



The Basics Of Strap Eyes, Rivets & Well Nuts For Customization & Repair of Your Kayak

by Tom Holtey - all images by author

Kayaks are built ready to use for the average paddler with attachment points for backrests, knee straps and other assorted deck fittings. However, many will want to customize their kayak for better fitting knee straps, rig up a backrest, add a rod holder, shock cords, or other variety of deck enhancements. This article will instruct you on how to properly work with the hardware involved.

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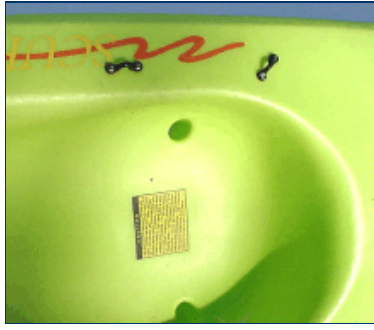
PRIMARY TOOLS NEEDED:

- DRILL - Hand &/or Electrical
- SHARP DRILL BITS - Selection
- RIVET GUN
- SILICONE - Tube &/or Gun
- PHILLIPS SCREWDRIVER
- PLYERS &/or VICE GRIPS
- BOLT CUTTERS - Small
- SAFETY GOGGLES



STRAP EYE WEAK POINTS

The strap eye is the primary piece of hardware used, fastened with rivets or well nuts. These attachments can fail over time or with hard use. Strap eyes can break and snap, particularly if you are a kayak surfer.



The strap eye is the attachment point for most of your accessories. They are the little black loops riveted or bolted to the deck. They are made of plastic for the most part, but you will see some kayaks outfitted with strap eyes of brass or stainless steel. I have heard them called inchworms and they do look like little inchworms with the arched back and suction cup front and hind feet.

Pad-eyes are another common name for these little bits of marine hardware. In some cases, strap eyes are flat and not curved. They still serve the same function but brass clips can not be used with them.

Rivets are the most common fastener to attach strap eyes, followed by bolts or well nuts and in some cases screws, I will discuss rivets a lot, but in most cases you can substitute rivets for well nuts and vise versa.

Your strap eyes for your knee straps are most vulnerable to failure. Those paddlers, who surf, run rivers or Eskimo roll put the most stress on these attachment points. Many manufactures place the strap eyes, for knee straps and backrest, in line to the centerline (bow to stern) along the sides of the cockpit, with pairs (right and left) at the hips and ankles.

The force applied to the strap eye by the knee strap pulls on these strap eye at a 45-degree angle, almost bending it sideways. If you are one of the paddlers described above you should replace these eyes. Don't remove the original ones, but install new ones that tilt in to the centerline and in line with the pull of the straps. This will be much stronger. Place the new eyes where they will best fit you. (Hips and ankles.) Now you will have the original strap eyes as spare attachment points if any of your new ones fail.

At The TopKayaker Shop:

Rivets:



These rivets are all aluminum, corrosion resistant, strong enough for most applications.

Well Nuts:



This fastening system is very easy to use in several different ways. Come w/ Stainless Steel Machine Screws 20 to a package.

STRAP EYE REMOVAL

To repair or add a strap eye follow the directions below. The principles are the same for installing new strap eyes in a customizing project.

If you have broken a strap eye you must remove the old one first. Generally the loop will be sheared and the two rivets will be in place holding the broken halves of the eye. Some are fastened with well nuts, bolts or screws. If you are lucky it is just a matter of unscrewing it.

Reaching into the kayak to hold the nut with a wrench or pliers will be the hardest part. Corrosion may make a simple unscrewing impossible, and drilling as described below will have to be done. Drilling stainless steel is hard, will require slower speeds and light oil on the bit tip.

For those fastened with rivets you can remove them using one of two methods. Fortunately most rivets are made of softer metals and are easy to drill. Any drill will do, but I prefer a small hand drill for field repairs and drilling new holes in the deck. For removing old rivets and well nuts you will want a power drill. New sharp bits are always going to make the job easier.

Drill off the head of the rivet with a sharp drill. Most rivets have a dimple in the center and can be taped with a center punch (or nail) and hammer to create a stable place to start your drilling. Use a drill bit that is the same size as the hole drilled for the rivet, usually 3/16 of an inch, or you may have to guess. You want to use the right size drill bit just incase you drill too far and go to deep. Remember you can always make a hole larger but never smaller.

The goal is to drill off the rivet heads, then pull off the broken strap eye and push the remaining rivet parts through to the inside of the kayak.

You should now have two holes on the deck of your kayak, some little circles of rivet head stuck on your drill bit, a broken strap eye, and some rivet parts rattling around inside your kayak.

Sometimes the rivet will start to spin with the drill bit. If it spins stop at once, or you run the risk of making the hole too large, by abrasion and heat. Grasp the rivet head firmly with vise grips and try again, You may need to crush the broken strap eye a bit to get a firm hold.

The alternative to drilling the rivet head off is to cut through the base of the strap eye and rivet with a small, sharp pair of bolt cutters. I suppose a hacksaw could do the same but I have not tried it. This works very well with plastic strap eyes fastened with aluminum rivets, but I have not tried it with metallic eyes, and I think your likelihood of success with them would be poor. The bolt cutters will be able to cut through corroded bolts relatively easily using this method. In one fell swoop you will cut trough both eye and rivet. You will have a few more shards on the shop floor but the result should be the same.

Removal of a well nut should be a cinch, but corrosion can make it difficult. Try to unscrew a well nut using only a screwdriver, and your fingers. The use of your fingers will save the nut for further use. If necessary use a pair of pliers or vise grips to hold the well nut, but you will probably damage the rubber coating and flange. If you are gentle you may get it off with success and only minor damage, otherwise you will just have to muscle it off and hope you have a spare.



ATTACHING STRAP EYES - with Rivets

Now that you have removed the broken strap eye you need to replace it. Inspect the holes to see that the plastic has not cracked or been enlarged by errant drilling. If it has, and the damage is minimal, and the stress on that area small, you can ignore it. If there will be stress or the damage is great you have two options: 1. Fill the hole with a rivet, well-nut or bolt and washer only, sealed with silicone as a patch, and relocate your strap eye. 2. Reinforce the hole using a washer inside and/or

outside, sealed with silicone.



Another and preferable alternative is plastic welding, but that is an entirely new subject. Assuming that there are no problems with the holes that you are replacing strap eyes in, or you are installing a strap eye where none has been before, the rest of the procedure should be a snap. There are three basic kinds of fastening hard wear to use: **RIVETS**, **BOLTS**, and **WELL NUTS**.

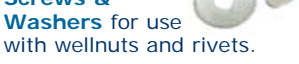
Rivets are the most common. There are two types: a mushroom rivet that just enlarges on one end, or rivets that bend out arms in a star pattern, usually in threes.

This second type is by far the best and can be found in our shop at the multitude of links provided on this page.

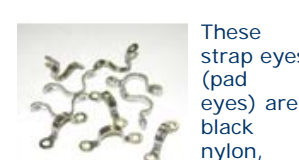
For nuts and bolts you will generally find stainless steal nuts with nylon locking rings and stainless bolts. Alternatively and far superior are well nuts. These little gems are the best for field repairs because they can be fastened with a screwdriver only, no wrench or rivet gun! They are a stainless, some times brass, machine screw (bolt) and the nut (NOT a hex nut) is a threaded cylinder, is often brass, always surrounded by a rubber cap that seals the hole. The only down side is that many come as a stainless steel machine screw and brass nut, and will corrode badly in salt water due to electrolysis.

At The TopKayaker Shop:

Machine Screws & Washers for use with wellnuts and rivets.



Strap Eyes



These strap eyes (pad eyes) are black nylon, chrome or stainless steel. Strong enough for all but the cruelest punishment.

The industry standard for kayak assembly, most commonly used for backrest and knee strap attachments, leash, shock cord, deck lines.

Some strap eyes are fastened to the deck with simple (wood type) screws. You can implement repairs with the original screws or better yet use rivets or well nuts as replacements. Use the better quality aluminum rivets as described above or well nuts when ever possible.

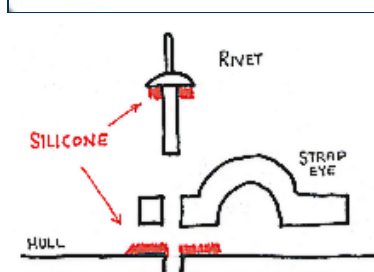
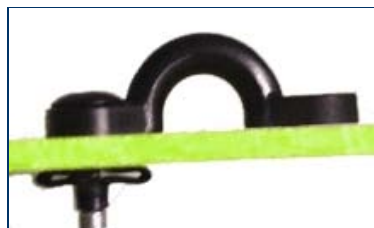
When using rivets always seal with silicone. Get 100% pure clear silicone at a hard wear store. White silicone works too, but won't look as good. Clear is sometimes sold as fish tank repair material. Descriptions like marine or bathroom mean very little. A small tube (like tooth paste comes in) is best for the occasional user and repair kit. Large caulk gun tubes are best for big jobs like hatch installations and entire kayak makeovers.

You will also need a rivet gun. Look for a higher quality gun that ejects the waste part of the rivet, the Marson brand is the best I have found. Kayak manufactures rarely seal the rivets in the factory with silicone. Do not let that disturb you; they only leak a tinny bit. One can assume that the holes drilled during assembly are tight. The tighter the hole, and the harder it is to insert the rivet/screw the better. This is usually 3/16 of an inch.

Put a dab of silicone on the holes, the rivets, and the strap eye. Place the strap eye in place over the holes; the silicone holds it in place, and insert the rivet into the hole through the eye. Use the gun to fasten the rivet and use caution if the gun ejects the waste part, eye protection is recommended.

The silicone should squeeze out like an overloaded peanut and jelly sandwich. Wipe it up quickly with a rag before it hardens. You may want to practice with some spare rivets and a piece of scrap plastic to hone your skills before you approach your kayak.

VIDEO PRESENTATION: BASIC PAD EYE INSTALLATION WITH RIVETS



ATTACHING STRAP EYES - with Well Nuts

A well nut will take the muss & fuss out of the job. No silicone or rivet gun is needed. You won't even need to practice. There are three ways to use well nuts; nut right side up, nut upside down, (both small holes) and the flange installation.

Small hole -

Nut right side up is my preferred application. The hole in the deck should be the diameter of the machine screw (usually about 3/16 of an inch) or a tinny bit smaller, so the threads can cut into the plastic for a very tight fit. Place the strap eye over the holes and insert the machine screws (bolts) into the holes.

Reach inside the kayak with the well nut(s), and twist the well nut onto the screw, with the larger flange end sealing against the hull material. Hold the well nut in place while you turn the screwdriver (out of the kayak) and eventually the well nut will hold it self and only a few more turns of the screwdriver will be necessary.

Reaching into your kayak will be the hardest part, and possibly be a two-person job. You can do the same procedure with the well nut upside down, with the large flange side facing away from the hull material. This may affect a more positive mechanical bond of nut and bolt, but in my experience there is little difference.

A large hole installation -

This is the intended method of those who engineered the well nut. The beauty of the well nut is that you do not have to reach into the hull to fasten the nut. Sometimes it is impossible to reach into the space inside to hold a nut in place. This is the time to use a rivet or the large hole application of the well nut.

To use the well nut in this fashion you need to drill a larger hole, the diameter of the smaller end of the well nut, usually about 3/8 of an inch. Make sure it is tight; the rubber will give while you force it into the hole. Insert the well nut(s) flange end up, the flange will prevent the nut from falling through he hole. Place the strap eye on top of the flange(s) and insert the machine screw(s) through the eye and into the top to engage the threads. Turn with a screwdriver until tight.

The small end of the well nut swells inside the kayak, and pinches the hull material against the flange making a watertight seal. This will be your only option when you cannot reach into your kayak, or you will have to use rivets.

In my experience this application is not as strong as rivets because the rubber is the only thing holding the fastener in place. That being said, I will say that this is stronger enough for most applications except for knee strap attachment points.

In general I find that plastic strap eyes and aluminum rivets are best to work with. Well nuts are preferred for field repairs, and the best way to attach eyes for easy removal and replacement if corrosion from salt water is not a threat. You can use strap eyes, rivets and well nuts to install and repair not only your accessory attachments, but shock cords, deck lines, cargo and hatch straps, bow line attachments, rod holders, some rudder components and customize your backrest and knee straps, see [Backrests](#), [Knee Straps & Paddle Shashes](#) For Your Kayak by Tom Holtey

