WNG Carbon Fiber Shanks

Ed McMorrow & Roger Gable
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Ed: **Shanks and Flanges**

First generation had a cloth bushing, but they would get tighter and looser at twice the rate as wooden parts. The new generation has teflon. The shanks come in three different thicknesses: thin, medium & thick. To cut the shanks, use an abrasive wheel. To glue the hammers to the shanks, use superglue. The flange, body and fork is carbon fiber reinforced nylon.

The pinning is excellent, and the need for repining is almost non-existent. The center pins are stainless, cut-to-length, highly polished, and come in fractions of 1000 increments and require precise fittings. They come with special reamers. If you discover a pin that doesn't fit, you can go up one size and test. Take a heat gun, heat up the tight side of the flange and it will come free.

When you go to travel, you can't use standard travel paper. With wooden flanges, Ed uses lick-to-stick paper. These papers won't stick on carbon fiber. Ed discovered that flame-retardant aluminum foil tape works. It is available from Home Depot and Ace. The Steinway flanges need more travelling than others because of the flange shape. You can't double-up on this tape or it won't stick: it will slide out. If you need more thickness, use a thicker grade of tape.

Carbon fiber flanges have a little too much side play. Push the fork bushing closer to the flange. Ed uses a hole-punch to push the bushings in. Sometimes it helps to heat the flange with a heat gun and move it while warm. Ed has no idea what material they use to make the bushings out of. Lay the shanks and flanges down in line on a flat table and test for travel.

Roger: **Boring the Hammers**

Roger chose Renner Blue point hammers. He used to use Abel or Ronsen. For Steinways he uses Ronsen. This is a higher-tension piano, so he's using Renner. So far in our example, all the hammers are bored except for six. Roger described how he bores hammers. He starts with raw hammers with no coving, arcing, boring or anything, and uses a Renner boring jig on a drill press. The bit is specifically tailored to the shank diameter, which in this case is a number 8.

To determine the bore distance, remove three hammers from the mid-section and from the mid-treble. Place the action in the piano. Draw a line up the middle of the hammer. Lay a piece of scrap metal on the string where the three dampers have been removed. Set the metal jig on the strings as a base. Use this scrap square to draw a straight line by leaning one edge against the shank and mark the hammer. Roger uses 90 degrees. If there is a rake on it, determine why they would have installed an obtuse rake; usually a rake is applied only if the string angle is sloped.

With the action in the piano, use a hook, pull a shank up until the hammer touches the string, drop the right angle down and examine the angle. Shave off felt until the sample hammer is at the correct angle. Install an unglued sample hammer that has been bored too long; shave the felt

off because it is too long, removing felt off this scrap hammer until it is at the proper angle. If the string is going uphill, the angle might not be correct, so check that as well. Uphill strings will cause the hammers to over-center. Ideally, the hammer should be 90 degrees to the string.

Roger demonstrated boring, using the drill press and jig. He set the jig to match the original hammer and bored on the marks he made on the hammers. He keeps a block of wood as a support beneath the hammer location so that the drill hole is always in the same place. By having this hole directly under everry hammer, the bottom side of the hammer will not chip out as the drill punches through the other end: the block retains the wood and the hole in the block allows the bit to continue through.

Ed: **Installing the Flanges and Shanks on the Stack.**

Steinway flanges are not as thick. Make sure the flanges are all butted against the lip of the rail so they are all in line. Make sure the screws don't go through and split the hammer rail.

Ed has calculated the ratios for the speaking notes. As hammers wear they tend to move the action back, so Ed starts with it a bit forward. Shape the V-bar. If this is not accurate, the speaking length can be off.

WNG suggests using gel glue, but it sets up fast. Slide all the samples where they should be. Ed then uses liquid super glue on both sides of the hammer, and lets it wick in since the shanks are already snug in the hammer holes. Don't touch them for a couple hours so the glue can set up. When done gluing, squeeze the glue up the nozzle and let it suck down, so as to leave the nozzle empty to avoid leaving hardened glue in the tip.

The WNG shanks and flanges were installed on the stack. We stuck some sample hammers on the treble section. Ed used a right-angle to set the hammers to be perfectly vertical and perpendicular to the shanks. One hammer leaned out too much, so he used a hand reamer on the hammer hole. He turned the reamer backward to crush the wood rather than forward, which would have actually removed wood. When he set the hammer back on the shank it was too loose, so he held the hammer tail under the sink tap to wet it. The wood swelled and fit tightly on the shank.

To determine the strike point, with a 6" ruler, using the bridge pins as a base reference, measure how far the center line is on the sample hammer is from the bridge pin. Ed has developed a formula that is empirically derived. He sets the sample hammers according to these numbers.

Glue the samples, then glue the other hammers between them using a straight edge. Cut off the protruding shank tips from the tops of the hammers with a metal grinding disk on a drill press.

Roger: **Arcing and Tapering the Tails**

Roger demonstrated how he arcs the tails on his special jig.

Using the sandwich Smart Chart, calculate the arc. This chart helps to determine how much to taper the sides and to increase the coving in order to match the key weight from one end to the other. Shoot for the average on the chart: make a sweeping arc with a pencil right down the middle of the chart. Take a piece of drill rod and bend it to facilitate drawing the proper arc on the chart. This chart is sold by Pianotek. Once you own one, you can copy as many as you want for yourself.

Once the hammers are hung, regulate the piano.