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Rebuilding an Estey Tubular Pneumatic Primary

by Chris Nagorka

In the summer of 1996, our company was commissioned to remove, releather as necessary, and reinstall a 1904 Estey tubular pneumatic organ. As it turned out, the individual note pneumatics had all been releathered in the past 10-15 years and looked like new, but the primaires were operating on their original leather. Unlike most builders, Estey used square "pillow" pneumatics instead of circular pouches. (Note: These are not typical "square" pneumatics in the sense that they do not consist of two blocks of wood with leather between- rather, they are just one piece of leather folded over itself with the ends glued together, and a hole punched in one side for the air to pass through. Thus, they are shaped like a little "pillow".) This was the first time we had ever rebuilt a primary like this, and we learned a lot as we went along!

One of the first things one realizes when taking the primaries apart is that no standard valve wires and leather nuts were used. Rather, Estey used 1/8" dowel rod for valve stems, and the valves themselves consist of a wooden disk covered with felt and leather on one side, with a tiny screw going radially through the disc to hold the valve to the valve wire. Disassembly is where the fun starts- have some of that dowel rod on hand, as it's very likely that some of the valve stems will break, as the valve disks shrink somewhat and become very tight- not only that, but the screw holding the disk on bores a hole through the dowel, and many dowels will break at that point.

The Estey primaries of this type have the "pillows" glued to wooden blocks on a single board which forms the base of the primary. Once the action disassembled, the board can be put on a workbench, and the old leather can be scraped off very easily. As far as replacing the pneumatics, I didn't have a clue how to replicate them as they were originally built, so I started looking through the supply catalogs, and, bingo! Laukuff sells this style of pneumatics in many sizes, and the smallest is a perfect replacement for the Estey originals. (Laukuff's catalog number for the part is 4 079 09.) As of the summer of 1997, 200 of the "puffers", as they are called in the catalog, cost about \$300.00 american.

The Laukuff units are very easy to install, as they have a hole punched in the bottom with a fiber ring glued around it. One simply has to be careful putting glue on the fiber ring, as a tiny bit of glue can run down into the pneumatic and glue it shut! Anyway, once the new units are glued on the primary board, it's time to move on to the valve stems and valves themselves. The valve stems have a small wooden rectangle glued on the bottom, which the "pillow" pushes on to raise and lower the valves for operation. The old leather and glue has to be scraped off of the rectangle. Naturally, now is the time to replace the felt and leather on the valves, and be sure to punch them through so that the felt and leather doesn't bind up too badly on the valve stem. After all of that is finished, the bottom valves can be put loosely back on the stems, the stems put through

the valve board of the primary, and the upper valve on last. (Note: some of the valves that shrunk will be very tight- you can ease them up by running a 1/8" drill bit through them a little bit.) The lower board with the puffers is then reattached. Now the fun begins!

This is where it gets tricky, and getting the primaries to work correctly requires a lot of patience. The Laukuff units have a cardboard plate glued to the top, which increases the height, as does the fiber ring underneath. This means that the old positions of the valves become irrelevant. One has to adjust the upper (inside) valve so that the wooden rectangle on the bottom of the valve stem rests about 1/8" above the cardboard plate of the Laukuff unit. The lower valve can then be adjusted to provide about 3/32" of travel. This is one item that was provided a baffling problem when the organ was reinstalled: the adjustment of the top valve is critical- the top of the Laukuff unit cannot rest on the bottom (i.e., where the air is coming in), as it seemed that the pneumatic simply would not inflate if the inlet was covered up. One would think that the pressure of the key action would inflate the pillow, no matter what, but this didn't work in reality. After the valves are installed, the wooden rectangle on the bottom of the Estey valve stem needs to be glued lightly to the cardboard top on the Laukuff unit. The best way to do this is with a very small brush, putting a little hot glue on the cardboard, then inflating the pneumatic with a piece of tubing underneath the pneumatic board. You can just try to pull up on the top of the pneumatic, but this is asking for inaccuracy. After everything is glued together, go through to make sure that the valves meet the valve board squarely, and test the assemblies for freedom of motion. If everything checks out, the primary is ready to go, and will work reliably for another 90 years.