

# Grand Piano Voicing

By Yamaha

## VOICING

### Chapter I

Voicing is making the piano sing. The purpose is covered under the following 3 items:

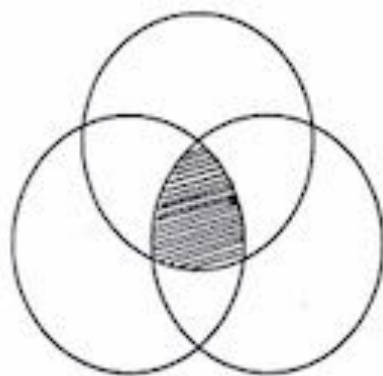
1. To develop the full capacity of the tone
2. To develop a good sound
3. To develop a beautiful musical tone

In other words, voicing is not making a hard sound soft, or just to make the sound even. If you work only with those principals the end result could, and usually will, be less than the piano is capable of producing. We should work in a positive way to create a good sound.

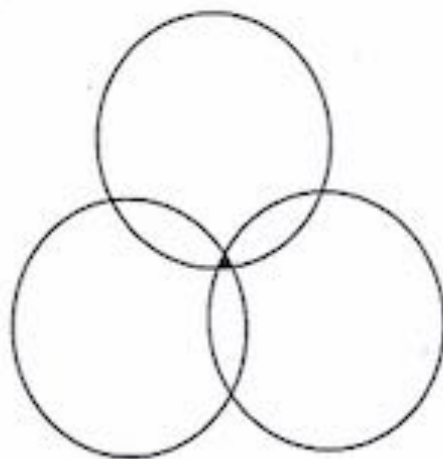
The three interlocking circles introduce the concept of tone being produced by 3 elements: tuning, regulation and working on the strings and hammers that we usually call voicing.

Voicing as we view it is only part of developing a perfect tone. Tuning and regulation are also part of the process.

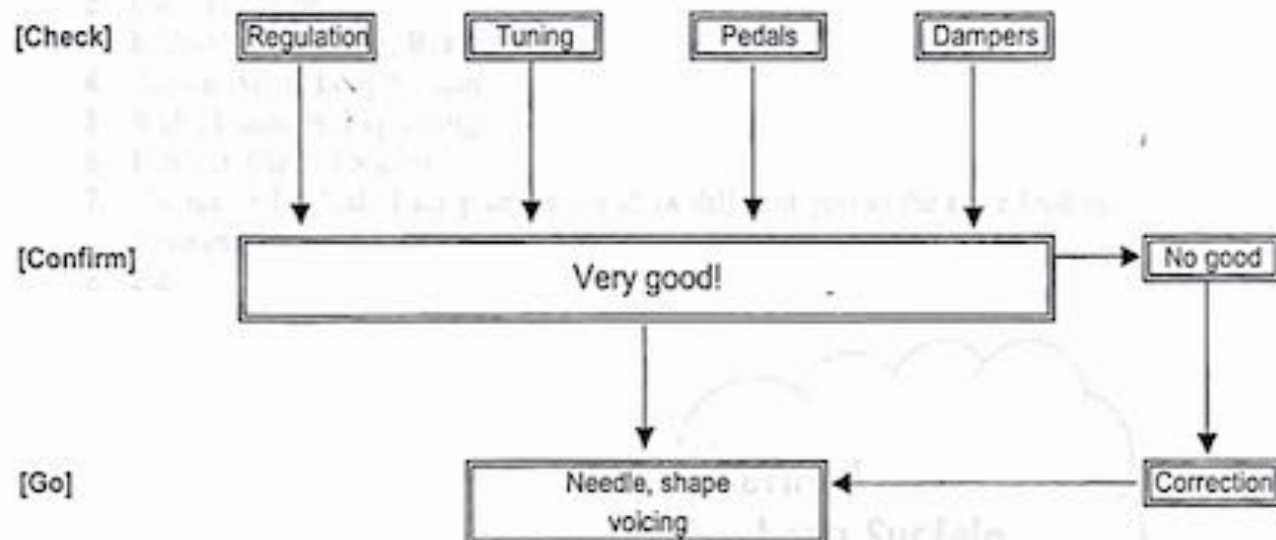
Important! Before voicing, make sure regulation, tuning, pedals and dampers are correct



Maximum results are found when all 3 work together




Minimum results are found when little attention is paid to tuning and regulation.



**Important! Before voicing, make sure regulation, tuning, pedals and dampers are correct**

## THE INGREDIENTS OF A GOOD PIANO SOUND

1. Bright and Shiny (Venus stands out in the starry heavens)
2. Clear and Pure
3. Refined, Good Taste, Beauty, Charm
4. Active, Alive, Long Sustain
5. Rich , Luscious, Expanding
6. Explicit, Clear, Focused
7. Unique, Individual. Each piano is somehow different, just as the same food in different restaurants will taste a bit different.
8. Etc.



**Refined  
Long Sustain  
Clear...**

To express sound with words is extremely difficult. Also the same piano will sound differently depending upon the pianist and the location of the piano. You must keep in mind the above 8 points when voicing a piano.

## What part of the sound to listen for when voicing

In the perfect tone, all the following will be satisfied.

1. Attack is the attack clear and clean?
2. Sustain is the sustain long and the decay smooth?
3. Volume is the dynamic range as large as it can be?
4. Color is the color and character of the tone well developed?
5. Balance is the entire piano well balance in color and volume? (Key by key, section by section)
6. Mass does the entire range of the keyboard have a graduated tonal weight whether playing pianissimo or fortissimo?

Each of the above 6 titles is a direction of tone (or sound). Thinking of each as an arrow, they should each be pointing toward a center point (good tone) and not pointing in its own direction without consideration of the others.

- 
1. Attack must be clear, not ambiguous. It should be definite on the softest blow and not break up when playing fortissimo. Attack sound should not be too big.

Good attack will create vowel sounds "Ah - OO("boot") - O"

In the bass section the attack sound will be "gōōng"

In the middle the attack sound changes to "pōōng"

In the treble the attack sound changes to "Kahn or Kohn"

Bad attack will create vowel sounds of "eh or e"

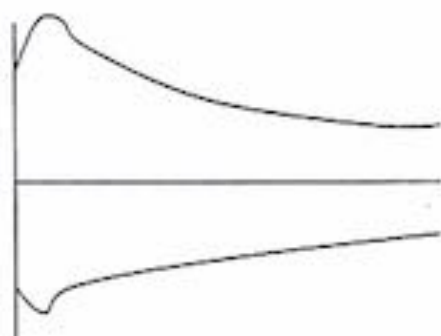
In the bass section the attack sound might be "ben or ding"

In the middle section the attack sound might be "pen"

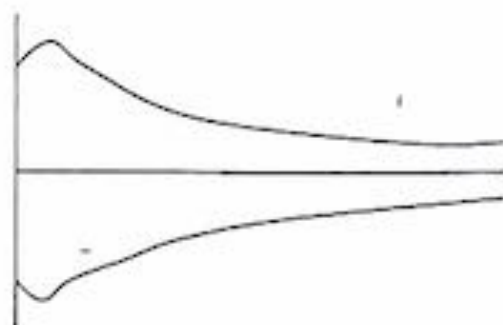
In the treble section the attack sound might be a metallic "keen"

2. Sustain  
physically)

the important thing is that the tone must sustain musically, (not just



Good Sustain



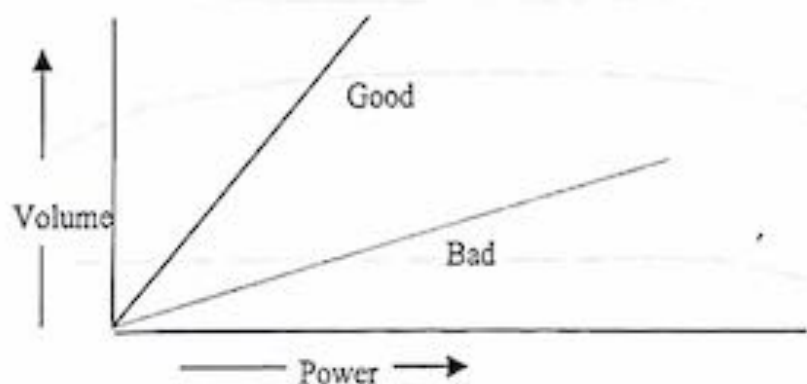
Bad Sustain

When used in voicing, the term "sustain" means the shape of the tone is natural.



3. Volume Each tone must have a large dynamic range, and the tone should vary in line with the volume. (For example, a soft tone should be round and somewhat mellow, while the same tone will be more brilliant and piercing if played at full volume.

Graph of a striking key



- Voicing is good when even a small change in power results in a corresponding change in volume
- It is not correct if it takes considerable power to change the volume.

#### 4. Color (Character)

- The tone must contain the total palette of sounds
- Each individual tone should contain many colors (like the rainbow)
- Pianissimo sound volume must contain sufficient number of partials
- The change from pianissimo to fortissimo should produce a range of colors.
- Fortissimo tone should not break up.

Tonal variation and control is dependent upon fine regulation.

## 5. Balance

- The piano must be one musical instrument, balanced from bass to treble.
- The illustration below shows that the middle of the piano can be slightly mellow with the bass and treble producing slightly more brilliance and volume.

OK!



NO



NO

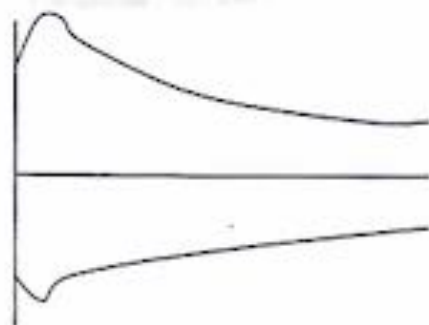


## 6. Mass

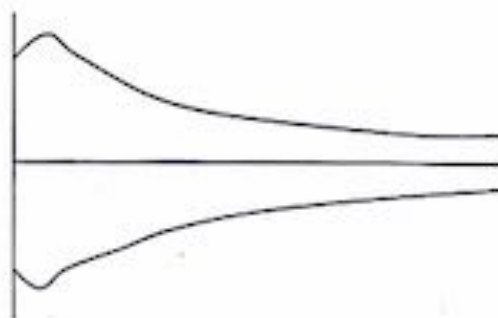
Tone should be compact, with sufficient fundamental.

The core of the tone should be solid, with no space (Baseball compared to a tennis ball,)

Artists do not like a tone that is overvoiced (no core or higher partials)



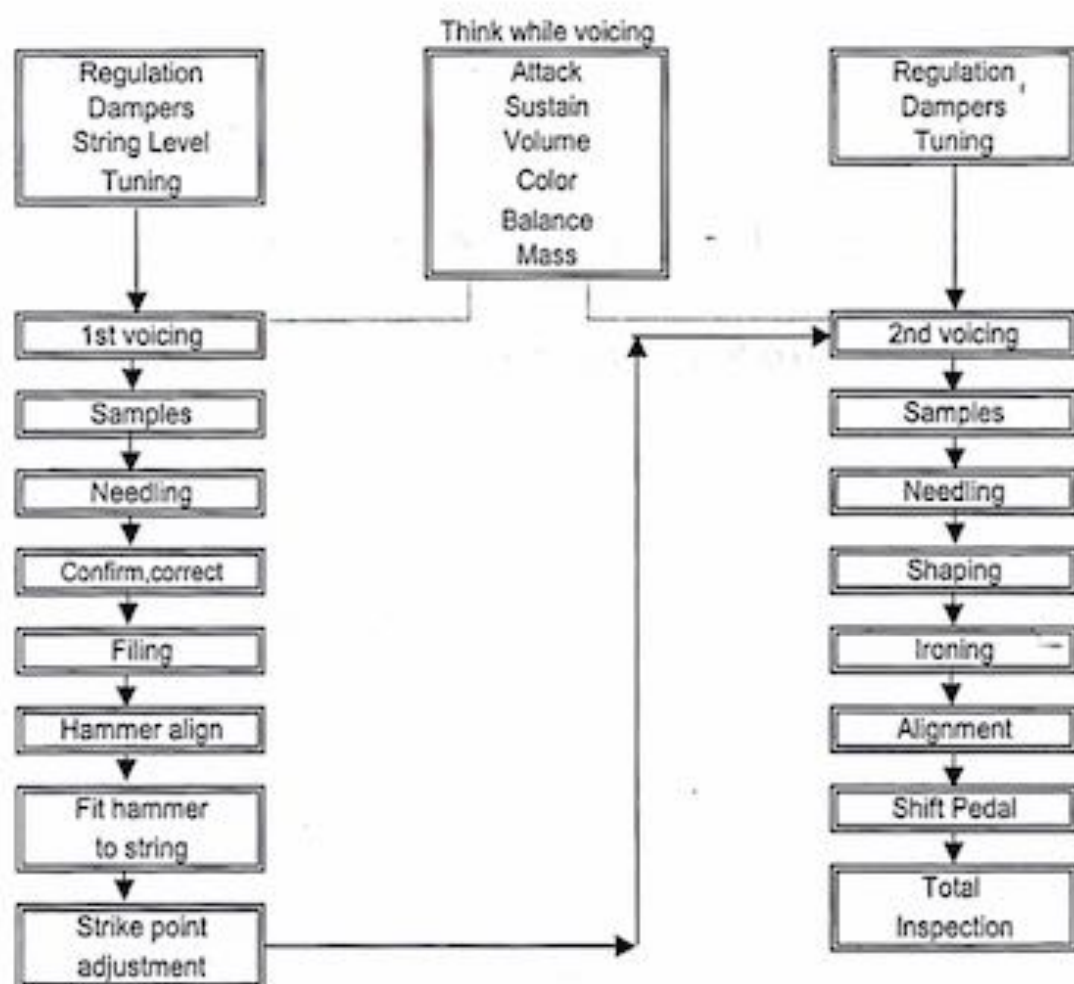
A good tone has  
Sufficient fundamental



not enough fundamental  
creates a poor tone.



# VOICING PROCEDURE Needling and Shaping



## TOOLS

Voicing tool with 3 needles.

Yamaha "CF tool" is recommended.

Voicing Block

Special shape should support 3 or 4 hammers.

"Sandpaper"

Garnet paper # 60 to 180 (Sometimes emery cloth can be useful)

String hook

Usually needs to be modified. Hook needs to be small and sharp.

Tuning Hammer

Felt wedge(s)

Needle nose pliers

For removing broken needles

Straight edge (ruler)

To mark top of hammers

Pencil

Chalk

Hammer Iron

Used mainly to seal the holes made by needling

## VOICING PRACTICE

### A. 1<sup>st</sup> Voicing

**Purpose** To determine the direction we will follow in developing the tone

Because this is the first voicing, we should focus on direction, rather than trying to make the tone even. In this 1<sup>st</sup> voicing, we will do only about 80% of the total needling necessary to complete the job.

#### (1) String Leveling

- In the process of string leveling, focus on the position of the string where the hammer will strike.
- Refer to the illustrations to see how to use the string hook.
- Be careful not to bend the wire past the point of level, it will never return correctly.
- Retune the unison after string leveling.



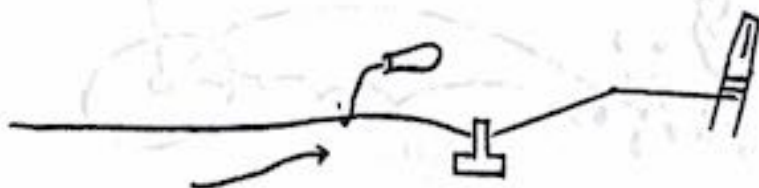
OK



NO



NO



## (2) BASIC IDEA OF NEEDLING

- Needling can injure the hammer felt, you must never over-needle.
- It is best to use the minimum number of insertions of the needles for best results. It is best for both the tone and the condition of the hammer.

### Rules of needling

- Never do a lot of needling at the same place.
- Proceed step-by-step, not all at once.
- Use a strong stroke. Pretend that the tool has no needles, and hit the felt surface with the front of the tool.

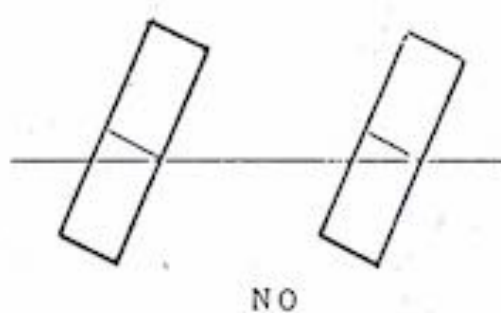
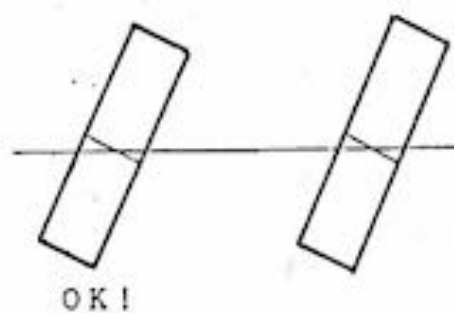
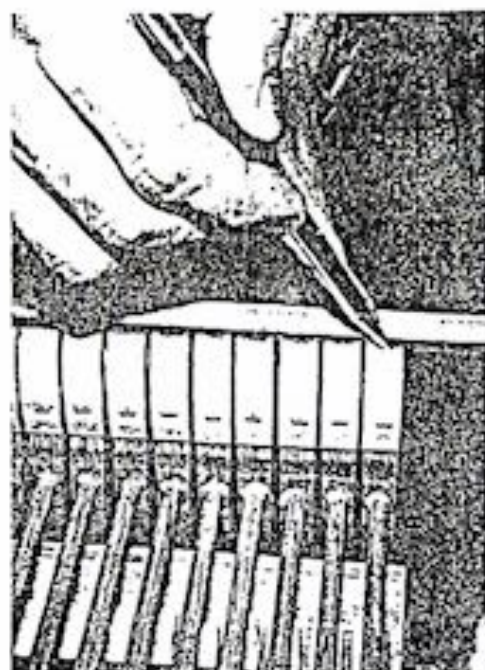
In golf, getting to the hole with the fewest strokes is best.

In voicing, more confirmation is best. (And fewer strokes)

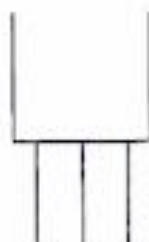


### (3) PREPARATION FOR NEEDLING

- Mark the top of the hammer (strike point) with a ruler and pencil



- Be careful to mark the angles hammers correctly
- Adjust the needle length to 6 or 7 mm



6-7 mm

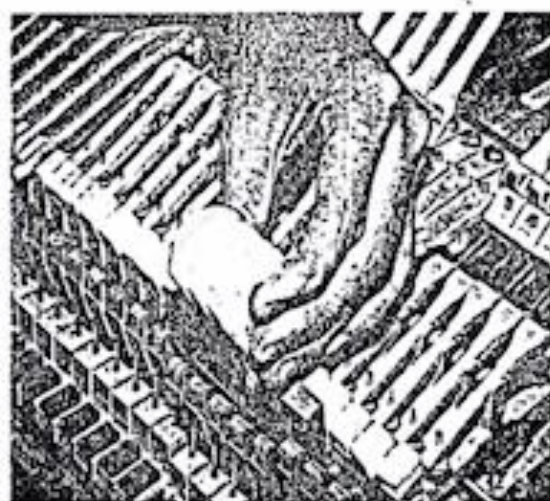
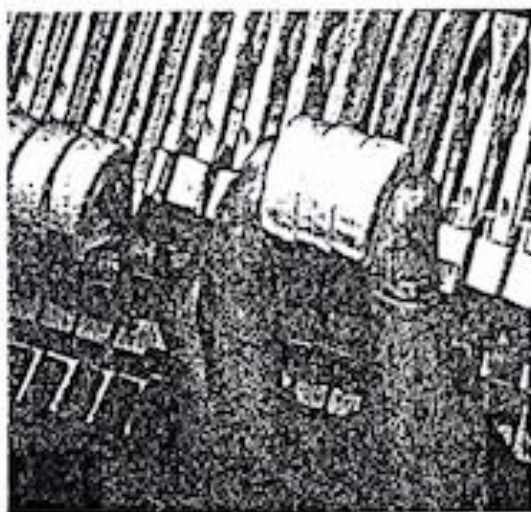


#### (4) NEEDLING

- Confirm the hardness of all 88 hammers (listening especially for harshness and noisy sounds, by playing all keys).
- Make samples in the middle section (F maj chord, G Maj chord)
  - This must be brilliant, clear, not harsh, good resonance, open.
- Needle other hammers to match sample.

#### (5) CAUTION OF NEEDLING AND STRIKING KEY

See the illustrations for information on how to hold the hammers for needling.



Grasp 3 hammers as shown, either from the front or back

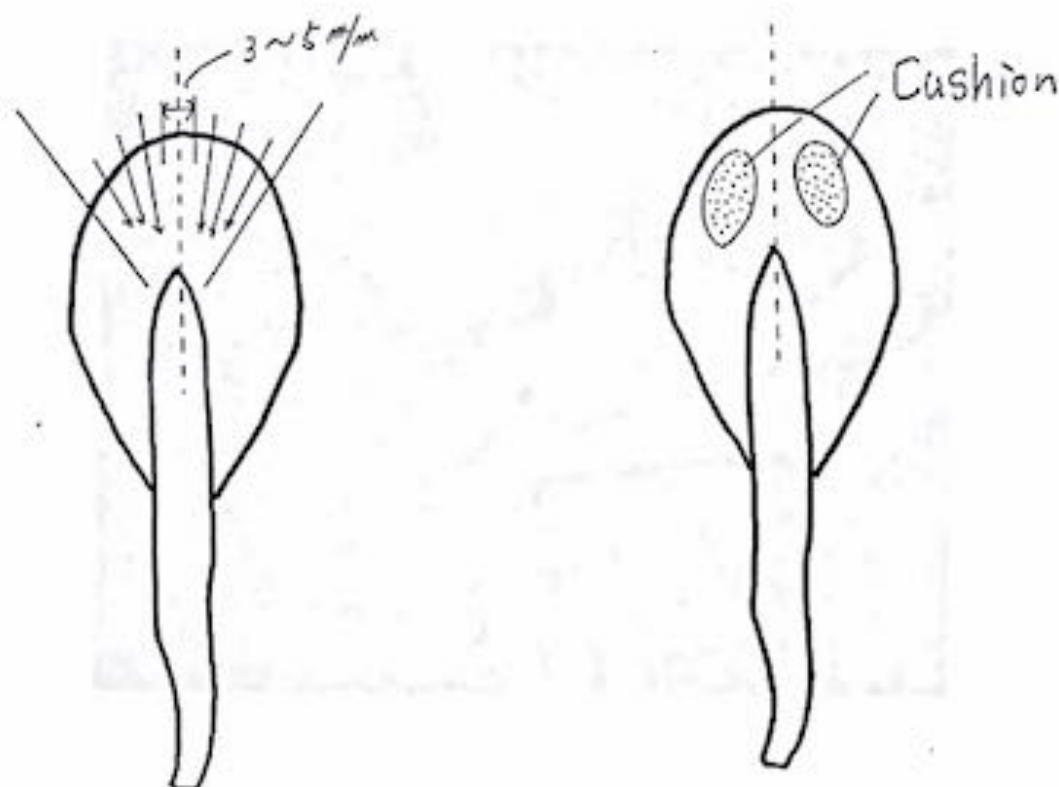


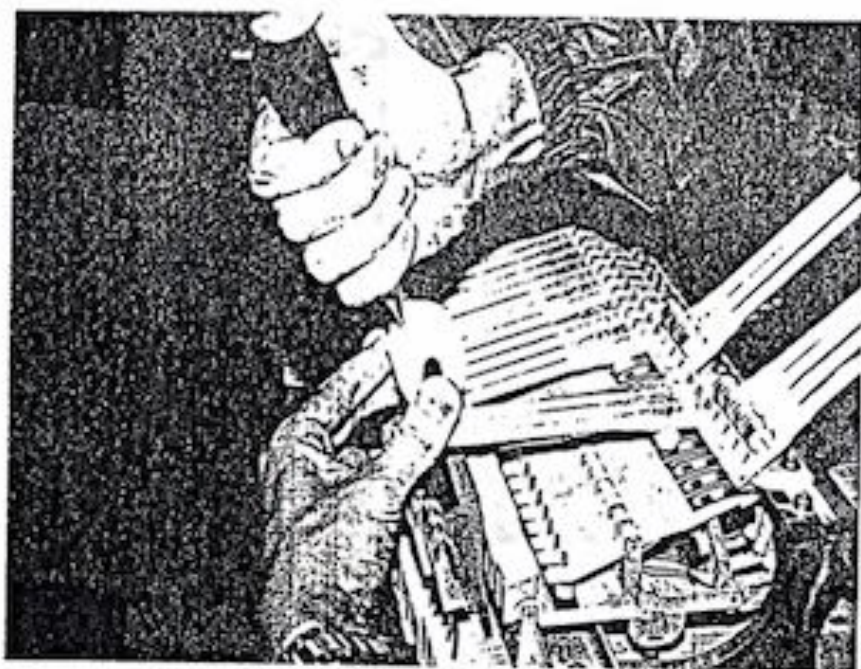
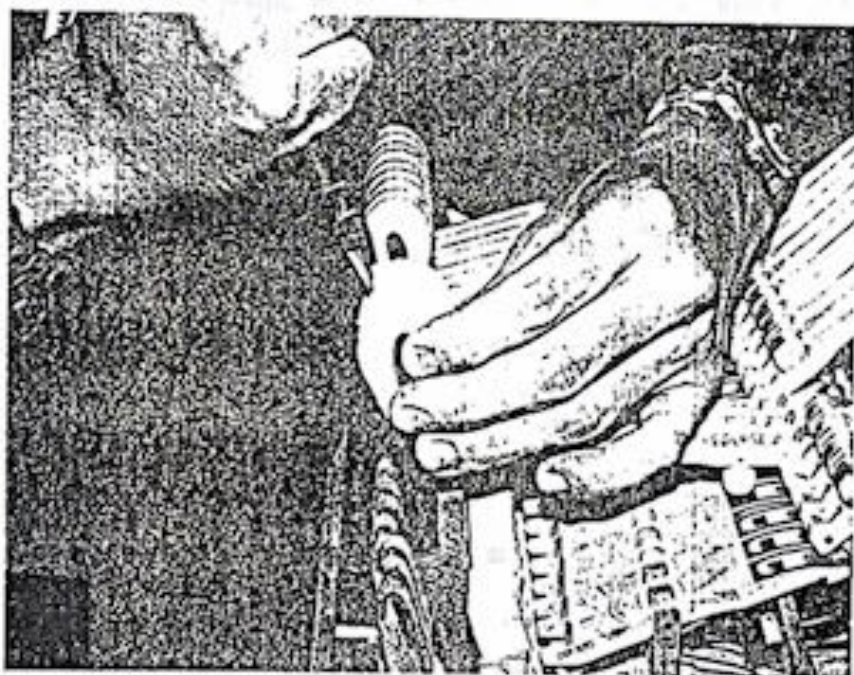
Angle of needle insertion (See figure below)

1. The angle of needle insertion should all point to a central point.
2. The angle of insertion near the striking point is vertical.
3. Never cross needle (at the top)

Range of needling

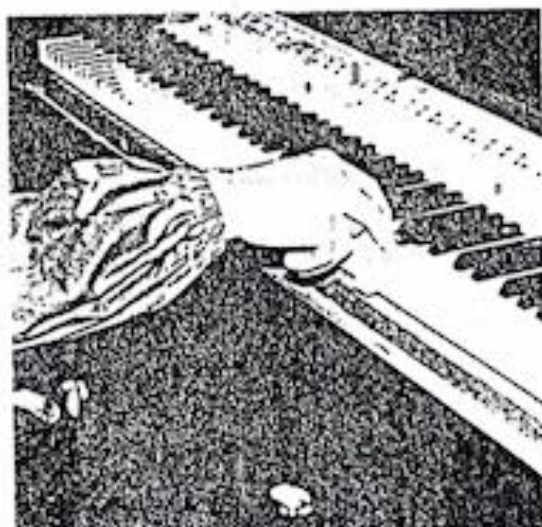
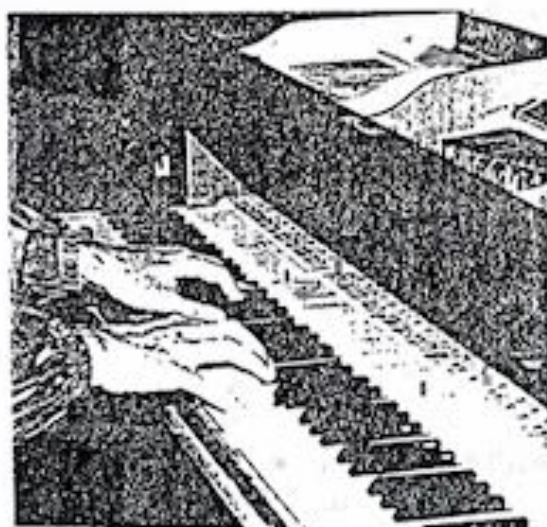
1. Point of insertion should be between 10 O'clock and 2 O'clock
2. Do not needle at the top. Leave 3 to 5 mm
3. Never concentrate needling at one place (it will cut the hammer)
4. Needle firmly up to the line at the crown. (Do not make the no needle area greater than 3 to 5 mm)
5. Remove broken needles





## Number of strokes

1. We cannot predict exactly, but with new Yamaha hammers, using a voicing tool with 3 needles set at 6-7 mm
2. Listen to the sound during needling. (Needle for equal cushion on both sides.
3. How to strike the keys
  - Basically, play each key evenly with a blow that produces a mezzo forte (mf) sound.
  - Play ff or pp if necessary
  - Occasionally use chords and arpeggios.
  - Play music





## (6) SHAPING (FILING) THE HAMMERS

(In general use 80 to 100 grit garnet paper for shaping, and 180 grit for final completion.)

### Purpose

1. To regain the original or ideal shape of the hammer that has been distorted by needling.
2. On new hammers, to remove the cup at the top, and possibly any damaged felt caused by the heat and compression of hammer making.
3. To reshape any hammers worn by usage.

### Method of shaping

Basically there are two types, the "shoe shine method" and by paddle filing. Both ways have merits and demerits. We need to master both ways.

#### 1. Shoe shine method

- Easy to make the striking area straight, (and lessens chance of uneven filing on different hammers)
- Allows for faster filing in the sections with straight bored hammers (treble and high tenor)
- On angled hammers, there is a chance to cut the corner of the hammers
- This method shouldn't be used on hammers of different sizes.

#### 2. Paddle filing

- If used correctly, it solves the problem of filing angled hammers correctly
- It can be used on hammers of different sizes
- Since each hammer is filed separately, it is more difficult to make the crown of each hammer identical (strike point)
- It takes longer to file straight bored hammers than with the "shoe shine method"

# Information concerning filing (including cautions)

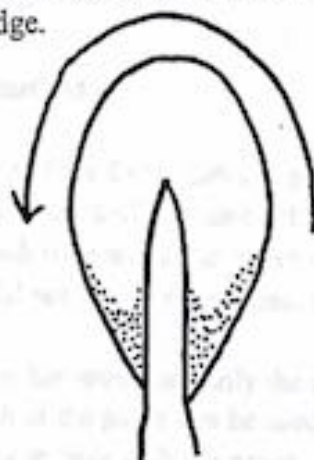
1. Bass and mid-section should be egg shaped. The top or strike point should always be curved (arc of a circle). Toward the treble, the radius of the arc becomes progressively smaller.



Dotted line shows how the needling process swelled the felt

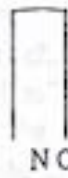
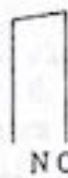
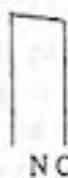
After shaping

2. File in one direction from hardener edge (color edge) to opposite hardener edge.



Don't sand only the top!

3. Remove some felt at the crown, but not too much
4. Periodically confirm how the filing is progressing. Keep the surface of the hammer at right angles to the sides



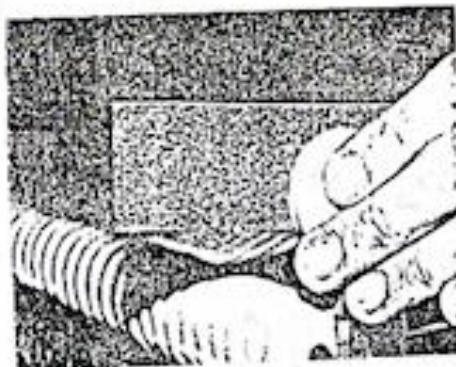


OK



NO

5. Side filing Used basically to remove needling marks



6. How to use sandpaper

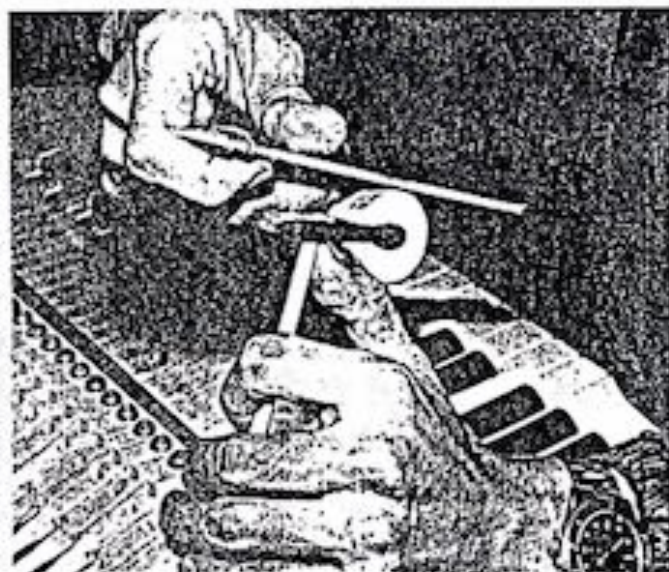
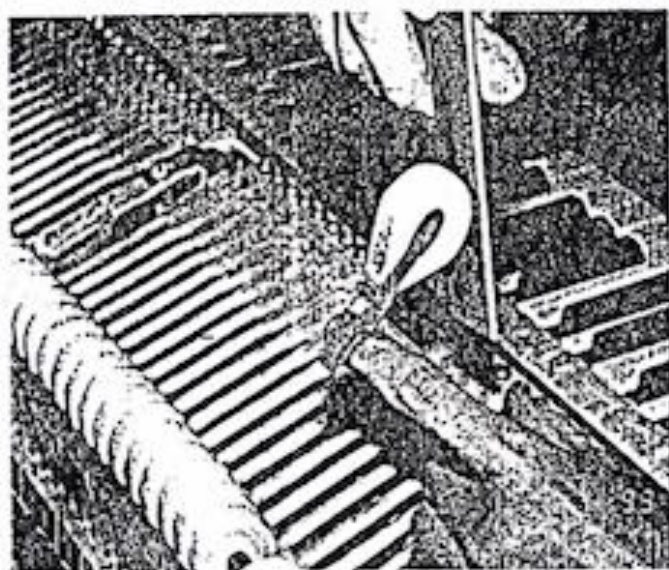
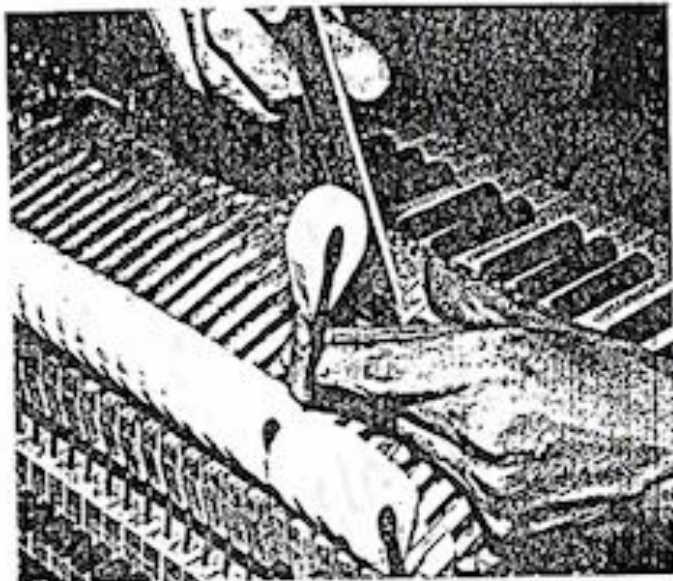
(1) Shoe shine method

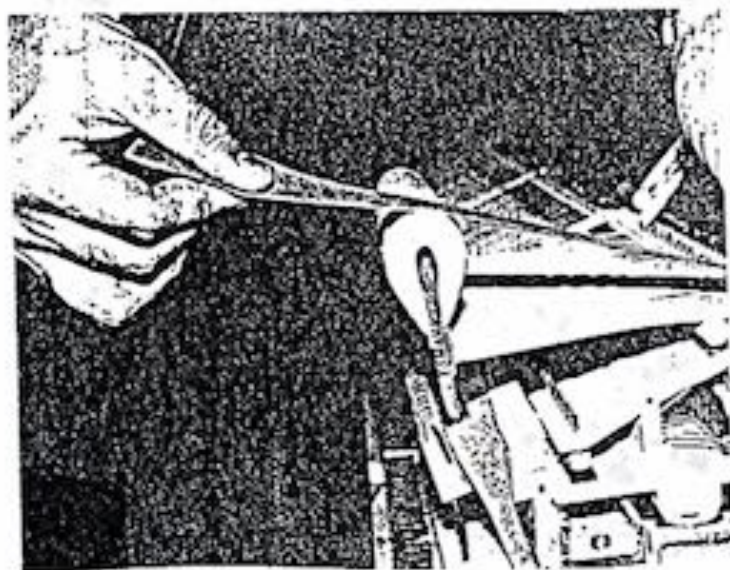
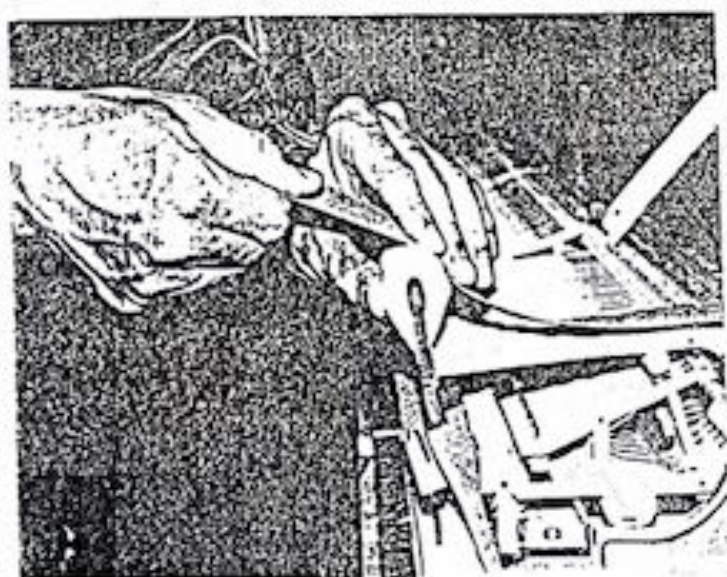
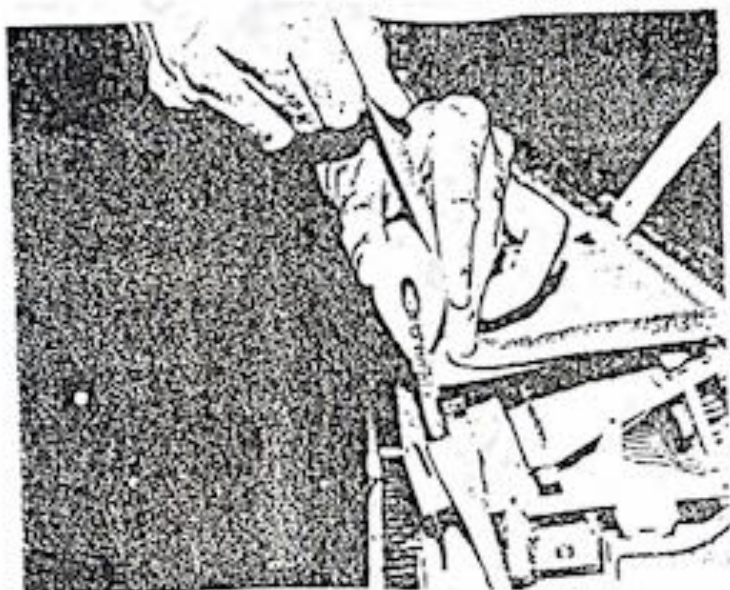
- The angle of the finger holding the sandpaper, the placement, and the pressure controls the amount of felt removal.
- Don't push too hard at the crown (top) of the hammer.
- Be careful not to remove too much at the side (shoulder) of the hammer
- On angles hammers, use only the edge of the paper. (On the top the full width of the paper can be used).
- Take long strokes with the paper.
- Another way is to use single hammer width strip of paper.

(2) Paddle filing

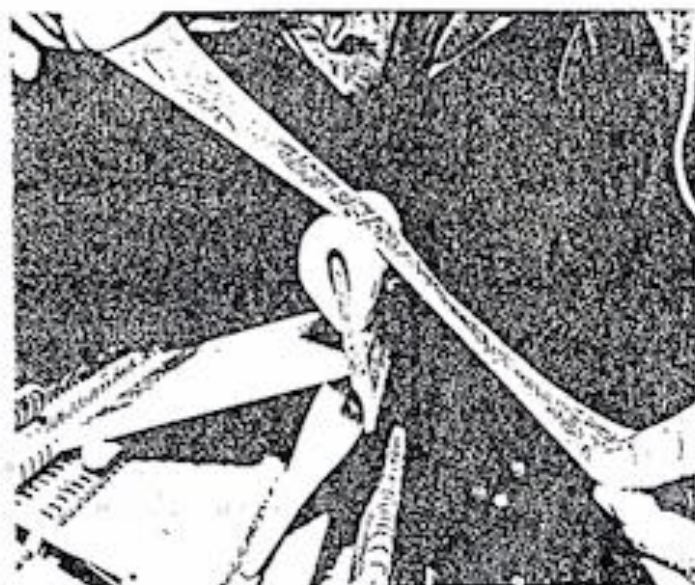
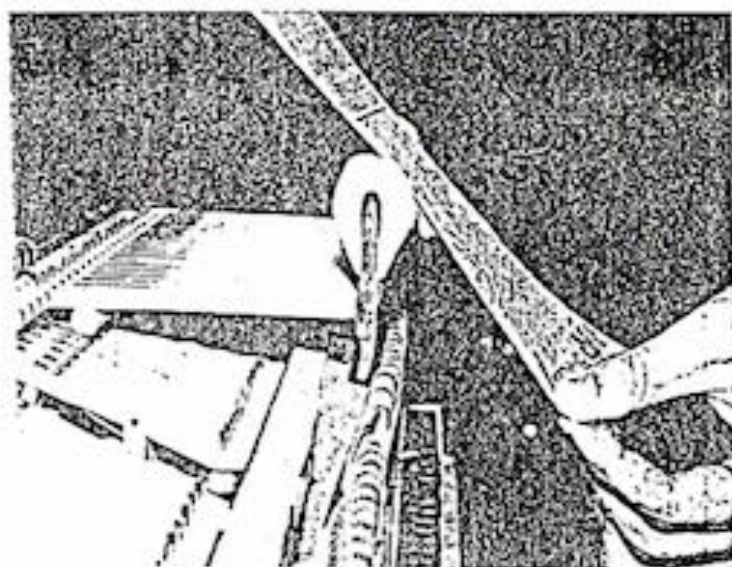
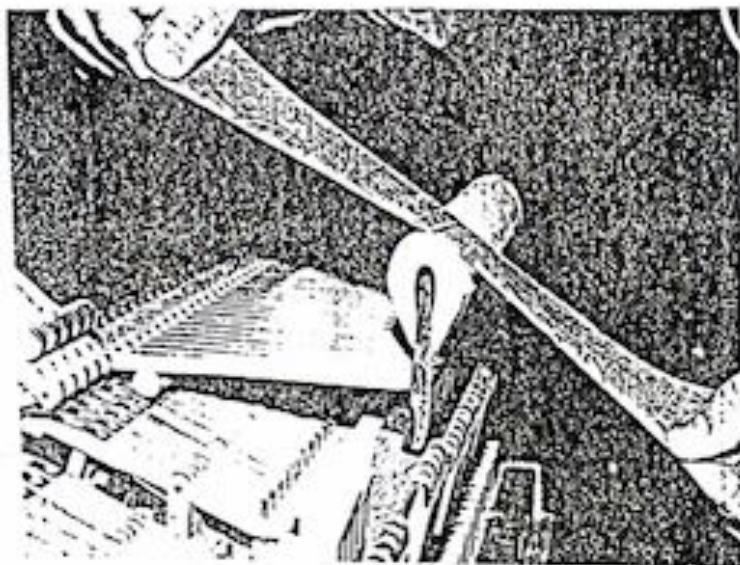
- Stroke of paddle should be straight and as a tangent to the surface of the hammer.
- Paddle angles should be at right angles to the side of the hammer and the angle of the paddle should not be changed during the stroke. (Focussing on keeping the "cut line" straight across the hammer will keep the filing even across the face of the hammer.)
- Use long strokes with the paddle, (Use the entire length of the paddle with each stroke.)











## B. 2<sup>nd</sup> VOICING

**Purpose** Along with controlling the direction of the tone, add what is lacking in tonal balance, making the individual tones even.  
Finalize the instrument as one piano.

**Condition** Tuning, regulation, pedal and damper adjustment must be regulated properly

### 1. Confirm string level

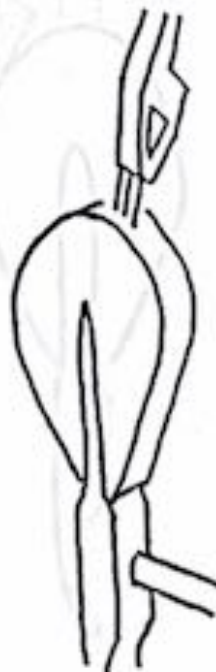
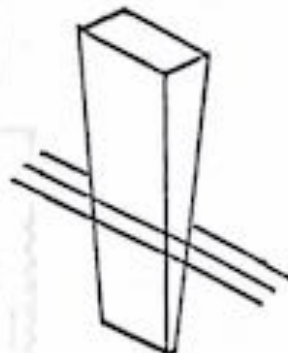
- Block each hammer against the strings; pluck all strings in the unison. Check and correct string level and hammer top.
- Check and correct the string level and the squareness of the hammer top
- Correct the string level using the same procedure as in 1<sup>st</sup> voicing

### 2. Make samples in the same manner as in 1<sup>st</sup> voicing

### 3. Needling

- Basically, use the same procedure as in 1<sup>st</sup> voicing
- During the final procedure, check each string individually by using a felt wedge as show in the illustration

Use the voicing tool turned to voice for one string only



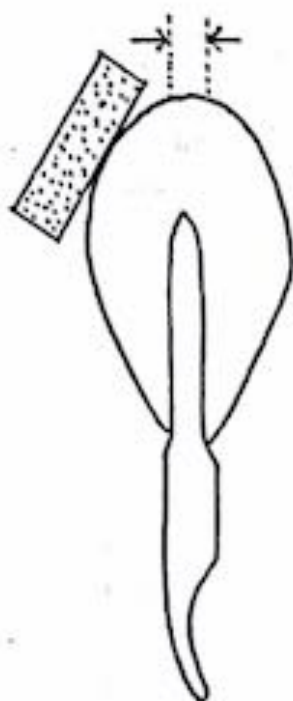
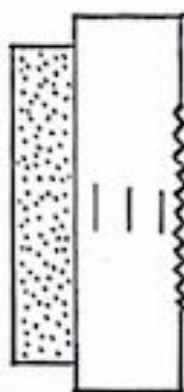
- After needling, to settle the felt surface, tap the hammer with the handle end of the voicing tool.

#### (4) Hammer filing

- Basically nothing has changed since the 1<sup>st</sup> voicing, so this step is generally not necessary.
- However, when it is necessary, use 180 grit carefully to keep from removing the cushion part.

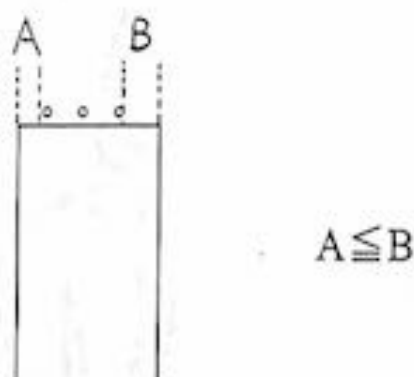
#### (5) Use of the hammer iron

- Basically the iron is used for appearance, and should not be used to the point of affecting the tone.
- Using the iron on the side makes alignment easier.
- Do not push the iron strongly against the hammer.
- Do not iron on the top.



(6) Hammer alignment

- Confirm and correct if necessary
- Engage shift pedal and adjust carefully.



(7) Shift pedal adjustment (amount of shift)

- Press shift pedal
- Block hammer against the string to see how much movement has taken place
- If amount of shift is incorrect, adjust the stop screw on the treble keyblock
- The standard amount of shift is like figure 1, but it could be altered to match the wishes of the artist.



Standard



More shift when called for.



(8) Confirm the tone with the shift pedal depressed

- Confirm the tones for evenness
- In case there is noise or unevenness  
Use the voicing tool as shown



Or file the left edge of each hammer that has the noise



(9) Total inspection

Confirm the condition of the tuning, regulation, pedals and dampers. Everything should work properly.