

Rebuilding an Artizan Model XA Pump/Reservoir Assembly

Scotty Greene

Martin Anderson and I work as volunteers at the DeBence Antique Music world in Franklin, PA. There are several band organs in the DeBence collection which we keep in running order. In the fall of 2000 the museum was contacted by the Conneaut Lake Park Amusement Park to see if we would look at their carousel organ, which had not played for several years, and consider repairing it. They thought it was a Wurlitzer, but when Martin went to look at it, it turned out to be an Artizan Style “XA” (Figure 1).



Figure 1. The Artizan Factories, Inc. catalog representation of a Style “X-A” military band organ.

We were excited to have a chance to work on it, and agreed to try to breathe new life into it, so we put it on its back on a trailer, gathered up a box of the loose parts, and brought it to the museum.

When we first pulled the lower back cover off, we noticed that the pump seams were reinforced with duct tape and staples—not a good sign.



Figure 2. The Style “X-A” pump as it appears before restoration.

When we turned it on it was evident that the interior stiffeners had come loose, as the sides of the pump ballooned on every power stroke. Air was coming through most of the duct taped seams, and of course the machine would not even attempt to play.

The first and most obvious thing that needed to be fixed was the main pump and reservoir assembly (Figure 2). Neither Martin nor I had ever done one, so we thought it would be prudent to ask for advice. We checked with Dr. Bill Black who kindly sent us a 2 page outline of how to do it. His closing remark “Pumps are tough!” stayed with us through the whole process, and was he ever correct!

Getting The Pump Out:

Before you can rebuild the pump you have to get it out of the machine, so I went to work on doing so. There is a wedge holding the right end down, with screws that come through from the outside of the cabinet. There is a block on the left end with visible screws. There are two air outlets on the left end. After that was all disconnected it still was held tight. After much tugging (and muttering) I finally found a screw that was holding the wind chest in place that had been replaced with an extra long one, and it ran down and also held the pump assembly. After I took it out the assembly slid out of the machine with no further problems.

Taking It Apart:

After the pump assembly is out of the machine there are a lot of exterior attachments to remove. Take a bunch of pictures and make good notes (Figure 3). Be especially careful to make dimensional notes for the bridge that retains the springs, those screw holes will be covered by the new leather and you will have trouble finding them when reassembling if you don’t have good dimensional notes.

As for the rest of the items, just use care and label everything. Put “match marks” on the parts as you disassemble to help with which way around things go. Look out for different length screws and note where they came from. You cannot make too many notes at this stage. You may think you will remember, but you won’t. (Note the liberal but failed use of duct tape on our patient.)



Figure 3. View of pump from air discharge end after removal from organ.

The next step is to take the reservoir off the top of the pumps. Make a note as to the fully opened dimension. Try a hot air gun on the leather to wood joints, and try to save the leather for use as a pattern for the new cover. When you get it off, the view will be like this (there was even duct tape inside the reservoir!).



Figure 4. The frame for the pump's reservoir.

In **Figure 4** we are looking at the frame for the reservoir, which is glued to the top of the pumps. There are actually two frames shown here, one on top of the other. There is the top one that the bottom edge of the reservoir material glues to, and a lower one that extends to the end of the air collector area and is attached to the top of the pumps. They do not need to be separated if you can get them off in one piece. There are a couple screws under the top frame into the pump that are hidden from view and have to be hacksawed off if you want to take the two frames off as one. Drive a knife into the joint and say a small prayer, and you may get lucky and not totally destroy anything. Of course you will have to repair whatever damage you did to the pieces when getting them apart.

Now you have the two pumps as a separate assembly (**Figure 5**), and you have to take them apart. Note that they are glued together with a pair of wooden strips between them. Be sure to measure the overall width, and get dimensions for the thickness of these strips now before you break them up, as these



Figure 5. The two pumps now separated from the reservoir frame.

determine the overall assembly width, and that must be correct to match up with the reservoir base. Separate the two pumps. You may have to saw your way through the strips to get the two separated. Watch out for the side wires, and try not to cut up the leathers when sawing. Measure the position of the side wires, and take them off. Remove the leather, use heat or care and try to save at least one for a pattern (**Figure 6**).

You will have to clean all traces of old glue from the wood where the leather is glued in order to get a proper bond when attaching the new leathers.

If the hinges are good you are in luck. If not then mark the centerboards so that you can get them back the same way.

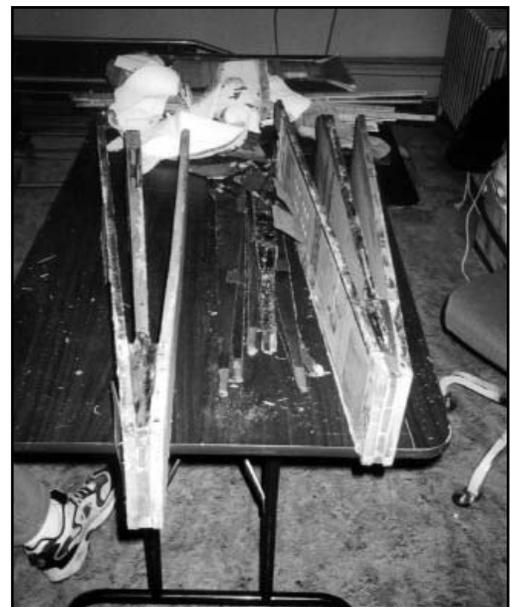


Figure 6. The disassembled pressure pumps detailing the hinges and centerboards.

If the internal leather stiffeners are shot you will have to make new ones. After a lot of hunting around we settled on material used for picture mats. We used the .060 thick, all cotton fiber, ph balanced acid free style.

Putting it back together:

The next step is to cut the leather and glue the internal stiffeners in place (**Figure 7**). After determining their correct position outline the area with masking tape before applying the glue to keep the glue confined to the area of the stiffeners. The stiffeners have to be weighted to keep them flat until the glue dries.

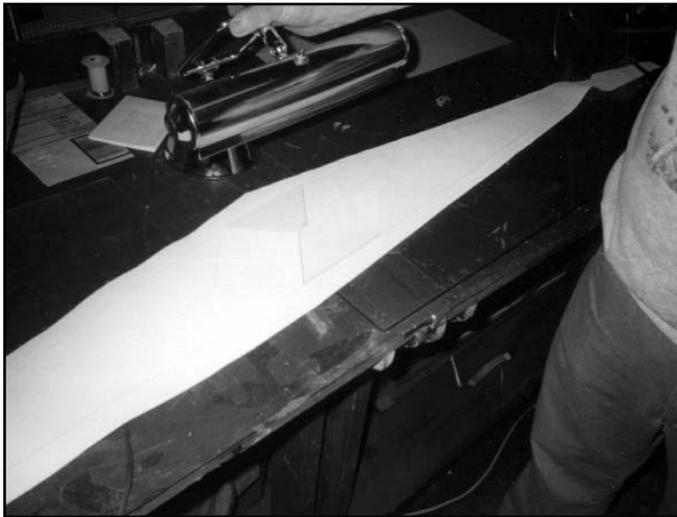


Figure 7. The trimmed leather ready for the internal stiffeners to be glued into place.

At this point you are ready to attach the leather to the pump frame (**Figure 8**). Start at the open end. Lay the leather out flat and glue one side. Nail down the tack strip.



Figure 8. Attaching the leather to the pump boards.

Then turn the whole assembly over, fold the sides into their proper position, and glue the other half of the open end. (**Figure 9**).

After that do the sides in whatever sequence seems good to you. You will have to watch out for the tendency of the leather



Figure 9. Attached the remainder of the leather to the pump.

to move in while you are trying to nail the tack strips. Ideally the base of the stiffeners should touch the wood about $\frac{1}{4}$ inch in from the edge, leaving just room enough for the tack strips. We used $\frac{3}{4}$ inch #17 headed brads, and pre-drilled the new tack strips—the original tack strips were mostly destroyed at disassembly.

After you have all the leathers in place then reattach the side wires (you did measure the positions they go in so you could find the original holes after the new leather covered them didn't you?). Then glue and nail the wood strip that go between the two pumps in place. We used silicone caulking to seal and glue the wood strips to the pumps. It is a mediocre glue but a good sealer—the top joint needs to be air tight.



Figure 10. The two pumps being glued back into place.

At this point it is a good idea to dry fit the reservoir frame to the pumps just to be sure everything is going to be the right size. If it is not you can add or shave some off the wood strips to get the required alignment. Assuming it all fits the next step is to glue the two pumps together. Again we used silicone caulk for this joint. Use a lot of clamps, and be sure the top edges are held in alignment (**Figure 10**). We clamped a wood strip across to guarantee this.



Figure 11. The pumps now have been glued to the reservoir frame and covering the reservoir is the last step.

After the glue/sealer dries you are ready to mount the frame to the top of the pumps (**Figure 11**). Again we used silicone seal as this is another joint which must be air tight. The other benefit we hope will be inherent with use of the silicone is that it can be taken apart without destroying the adjacent wood parts. It is also able to fill the gaps and uneven surfaces caused by damage during disassembly. If you have already sealed/glued the two parts of this frame together you will have to drill two holes on each side for screws that go through both frames and into the pumps. Be careful not to hit the old screw holes or the side wires

With the frame mounted "all" you have left to do is cover the reservoir, and after what you have been through to date this should be a piece of cake. The original on this machine was rubber cloth, and that is what we used.

The joint down the center between the two pumps was originally covered with a leather strip, and even though we were sure the joint was sealed with silicone we replaced the leather strip to be on the safe side.

After this step you put all the miscellaneous parts back on and the unit goes back into the machine. We hooked it all up turned the switch, held our breath, and lo and behold it worked. We did have one final problem though. The exhaust valve flap located under the outlet to the main air chest got stuck open by lodging on the internal brace at the inner edge of the outlet manifold. This was an original piece which we had not replaced, and it caused our hearts to skip a few beats until we located the problem. It was resolved by making a flap about two inches longer than the original and tapered to eliminate any possibility of future hang-ups on the support. At a later time I got to look at this area of the pumps on an XA-1 serial number 523, and it had two hold down straps over each of these valves.

Our thanks to Dr. Bill Black for his coaching and support in this venture, and my thanks to Martin Anderson for all the hide glue work and moral support that went with this job.

Since Then:

The machine has been in service on the Conneaut Lake carousel during the 2001 and 2002 seasons with no problems from the pump. During the off season we have done other maintenance and rebuilt other systems to the point that the machine has now had a fairly complete overhaul. If you want to hear it play it will be back on station when the park opens in 2003.



Figure 12. The Conneaut Lake organ on DeBence trailer for return to work. Pictured are (left to right) Frank Weltner (Board Chairman), Lynn Zillmer (Executive Director), Ed Bottegal, Martin Anderson and the author, Scotty Greene.

Scotty Greene is a mechanical engineering graduate of the University of NH. He worked for Joy Mining Machinery in design and application of underground mining machinery for 41 years. He started working at the DeBence Music world after retirement in 1999. His first project there was repair of a Wurlitzer 105, and most of his work since has been on various band organs. He owns an Artizan XA-1.