How to make a leather piston seal

by B.B. Pelletier

Before we begin, I have to tell you that **next week is going to be exciting.** I will fulfill two promises you guys have been waiting for, plus there are some other nifty things going on in this blog. So, next week is not a time to skip reading. I promise...you will see some neat stuff. On to today's post.

Here's a good tip you can use to resuscitate many older spring-piston airguns. And, not just rifles, because plenty of old air pistols have leather seals, too. Dyb asked for this, and I've been meaning to do it for several years.

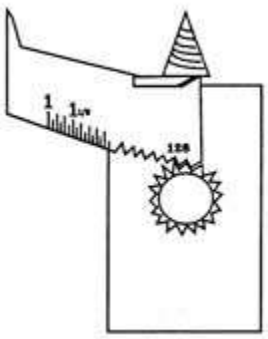
First, you need a supply of leather. I save old belts and shoes for this purpose. The leather needs to be about 1/8" thick, but don't obsess over that. It should also be on the stiff side, though it does have to be at least a little pliable for the forming you'll do.

Step 1. Measure the seal

If there's an old seal in the gun, measure it. A dial caliper is an easy way to measure, just try to forget those measurements on the dial smaller than 1/10". With leather, they're meaningless. Leather expands and compresses to fill the compression chamber. If there isn't an old seal, measure the diameter of the compression tube. That's the size of your seal.

Step 2. Make the form

Making a form for a leather piston seal is easy. Just drill a hole in a 1" plank and you're done. Drill the hole larger than the diameter of the piston seal, for reasons you'll see shortly. The only challenge is finding the right size drill bit, and I have a tip for that. If possible, use an adjustable drill bit. Drill the hole all the way through the board but don't obsess about the smoothness of the edges.



An adjustable drill bit makes it easy to drill a hole just the right size.

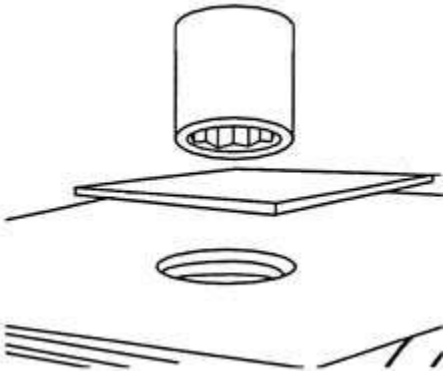
Step 3. Prepare the leather

Cut a square piece of leather wide enough to cover the piston with enough left over to make a sidewall at least 1/4" high. I like to make the sidewall higher than that, but don't get hung up on how high to make it. Keep it in the 1/4" range. Soak the leather in water for 24-48 hours. Add a drop of dishwashing

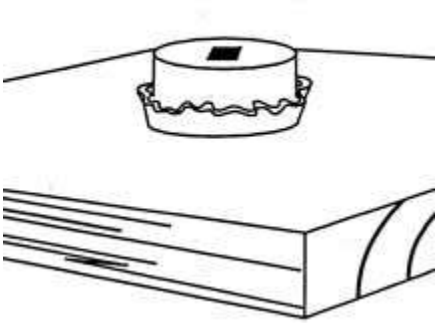
detergent to the water to break the surface tension and make the water easier to be absorbed into the leather.

Step 4. Form the seal

Take the wet leather and center it over the hole in the board. Use the appropriate size wrench socket to drive the wet leather into the hole. Drive it in as deep as you want the sidewalls to be high. Set the board aside to dry for 2-3 days.



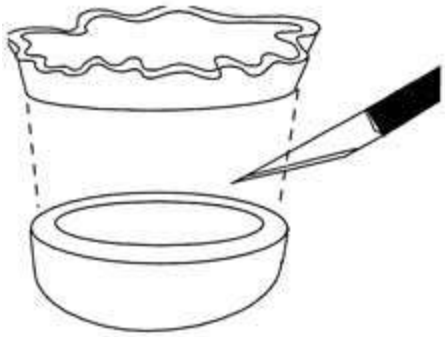
A wrench socket drives the wet leather into the hole in the board.



Set aside for several days to dry.

Step 5. Trim the seal

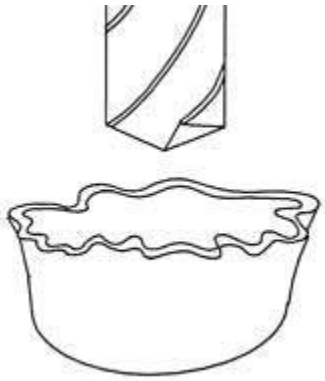
When the seal's dry, trim the edges while it's still in the board. I find a razor knife does this best. There may be wrinkles in the seal near the top, but disregard them. They'll go away when the seal's used.



Trim the dry seal while it's still in the board.

Step 6. Drill the screw hole

Invariably, leather seals are held to the piston head by a flathead screw countersunk into the steel piston. There has to be a hole for this screw to pass through, and drilling it while the seal is still in the board is easiest.



Drill the hole for the seal retention screw.

Step 7. Remove the seal and soak it in oil

If you're going to use the seal right away, soak it in petroleum oil for about 24 hours. If you have a magnum air rifle such as the Diana 45 or the BSF 55, use silicone oil. If you don't plan to use the seal soon, store it where it will get air.

This method produces seals with rounded bottoms. That bothered me before I bought a factory leather seal and saw that it looked the same. Shooting will flatten it out.