

Sail Repair - Problem areas

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Before embarking on your voyage across the ocean, take your sails to a sail loft and have them checked over. Make sure you explain that you are planning an ocean crossing so that they know to look for the small stuff too. There are a lot of things that can be considered "no big deal" if you are just planning day sails in the bay. And there are many things that should be caught and corrected before you leave because the repairs are really outside of what you can expect to accomplish at sea. Some of the procedures that I will describe are almost exactly how you would repair a similar problem in a real sail loft except you are most likely limited to handsewing, where a sail loft would opt for a heavy duty zigzag machine. Other repairs I describe are quick and dirty just to get you going and will hold until you get to a professional. I would never repair a sail by slapping a bunch of cloth over the rip and sewing over it if I had access to a sewing machine, but that's what I'm going to tell you to do if it will be good enough. Also, unless noted, these repair procedures apply to woven cloth sails or laminates. Let's start at the top of the sail and work around the edge.

Halyard attachments: Headboard, webbed rings, web loops.

Webbed rings and webbed loops are fairly easy to repair at sea. Simply remove the damaged webbing by cutting the threads with a seam ripper or lightly passing the edge of a hot knife over the threads. You may need to use a pair of pliers to pull up the webbing once you have loosened a corner. Cut a piece, or pieces of webbing matching the length of the pieces you removed. Apply double sided sticky tape to the back of the web pieces, peel off the paper backer and place the web in the same location the removed webs were located. The sticky tape will adhere much better if all the little threads are removed from the sail first. If there was a ring in the head and it shows any signs of deformation, replace it with a new ring, and perhaps with one that is a slightly heavier gauge. To restitch the webbing back onto the head, you will have to pre-punch holes with an awl in order to be able to pass the needle through the many layers of patch cloth and webbing without breaking the needle. This is where a strong stable sewing palm pays for itself. The cheap ones do not fit snugly on your palm so they can accidentally slip and you can possibly jam the needle through your hand. Don't skimp here! Once you have pushed the needle part way through the layers of fabric, use pliers to pull it out the rest of the way. You want to avoid wiggling the needle to push or pull it through as the needle will often break at the eye.

Check your headboard for wear at the halyard attachment hole. If it is minor you may be able to get your sail loft to insert a liner into the hole. This requires a hydraulic press. If there is excessive wear or the headboard looks fatigued, you will need to replace it. This you want to do before you leave. You will need to drill out all the rivets. So you'll need a power drill. That uses power. From your batteries. Did you budget for that in your power needs? Also, what are you doing racing to Hawaii with a power drill on board? Are you sailing a boat or a tool shed? Check this before you leave, okay? So, once you get the headboard drilled out, if you're lucky your replacement headboard has the same holes and you won't have to punch new ones. If you have to punch new holes, you'll need a hole punch, a rawhide mallet, and something hard and stable to put under the sail to support it while you bang in to it. A cutting board placed in a strongly supported location will work. To install the new headboard you will need a rivet gun or a hand setter. There are some headboard that have a slot in the lower edge that allow you to thread a piece of webbing through it to add an extra bond between the board and the sail. That's a good thing.

Luff attachments: Slugs/slides, grommets, shackles

Torn out grommets holding luff hardware are a common problem on mains and jibs. You will have to remove the luff hardware first and then the grommet. If you are prying off a hank, the metal has probably been stressed enough that it is not worth reusing it, so make sure you bring spare hanks of the appropriate size. Take a piece of heavy Dacron that can be folded in half and fit around the bolt rope covering the hole on both sides and extending an inch all the way around the hole. Hand stitch this into place. If the problem is in your main, you have the option of reattaching the slug or slide with just a piece of webbing folded over the bolt rope and hand stitched to the luff of the sail. Use a piece of webbing that is narrow enough to fit through the hardware eye, and cut the webbing piece long enough to extend into the sail at least 2 inches past the bolt rope. Sew it in the same fashion described for sewing a webbed loop at the head. One important thing to check is that the distance between the load bearing edge of your replacement hardware matches that of the existing hardware. If this distance is different, when you reset the sail and apply luff tension the load will not be evenly distributed. If the distance is shorter than the other hardware, the replacement piece will have more load on it and could break again. If it is too long it may deform the set of the luff. If you need to replace a hank on your jib, you will have to install another grommet in the repaired location. It would be fine if you set the new grommet an inch above or below where your repair is located.

Reefs: Pressed ring corrosion, intermediate points

The fabric around a pressed ring can break away from the ring from excessive flexing right at the edge of the ring. If the ring is mostly intact, you can simply add a piece of 1" tubular webbing as you would at a head ring. Make sure that you place the webbing along the lines of force that are being applied to the ring. You can splay the webbing so that one side goes up the sail and one side goes parallel to the foot, which is the typical force lines along a reef cringle. Look at the webbing lengths found elsewhere on the sail and use a piece at least that long. If the pressed ring is barely intact or badly corroded, cut out the old ring with a hot knife and fit in a stainless steel round ring in its place. Use a couple of pieces of webbing to hold the ring in place. Make sure to tension the webbing as you tape it to the sail as the webbing will stretch when loads are applied to the ring that is being held.

If an intermediate reef point has pulled out. Cut off the dangling grommet, tape a piece of heavy Dacron over the rip making sure to extend the repair at least an inch larger than the rip. Then cut two pieces of Dacron insignia cloth that are even bigger than the heavy Dacron piece, placing one on either side of the sail. Make sure to round the corners of the insignia cloth to avoid them getting snagged by something and peeled off, and rub the patches down well, the heat from the friction will activate the adhesive more. Also, before applying the insignia cloth to the sail, clean off any salt, grease, dirt from the repair area with alcohol so that the cloth will stick better. The sail should also be dry where you apply the insignia cloth. Finally sew around the edge of the heavy Dacron piece through all layers of cloth. If the sail is clean and dry where the insignia patch is, it should hold. If you don't trust it, sew around the edge of the insignia patch too. Then install another grommet in the same location and the removed one.

Corners: Corner & sail body join

The point where a corner patch ends inside the sail body is very vulnerable to wear and eventual tear. A hinging effect happens in these locations where there is a sharp difference in cloth weight. The clew of a jib is highly susceptible to this sort of wear due to the effects of tacking. This fatigue is also common around the edges of batten pockets, but mostly at the inner tips. If this problem was repaired in a loft,

the patch or pocket would be pulled away from the damaged sail area, the hole would be cut out and replaced with a new piece of cloth sewn down, and then the patch or pocket would be sew back to the sail body. What you'll do is clean the area with alcohol, stick down a piece of heavy Dacron at least an inch bigger than the rip, slap on several layers of insignia cloth, gradually getting larger with each layer, don't forget both sides, and finally hand sew around the heavy Dacron piece.

Leech: Leech line and cleats, Batten pockets

Leech line repairs can either be a simple repair or your worst nightmare, depending on where the leech line breaks and how "tired" the remaining line is. Best case, the leech cord is in good shape and the break is close to the exit from the leech at the reef or clew. First you unpick the leech tabling at the point where the line is broken. Hand stitch the end of the broken line to a piece of new line VERY SECURELY. Attach the other end to a safety pin and feed the new line down to the exit. If the pin will not fit, you will have to open the tabling from the exit to the break and restitch it down. You must insure that the location of the join is not in a position that it will catch inside the tabling when the line is pulled snug. If so, shorten the existing line enough to avoid the problem. So, what if you can't get to a section of the leech because the reef cringle is set too close to the edge of the sail? Run the leech cord on the outside and cover it with a folded piece of Dacron tape, which is then stitch down. What if the leech cord needs to be replaced entirely? Open up the tabling at the head of the sail to retrieve the tail end of the leech cord. Cut a length of new cord the length of the leech plus a foot, hand sew it to the end of the existing leech cord VERY SECURELY, gently pull on the broken end until you have pulled the new cord all the way down the leech to the opening you made earlier and continue as already described. Make sure you don't pull the new cord end past the opening in the head, in fact you might want to tie something to the end so this can't happen. What if the old cord breaks while you are feeding the new cord through? Find the break, open up the leech tabling to retrieve both ends, pull the new cord down to the new opening, remove the old cord piece and attach the new cord end to the new old cord and continue pulling gently. You of course will have to go back and hand stitch closed all these leech table openings.

Most leech line cleats are riveted on, so if the cleat needs to be replaced you will have to drill out the rivets. The replacement cleat can be hand sewn back on by placing the cleat in position, marking the center hole onto the sail with a pen and also marking three locations just outside the cleat in a radial pattern from the center mark. Punch awl holes at the pen marks and hand sew the cleat in place by alternating between the center hole and the radiating holes.

Batten pocket repairs are one of the most common problems found on sails. Battens being much stiffer than the surrounding sail often cause the sail to fatigue and breakdown. Also, if the batten tips are ruff the batten itself will poke through the end of the batten pocket or the backside of the sail. Before replacing the batten, make sure the ends are sanded down smooth and rounded. Again, layering of heavy Dacron and insignia cloth after cleaning the damaged area is a reasonable way to repair this problem.

Stitching: Seams and UV covers

Using double stick tape, tape the edges of the seams together as closely and possible to how the sail was originally. Make sure to pick out any loose threads and use the old needle holes as guides when resticking the seam. Hand stitch the seam together in a / / / pattern one direction and then back again to form a zigzag pattern that will stretch with the cloth. If the seam is in an area of chafe, cover the repair with a strip of insignia cloth. UV covers can be repaired similarly. If the edges of UV cloth have frayed, cover the rip first with a piece of insignia cloth and then stitch around the edges.

Spinnaker Repairs:

Insignia tape. If the hole is small, a patch slightly larger with rounded corners applied to a clean sail should hold fine. If the area is in a location of chafe, like where the foot touches the bow pulpit, the repair might require a layer on both sides of the sail. If the rip is large, a strip of insignia tape should be applied to both sides of the sail and sewn down around the edges. Before the first layer of insignia tape is applied to a large rip, it is important to first attempt to align the thread lines of the sail across the rip or your repair will have puckers. This is just a temporary tape job, with small pieces of masking tape or duct tape placed several inches apart just to hold the ripped edges together. If there are pieces of cloth missing, you will have to use your best guess as to how the sides should align. Unless the rip is at a seam, the edges of the rip should never overlap. Once you had reconstructed the sail, gently turn the sail over and apply the first layer of insignia tape along the rip. Try to center the rip in the middle of the tape so that there is equal holding on both sides of the rip. If the rip zigzags up the sail, use short strips of insignia tape and follow the rip as closely as possible. Once you have one side completely taped, turn the sail back over, remove the temporary pieces of tape and run a second layer of insignia tape along this side of the rip.

Before you reset your repaired kite, try to determine if the rip was caused by the sail catching something on the boat, like a cotter pin or meat hook in a shroud. If you believe that to be the cause, make sure to repair that too.

Puncture and chafe patches on Dacron or Laminates:

Any repair can be made by applying layers of insignia cloth down on a clean sail, just as what was described in the spinnaker repair section. Depending on the cause of the puncture, you may want to add a small patch of Dacron as an inner layer just at the puncture point to add more strength. If the cause of the puncture was from your spreaders poking into the backside of your main while sailing deep down wind, you might consider climbing your mast and taping up the spreader tips to avoid future reoccurrences.

Basic sail construction:

In all cases of sail repair, it is important to look at how the sail was originally constructed and try to maintain the sails initial integrity. First thing is to look at the thread lines of all cloths, woven or laminates. Generally a rip will follow the fabric thread line. When possible try to line up the thread line of the patch material along the same line as the sail section you are repairing. This is to try to assure that the patch will stretch in the same way as the sailcloth around it. Because most of the repairs I described involve using insignia tape and not matching cloth this is not quite as important as when a proper repair is done in a sail loft.

Matching cloth weight is also an important factor in accomplishing a strong repair. If the repair is too heavy, it will distort the sail. If it is too light, the repair can fail. The flexibility of making repairs with insignia cloth is that you can keep applying layers until you have matched the weight of the sailcloth you are repairing. Keep in mind that each layer should be slightly larger than the under layer to avoid a hinging effect. Insignia cloth is a 2 oz adhesive Dacron fabric, but it is possible to find adhesive Dacron in heavier weights.