

Regulating for the Artist

- The Goals
 - Evenness
 - Speed
 - Sensitivity
 - Power
 - Comfort
 - Control
- Regulating for the Artist
- Action noises
 - Loose parts
 - Hard knuckles
- Regulating for the Artist
- Action noises
 - Loose parts
 - Hard knuckles
 - Worn key bushings
- Aftertouch
- Defining aftertouch
 - Key dip left over after letoff is complete
 - Aftertouch
- Understanding aftertouch
 - You have a given amount of key travel to get the hammer from rest through letoff
 - You may adjust aftertouch either by changing the amount of dip or changing the distance the hammer must travel to get through letoff
- Aftertouch

- The Aftertouch Equation
 - Aftertouch varies directly with key dip
 - Aftertouch varies inversely with hammer blow distance
 - Aftertouch varies directly with letoff distance
- Aftertouch
- Start by establishing correct dip
- Aftertouch
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- Set hammer blow samples to achieve desired aftertouch
- Aftertouch
- Start by establishing correct dip
- Set hammer blow samples to achieve desired aftertouch
- Set blow to samples
- Nit-pick aftertouch with the gauge
- Regulating for the Artist
- Creating controllability
 - Action centers
 - Letoff and drop
 - Repetition springs
 - Side friction
 - Regulating for the Artist
- Touchweight
 - Two components of touchweight
 - Weight resistance
 - Friction resistance

- Touchweight
 - Two things to measure:
 - Downweight
 - Upweight
- Touchweight
- The Touchweight Formula
 - $W_r = (D_w + U_w) / 2$
 - $F_r = (D_w - U_w) / 2$
 - $W_r + F_r = D_w$
- Touchweight
- Desirable ranges
 - Dw between 56 and 48 grams
 - Uw above 20 grams
 - Fr from 12-14 grams
 - Wr from 38-42 grams
 - Touchweight
- If friction is too high
 - Tight key bushings
 - Tight hammer flange centers
 - Hammers or keys rubbing
 - Touchweight
- If weight resistance is too high
 - Hammers are too heavy
 - Leverage is insufficient for hammer weight
- Touchweight

- Changing touchweight by regulation
- Touchweight
- Touchweight, Inertia, and Leverage
- Touchweight

Dampers!

- Pedals
- Damper and Pedal Regulation
- Damper timing also affects the pianist's perception of touchweight
 - Earlier damper lift feels heavier
 - Later damper lift feels lighter
 - I recommend no earlier than $\frac{1}{3}$ of key travel, no later than $\frac{1}{2}$ of key travel
- Damper and Pedal Regulation
- Leaking dampers
 - Test for follow
 - Isolate leaky strings
- Damper and Pedal Regulation
- Damper lift with the pedal
 - Personal preference of the artist—easily adjustable
 - Evenness of lift is very important
- Damper and Pedal Regulation
- Noises—four kinds
 - Oinking
 - Whooshing or plucking
 - Damper pedal noise

- *Una corda* noise
- Oinking
 - Usually caused by hard or crusty trichord wedge felt
 - Sanding the wedge felt where the string touches it can help
- Whooshing
 - Caused primarily by trichord wedge felts that are too long
- Damper pedal noise
 - Isolate source by a process of elimination—start low and work your way up
 - Most common sources
 - Pitman contact point on traplever
 - Pedal rod contact at guiderail bushing
 - Lift tray end pins
- *Una corda* noise
 - Clean first, then lubricate
 - Most common sources
 - Keyframe rubbing keybed
 - Glides rubbing keybed
 - Keyframe end pins
- Clean keyframe end pins and cheekblock inserts with steel wool
- Lubricate with VJ Lube or any thick-bodied lubricant
- Regulating for the Artist
- Some final things
 - The Keys: To clean or not to clean?
 - The bench
 - Positioning the piano