

## Introduction.

A piano action is unusually complex and involves over 4000 separate parts. Action adjustment aims to make all parts work together. It takes time to perform these procedures and therefore some cost and skill level is involved. It does not have to be done in one go though. It can be done progressively over a 1-year period, Keyboard Adjustment first, then Hammer and Whippen Adjustment, etc. as specified.

## Keyboard Adjustment (\$350) - 7 hours

Keyboard Adjustment (or Regulation) is a series of overall but fine adjustments to the moving parts in the piano and the keyboard forms the foundation of the entire piano action. It is aimed at making the mechanical functioning of the keyboard more accurate, consistent and efficient.

## Hammer and Whippen Adjustment (\$350) - 7 hours

Each note, when activated, involve movement of around 65 separate parts, including 32 small pieces of felt. Over a couple of years an amount of wear and tear adds up, making it harder to play the instrument. The mechanism effectively becomes less efficient and begins to respond inconsistently. Your rhythm, as a piano player, is being compromised as a result. In reality almost all pianos have the potential to be revived closer to their original efficiency and responsiveness, even when they are many decades or even a century old, unless the mechanism is completely worn through.

## Damper Adjustment (\$150) - 3 hours

This area of the action is important to have working efficiently in order to not have notes ringing on and for chords not to become confused and jumbled. It is a very complicated system and takes many hours to set up correctly

## Hammer reshaping (\$140) - 2 hours

The face of each of the 88 hammers sustain small grooves every time they strike the strings. These grooves grow deeper as time goes by, and eventually they may completely surround the string briefly as the hammers strike and then withdraw again. It is not uncommon to see hammers where the strings bury themselves a full 2 millimetres every time the hammer strikes the string. This tends to muffle the sound and affects the quality of the tone, so therefore, the music listening-experience suffers and also the mechanical response from the piano may become unsatisfactory to the pianist.

The remedy for this is Hammer Reshaping which involves removing the top 1 to 2mm surface layer of felt on each hammer head. This brings the hammer head back into a uniform tear drop shape with clean and vibrant felt which is usually present just below the surface in all hammer heads.

## Voicing (\$180) - 3 Hours

Hammer Reshaping is generally combined with Voicing to achieve a higher level of consistency and a better tonal quality across the entire keyboard. These two procedures, when performed correctly by a skilled piano technician, can be fine-tuned to suit your personal preferences. Some people like a mellow sound while others want a more powerful and almost hard or harsh sound. Depending on your preference, the hammer head can be adjusted to achieve just the desired effect that is right for you. This is done by perforating or needling the highly compressed felt of the hammer head. A special tool is used to slightly part the fibres of the hammer head shoulders, which are there to support the felt at the striking point.

## Conclusion.

It is recommended to schedule Action Regulation every 5-8 years. Action Regulation at this interval will prevent any excessive and accelerated deterioration of action parts which occurs when adjustments are not made and wear mounts up due to alignment issues and loose screws. This, in some cases, can effectively reduce the pianos useful life from 90-120 years, down to 20-25 years.

# The Piano Doctor      Action Adjustment 2 to 3 days work

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## Action Adjustment/Regulation in Detail

These procedures deal with the mechanics of each key to ensure correct and optimal functioning.

- 1      Action position adjustment (for optimal striking point) & ensuring centre-rail straightness.
- 2      Screw tightening of all action screws (including pedal brackets).
- 3      Keyboard lateral adjustment (for all 88 notes):
  - a.      sideways key movement/easing
  - b.      balance pin - hole sizing (key should drop slowly into its resting place)
  - c.      balance pin - roll movement, deform timber slightly to tighten using a blunt punch
- 4      Key (upward movement) stop-rail adjustment.
- 5      Check Centre Pins - replace if necessary, weight of screw should make flange drop slowly (for all 88 notes).
- 6      Keyboard levelling (42-47mm key height from key frame, black keys +12mm).
- 7      Key depth adjustment - white keys (10mm).
- 8      Key depth adjustment - black keys (10mm).
- 9      Set striking distance 46mm to 50mm.
- 10     Adjust lost motion (for all 88 notes).
- 11     Bridle tape adjustment (for all 88 notes).
- 12     Jack stop rail adjustment.
- 13     Whippen assembly lateral alignment, shim if incorrect angle (for all 88 notes).
- 14     Capstan alignment – forward to lighten touch/toward strings to make heavier.
- 15     String alignment (for all treble strings).
- 16     Align Hammers – laterally (screws), travel (shim) & angle (use heat iron to reset & twist shank fibres).
- 17     Jack alignment – bend centre pin slightly with use of doe skin padded hammer (for all 88 notes).
- 18     Set escapement (for all 88 notes) – 2mm to 5mm (up to 6-8mm in some cases where double hitting persists).
- 19     Hammer catcher alignment (for all 88 notes).
- 20     Set hammer catching at 18mm to 23mm (for all 88 notes).
- 21     Damper alignment (for all individual dampers).
- 22     Damper lifting (for all individual dampers).
- 23     Adjust loud/soft pedal (1mm clearance to ensure that striking distance is not altered).
- 24     Damper engagement – set at 15 to 20mm (up to 35mm thru hammer stroke, if heavier touch is desired).
- 25     Pedal side-ways adjustment.
- 26     Trap work alignment.
- 27     Adjust pedal stop felt.
- 28     Set damper stop rail (10 to 15mm) according to allowance.

**Please note:** These procedures require years of training and experience and should only be attempted by a qualified piano technician. Irreparable damage to the hammers and action can occur if an untrained person attempts to undertake this type of work. This document is not intended as an instruction manual, but it does serve as general information for the piano owner.