Strings, Pins & Plates

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Ed

Shaping a V-Bar

Bend a tight hairpin bend on size 24 wire. Cut the end of the hook with a grinder, but don't let the wire get too hot.

Almost no V-bars are actually V. Do notes buzz because bars get grooves in them? Some very old pianos have no buzzes. Piano wire is very stiff. In the old days they thought of the string as a point on pivot. When the string and the V-bar communicate, you get more friction. Does the energy get sucked from one part to the other? Which section drives the other section? The speaking length is the part that moves.

When a plate is upside down it's much easier to work on a v-bar. Employes wear work suits in the factory because the work is dirty. The new Kawais have remarkably clean, even V-bars. Don Manino did life testing with bars that are V and those that are U. The soft V's last longer. Because piano wire is so brittle, the V-bar needs to be soft, not hardened. The string will form a groove.

To shape a V-bar in the shop, Ed uses a die grinder and a compressor, and wears ear muffs. Diamond is abrasive. Most pianos require a lot of work and labor to keep them functional. When you take leverage out, it takes longer. Escapement helps the hammers get away from the string fast. If it's sitting bouncing up and down on the repetition lever, it's killing the sound. Our goal is to make things better at the beginning in order to reduce unnecessary laborious repairs later. Shaping the v-bar will produce a clear tone and can eliminate or reduce false beats.

When there is a blow hole in the plate from a factory mistake, drill a hole, pound in a bridge pin and file it down. Use a die grinder to shape the V. With both the die grinder and the hand file, move it sideways along the line of the bar to assure evenness. Filing up and down could take off more in one area than another. When hand-filing, a hardened capo bar sounds like two files rubbing together. You can hear the sound of the filing change as the rough rusty metal disappears and the metal wears down to fresher material. Look at the curve; if it looks irregular, you can take more off one side than another. Measure the elevations so you can decide how to get it perfectly even. Steinway bridge elevations get gradually higher as it goes lower, which is good. Ed used a very large and fairly coarse file for hand-filing the v-bar.

Removing Broken Agraffes

- Ed demonstrated how to remove a broken agraffe with a reverse-threaded bit, using a power drill on slow. He first made a dimple in the center of the broken agraffe using a punch, and then held the reverse drill bit vertically above the agraffe. Sometimes he would slightly tilt the bit to get it started; once the hole was sufficient, he turned the bit precisely vertical and with the drill turning slowly, the bit gripped and unscrewed the agraffe. Ed gave each participant a reverse-threaded drill bit. Those who dared had hands-on opportunities to break, remove and replace agraffes.
- Another way to remove a broken agraffe is to tap a dimple for starting a bit and then to drill a hole in the center and use a hand-turned easy-out to unscrew it.

- Sometimes a slot can be cut in the top of the broken agraffe using a screwdriver, knife, or MotoTool disc, so that the slot is deep enough to hold a screwdriver blade for hand-unscrewing the agraffe.

Dean

Dean brought a grand piano to practice on.

Aligning Strings to Hammers

- Using string hooks, we pulled up on low wires near the de capo bar.
- Using a small hammer and wooden and brass dowels, we tapped down on high wires.
- To move all three strings left or right to align with the hammer, we placed the three grooves of a string spacer on the trichord and tapped the spacer left or right with a small hammer, keeping the spacer next to the V-bar.
- We used screwdrivers to move individual wires left or right by twisting the blade between two wires. We also pulled and tapped on the shank, using the center of the screwdriver shank to move the strings.
- We tapped individual wires with wooden dowels

String Breakage

Dean selected a wire that was the right string of one note and the left string of the next note up. We tuned the left string on the upper note in half-step increments until it broke a fourth interval above its starting pitch. Even though the right string of the note below was the same wire, there was barely any change in pitch during this process.

Knot Tying

Dean demonstrated various ways of tying knots in piano wire. Using two pieces of Romex wire, he showed the group a large version of a string knot. Then individuals practiced tying knots using round pliers, vice grips, and needle-nose pliers. No one spliced a string in the demonstration piano.

Removing Wire from a Tuning Pin

- We used a becket-breaker to break the wire off the tuning pins at the point where the wire becket enters the pin hole.
- We pried the coil out of the tuning pin hole with a screwdriver.
- We loosened the coil and pulled it off with needle-nose pliers.
- We drilled the pin out with the wire still connected, allowing the force of the drill in reverse to break the wire.
- We cut the wire as close to the coil as possible, using wire cutters.

Tightening Coils on Tuning Pins

- We used an impact coil tightener to snug up crooked or separated coils.
- Another way to tighten coils is to pry a screwdriver blade against adjacent tuning pins, putting pressure on the bottom of the coil, while loosening and then tightening the pin with a tuning hammer. A third way is to pull up on the wire with a string hook as the coil is being tightened.

Shimming Loose Pins

- We removed some coils off a few pins for demonstration and practice.
- Because the tuning pins were so tight in the pinblock and there were no loose pins needing shimming, we created loose holes by drilling existing tuning pins repeatedly in and out of the pinblock until the holes started smoking from the friction.
- We cut various grits of sandpaper to fit around the diameter of a tuning pin.
- Roll the cut piece of sandpaper around a narrow straight-shank screwdriver or a brass rod to make the scroll small enough to fit easily into the pin hole. Leave an eighth of an inch of paper sticking up out of the hole so that it does not get pushed down into the hole, and also so it is visually obvious which pins have been shimmed.
- Enlarge the paper in the hole by rolling a thin screwdriver blade around the inside.
- Insert the tuning pin into the center of the sandpaper and pound the pin in with a large hammer and a pin punch.
- Leave the top of the pin slightly higher than the other tuning pins, since it will be turned down as the string is tightened.
- Test the tightness of the tuning pin with the new shim. Compare the feel to adjacent pins and the feel of the pin before the shim was added.
- If the pin feels loose, remove it and look in the hole. Most likely the paper broke and was shoved down into the hole. Pick the paper scraps out of the hole with a dental tool or a hook made of piano wire. Possibly the sandpaper was too thin. Grits as small as 200 and 220 will usually break, although with care, for small differences, they can be kept whole.
- We removed the pins and tested the same holes with different grits. Depending on the looseness of the hole, the best grits ranged from 100 and 150 down to 80, and even as large as 60-grit, for very loose holes. If the shim is so tight that it is difficult to turn the pin at all, beware that it may be possible to break the tuning pin.
- Ideally we are striving for 60-80 pounds of torque. Loose pins will not hold a pitch. Tight pins can break. Try to match the torque of the other pins if they are good.
- Shimming individual pins is a quick, easy, and inexpensive way to eliminate random slipping tuning pins. If all the pins are loose, it may be more efficient, quicker, and easier to restring the piano. Replacing the pins with larger pins while leaving the original strings is often more work than installing fresh wire. If the pins are that loose, check the bridges for splits, the soundboard for cracks, the V-bar for grooves, and consider a complete restringing job.