Grand Piano Regulation

Eric Schandell

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Sprung system

The Steinway key bed is made with floating tongue-and-groove slats.
The key-bed has a 1/32" positive crown, and the key frame crowns in the opposite direction, creating a sprung system.

- Key-frame and key-bed
- Cheek-blocks and key-frame pins
- Down-bearing of strings and bridge
- Lyre braces and key-bed
- Tubular metallic action frame
    - By crimping the edges. the tube can expand and contract

If there is a knock, remove material from the key frame, not the key bed. It is very easy to remove too much material with sanding. Because of the coving, sand very little, using 180 or finer paper.

Regulating Procedure

To remove the fallboard, wet your fingers a little, lean in, disengage the dowels on the check blocks and rest it so the fallboard can be removed without the cheek blocks.
Before the key frame and action are taken out of the piano:

- Press on the pedal and pull the action back and forth. If there is a clicking, the cheek block plate contacts only on the edge and the side to reduce friction. If this is too loose, take an upholsterers mallet and peen the bass plate to make it fit to the key frame guide pin forward and aft. A piece of maple veneer can be used to lower plate. If you peel off a little of the spacing paper on the cheek block take the screws out of the plate and add some veneer. This will pull down the position.
    - The Hamburg key block has a nylon roller, and an
    - adjustment screw for vertical adjustment of the plate position. Lift up with your thumb on the key frame and knock.
    - In and out adjustment
- Key block adjustment
- Key frame bedding
- Balance rail stud regulating
- Keys squared and marked for leveling., can all be done
- Lubricate the lid hinges if they squeak. Check the hinge screws.

With the action out, use the lid of the piano for a workbench.

- Lubricate and ease keys
- Travel and burn shanks
- Refine hammer spacing
- \space repetitions to knuckles
- Regulate repetions sptings
- Fly
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- Tool used to adjust tension or to vertically align the right action spring with the edge of the keyframe. It also makes it possible to strengthen the back part of the spring to reduce the kicking of the key.
- Bed the key frame
    - Initial setting of balance rail studs
        - You must see something that is out of sight – the studs relative to the keybed. We regulate this with the action screwed to the key frame, key blocks screwed in. Put your hand on the keys and play notes, while feeling the keybed with the other hand. Or just push on the keyrame. Try knocking.
        - Try pushing on the balance rail, seeing if the key level mores, or turn a stud until the key height rises. Any reference will show movement in the keys when a stud is turned while touching the keybed. Turn iot back until it stops going down. Now listen for a knock.
        - Make the stud knock on the keybed, turning the stud until the knocking stops, or move tissue paper between the stud and the keybed while adjusting until the paper is caught.
        - Lift stud until you introduce a knock this way by pulling up on the bracket or the keyframe pin. Press with the other hand on the keys over the balance rail. Let go, and knock until it goes away.
        - Start with the second stud from the treble and regulate using favorite method. Get one right for sure, then move on to the others. Tighten until knock is heard in first stud. Adjust, removing knock. Listen by pressing on the key with enough force to flex the balance rail. Pump the pedal and check again. Push down on the keyframe and check again.
        - By removing the lift, aftertouch may be lost, so consider how much work you have time to do.
        - The final test is to press hard on the damper pedal. This will pull the keybed down. The stud settings must be adjusted
        - When doing the bass, disengage the key frame by lifting up and listen. Adjust in this order: 4, 3, 2, 1, 5. (4=bass, 5=treble stud)
- Re-pinning
    - When reaming out a tight pin, using Don Marino's burnisher might be too tight
    - Make your own reamer by knurling half of a pin with a file and place in a pin holder.
- Traveling
    - Traveling paper must be placed symmetrically on the side of the flange to avoid spacing the shank unintentionally because the Steinway flanges are shaped.
    - Paper that is placed only part of the way under flange will also space the hammer. The longer the piece, the more it will kick the flange over.
    - Cross-papered flange for extreme spacing. This multiplies the effect of the spacing.
    - You can also cross-file with a rat-tail file, which would be the opposite of papering.
    - Spacing can be accomplished by shifting the flange laterally on the rail.
    - To block the hammer against the string, hold the jack tender on the let-off button, and lift with the second middle finger to hold the hammer against the string. This prevents the jack from letting off.
    - To avoid parallax, stand square to where you are working.
    - By raising just the damper of the note you are working with it is easier to hear when the hammer connects.

    - The shank can be pulled up with a hook, but to keep the hammer from moving at an angle, bend the hook off-center.
- Spacing Hammers to Strings
    - Decide where you want the hammers in relation to the strings, allowing for shift.
        - Because hammer width varies on every piano, the critical part is the third string.
        - Allow for needling in fresh felt during shift.
        - An alternative way is to allow a little more spacing on the left-hand side so that in the shift position the third string can be included. Turn the stop screw a little to miss the third string, but this is difficult and takes a lot of time spacing. If there is an oink during shift, include the third string.
    - Strike point
        - To find the strike point, make a mark on the keybed where the keybed is at the moment, and gradually push the action in to find the tone. Make a second mark next to the first one, pull the action out,
        - The hammers can be removed and reglued
        - The hammers can be shaped off-center.
    - If all sections are incorrect in one direction the key frame rest block may be bolstered or reduced.
        - Before making a change in the stop block, check to see the shift pedal is not regulated.
    - Ensure the spacing will allow the action to shift and miss the third string, while the remaining two strings are struck by fresh felt.
    - How much overlap is there between the sostenuto and the strings? Use a flashlight.
    - Seeing hammer spacing
        - Block hammer against string to minimize parallax. The point of contact is at the bottom center of the string not he outside edge seen from above.
        - Look at the groove in the hammer.
        - Use a flange spacing tool while holding the hammer against the string.
        - With a screwdriver, push against the screw. If you are too far in or not far enough you will affect the adjacent flange as well.
        - In the bass, favor the hammers to the bass side.
        - When refining hammer spacing with hammers at rest, ensure that flanges and hammers are equally spaced. Rest the hammers on a higher level rail straightedge and you can see precisely how even the spacing is.
        - Use a straightedge to support the shanks to better see hammer spacing.
    - Travel and burn the shanks
- Shape the hammers. Steinway uses a diamond shape. Follow the shape of the piano brand.
    - Fit the hammers to the strings, parallel to the key-bed.
    - When voicing later, fit the strings to the hammers.
- Adjust key spacing.
    - Grind down the front so the tool slides more easily under the front rail punching
    - An adjustable wrench on the shank will work as well.
    - Some people bend the tool for leverage.
- Space repetitions to knuckles and capstans
    - It makes more sense to leave things right in position when adjusting. Move the nearest thing to object. Reduce excess movements.
    - Slide and space the balancier to align the balancier to the capstan but keep the let-off button in line with the jack.