:

1. You are sure your measurements are accurate. Ideally, you are able to send the rigger your old standing rigging for them to replicate; AND,
2. There is no reason for a rigger to come out to your boat. The cost saved by hiring a rigger to install and tune your rig is quickly eaten up when you are paying an hourly rate and travel time.
3. You are replacing the lower terminals only; in which case, you can buy the long stud or eye fitting and replace the terminal while the stay is still hanging. You also have the option of placing toggles below the turnbuckle.

Because mechanical fittings can be installed with the mast up once you are sure of the measurements, they build in a lot of flexibility to a project.

If you are going to be in warmer climes and in salty ocean water, then for my money mechanical fittings are worth it – certainly on the lower fittings.

I ordered all wire cut about one to two feet longer than measured, with swages at the top end, and StaLok fittings on the lower end. For those of us that are hanging our own rigging, and will not have a rigger visit the boat, this is my recommendation. This is especially true if you are not certain of the measurements of the current rigging.

Bill of Material

So what do I need to order? This section looks at the bill of material that you need to approach your rigger for. The prices shown are list prices.

	Part #	Description	Feet	Price	Discount Price	Price	Total Price
Wire	WS06	3/16 SS #316	80	\$ 1.33	\$ 1.33	106.40	
	WS08	1/4 SS #316	152	\$ 2.09	\$ 2.09	317.68	
							\$ 424.08
	Part #	Description	Quantity	Price	Discount Price	Total Price	
Terminals	SLEY0816 -- 133-06	1/4 Sta Lok Eye	1	57.01	\$ 57.01	57.01	
	SWME0816	1/4" Marine Eye 316SS	1	15.52	\$ 15.52	15.52	
	SWET0816	1/4" Marine Eye Toggle 1/2 Pin 316SS	2	27.20	\$ 27.20	54.40	
	SWME0612	3/16" Marine Eye 316SS	4	9.77	\$ 9.77	39.08	
	SLST0816 -- 136-06-1/2	1/4 Sta Lok Stud; 1/2 thread	3	63.11	\$ 63.11	189.33	
	SLST0812 -- 136-05	3/16" StaLok Stud Terminal; 3/8" Pin	4	48.57	\$ 48.57	194.28	
							\$ 549.62
	Part #	Description	Quantity	Price	Discount Price	Total Price	
labor	LARS08	1/4 swages: Cut Wire and install top swage on forestay & Upper Shrouds	3	10.00	10.00	30.00	
	LARS06	3/16 swages: Cut Wire and install top swage on Lower Shrouds	4	7.50	7.50	30.00	
							\$ 60.00
Total							\$1,033.70

Not included are the Turnbuckles. Add \$100 x 4 for 1/2' turnbuckles, and an estimated \$60 x 4 for the smaller 3/8' turnbuckles. Total additional = \$640.

Total re – rig = \$1,700.

Tuning the Mast

- Start with everything loose.
- Get the bottom of the mast to the right place. From the forward stem pin to the fwd edge of the mast (the J dimension) should be 10' 8". The mast step should be all the way forward on the step, which may require trimming the washers. Not only is this likely needed to get the J dimension right, but this better places the mast over the main beam, better distributing loads.
- Get the top of the mast to the right place, by setting the backstay to the correct length – adjust the forestay as required. If you attach a tape to the main halyard, and haul it to the top of the mast as far as it will go, the measurement should be 39' 5" from main halyard to the backstay chainplate pin.
- Verify the measurement is the same from the mast top to both port & starboard chainplates (i.e. mast is plumb)
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- The aft lowers should have almost no tension on them. However, tighten them so that they are not flopping around.
- Use backstay to further adjust mast bend if needed; whether you need to do this will depend on the luff curve of your mainsail.
- Set tension to the rig. Total load when a gauge is applied to the cables should be about 10% of breaking load.
- At this point you need to test-sail; verifying your dockside settings and that the mast stays in column. Leeward shrouds on a close haul should be tight, but not bar taught.

Tune to 10% of the wire's strength

Wire Size	Type	Approximate Breaking Strength
3/16"	1x19	4,400 Lbs.
7/32"	1x19	5,600 Lbs.
1/4"	1x19	7,300 Lbs.

<http://www.alberg30.org/maintenance/SparsSailsRigging/tensions.html>