Small Shop - Big Results

Simple Grand Pinblock Replacement, part 5 – A Final Twist

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The assumption in the first four segments of this series dealing with replacing the simple grand pinblock is that the flat surface of the plate that the pinblock fits up against is true. In many cases it is, or at least close enough that it is not a factor to obsess over. When the board is screwed securely to the plate, the flex in the board allows closure of a side-to-side gap, if it is of an inconsequential nature.

Photo #1: A gap to gape at.

The plate in question for this final segment of the series does not fit the above description. It was removed from a Steinway M, and brought to me by Frank Ludnak of Traer, Iowa to work on. Frank has been doing this type of work for over a half century and has seen most everything, but the amount of curvature to this particular plate surprised even him.

Putting a straight edge from one side of the webbing to the other, the amount of deflection in the center in this plate was nearly ¼". Using the index card method to check the exact amount of bow in the plate, I discovered that at the point of widest separation from a straight line, I could insert 27 index cards before the friction of the straight edge would prevent me from pulling them out. Twenty-seven of the index cards that I use for this purpose measure out at 7/32"- more than triple the greatest amount of deflection that I had seen in any cast iron plate up to that point.

Upon a careful examination of the block, it was obvious that it had been tapered on either end, to the point where you could see where the factory techs had planed down through the first lamination. A swell in the middle of the webbing was matched by a depression carved into the pinblock. There was no filler used by the factory whatsoever, but a very tight fit between the block and the flange and webbing had been achieved by filing the block.

Feeling that I needed more information, I wrote up the crux of the situation, and posted it on the pianotech website. I was curious as to whether this was a unique situation, or whether those who dealt with pinblocks on a more regular basis than myself occasionally saw plate deflection of this magnitude. I addressed my comments to any "Steinway specialists" out there, in other words, someone with more experience than myself in dealing with this type of issue.

The most informative response to my initial query came from Frank Emerson, from Silver Springs, Florida. Frank's experience includes working as a university tech at Ball State University, in Muncie, Indiana, and later as factory technician for Baldwin, Mason & Hamlin and currently for Hailun in China. Frank stated that "*while I have not worked for an extended period of time in a foundry, I have had a great deal of interaction with foundries and their engineers, including visits to observer their operations*." Following are excerpts from the comments he posted on the pianotech website:

> *I doubt that this condition has developed over time. More likely, the plate left the foundry with the curve you describe. 1/4" may be a bit excessive, but not by much. What would be more surprising would be to find a grand plate that was absolutely flat, unless it was machined flat. In the extreme case of a 1/4" curve, if the manufacturer attempted to machine that out, there would be little or nothing left at the extreme treble, as the webbing is often only 1/4" thick in the treble."*

Following a discussion of more modern factory techniques, Frank further advised that "*the pinblock will flex enough to conform to the curve of the cast iron when it is an offset of around 1/8" across the scan of 4+ feet*."

Ron Nossaman, a frequent contributor to the pianotech website, as well as a Journal author, also responded to my query with an informative posting:

> *I doubt you'll hear from many "Steinway Specialists", but a number of us "Generic Trench Troops" have seen this. It wasn't intentional; it's a random casting cooling event. Some are pretty flat, some aren't. You'll get plates that twist and curve in all sorts of directions. The block will conform to the plate if it's just screwed to it, but If you expect to have the block end up flush with the underside of the stretcher, you'll have to taper it like the factory did. This is a good excuse to look at power hand planers, if you haven't already.*

Armed with the knowledge that what I was facing wasn't as unusual as I first believed, I began at that point in designing a jig to measure the exact curvature of the

original pinblock for duplication. My feeling was that since the factory block fit extremely well to the plate, the task boiled down to making a replica of the original.

The jig I envisioned would have a platform for the original pinblock to be secured to. This platform, I thought, should be made of 1 ½" Delignit for absolute stability. Six ¾" bolts, one at each corner and two in the center, would rise up and allow for a second "floating pinblock" to be positioned over the original block. The floating pinblock would have a grid work of3" screws spaced 1" apart which would penetrate the floating pinblock. With the factory tapered side of the original pinblock up, the floating pinblock would be lowered down on the ¾" bolts until the first screw touched the original pinblock, then would locked into place with a nut above and below on each bolt. Each 3" screw would then be carefully turned down until the point just touched the original block, thus forming an pattern showing the contours to be duplicated.

With that done, the old pinblock would be removed, and a new pinblock blank put in its place and secured. The nuts suspending the floating pinblock would be turned down the exact amount of distance between the lowest 3" screw and the highest. The floating pinblock would be placed in position, and pounded down until the points of the highest screws made contact with the blank. The areas needing to be ground down would be indicated by the prick marks of the screws.

Or at least, that was the idea I had in mind.

I posted a brief description of this concept on the pianotech website, and received a though-provoking post from Will Truit:

> *Have fun with it, but I am not sure it would save you any time or be any more accurate. I've fit many a Steinway block and others over the years. It is almost always my practice to top fit the pinblock to the bottom of the plate as well as face fit it to the flange. Like others on the list, I have seen very warped plates every way from Sunday, but my fitting is more or less the same for all.*
>
> *With a block like yours where you know you will be taking down the ends quite a bit, I would take some thickness measurements on the old block at the ends. Then I would use a belt sander or power hand planer to hog the material down to something above the height of your sample. Don't be too fussy yet. Having either chalked or graphite the face flange and the bottom of the plate, I would start by smacking the pinblock along its length with a mallet against the bottom of the plate. Then I use a 4" disc sander with 60 grit paper on it to start grinding down the high spots. (Or use the belt sander if you are still hogging a fair amount off.) Keep grinding down the high spots that are indicated by the chalk or graphite marks. You will be whacking the pinblock against the face flange and grinding down the high spots. Go back and forth between the face and the top. When the entire length of the top of the pinblock lies flat on the plate without rocking you are there. Same for the face flange.*

This procedure sounded so much simpler than the complicated contraption I was thinking. Sometimes, simple is better. I posted a thank-you to Will for his good advice and without further ado, set to work. The good news in all this was that my end of the job was just to fit the block to the plate. It would be left oversize on the outer edges all around for trimming down to fit in the piano back at Frank Ludnak's shop in Traer.

The process suggested by Will not only worked, but turned out to be very straightforward. An afternoon's investment of time was all that proved to be required.

Photo 2: "Oh so blue!"

For this type of fitting, begin by chalking not only the flange, as is the procedure when the webbing is straight and true, but also the entire curved webbing area of the plate (Photo 2). The pinblock should be cut and ready to fit, then placed into position. With a rubber mallet, thump the pinblock every few inches along the outer edge to chalk the high points along the flange. Then tap the pinblock down toward the webbing along the length of the board (Photo 3). Be sure not to hit the pinblock with too much downwards force. If the board flexes at all when hit, more of its surface will come in contact with the plate than is normally touching.

Photo 3: Mallet work.

The initial results will be small, widely separated dabs of blue chalk marking the high points of the plate where actual contact between the plate and the new pinblock occur. These marks indicate wood which must be ground off. Each time the block is lifted off of the plate, it should be first put in a double vise system for grinding down the high spots of the flange edge (Journal, September '09). A plug-in drill with plenty of torque mated to a drum sander with 36 grit paper is ideal for this job. Work from one side to the other, and grind off the chalk and a small amount of wood underneath the chalk.

Once this is done, turn the block up onto the bench top, with the chalked surface upwards, then tighten down a single bar clamp to hold it in place (Photo 4).

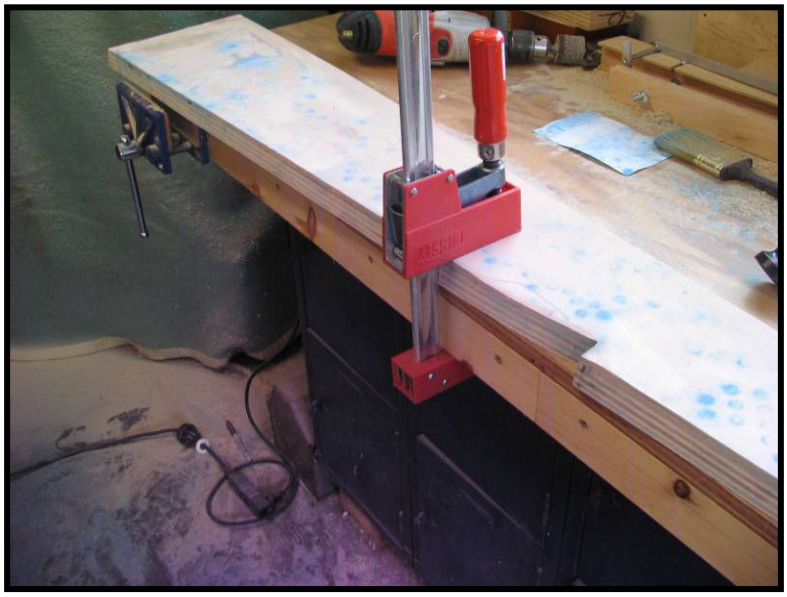

Photo 4: A firm grip is necessary.

The high spots on this face of the pinblock are taken down with a disk grinder (Photo 5). This type of grinding is fast-working and long-lasting – ideal for the job.

Photo 5: The right tool for the job.

A grinder, by the way, works much better than a power hand planer for this job. The planer does not work especially well for hollowing out an area in the middle of a flat surface. Also, by using just one edge of the tilted grinder, the contours of an area needing attention are much easier to follow.

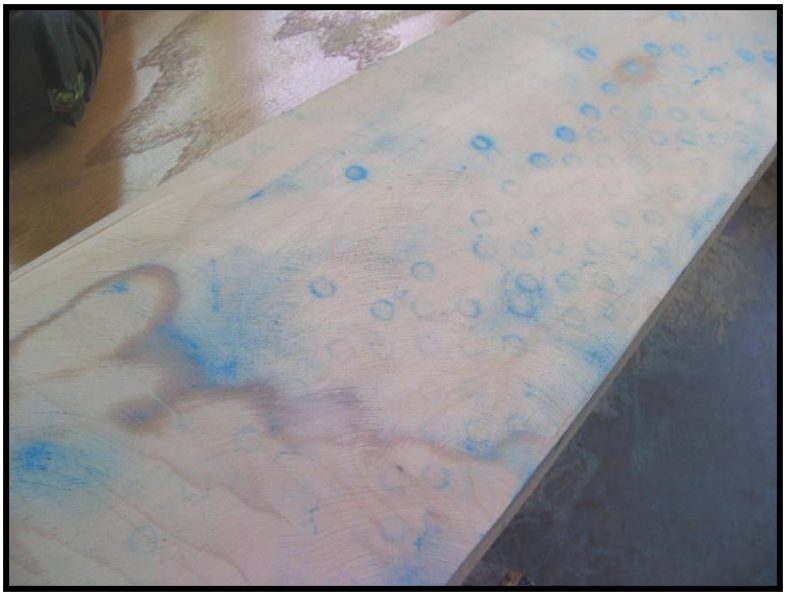

Photo 6: Ghost spots.

A word of caution is in order at this point: Not every blue spot on the face of the pinblock indicates that contact is actually being made. Air movement through the pin holes in the webbing when the board is hit will cause “ghost spots” in areas where actual contact is definitely not taking place (Photo 6).

Photo 7: Where wood meets metal

Physical contact of pinblock to plate is indicated by heavier concentrations of chalk, such as those seen in Photo 7.

In the spots where the heavy marks of chalk indicate contact, wood needs to be removed – not just the chalk itself. Grind down through the area under and immediately around the chalk to fit the block to the plate. Due to the severity of the problem in this case, as the pinblock was fitted to the curvature of the webbing, the grinder actually cut down through the initial laminations of hardrock maple.

The idea of this process is to alternate working on the fit between the pinblock and the flange and between the pinblock and the broad face in contact with the webbing. Otherwise, if only one surface is attended to at a time, the fit attained on the first surface will be altered as the block is adjusted in towards the flange, or down towards the webbing of the plate.

As one goes back and forth between the fit of the flange and the fit of the webbing, the gap becomes less and less in both respects. The number of index cards which fit in between the plate and the block will dwindle in number until a single card is tightly clamped in place. Along the length of the flange, a single card should be held tightly at whatever point you chose to place it.

In Photo 8 Frank Ludnak, having returned to the shop to pick up the plate and newly fitted pinblock, applies the final touches in grinding off a bit of wood near the end of the process.

Photo 8: "Oh, Golly!"

The lesson to be learned for me in this process was to reach out and ask for the expertise of others when the way is uncertain. In this trade, secrets are few, and one only has to ask to have others share what they know. This is one of the great things about the profession we are in.

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