Grand Piano Dampers

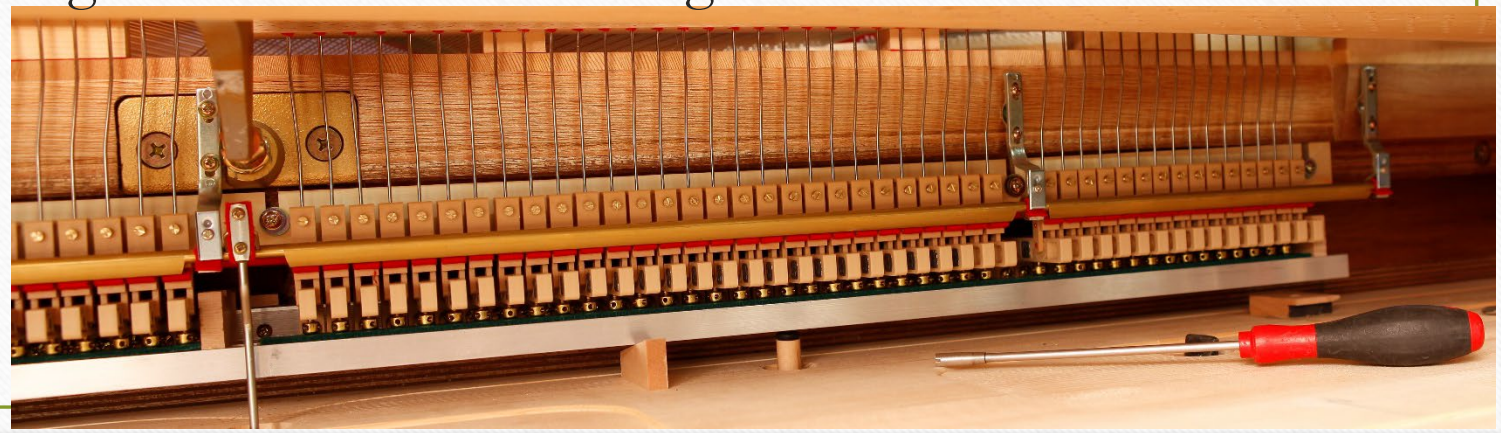
Regulation and Service

Agenda for Class

- Introduction
- Damper tray block repair / replacement
- Regulating damper lift at the key
- Solving Damper Problems / Wire Bending
- Trimming Damper Trichord Felt

Introduction

- Kawai damper system is similar in design to other pianos from Asia and Europe.
- Damper flange rail is mounted directly to piano cross block
- Damper tray pivots on flanges in line with lever flanges
- Quiet and stable system, very little wear on tray felts

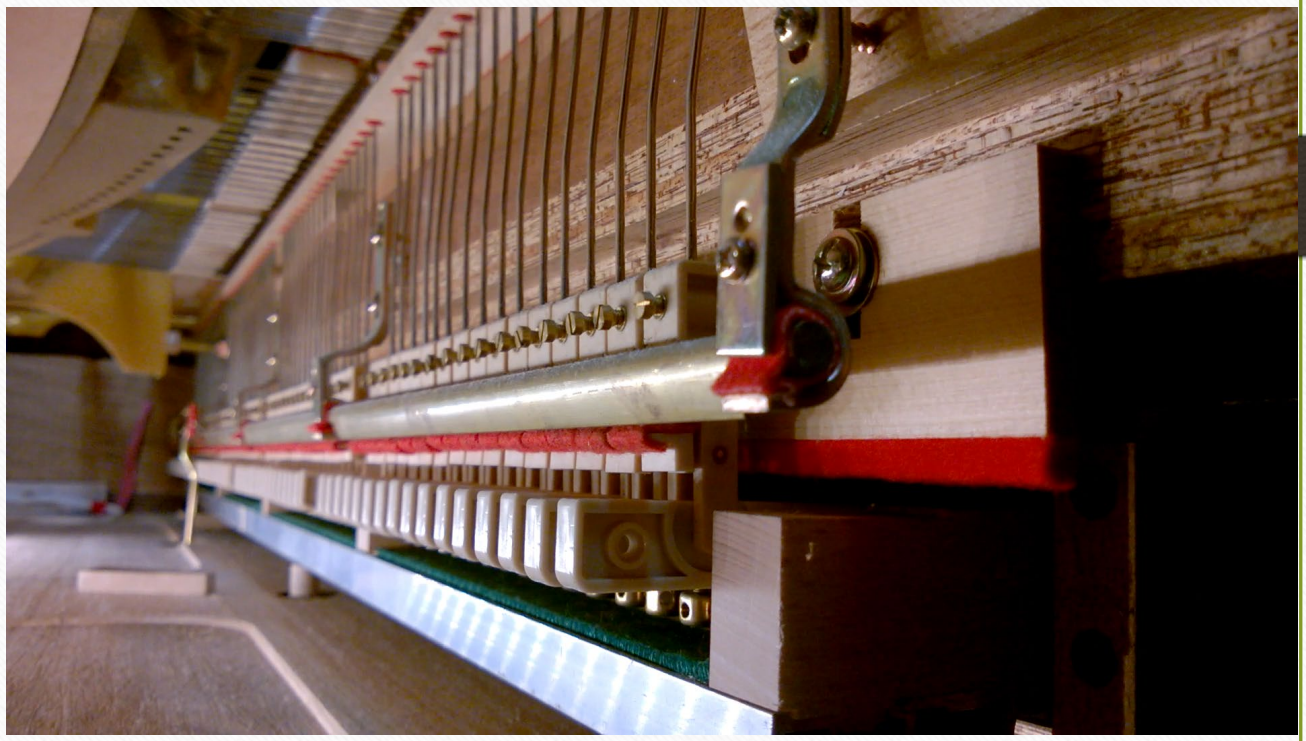


Introduction

- Shigeru system is modified so that the entire system pivots on end blocks
- Damper flange rail and damper tray locked together
- Damper Pivot axis is different from damper lever center pin, giving more sensitive half pedaling function.

Shigeru Damper Action

- Shigeru system levers and wires can be seen to move in and out.
- This also slightly tilts the damper heads when lifted.
- This makes ½ pedaling smoother for the pianist.



Damper Tray Blocks

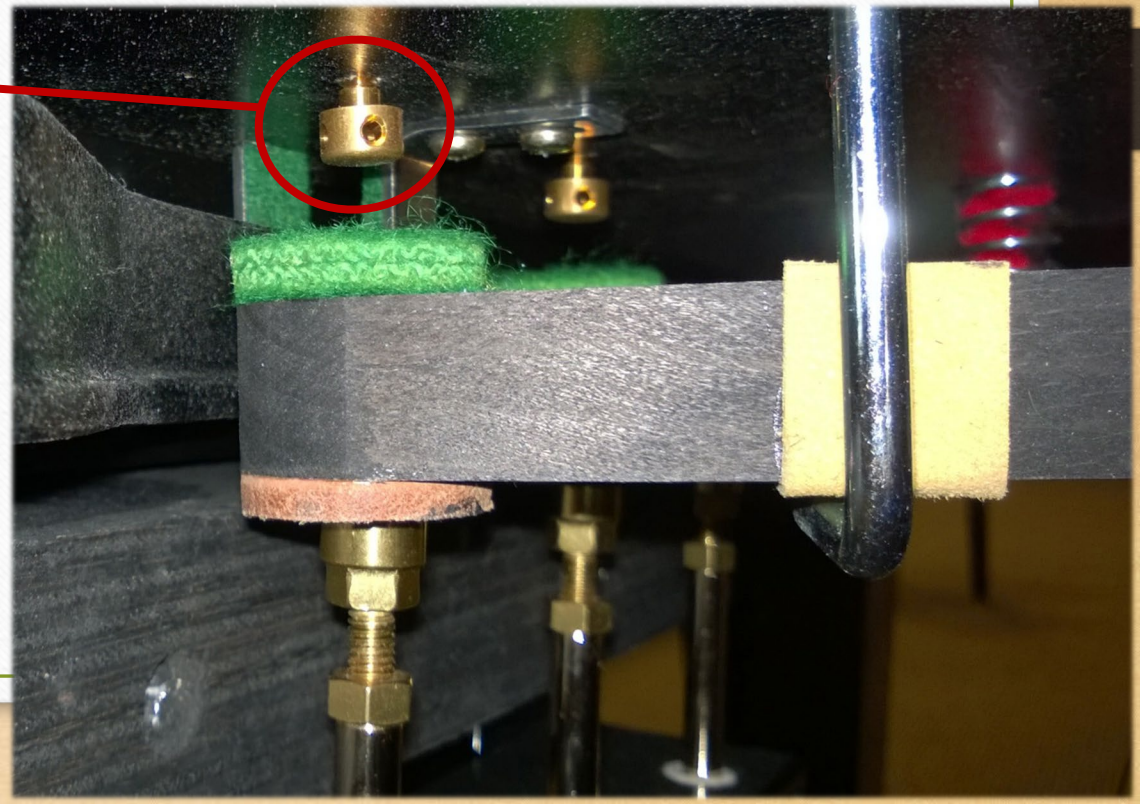
Tighten, Repin, Replace

Noisy Damper Tray

- Diagnose First
  - In dry conditions the blocks can become loose – can be repaired by tightening screws.
  - If center pin is working out, block must be removed and re-pinned.
  - If block is cracked at the birds eye it must be replaced.

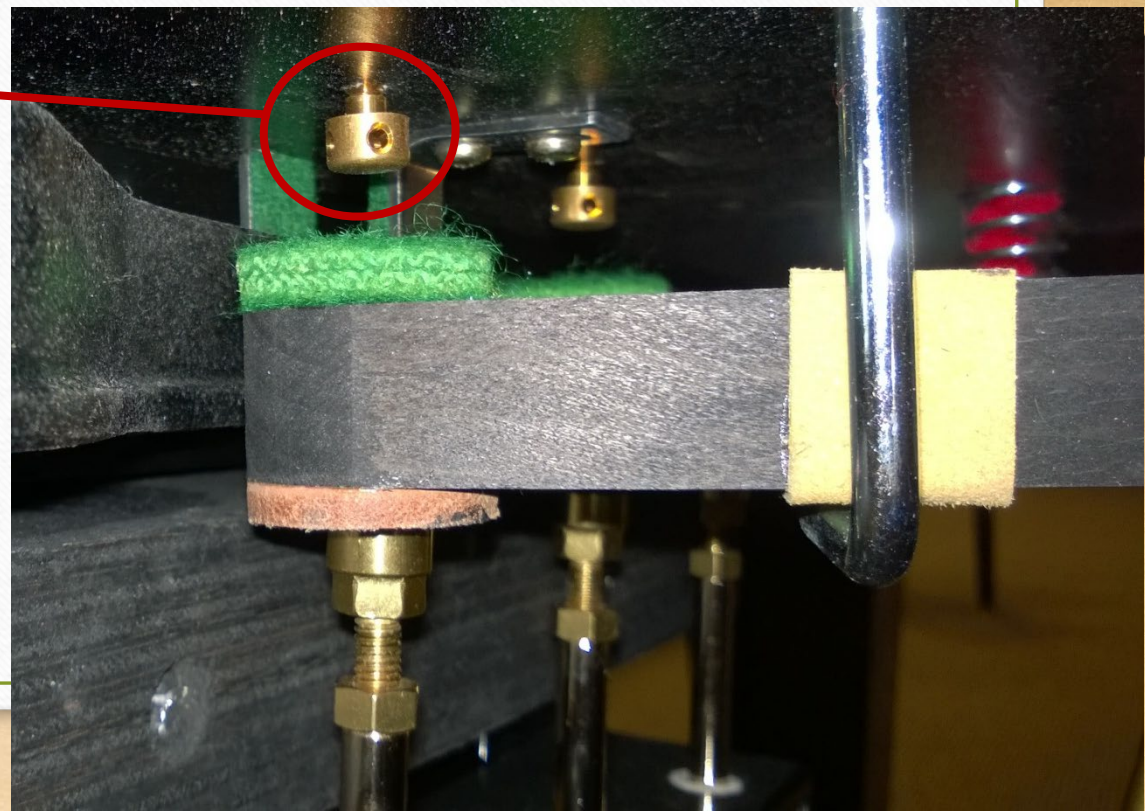
Noisy Damper Tray

- Important: broken blocks or damaged flanges have a cause – you need to also fix the underlying source of the problem in order to keep it from going bad again!
- Heavy pedaling combined with excess pedal travel stresses the damper tray flanges and also pushes the upstop rail too high.
- Make sure pedal travel is correct.
- If pedal stop capstan is not solid enough, replace with block of wood or hard felt cut to the correct thickness.



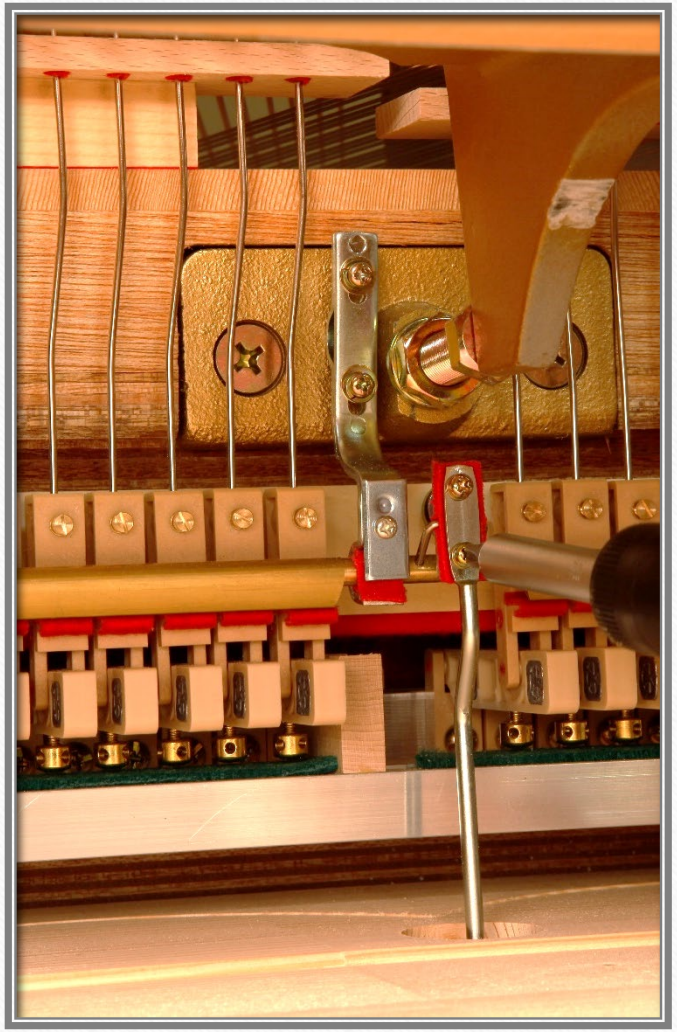
Noisy Damper Tray

- Set the pedal stop so that the dampers are lifted just slightly less than they are lifted with the black keys.
- Hold the pedal down then play the black keys – the damper heads should just barely wink.
- This will prevent stress on the damper action, and will also make it easier to set the upstop rail correctly.



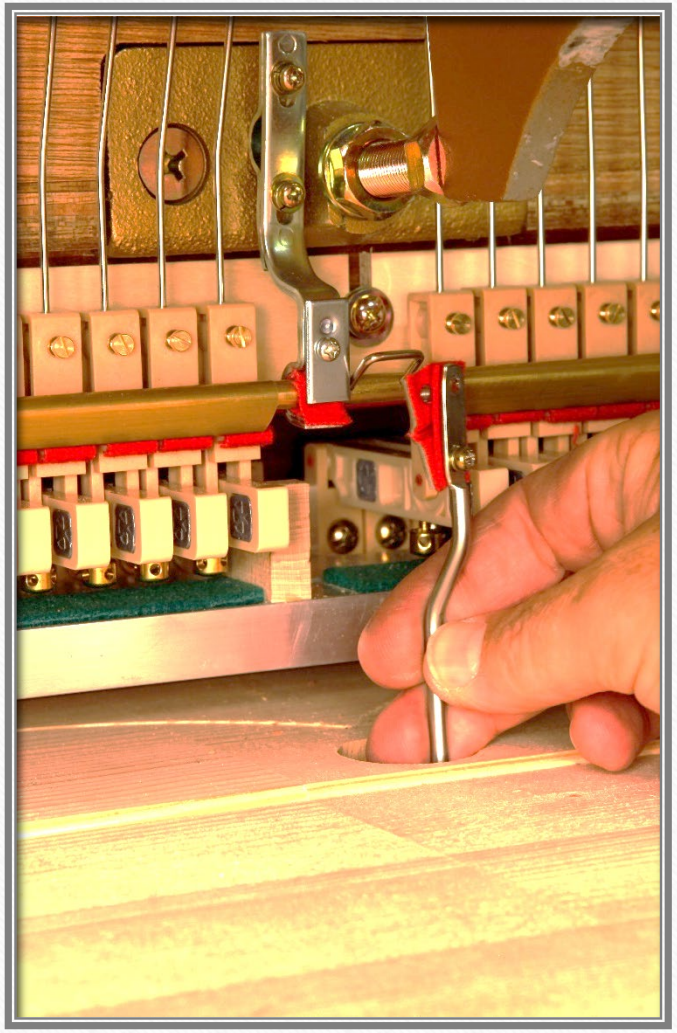
Servicing Damper Tray Blocks

Loosen Sostenuto Pitman Screws



Servicing Damper Tray Blocks

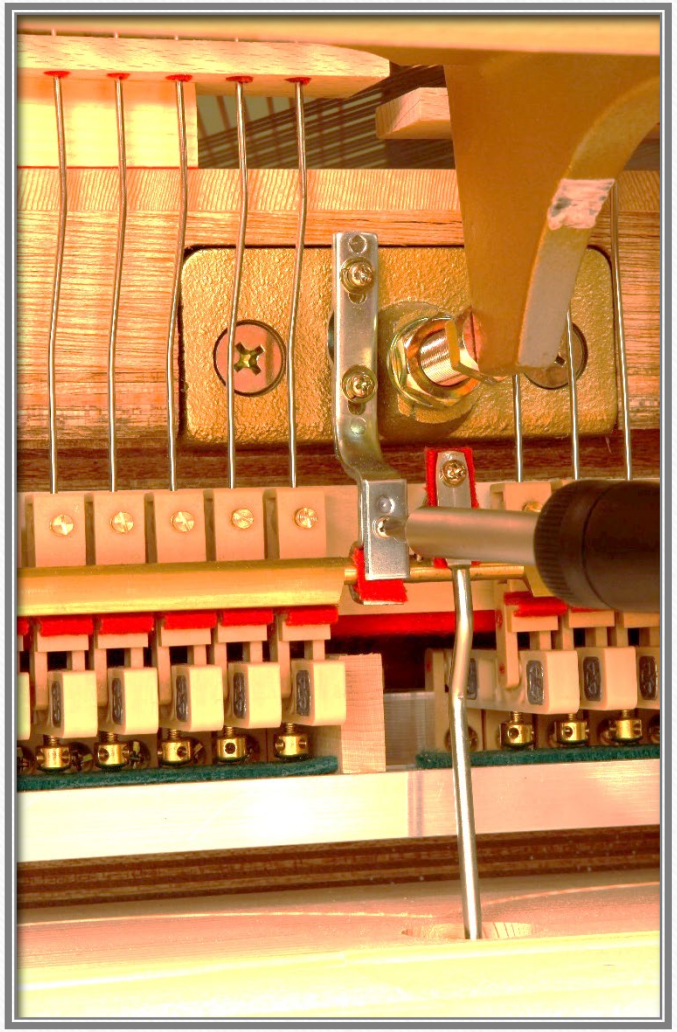
Disengage Pitman from Sostenuto Rail



Servicing Damper Tray Blocks

Loosen Sostenuto Rod Retaining Screws, turn clamp 90 degrees.

Remove rod but leave felt in place.

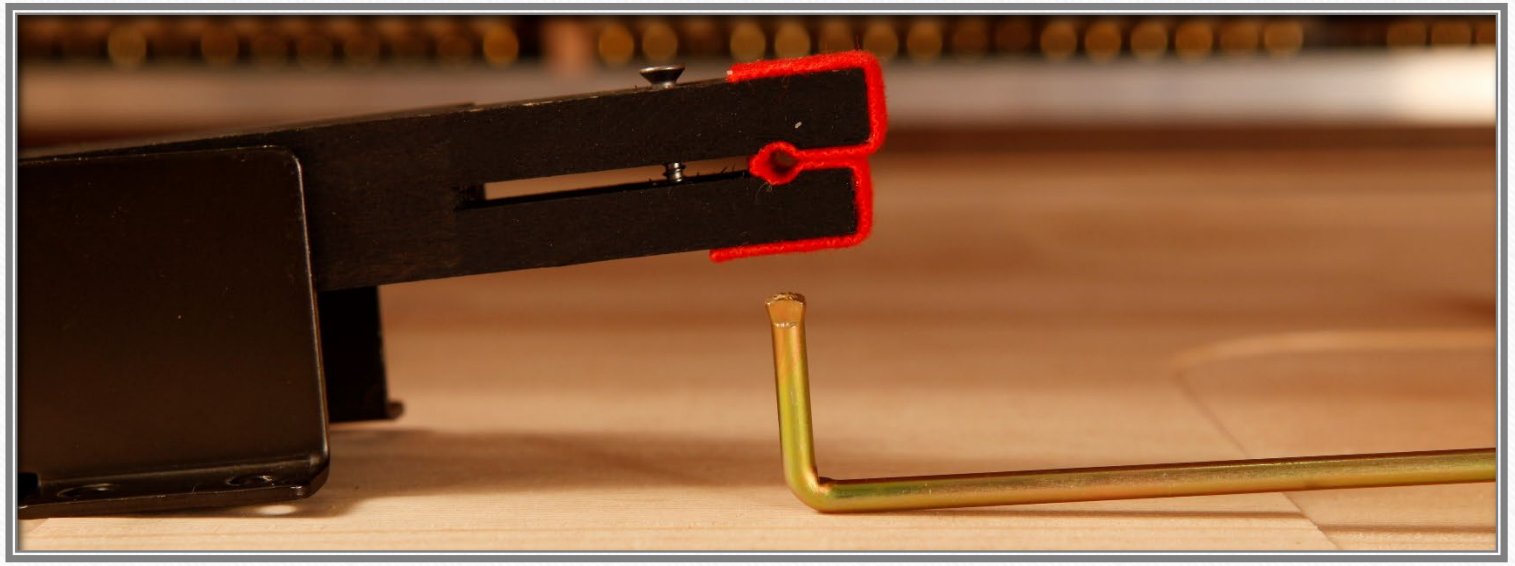


Servicing Damper Tray Blocks

Remove pedal rods from damper and sostenuto pedals

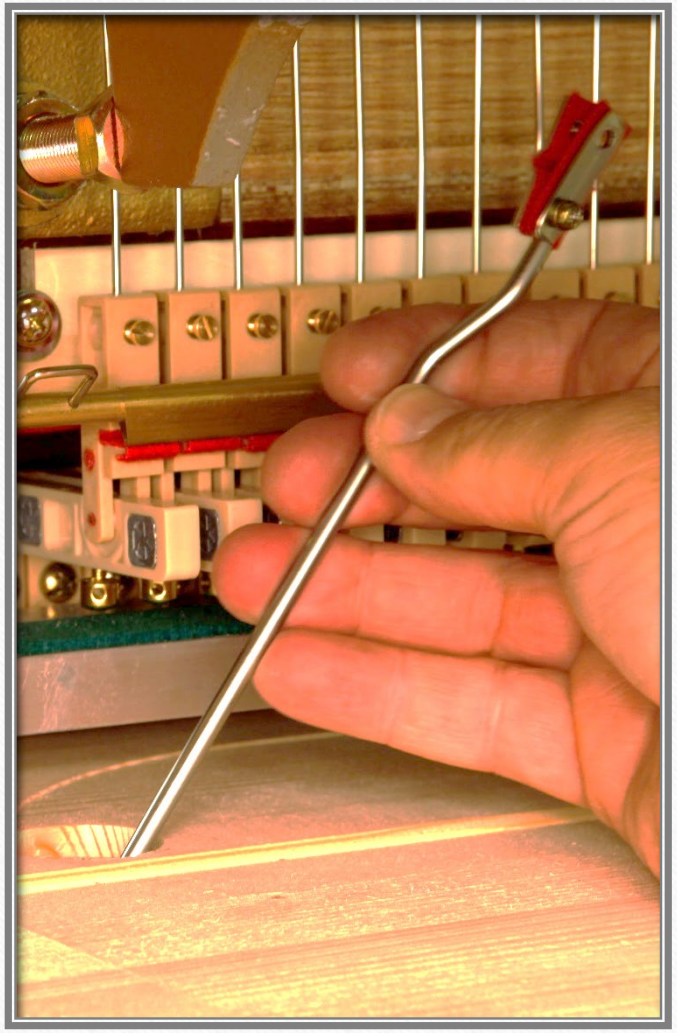
~then~

Remove Pitman from Sostenuto Pedal Lever



Servicing Damper Tray Blocks

Remove Sostenuto Pitman

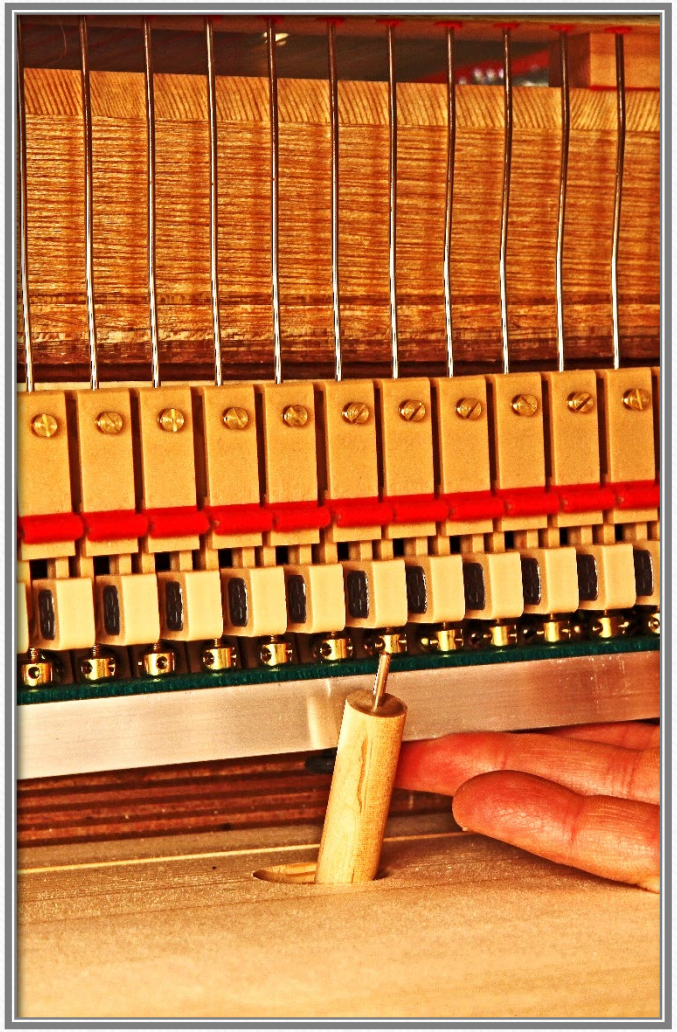


Servicing Damper Tray Blocks

Raise Upstop Rail All the Way

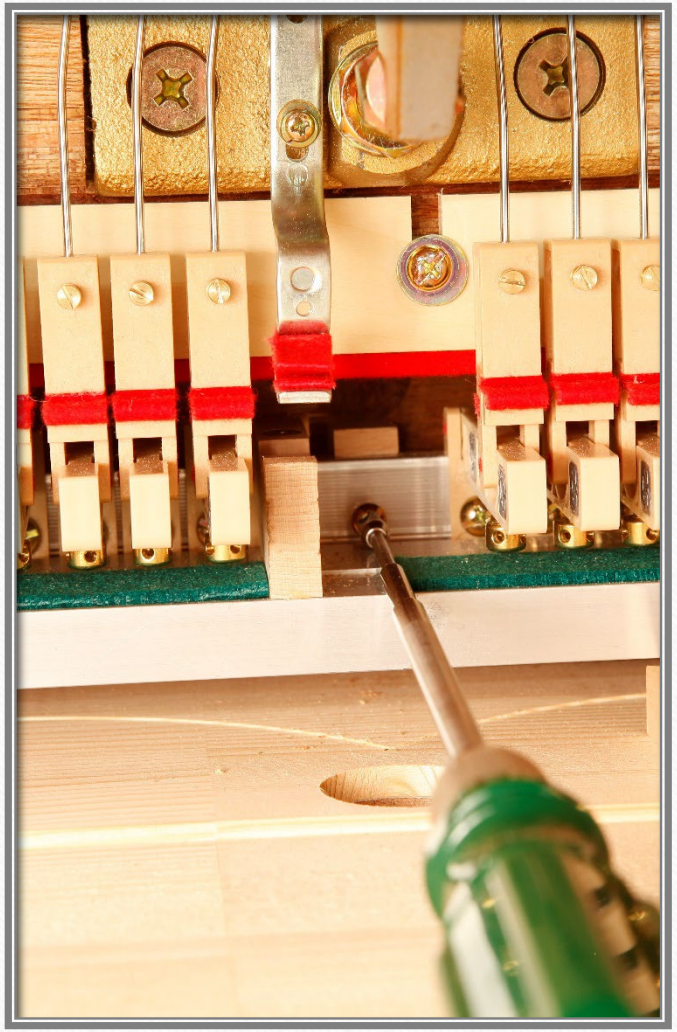
Servicing Damper Tray Blocks

Remove Damper Pitman



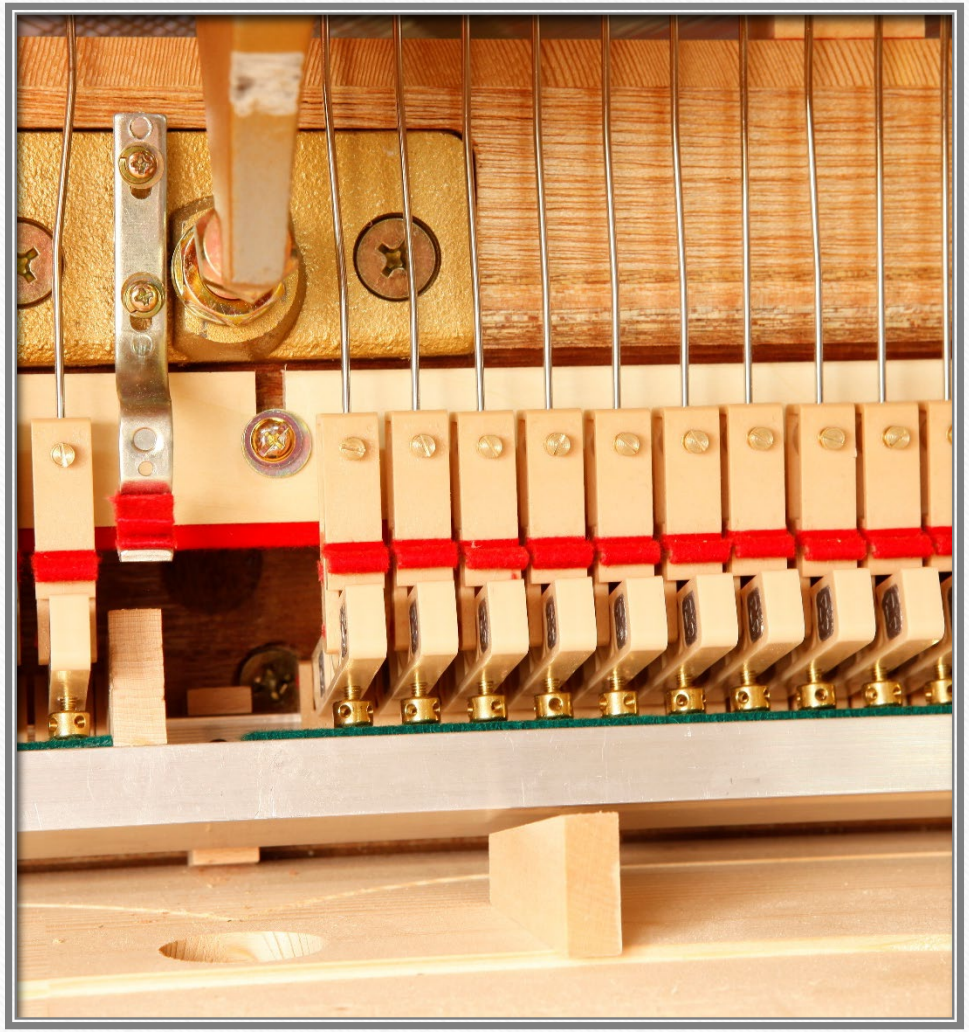
Servicing Damper Tray Blocks

Remove Back Action Mounting Screws (4)



Servicing Damper Tray Blocks

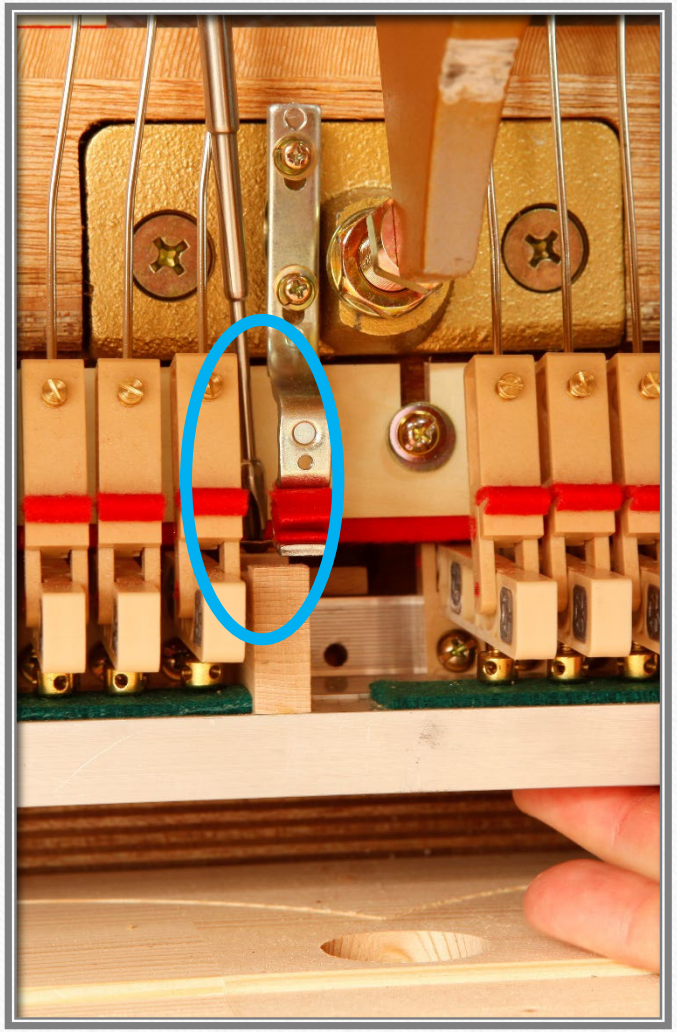
Lift dampers up, pull rail out.



Servicing Damper Tray Blocks

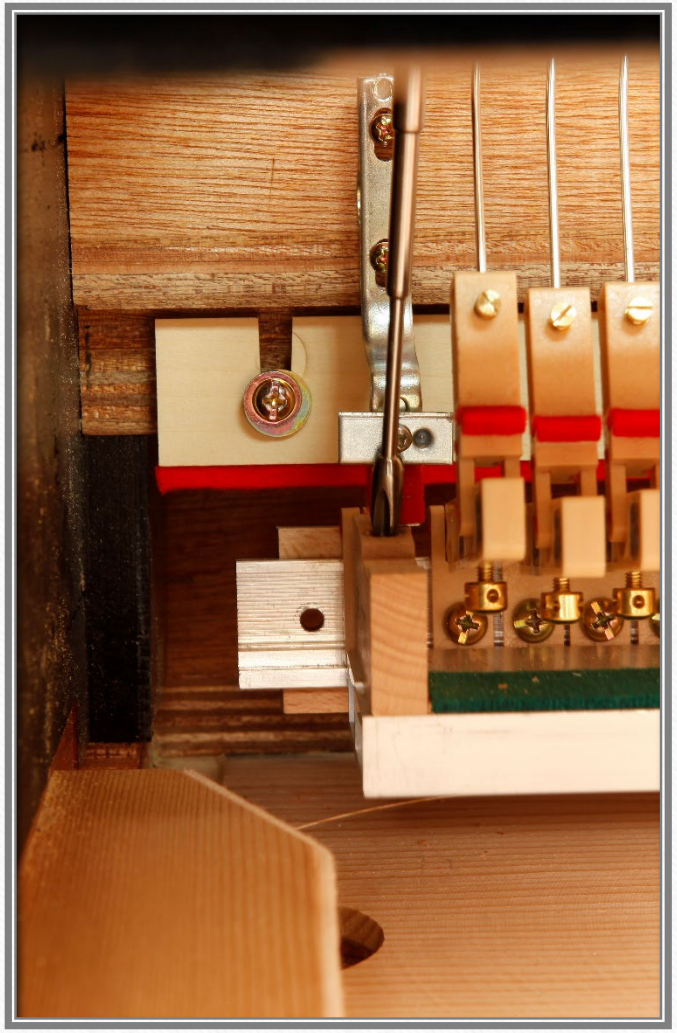
With action pulled forward, you can access the block screws.

If only loose, tighten them and reassemble action.



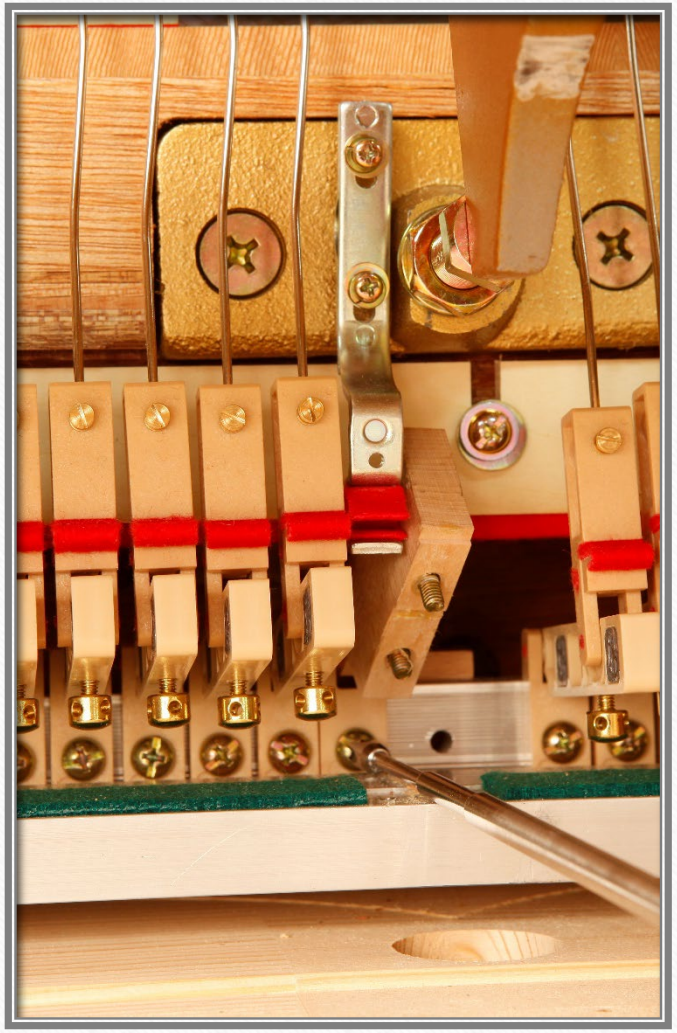
Servicing Damper Tray Blocks

If a block need repinning or replacement, loosen both screws.



Servicing Damper Tray Blocks

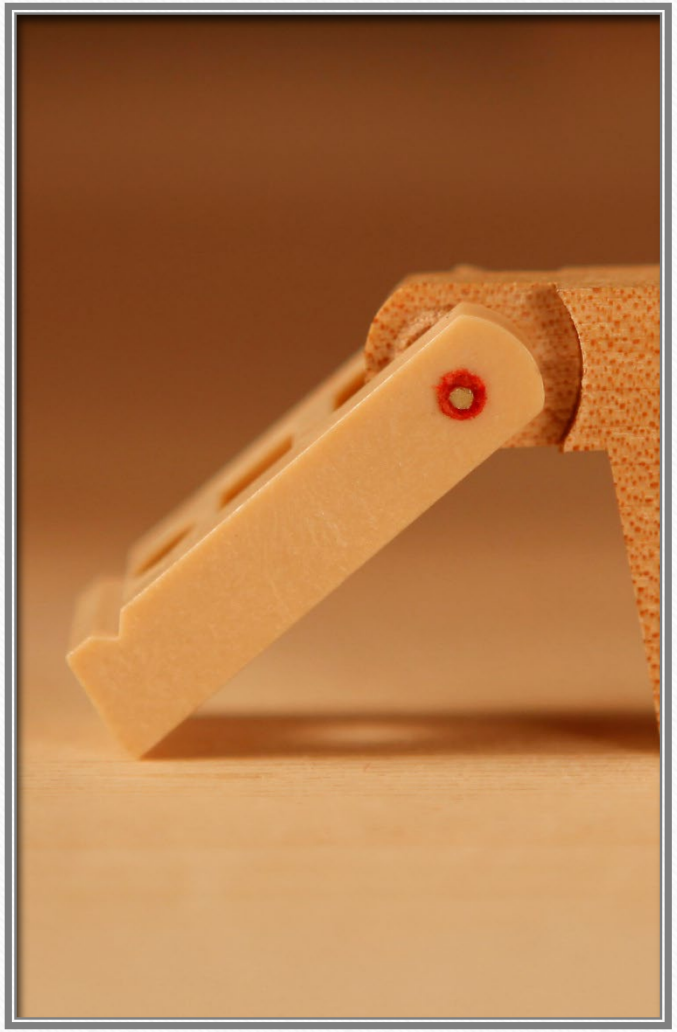
Raise block and remove flange from the rail.



Servicing Damper Tray Blocks

Replace center pin for tight fit in birds eye.

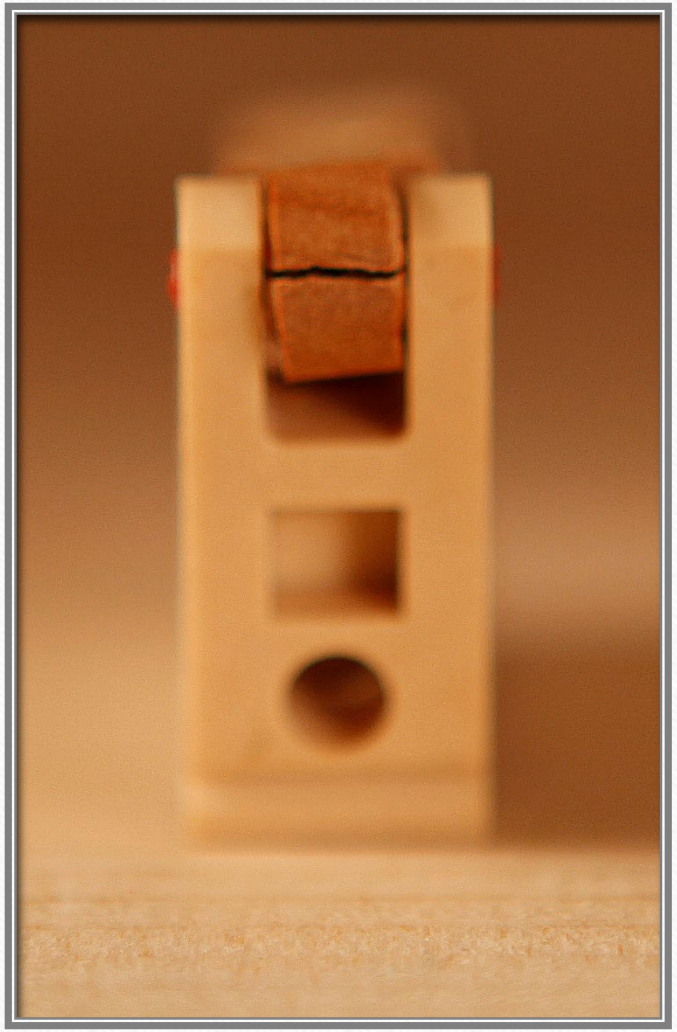
Pin fit in the bushing should be much tighter than normal action parts.



Servicing Damper Tray Blocks

If the Damper Tray Block is cracked,

Order a replacement from Kawai.



Regulating Damper Lift

Setting Lift for ½ Hammer Blow

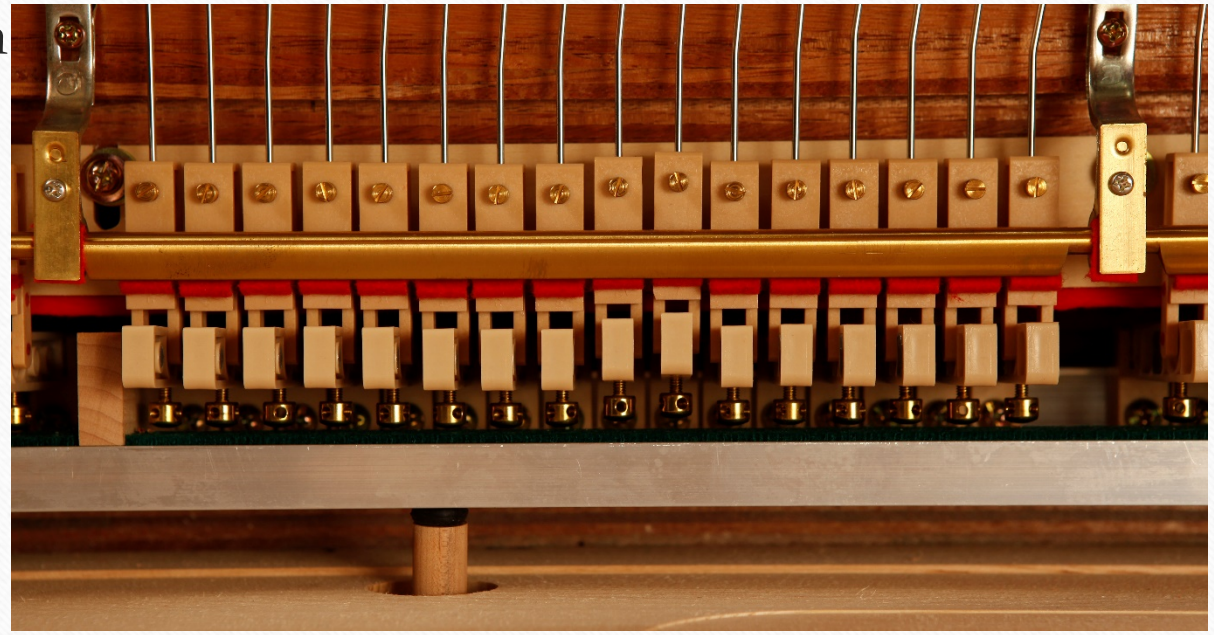
Setting Even Lift with Keys and Pedal

Regulating Damper Lift

- Damper should begin moving when hammer is ½ way to the string.
- Early lift makes action feel heavy, tone seems dull.
  - *Legato* play is easier and smoother, *staccato* not super sharp and clear.
- Late lift makes action feel light, tone bright.
  - *Legato* play is more difficult, *staccato* very dry and short.
- Uneven lift makes for uneven touch and poor articulation for pianist.

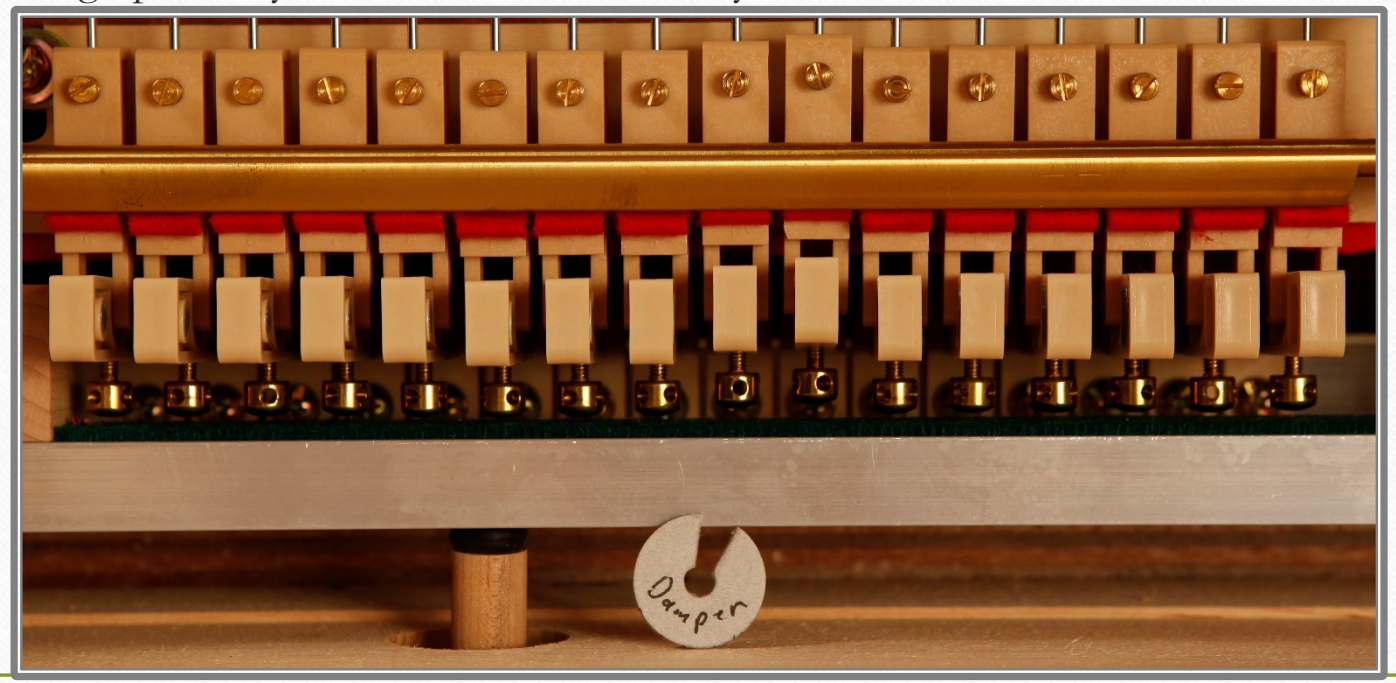
Regulating Damper Lift

- Set 3 sample damper levers in stair-step fashion.
- Install action, check to find which one is at the correct lift point.
- Mark correct damper head with chalk, remove action again.



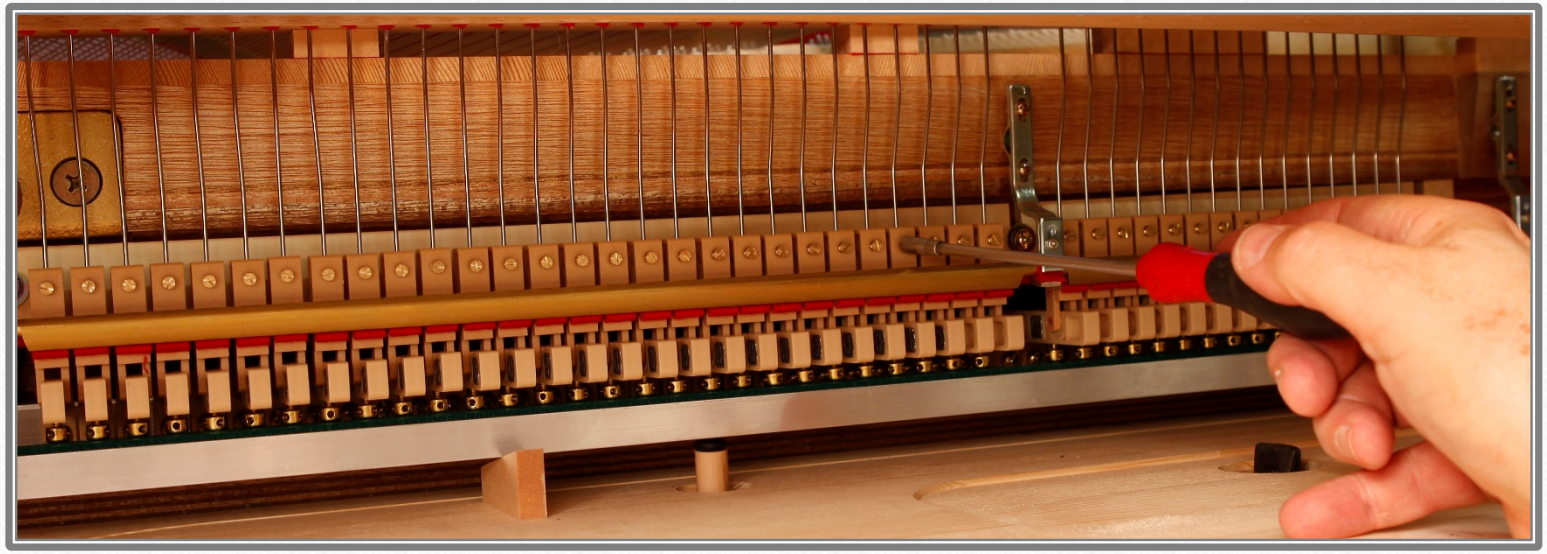
Regulating Damper Lift

- Install 2mm shim at pitman.
- Adjust pedal rod end so that damper tray is supporting the sample lever exactly at rest – damper is on string, lever is resting on tray
- Pressing down on tray does not move sample damper lever
- Lifting up on tray lifts the lever immediately – no lost motion.



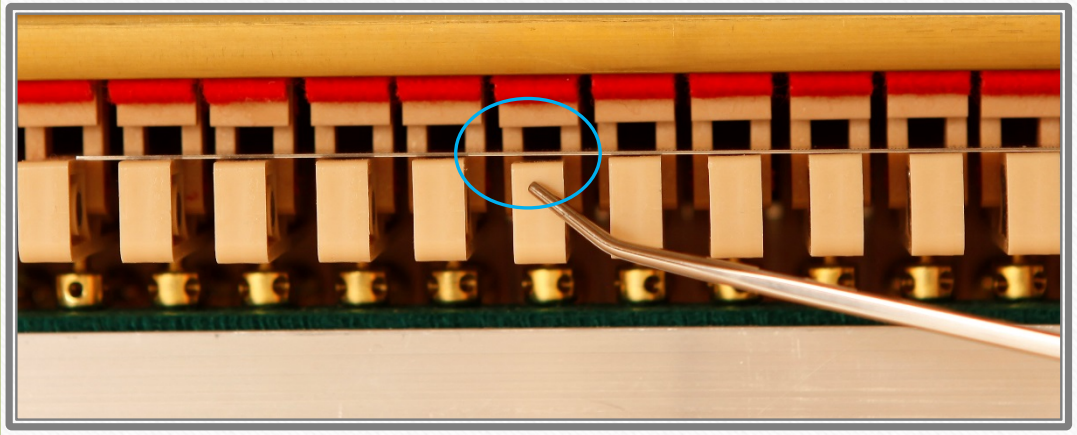
Regulating Damper Lift

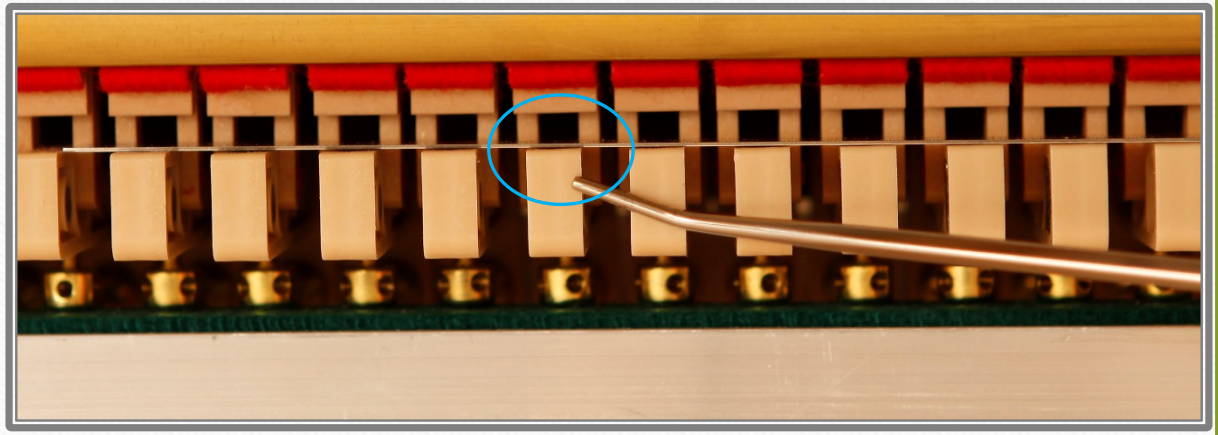
- Loosen all damper wire screws.
- Let damper levers rest on tray, check that all damper heads are resting on strings.



Regulating Damper Lift

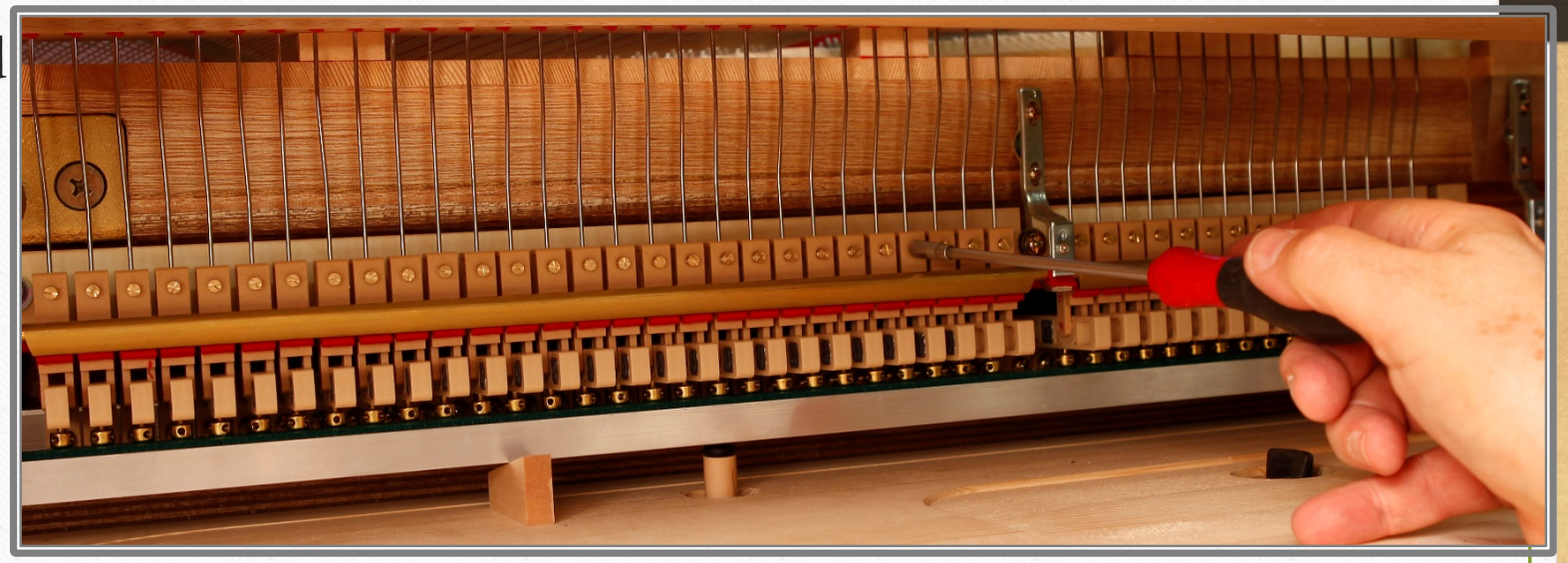
- Regulate damper lever capstans.
- Levers should be perfectly level resting on the tray.





Regulating Damper Lift

- Once all damper levers are level, then re-tighten wire screws.
- In ABS parts these don't need to be too tight – just snug enough to hold.
- For flat dampers, hold heads straight with one hand, tighten screws with other.



Regulating Damper Lift

- Remove 2mm shim from top of pitman dowel
- Lift tray by hand and look for uneven damper lift.
  - "Tap" the tray up on the damper levers, watch for levers that jump
  - Wink the tray up and look for late levers.
  - Don't use capstans – this will create uneven lift with keys.
- Loosen wire screws of incorrect dampers, re-tighten at correct position
- Straighten crooked dampers by twisting wire in the block using pliers

Damper Function

Troubleshooting Alignment

And Damping Effectiveness

Damper Function

- Play loud chord with pedal, slowly release pedal, listen for late notes.
- Play every note *forte* – *staccato*
- Listen for leaking notes, high partial rings, loud “oinking” cutoffs
- Play *mf* with una-corda pedal, listen for noisy trichords.
- Chalk mark problem dampers

Damper Function

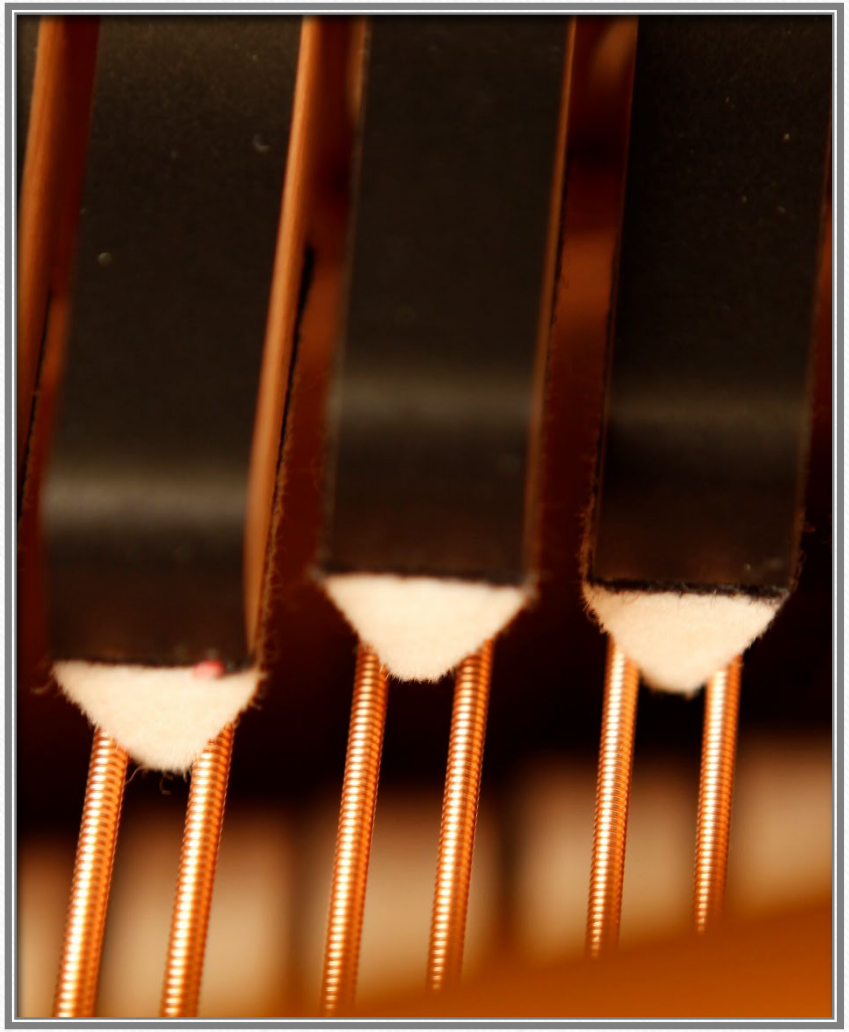
- For late cutoff notes, check damper lever height to see if it is level with neighbors.
  - If it is even, use capstan to make lift even with others.
  - If it is not even, use wire screw to reset lever height.
- Also check that felt is seating into strings – head may need alignment.
- Or felt might need trimming to keep it from hanging up on strings.

Damper Function

- For leaking notes, check for uneven string spacing or uneven wedge widths.
- Look for trichord wedges that seat slowly because they are too wide.
- Squeeze and trim wide side to fit strings.
- Squeeze trichord strings to see if string spacing can be improved.

Damper Function

Wedge Felt must be Centered on Unison



Damper Function

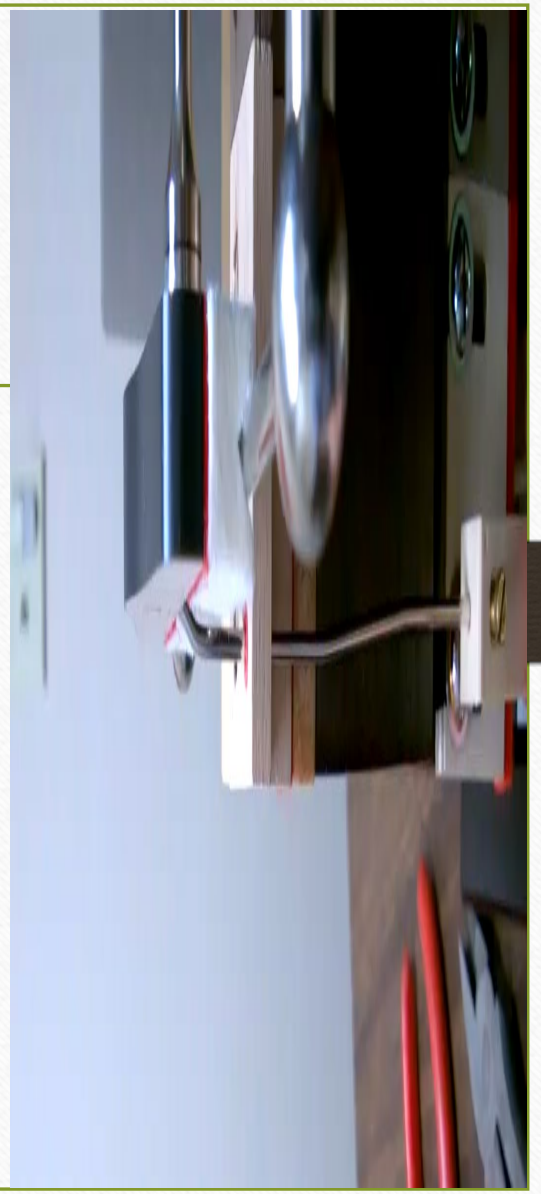
- Damper head should seat evenly front to back
- Lifting slightly early at the back can improve ½ pedaling.
- But must never cause leaking harmonics.

Damper Function

- Flat felt must sit evenly on the unison
- Side to side unevenness is from a tipped head.
  - Wire bends at head
  - Upper wire bend underneath
- Front-to-Back Tilt causes rear or front felt to be raised
  - Wire bend at the head
- Uneven or damaged felt blocks.

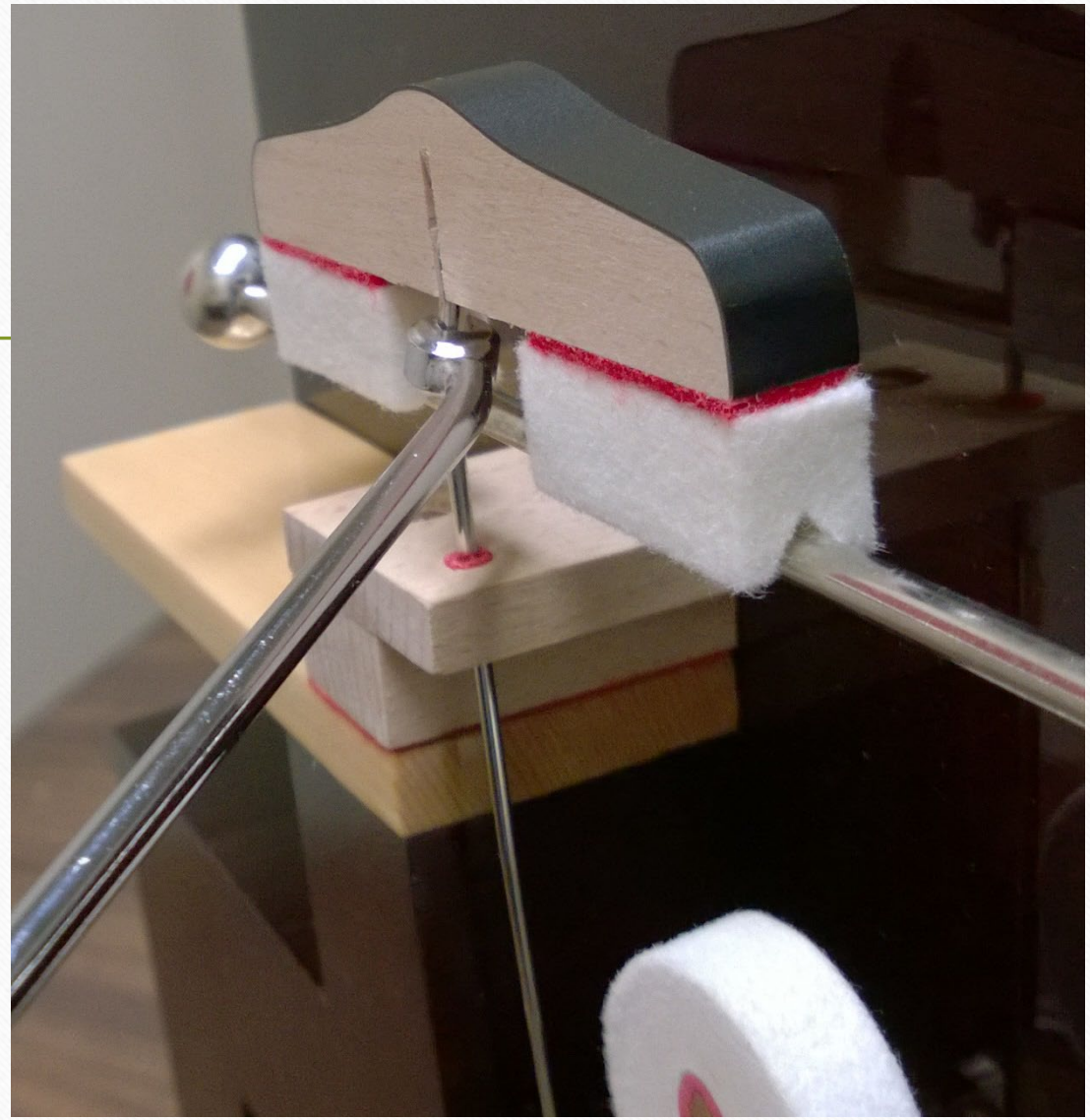
Damper Function

- This damper is slightly misaligned towards the right.
- Wire Bends at Head need to be decreased to move it farther left.
- Head is also tilted towards the right.



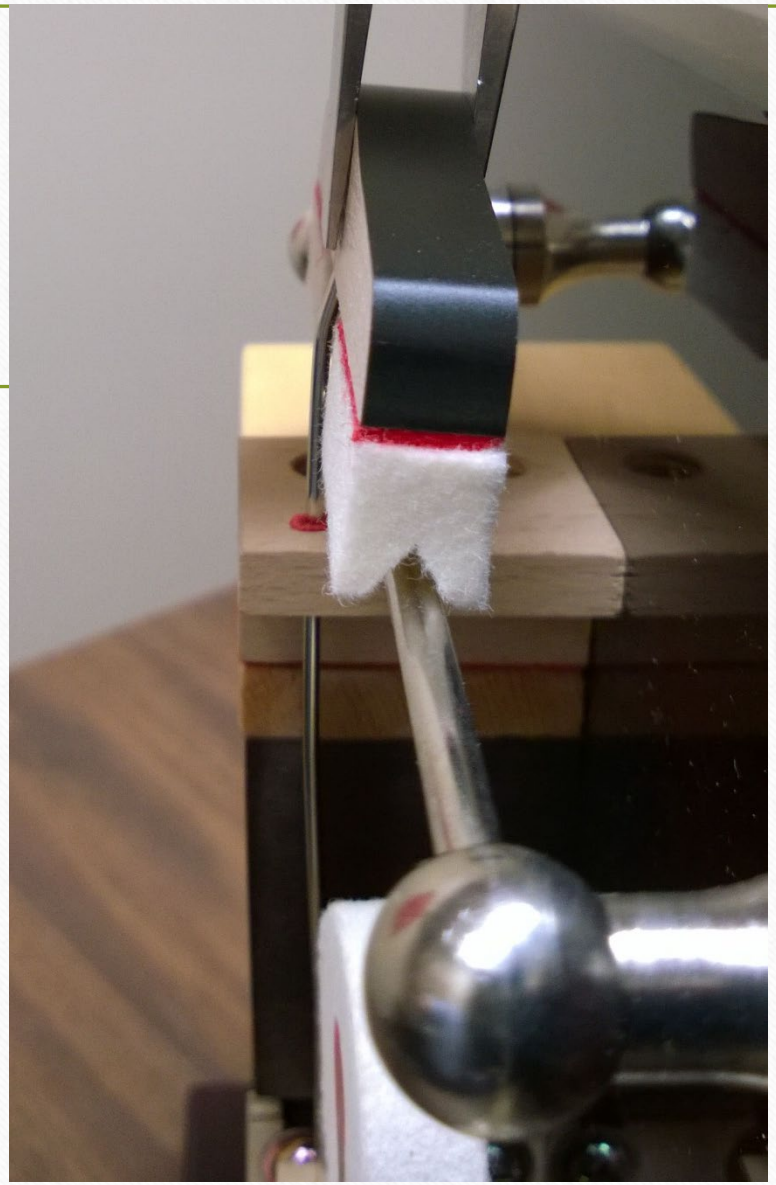
Damper Function

- Use Wire bender to tip damper head towards the bass.



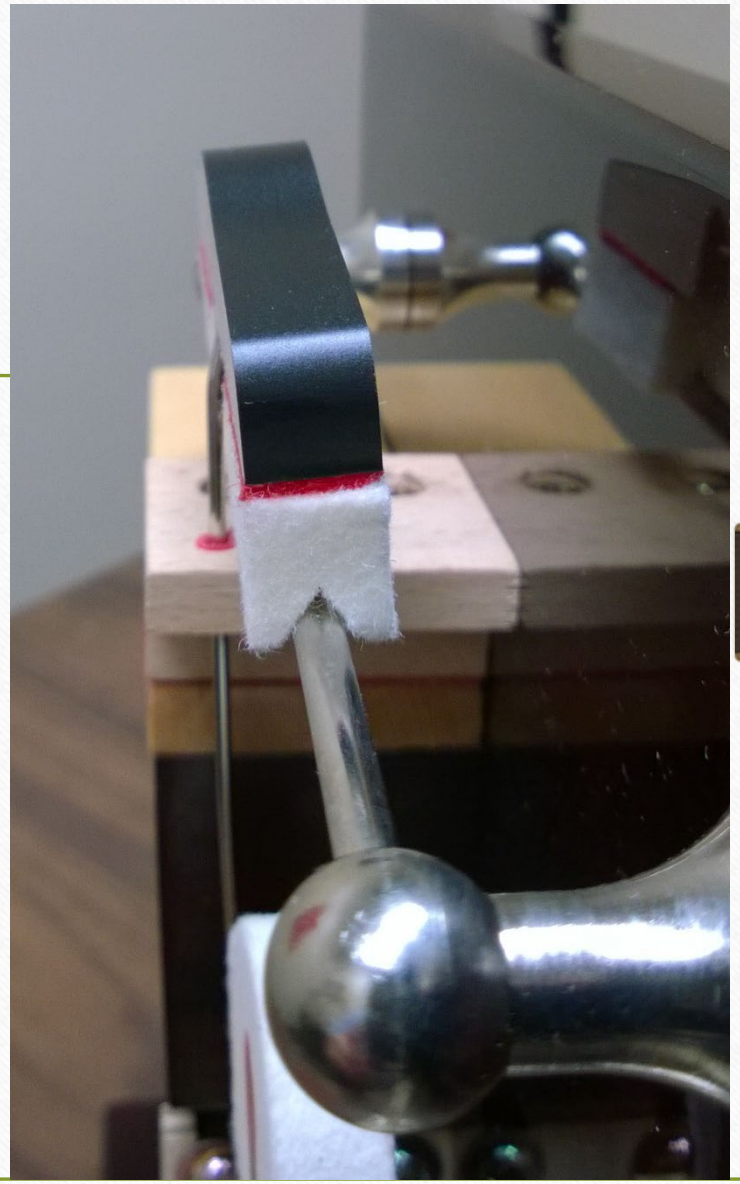
Damper Function

- Then tip the head back the other way, so that felt will be aligned with wire.
- You can often do these adjustments in the piano, but sometimes it is more safe to remove the damper.



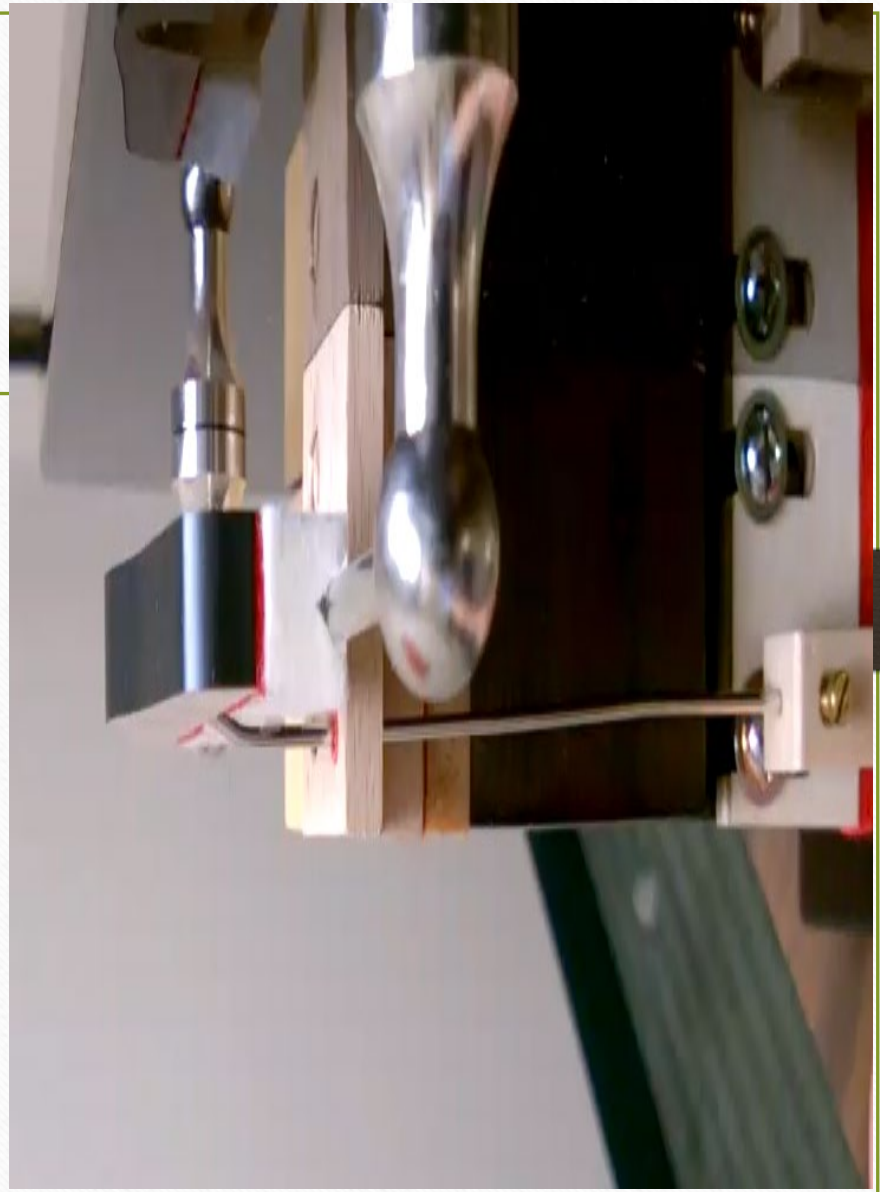
Damper Function

- Now the felt is aligned with the string, but the head is tipped towards the left.
- It needs to be bent at both bends one more time.



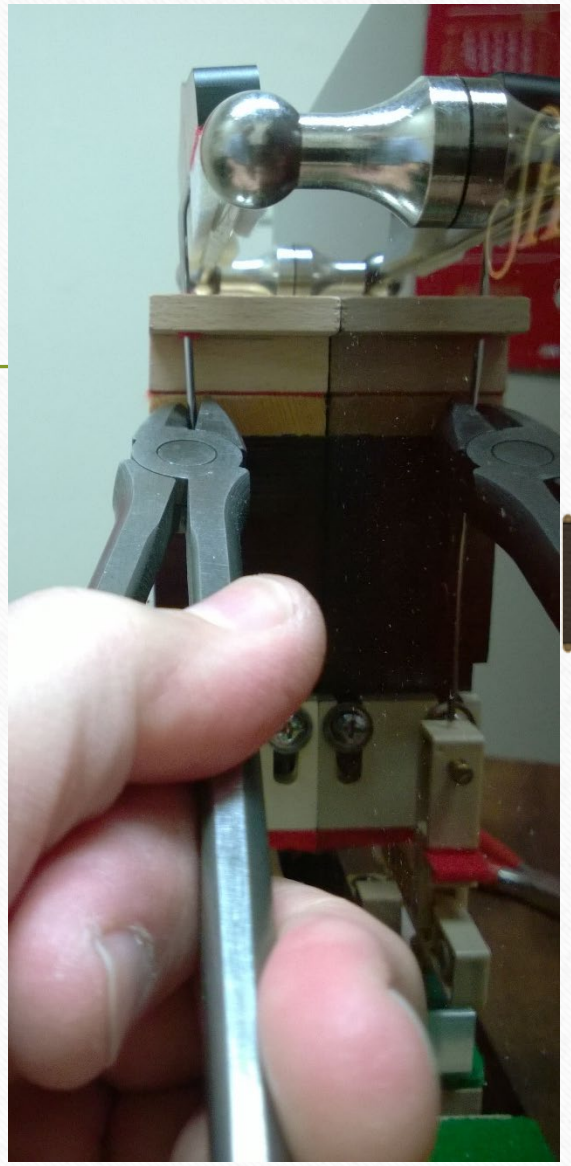
Damper Function

- After alignment, damper seats straight onto the wire.



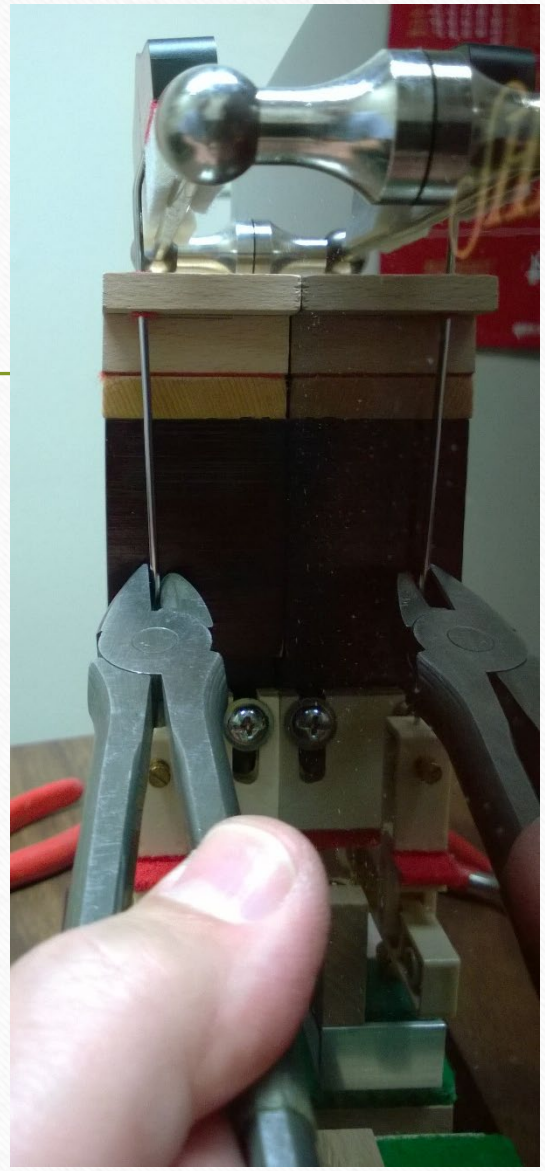
Damper Function

- Wire bends under the strings:
  - Upper bend makes head travel straight up and down.



Damper Function

- Wire bends under the strings:
  - Lower Bend aligns wire with the damper block, and adjusts the side tension on the bushing.
  - Some pianos have very loose fitting bushings, require some side tension.
  - Kawai pianos normally do not.



Damper Function

- End result should leave all damper heads moving as one unit with the pedal.
- Damper heads evenly spaced, with no side movement or twisting motion.
- Slow release of dampers should provide a quiet damping action, no extra noises or ringing partials.

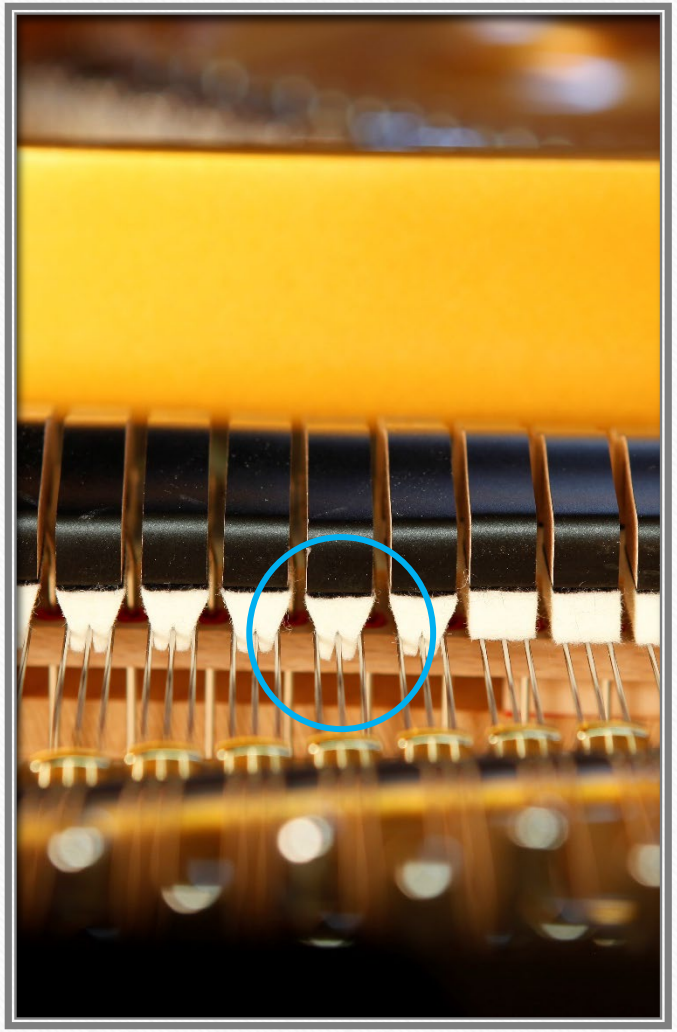
Trimming Trichord Felt

Trichord Felt Trimming

Extra Felt below the strings causes noise when dampers lift, especially with the pedal.

Becomes worse as felt wears, settles, and ages.

One damper in this photo is longer than the others, but all could be trimmed to make them more quiet when lifting.



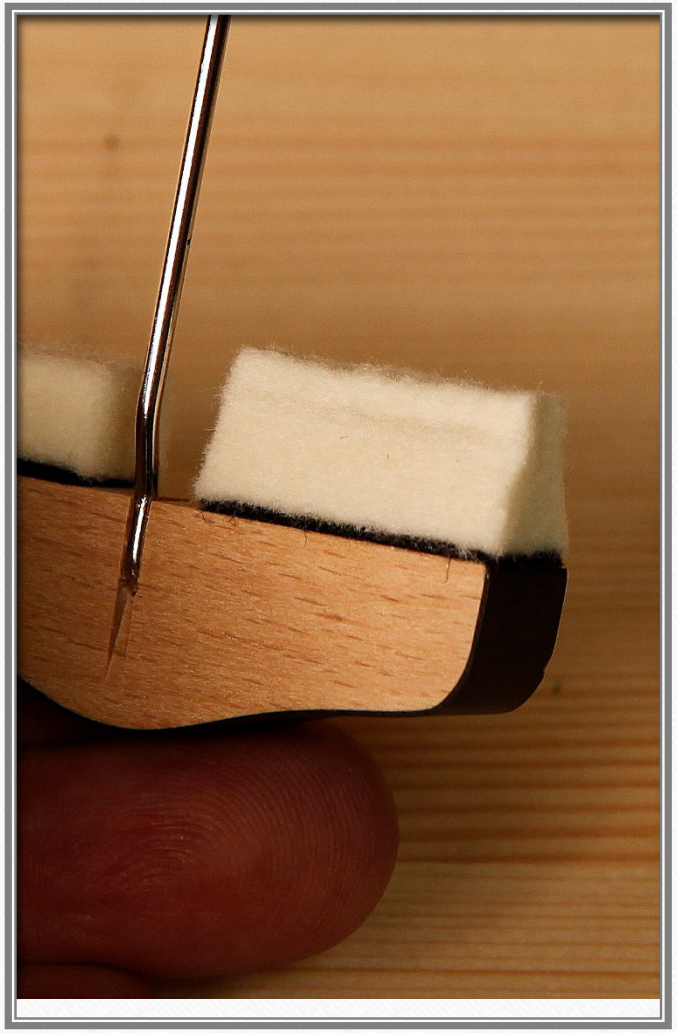
Trichord Felt Trimming

Remove damper from the piano

Trichord Felt Trimming

Extra Felt below the strings has no function, contributes to noise when using the pedal

Felt can be trimmed just below the string line, then rounded.



Trimming Trichord Felt

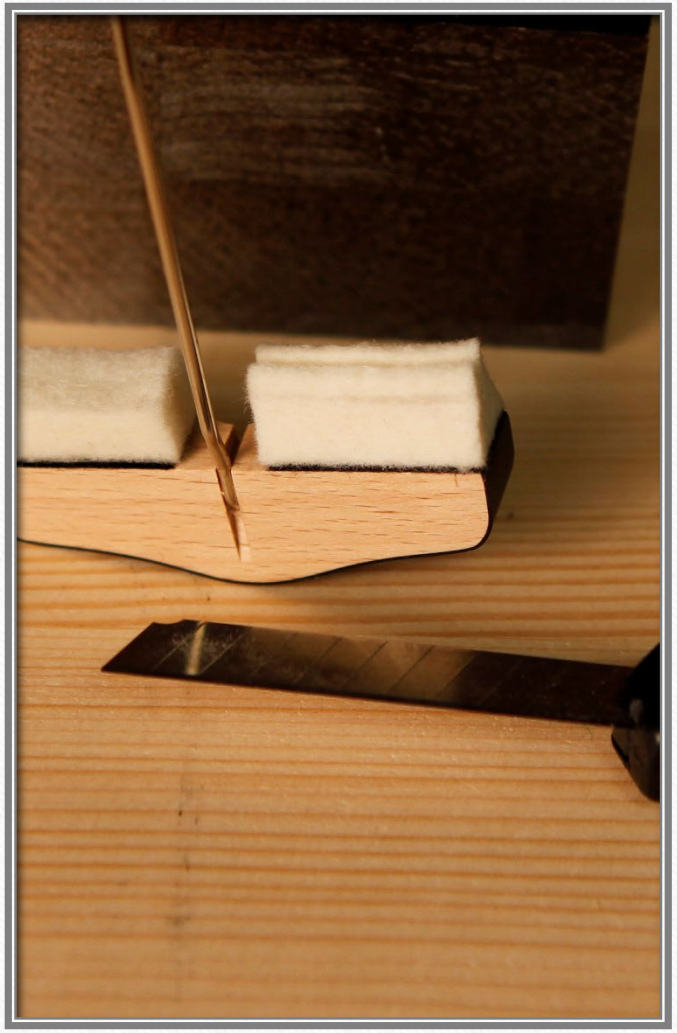
- For trimming wedges, quality scissors are essential!
- Available in Barber supplies and high-end knife shops.
- Pianoforte Supply also sells good scissors.
- If they cost less than $50, be suspicious!
- Be sure to also have a sharp razor knife for making the center cut deeper when needed.

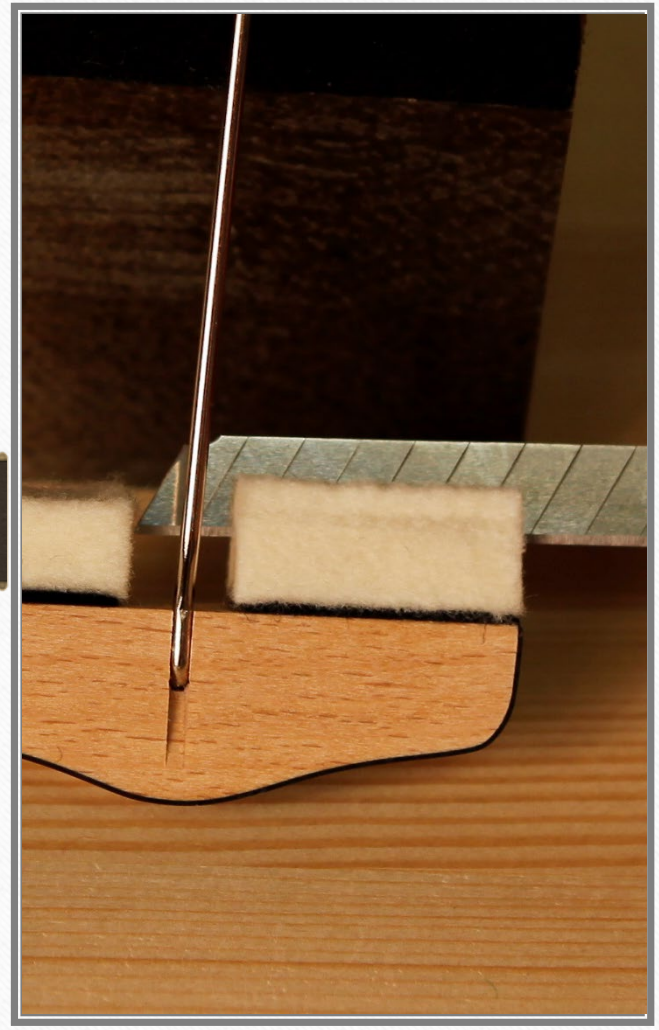
Trichord Felt Trimming

First check to see that the center cut is deep enough.

Center string should not be at the bottom of the cut.

Wedges should be parted and not pinch in on the center string.





Trichord Felt Trimming

If needed make center cut deeper with razor knife.

Very firm felt can also be spread wider using a length of cotton string pushed into the center cut.

Trichord Felt Trimming

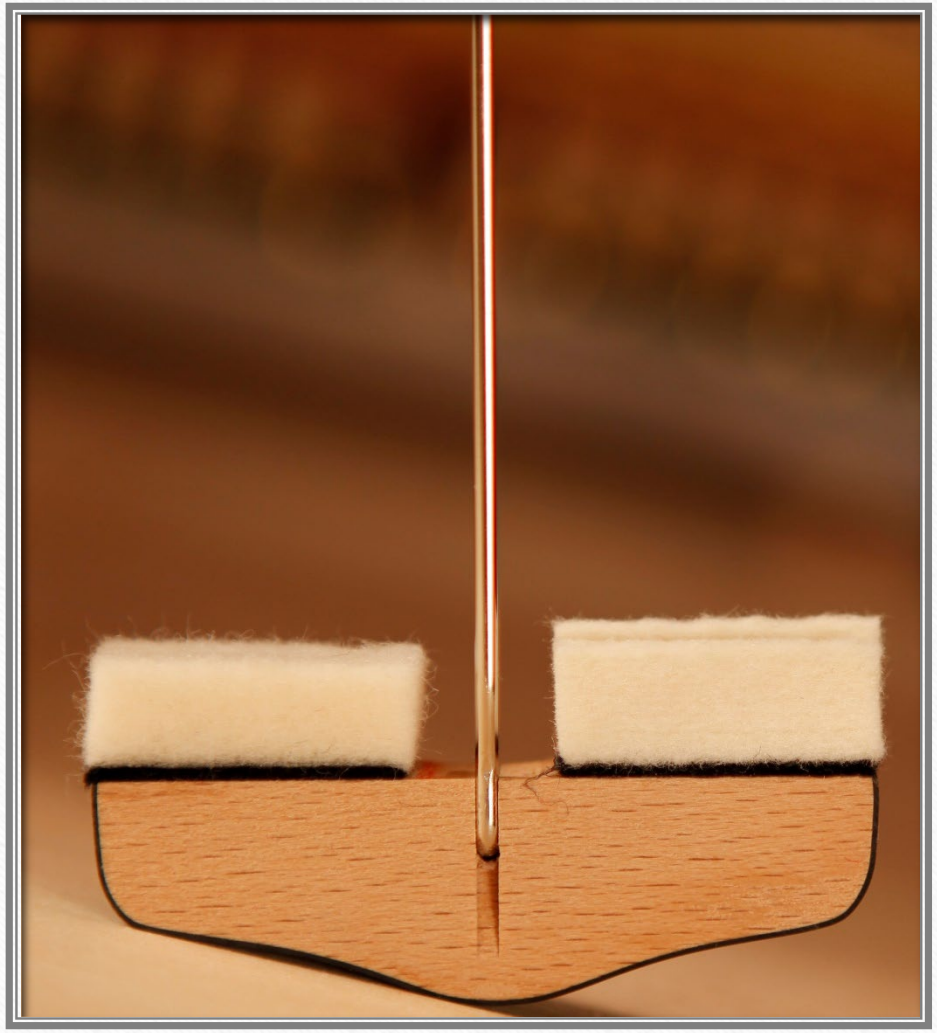
Sample snip made to show location.

Note that it is completely below the string mark.

Trichord Felt Trimming

With good scissors, make one smooth cut straight to the end of the wedge.

One side of this trichord wedge has been trimmed.



Trichord Felt Trimming

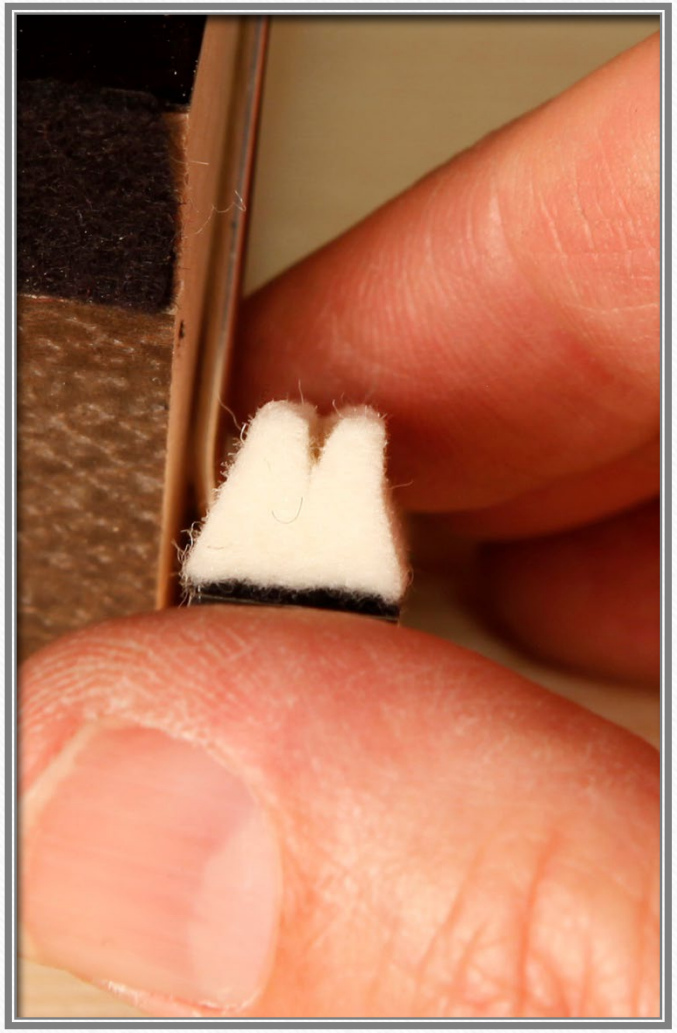
Then cut the other side of the wedge.

Note that the bottom of the wedges are rather flat, side edges are sharp.

These side edges need to be rounded with very gentle scissor cuts.

Trichord Felt Trimming

Now the edges have been rounded, and felt cutting is complete.

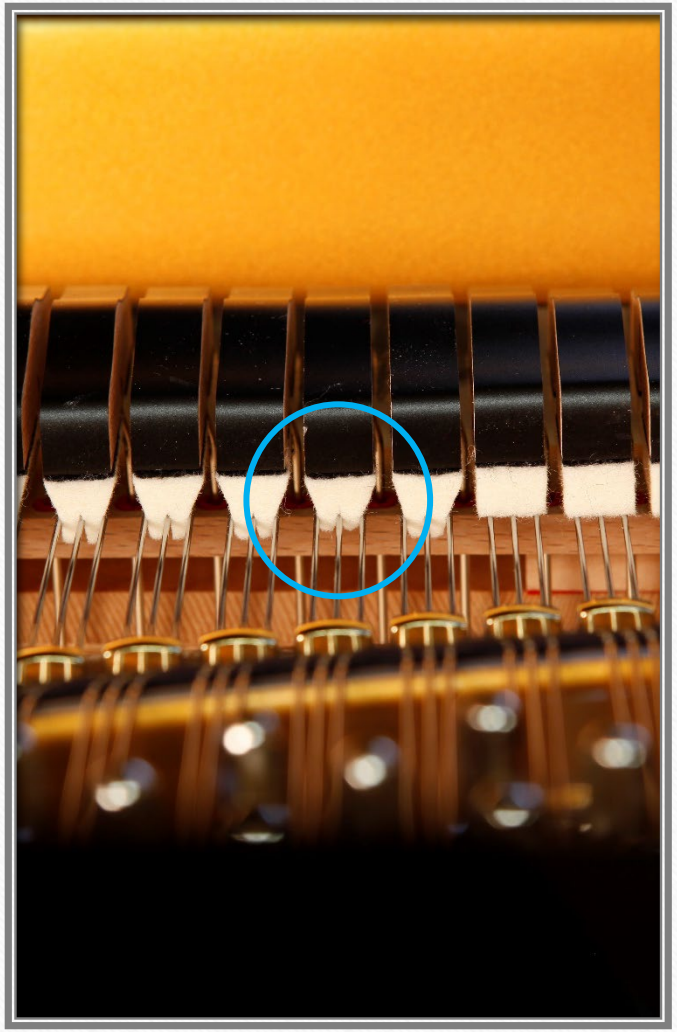


Trichord Felt Trimming

- An optional step is to put string into the center cut so that
- the 2 wedges will be separated.
- #5 Cotton Perling String is excellent for this.

Trichord Felt Trimming

After Trimming, rounded bottoms should just extend below strings, no straight-cut side felt is left to rub strings.



Trichord Felt Trimming

- Trichord felts can sometimes get noisy again over time.
- High humidity can exacerbate the problem.
- Also heavy playing and compacting of the felt over time.
- Felt type also impacts the sound – vertical felt fibers have less lift noise than horizontal, but may be more noisy when damping, especially with una-corda pedal playing.

Concluding Comments

- A well functioning damper system can have a large impact on the pianist's comfort level at the piano.
- Besides just making sure the dampers don't leak, a well regulated and smoothly functioning damper system makes the piano easier for the pianist to play.
- Providing correct lift, silent damping action, and consistent lift for legato tone eliminates a level of difficulty from the piano, so the pianist doesn't have to work hard to "learn the piano" and adjust to it.
- Dampers should never be a concern for the pianist – they should just work smoothly and effectively.

Questions ~ Comments?

Thank you for attending!

SHIGERU KAWAI