KAWAI

Professional Service Manual

The Manufacturers Guide
for the Preparation and Service
of Kawai Acoustic Grand
and Vertical Pianos

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Forward

In this manual, we will give an outline of procedures for proper regulation of Kawai grand and vertical pianos. These procedures, however, are only guidelines. Further, we would like to emphasize that no single operation can be done independently or even just once. One can think of this as a "CIRCLE OF REFINEMENT" with the touch and tone that meets the demands of the customer. Piano technology is not a "paint by number" set. It is assumed by the manufacturer that the use of this manual is by technicians who have a working knowledge of piano parts and their functions and who will put the manufacturers intent in design and the customers wishes above his own personal convictions.

Kawai Technical Support

Dealer Preparation

Dealer preparation should encompass (at least) inspection of every procedure as outlined in the following Service Manual. On a new Kawai piano the timetable to accomplish "make-ready" is approximately two hours (including tuning), but as the instrument matures and is played these procedures will become more labor intensive.

In the event of a damaged crate, the following procedures should be followed:

1. Before driver departs, inspect crate for any external damage.

2. Itemize the damage on the freight bill and obtain signature of the driver.

3. Call the freight company and have them send out an inspector. Do not uncrate until the inspector arrives. Obvious freight damage should be covered by the freight company.

4. Report all concealed damage to Kawai Technical Support immediately.

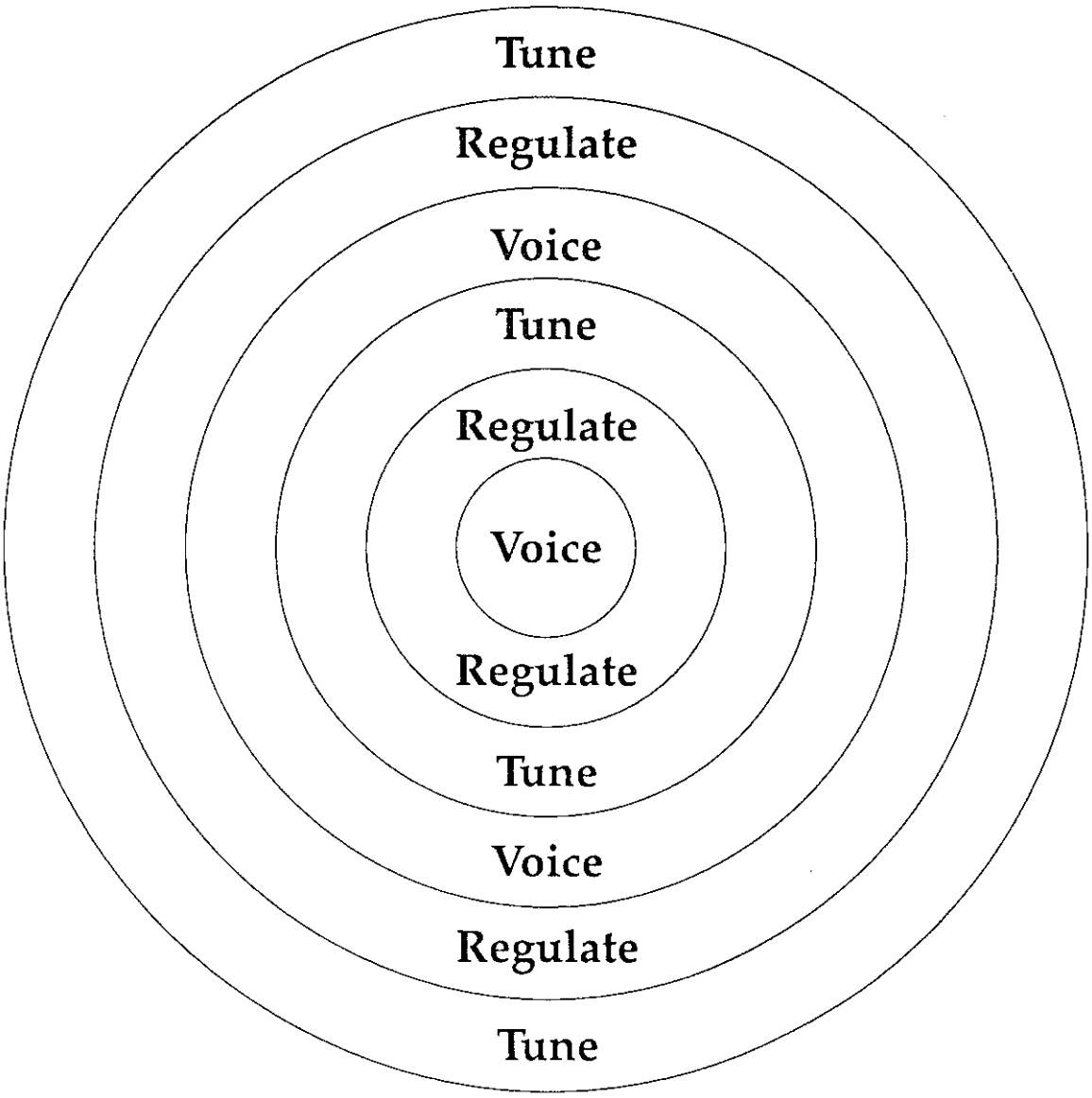
5. No damaged merchandise shipment will be refused per the Kawai dealer agreement. Contact Technical Support to report any problems.

After uncrating, check the finish and case for any visible signs of damage from shipping.

IF THERE IS A PROBLEM, CALL KAWAI AMERICA IMMEDIATELY!

Remove packing material, hammer rail wedge, and action packing stick.

"Circle of Refinement"



Grand Piano Preparation & Service

Initial Piano Preparation

Tighten Bolts and Screws

Tighten all case and action screws, leg and lyre bolts, plate bolts.

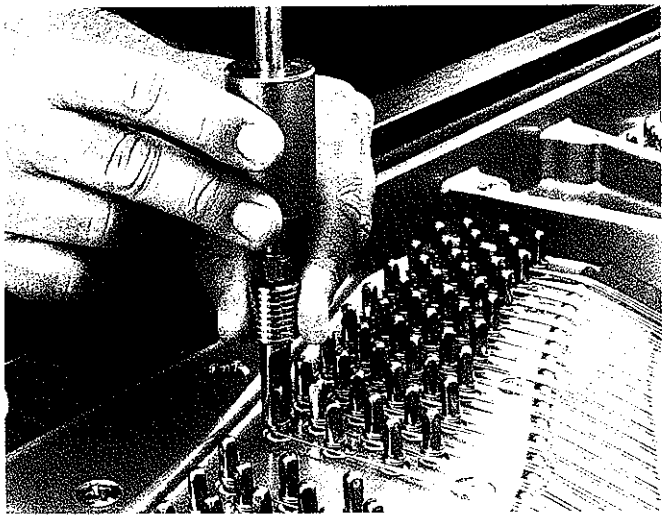
CAUTION: Do not over-tighten. Assemble bench (if already assembled, check bolts).

Settle String On Hinge Pins

Do all string settling and moving with a soft metal tool to prevent nicking the wire.

Level Coils and Seat Becket

Make sure coils are level and becket is seated in tuning pin.



Level coils.

Check Pitch and Raise, If Necessary

Settle Strings On Bridge/Agraffe

Tap strings down on both sides of bridge and all bearing points. Level strings at agraffe and V bar with string hook.

Tune to A-440

Frequently, during a fine tuning, a technician can determine if action adjustments are necessary.

NOTE: We have included a sample service check list at the end of this manual.

Action Regulation

Tighten Action Screws

Tighten all action flange and bracket screws.

NOTE: Tighten nuts on the hammer rest rail.

CAUTION: Do not change the position of the action rails from the factory setting.

Clean

Clean action and keybed.

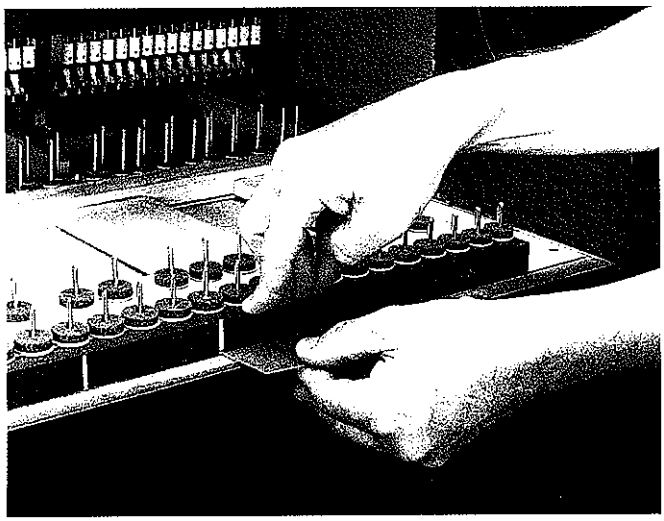
Keyframe

Bed Top Action to Keyframe

Remove the keys. Tighten all keyframe screws. On a flat surface, place the top action on the keyframe and check to see that all the feet contact the keyframe solidly. Shim as necessary. Replace the top action on keyframe making sure that the screws that go into the frame at an angle are tightened last.

Bed Key Frame to Keybed

Front Rail: Turn up keyframe glides (including the two hidden glides) in the balance rail so that the glides will not hold the keyframe off the keybed. Place the keyframe in the piano and screw down both cheek blocks. Using your fingers, tap along the front rail to see if the keyframe knocks against the keybed. If knocks are found, chalk mark the beginning and end of the knocking section. Remove the



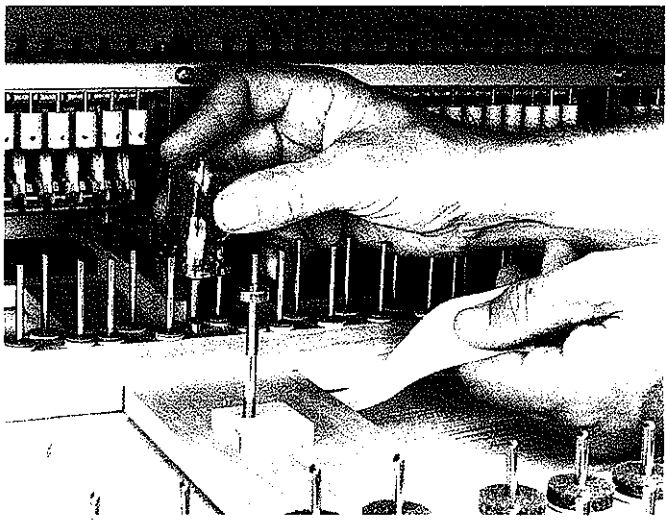
Bed front rail.

cheek blocks and carefully sand away the spots that were not knocking with 220 sandpaper. This can be done by inserting sandpaper strips between the keyframe and keybed, sand side up, and pressing down on the keyframe while pulling the paper out. Repeat until front rail is bedded.

CAUTION: Do not remove material from the spruce keybed.

Glides: To regulate keyframe glides, replace

cheek blocks and tighten. Place a strip of newspaper under the glide and turn down the screw until the paper can just be pulled out without tearing. Repeat for each glide, checking previous glides as you go. Be sure the two hidden glides (where present) are also adjusted from underneath using glide bolt adjusting tool or long nosed pliers. Lubricate keybed



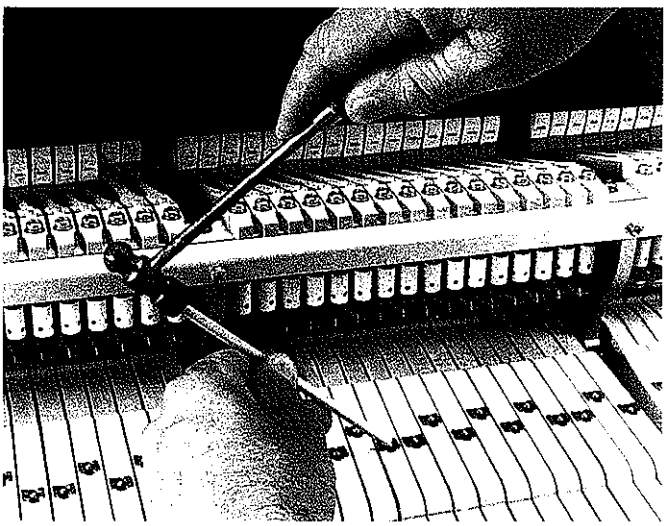
Bed glides.

where glides make contact; lubricate keyframe where it makes contact with dags.

NOTE: "Dry Lube" (powdered mica) seems to give good results; however, there are other acceptable lubricants. Do not use grease of any kind.

Keys

Square and space: Make the keys parallel in the front by tapping the balance rail pin to one side or the other using a hammershank or other piece of hardwood. Then space the keys by bending the



Squaring keys.

Spacing keys.

front rail pin to one side or the other with a spacing tool.

CAUTION: Put spacing tool below the punching to avoid nicking the pin.

Key Bushing

Front Rail: Inspect keys by depressing each key fully and moving from side to side while holding the balance rail to prevent rocking at the balance rail bushing. There should be very slight lateral movement. Ease or re-bush keys as necessary.

Center Rail: Place fingers on front and back of key button. Move from side to side. Again, there should be slight lateral movement. Ease or re-bush as necessary.

Balance Rail Hole

Inspect keys to see that they will fall of their own weight when lifted at the front and lightly held at the back. If they are too tight, they can be eased by using a Nicholson 4" round bastard file ground off on opposing sides or a balance hole burnisher available through piano supply houses.

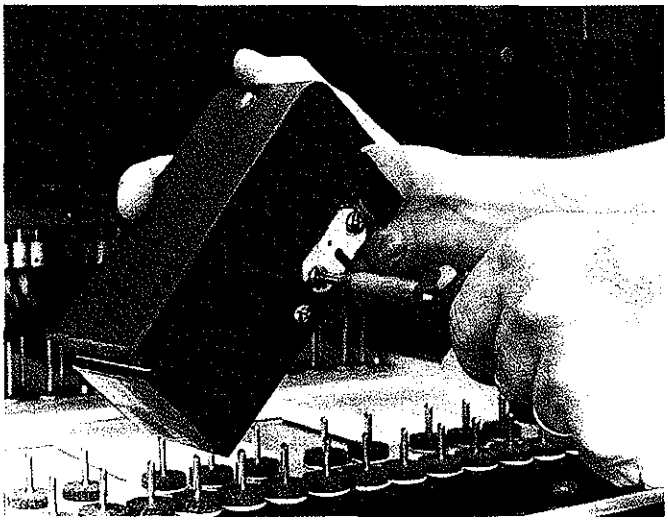
CAUTION: With either method, do not remove or compress material from the front or rear of the key.

Check Action Centers

Check for excessively loose or tight centers. For loose flanges, repin with a larger pin; ream and repin if too tight.

Check Strike Point

Determine proper strike point by moving action in and out while listening to change in tone and vol-

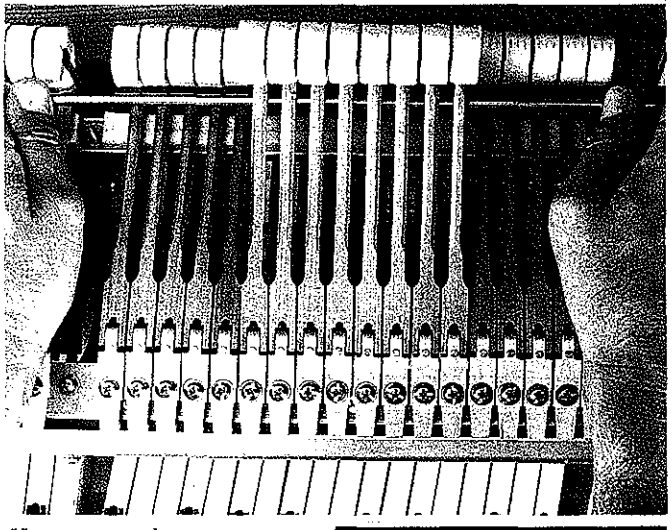


Check strike point.

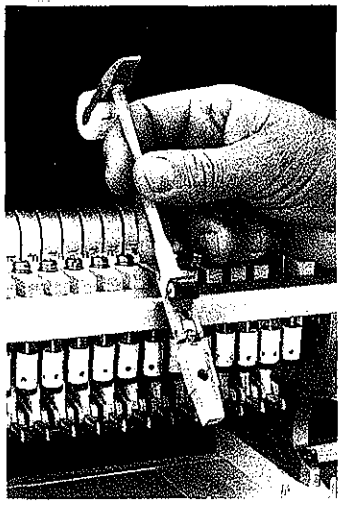
ume. Adjust keyframe guide plate in the cheekblock as necessary.

Fit Hammers to Strings

Travel: Lift a number of hammers with a straight edge and look for sideways movement as the hammer travels upward. Place a piece of travel paper between the flange and hammer rail on the same side of the screw as the direction the hammer is traveling. Differences in thickness and/or length of paper will determine the degree of correction.



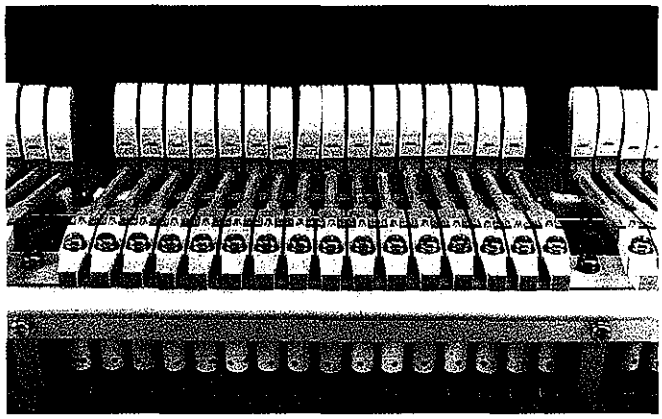
Hammer travel.



NOTE: This must be done before accurate hammer angle and alignment can be achieved.

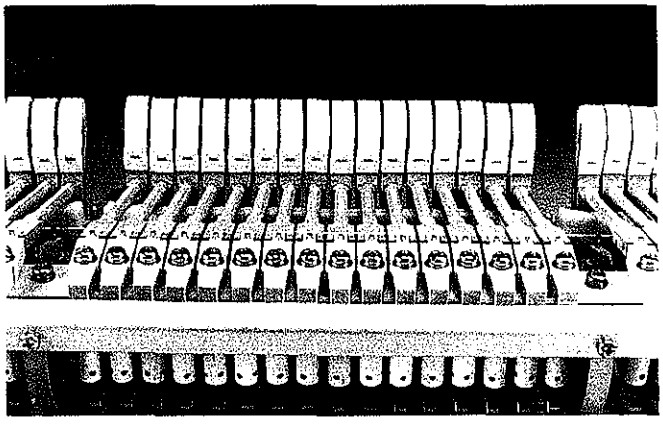
Angle of hammer: The spacing of the hammer heads and tails at rest and at strike point should maintain the same symmetry. The angle can be changed by heating the shank with a heat gun or alcohol lamp and twisting the head at the same time.

CAUTION: Do not use excessive force as this will unduly stress flange.



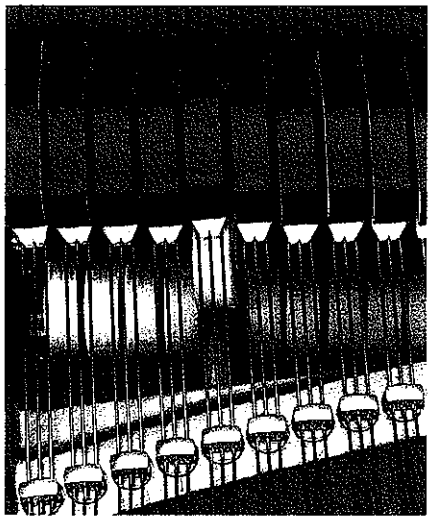
Hammer at improper angle.

Changing angle with heat gun.

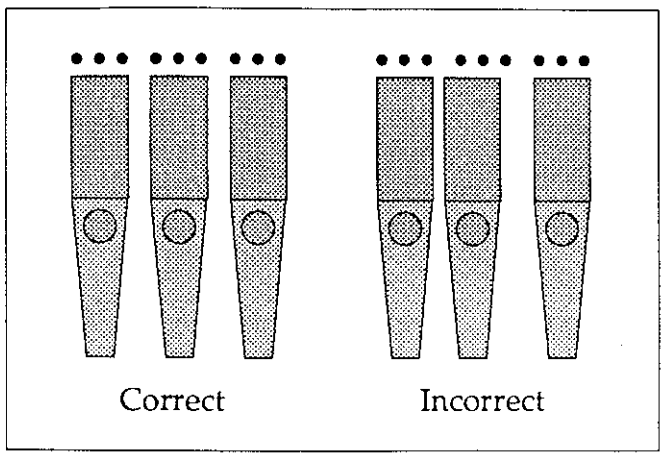


Hammer at correct angle.

Align: Block the hammer against the string with your hands by pushing up on the wippen with your forefinger and keeping the jack from escaping with your thumb. Mark those that are off with chalk. Center the hammer to the string by loosening the flange screw and shifting the hammer over. Re-tighten the screw. If all the hammers are over to one side, corrections can be made at the action stop block on the left side of the keybed. Simply add or remove shim stock from underneath.

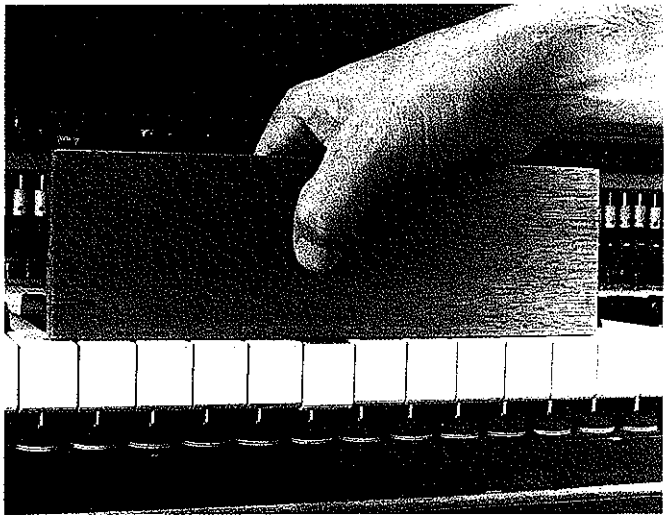


CAUTION: Make certain that this does not cause the key to lift a neighboring damper with the soft pedal depressed.



Set White Key Height and Level

Make certain hammers are not touching hammer rebound rail. Set end keys (or several samples if using a short straight edge) to correct height by placing paper punchings under the keys and cloth punchings. Using a straight edge, mark the low and high spots with chalk for which size punching will be needed. Then remove the top action and place paper punchings under the keys and cloth punchings. Repeat as necessary. If only minor adjustments are needed, the top action need not be removed. Punchings may be split, NOT NOTCHED, the key and cloth punching lifted up and the split paper punching inserted with tweezers.



Check white key height.

NOTE: See chart for specific specs on Kawai models.

CAUTION: When inserting split punchings, lift the key only to the point of resistance. **DO NOT FORCE AS DAMAGE TO THE BALANCE PIN HOLE WILL RESULT.**

Black Key Height and Level

Set the end black keys to 12 mm (±) above the whites. Level as above.

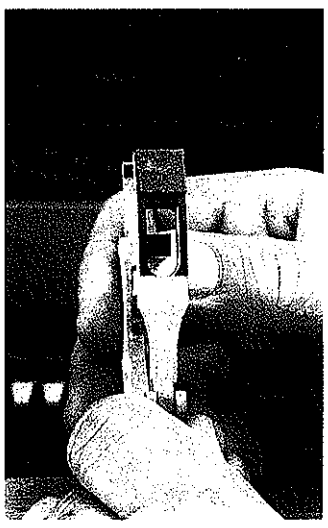
White Key Dip

Using a 10.5 mm (±) dip block, depress each key and compare with the height of the neighboring key. Add or subtract punchings until desired dip is achieved. Put paper punchings under cloth.

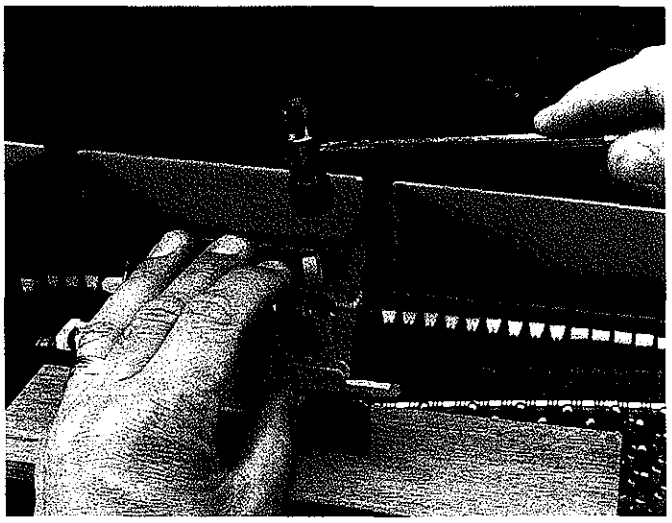
NOTE: Make certain that the same pressure is used throughout the keyboard. Do not dip blacks at this time.

Center Jacks In Repetition Lever Windows

If the jack is not centered in the repetition window, remove the wippen. Determine which direction the jack needs to move towards. Supporting that edge of the wippen on a firm surface, lightly tap the top of the jack.



Center jacks.

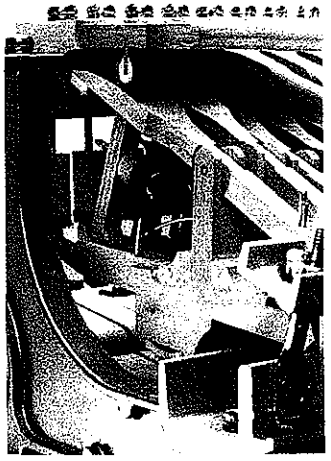


Center jacks.

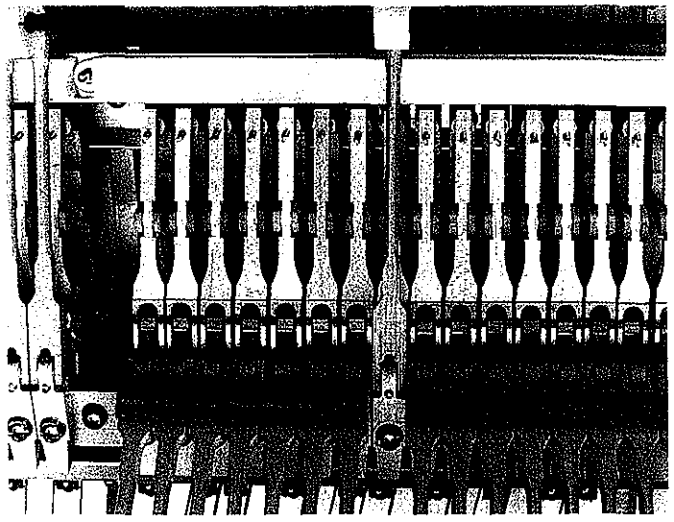
Align Wippens

The knuckle should be centered on the repetition lever, the capstan on the repetition cushion and the jack on the regulating button. To adjust lateral position of the wippen, loosen screw and shift the wippen. To position the jack tail under the let-off button, paper the side of the wippen flange that you want the jack tail to move towards.

CAUTION: Do not "rotate" wippen. Make sure knuckle is supported equally by both sides of repetition lever window.



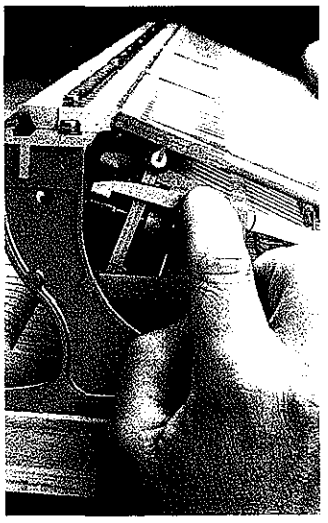
Align wippens.



Hammer/wippen alignment.

Jack Adjustment

Align the back of the jack (nearest the hammers) to the back of the wood core of the knuckle by turning the jack screw in or out. Test by using a hard and fast blow on each key. If the jack cheats and comes out without activating the hammer then the jack is too far forward (towards keys). Another test is to apply pressure on the hammer while pressing on the key and rocking them up and down.



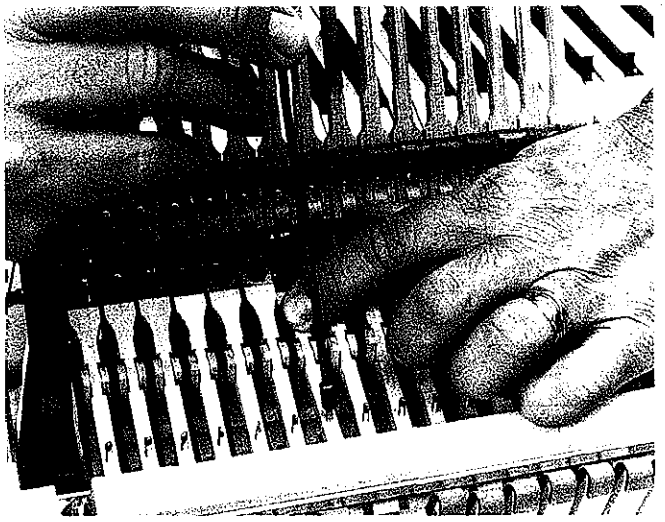
Jack to knuckle alignment.

Repetition Lever Height

Regulate the top of the repetition lever so the jack will return all the way under the knuckle on a slow release. No lost motion is allowed.

NOTE: Before adjusting, depress repetition lever to avoid damage to felt button or pad.

CAUTION: Before adjusting, make certain there is enough tension in the repetition lever spring to support the hammer.



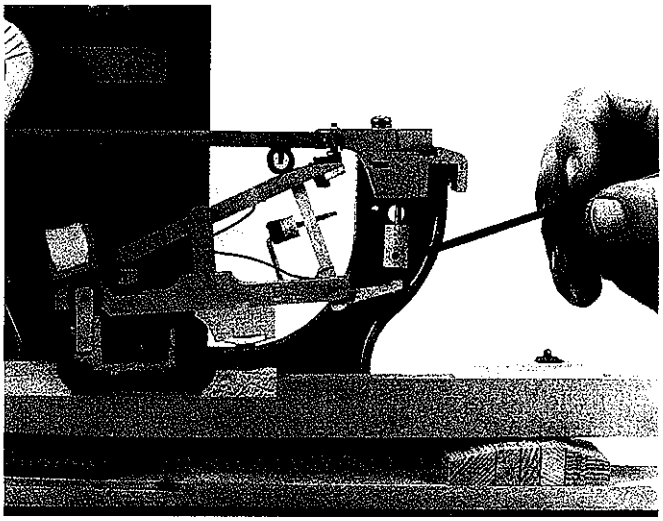
Adjust repetition lever height.

Hammer Height

Regulate the capstan screw so the top of the hammer is 46 mm (±) from the strings.

Hammer Rebound Rail

Adjust hammer rebound rail so the hammers are 5 mm (±) above the rail.



Adjust let-off.

Let-Off

Let-off should be regulated so that, on a soft blow, the hammer releases as close to the string as possible without blocking. Let-off should be 3 mm (±) in the bass and 2 mm (±) in the treble.

NOTE: Make sure there is some drop to ensure the possibility of let-off.

Black Key Dip

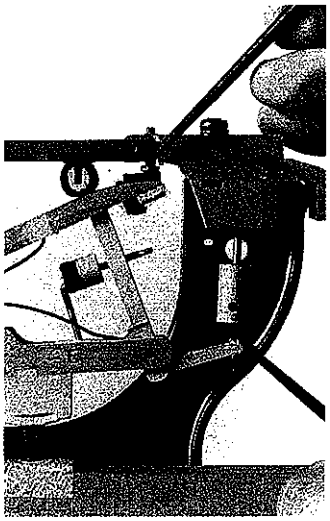
Set the black key dip by comparing the aftertouch in the whites with that of the neighboring blacks. Remove or place punchings underneath until the feel is the same. Put paper punchings under cloth.

NOTE: Test the keys at the front, in the same place each time.

Hammer Drop

With the action on a bench, shim the balance rail or front rail to give the exact key dip as found in the piano. Regulate each hammer so the drop screw touches the top of the repetition lever at the same time the jack touches the regulating button. This is felt in the finger as a firm and solid bump in the key. Check that all hammers are level in their drop position.

NOTE: Incorrect setting of drop can result in bubbling hammers when played softly.



Drop screw to let off button relationship.

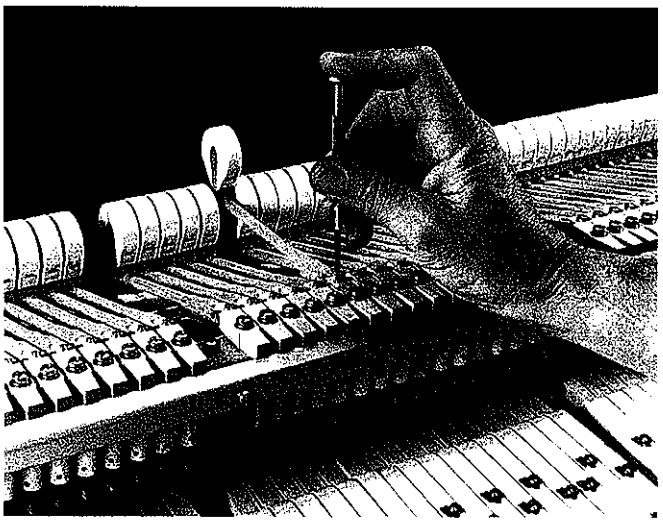
Check Aftertouch

Proof of proper regulation of hammer height, key height, key dip, let-off and drop is felt in the aftertouch. Each key should feel exactly the same. If not, check and re-regulate, as necessary, the following: key height, key dip, hammer height, let-off and drop. Remember the "Circle of Refinement".

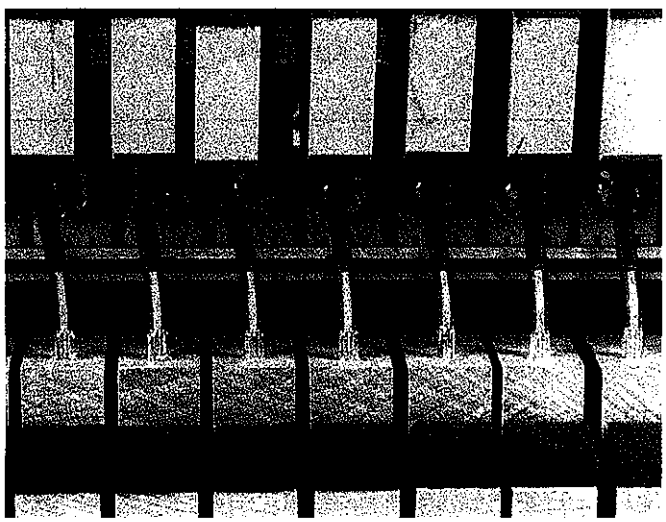
Back Check

Alignment: Using bending pliers, space the backchecks so they are even and square to the hammer tails. Maintain the squareness when moving the backcheck over by bending the backcheck wire twice, once at the bottom and the opposite way at the top.

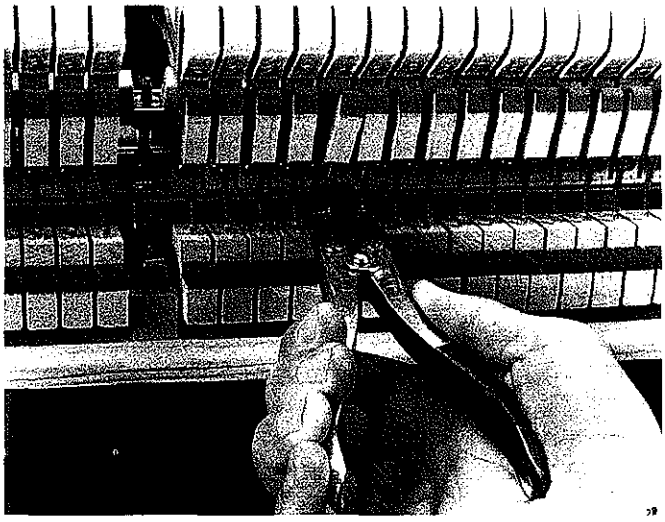
Angle and Catch: With one hand, make the hammer check; with the other hand, bend the back-



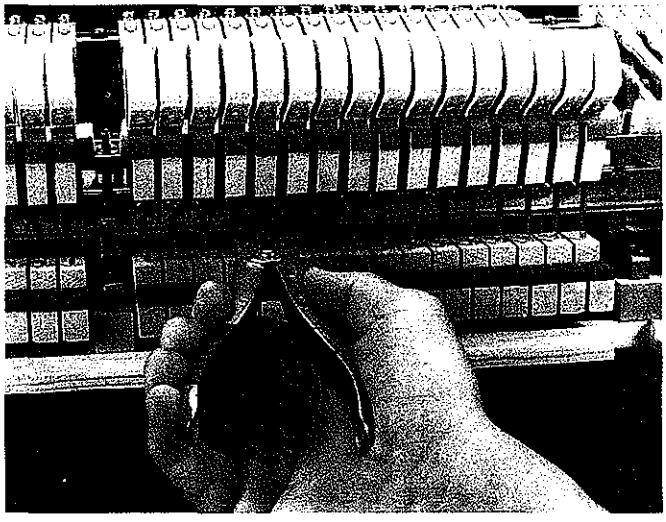
Adjust drop.



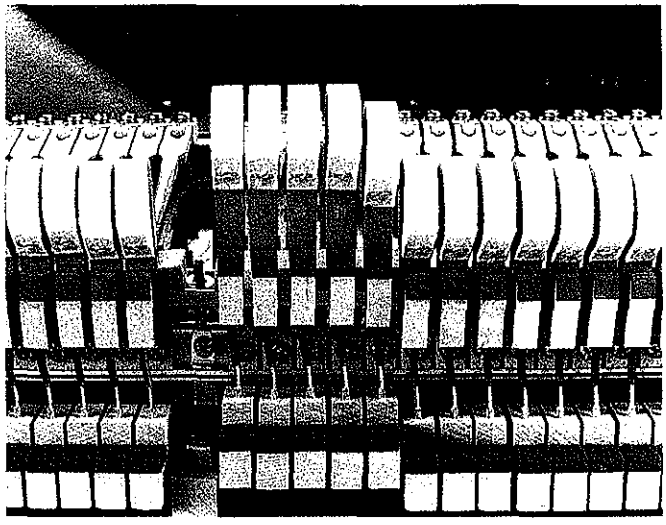
Backcheck out of alignment.



First correcting bend.

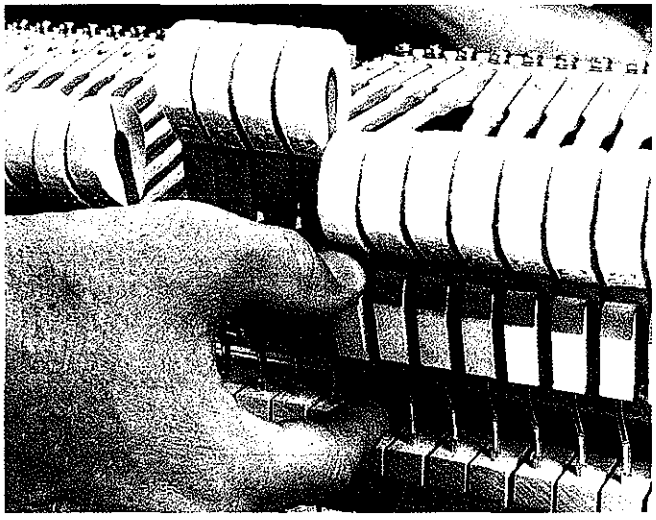


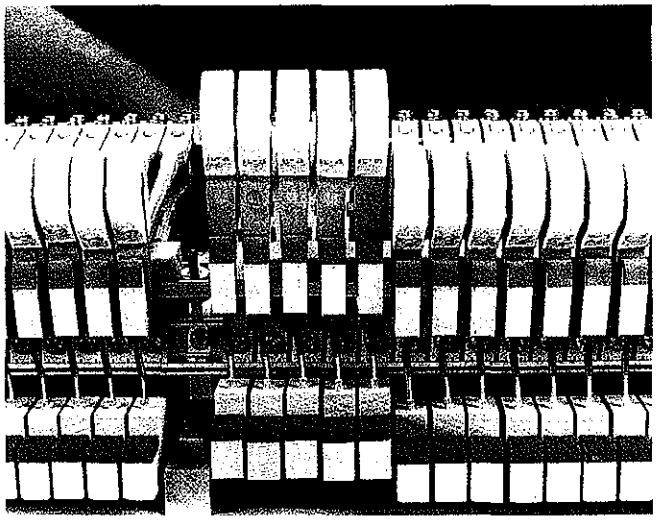
Final correcting bend.



Backcheck in proper alignment.

check forward or back so the hammer will be caught 15 mm (±) from the string. Check to see that the hammer tails do not drag on the backcheck by moving the key with one hand and pushing down on the hammer with the other. If the tail drags, adjust as necessary. Also, check to see that when the hammer is caught, the backcheck is holding the hammer tail firmly. Do this by pushing down on the hammer while in its caught position. Resistance should increase. If it doesn't, adjust the angle of the backcheck.





Catch adjustment.

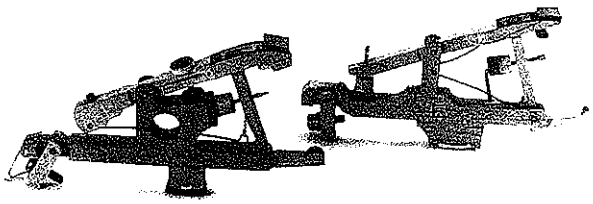
Repetition Spring

With the action on a bench, regulate the repetition spring so the hammer will rise smoothly from check to drop position. On Kawai "C" and "D" style wippens, adjust the single repetition spring using the adjusting screw located on the back of the repetition lever. On "E" style wippens with butterfly-type springs, adjust by first unhooking it from the

repetition lever and then spreading or compressing the coils of the spring. Make sure the spring groove is clean.

NOTE: If the spring tension is too strong the hammer will bubble on a soft blow.

CAUTION: Do not introduce a new bend into the long sections of spring.



Wippen types (C & D on left, E on right)

Key Stop Rail

Regulate 2 mm (±) above the top of the black keys.

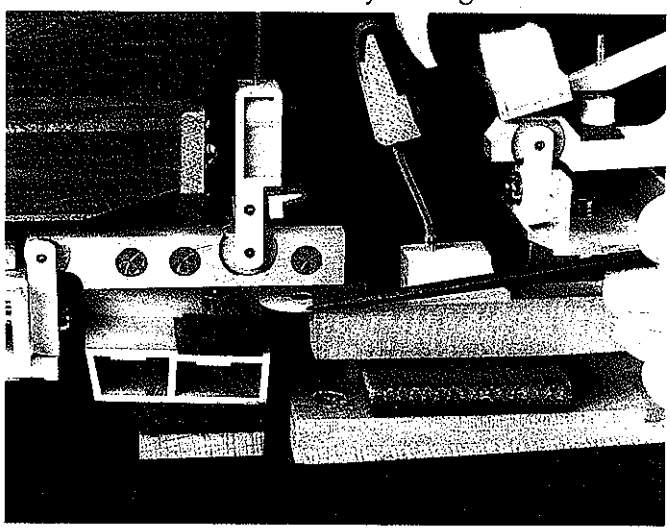
Dampers

Guide rail bushing: When damper is gently lifted, there should be a small amount of play in all directions. If too tight, ease with umbrella wire. If there is too much play and the damper rattles when played, re-bush.

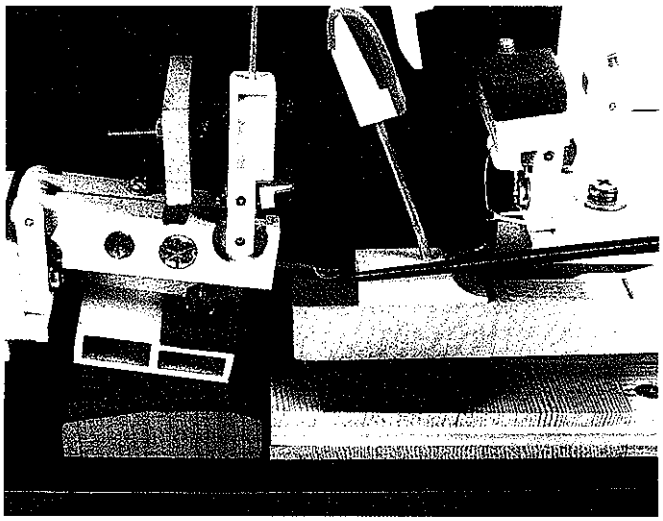
CAUTION: Do not over-ease.

Alignment: Adjust dampers so they are seated squarely on the strings.

Lift from key: Dampers should begin to lift when the hammer is halfway through its travel. Set



Adjust damper lift from key.



Adjust damper lift from key.

samples. Regulate to the correct samples by placing a block or jig under the underlevers. Loosen the screw in the bullet and move the damper up or down. Make sure the dampers track straight by bending the damper wire with bending pliers just above the damper lever. If dampers are not straight on the strings, using vise grip pliers, twist gently just above damper lever.

NOTE: If the damper lever has a spoon, adjust the damper lift by gently bending the spoon up or down. If there is a regulating button, adjust by turning the screw. Sostenuto tabs must remain in a straight line with either of these types of adjustments.

Tray lift: Adjust dampers so they lift evenly with the damper tray, adjust damper lever capstan.

Damper up stop rail: The damper up stop rail should be adjusted so there is a small amount of play between the black key damper and the stop rail when the key is fully depressed.

Pedals

Adjust Damper Pedal

There must be slight lost motion in the damper pedal. The damper should follow when the string is pushed down lightly.

Pedal Stop Capstan

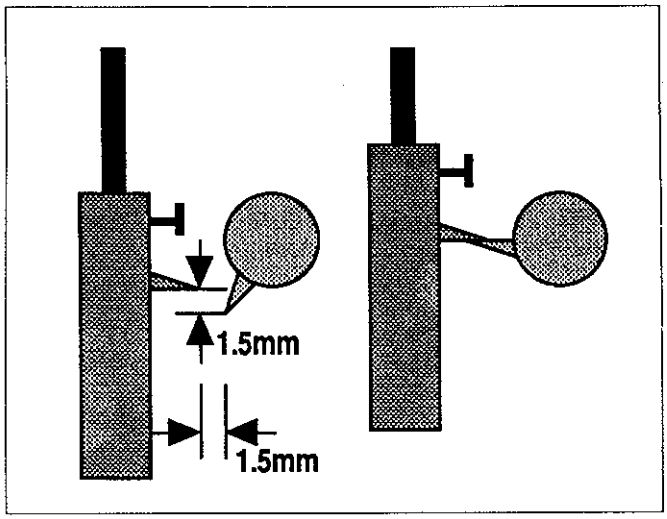
The dampers should be at the same height with the pedal depressed as they are with the keys depressed. Adjust the pedal stop capstan.

NOTE: In aggressively used pianos, replace the stop capstan with hammer trim felt. This will minimize callbacks for pedal readjustments.

Sostenuto

When the sostenuto rod is rotated with the sostenuto pedal, the rod lip should just clear the sostenuto tabs. With the keys depressed (or using the damper pedal when the action is out) and sostenuto engaged, the rod lip should firmly catch and hold the tabs. Tabs of "uncaught" dampers should not be able to pass the rod lip on a firm blow.

CAUTION: Dampers must be properly regulated before adjusting the sostenuto pedal.



Sostenuto tab clearance.

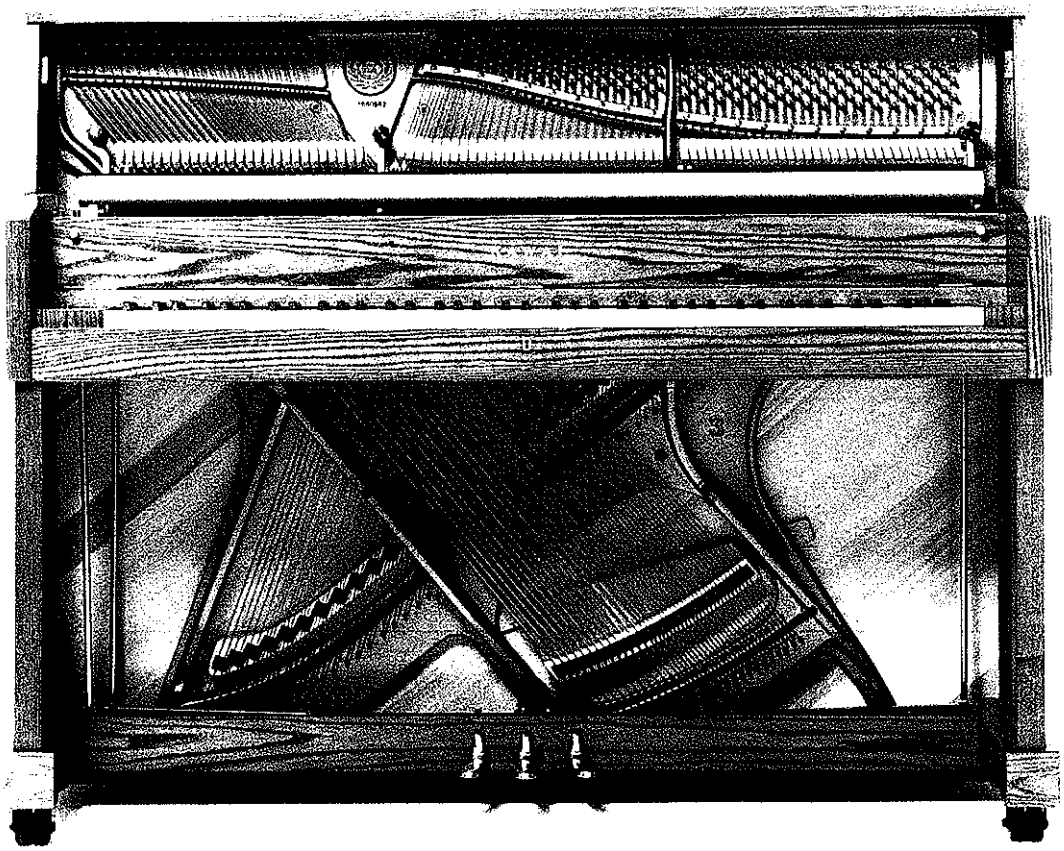
Shift Pedal

Adjust with the nut at the top of the pedal rod so there is no lost motion. Adjust the screw in the right cheek block so the action will shift, allowing the hammers to strike the string halfway between the string grooves.

Auxiliary Wippen Springs

Some earlier Kawai models have auxiliary wippen springs. The intent of the spring is to add an element of refinement to touch in the regulation process.

CAUTION: Do not use the springs to circumvent proper regulation procedures.

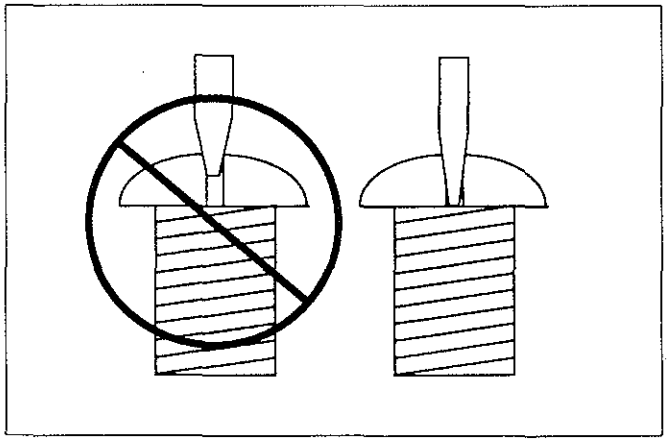


Vertical Piano Preparation & Service

Action Regulation

Tighten Screws

Tighten all action flange and bracket screws. NOTE: Make sure screwdriver blade fits slot.



Clean

Clean action and keybed.

Jack Stop/Let Off Rail

Adjust rail so that when key is firmly depressed, there is approximately 1/8" between jack and felt cushion on rail. Failure to have adequate clearance will cause wippen to hang up on a hard blow.

Keys

Space and square: Make the keys parallel in the front by tapping the balance rail pin to one side or the other using a hammershank or other piece of hardwood. Then space the keys by bending the front rail pin to one side or the other with a spacing tool.

CAUTION: Put spacing tool below the punching to avoid nicking the pin.

Key Bushings

Front rail: Inspect keys by depressing each key fully and moving from side to side while holding the balance rail to prevent rocking at the balance rail bushing. There should be very slight lateral movement. Ease or re-bush keys as necessary.

Center rail: Place fingers on front and back of key button. Move from side to side. Again, there should be slight lateral movement. Ease or re-bush as necessary.

Balance Rail Hole

Inspect keys to see that they will fall of their own weight when lifted at the front and lightly held at the back. If they are too tight they can be eased by using a Nicholson 4" round bastard file ground off on opposing sides or a balance hole burnisher available through piano supply houses.

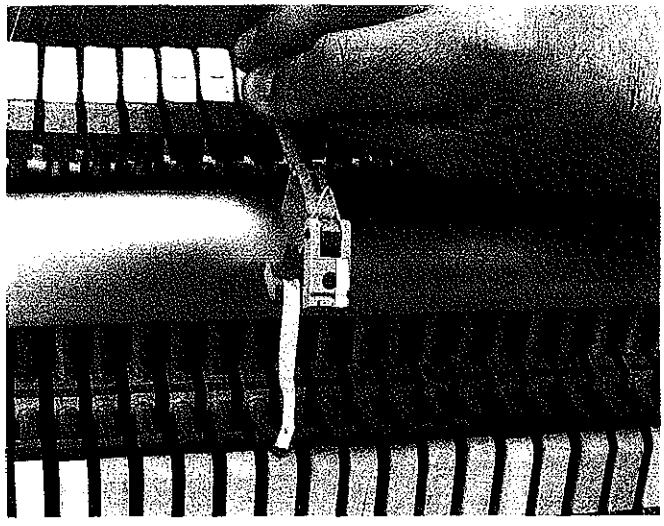
CAUTION: With either method, do not remove or compress material from the front or rear of key.

Check Action Centers

Check for excessively loose or tight centers. For loose flanges, repin with a larger pin. Ream and repin if too tight.

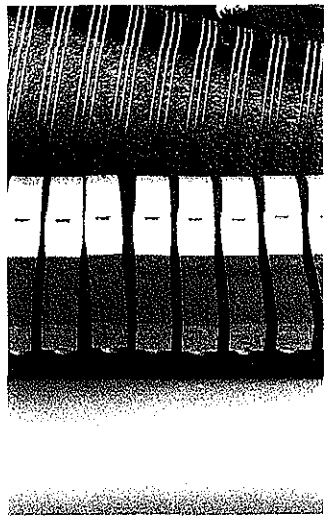
Fit Hammers to Strings

Travel: Push the hammers to the strings and look for sideways movement as the hammer travels to the string. Place a piece of travel paper between the flange and hammer rail on the opposite side of the screw that the hammer is traveling to. Differences in thickness and/or length of paper, put under the flange, will determine the degree of correction.



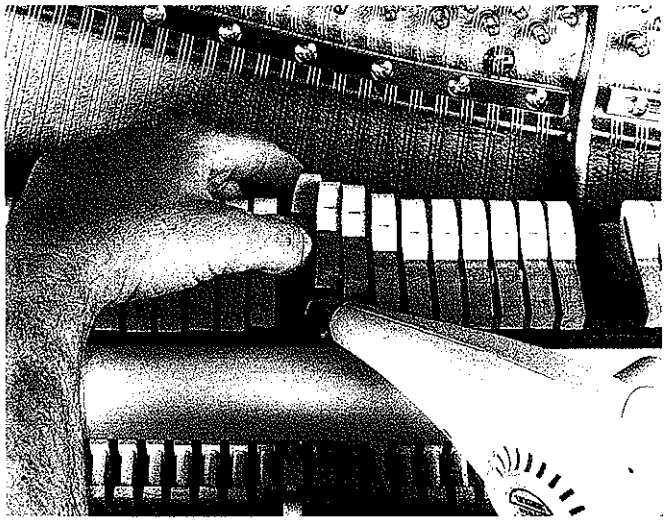
Travel butts.

Angle of hammer: The spacing of the hammer heads and tails at rest and at strike point should maintain the same symmetry at both points. The angle can be changed by heating the shank with a heat gun and twisting the head at the same time.

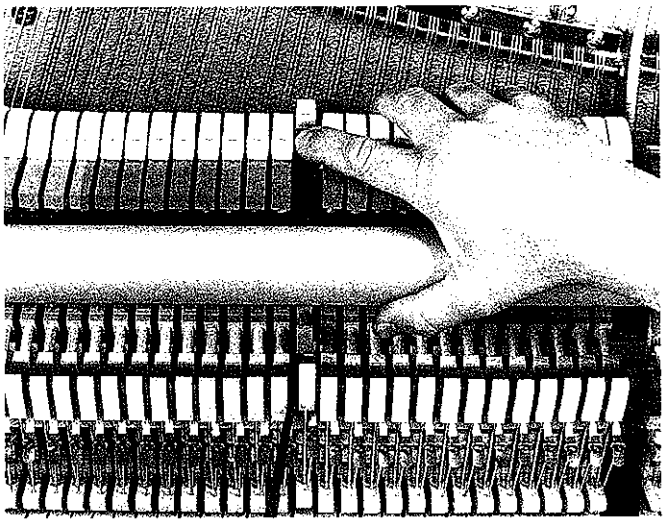


Hammer at improper angle.

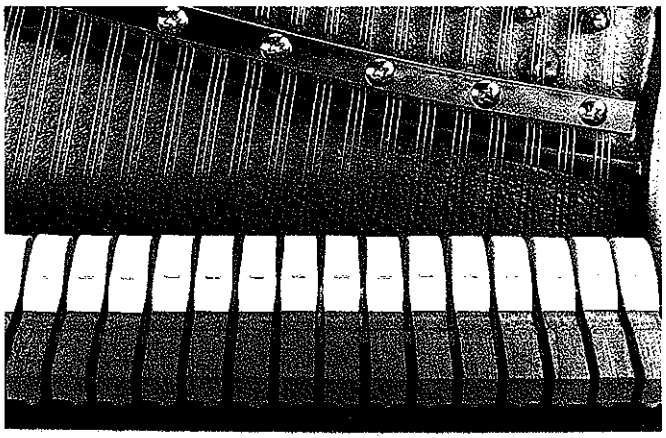
CAUTION: Do not



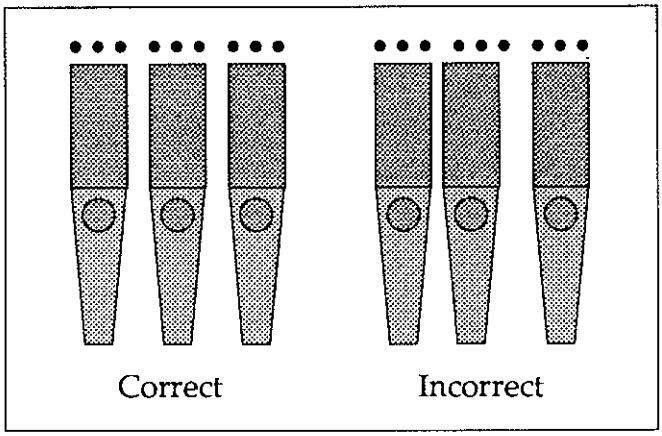
Changing angle with heat gun.



Hammer alignment.



Hammer at correct angle.



use excessive force as this will unduly stress flange.

Align: Block the hammer against the string with your hands. Center the hammers to the string by loosening the flange screw and shifting the hammer over and re-tightening the screw.

Align Wippens

The jack should be centered under the butt, and the capstan under the wippen. To change the lateral position of the wippen, loosen screw and shift the wippen. To change the position of the jack tail under the let-off button, paper the side of the wippen flange that you want the jack tail to move towards.

Set White Key Height and Level

Set end keys (or several samples if using a short straight edge) to correct height by placing paper punchings under the keys and cloth punchings. Using a straight edge, mark the low and high spots with chalk for which size punching will be needed. Remove each key and place paper punchings under the keys and cloth punchings. Repeat as necessary. If a key is slightly higher than surrounding keys, use a sandpaper stick to remove a slight amount of wood from the bottom of key.

NOTE: See chart for specific specs for Kawai models.

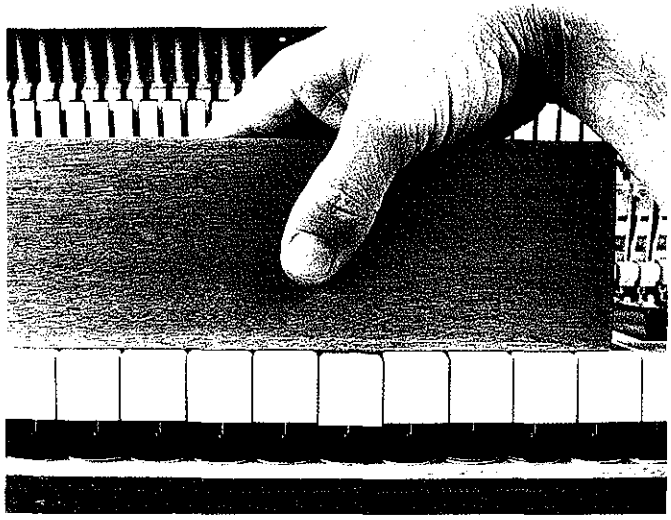
Black Key Height and Level

Set the end black keys to 12 mm (±) above the whites. Level as above.

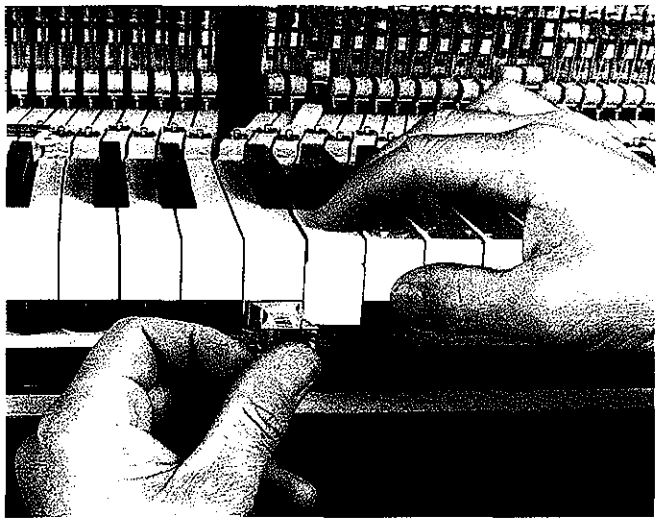
White Key Dip

Whites: Using a 10.5 mm (±) dip block, depress each key and compare with the height of the neighboring key. Add or remove punchings until desired dip is achieved.

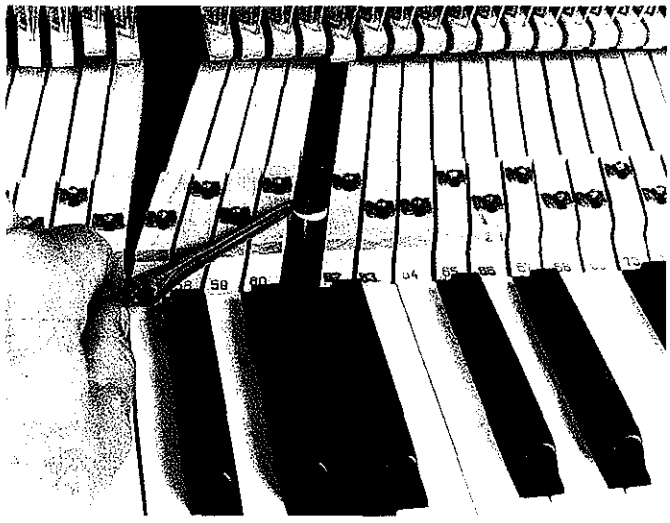
NOTE: Make certain the same pressure is used throughout the keyboard. Do not set black key dip at this time.



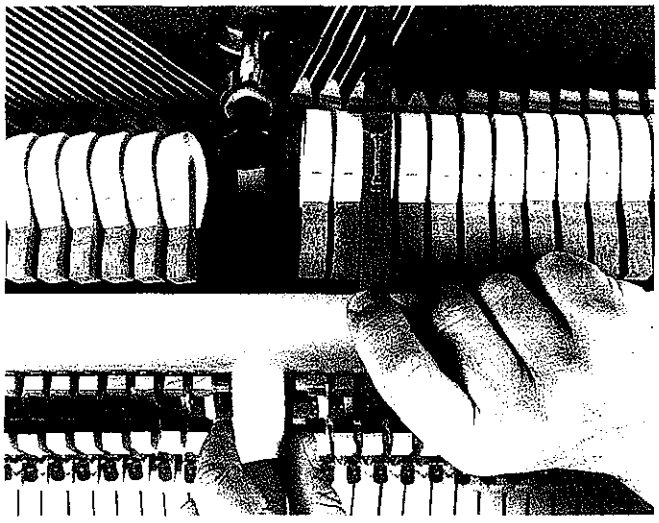
Test white key height.



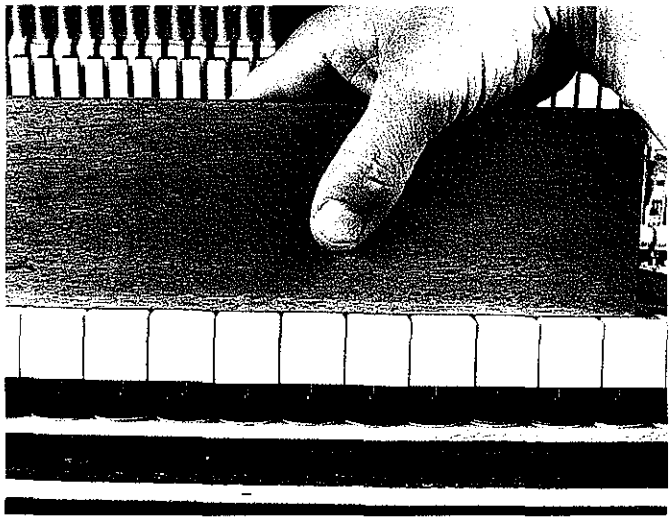
Adjust white key dip.



Adjusting white key height.



Testing for hammer blow distance.



White keys at proper height.

Hammer Blow Distance

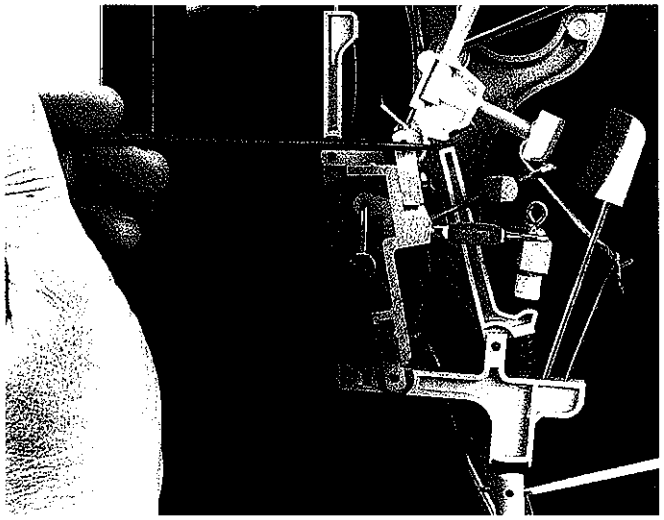
Set the blow distance to 46 mm (±) by increasing or decreasing the thickness of the felt block between the hammer rest rail and action brackets.

NOTE: Do this regulation with the soft pedal dowel removed.

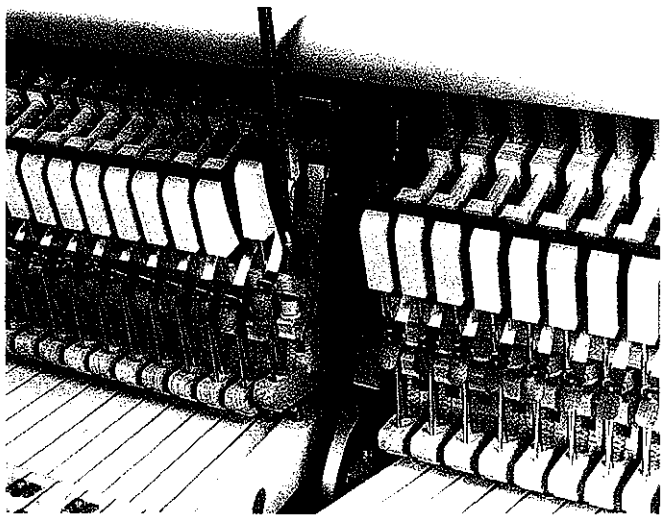
Adjust Capstans (Lost Motion)

The end of the jack should be almost touching the hammer butt while the hammer is at rest. Check by pulling back slightly on the hammer rest rail. The hammers should follow slightly.

NOTE: When jack tail is depressed and then released, jack should move smoothly back under butt. Another test is to play the note and release the key slowly. Watch to see that the jack slips smoothly back under the butt. This technique can be useful to detect possible tight key bushings.



Adjust "lost motion."



Adjust let-off.

Let-Off

Let-off should be regulated so that, on a soft blow, the hammer releases as close to the string as possible without blocking. Let-off should be 3 mm (±) in the bass and 2 mm (±) in the treble.

Black Key Dip

Set the black key dip by comparing the aftertouch in the whites with that of the neighboring blacks. Remove or place punchings underneath until the feel is the same. Put paper punchings under cloth.

NOTE: Test the keys at the front, in the same place each time.

Back Check Alignment and Catch

Alignment: Square backchecks to catchers.

Catch: Set backchecks on all keys so the hammers check 15 mm (±) from the strings on a medium blow.

Alternately: After setting white keys, use a straight edge to line up all black keys. Adjust black key dip so hammers are catching the same as on white keys.

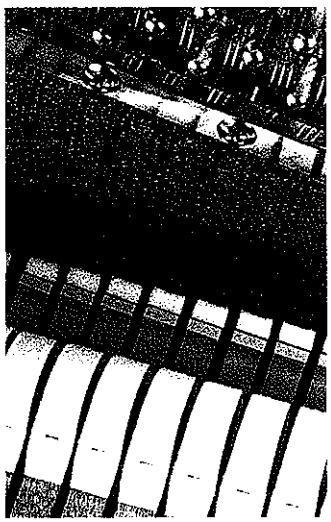
Check Aftertouch

Each key should feel exactly the same. If not, check and re-regulate, as necessary, the following: hammer blow distance, key height, key dip and let-off. Remember the "Circle of Refinement".

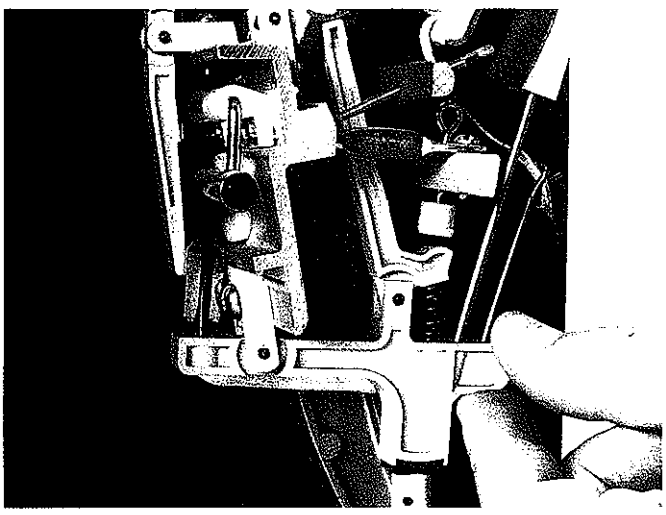
Dampers

Alignment: Adjust dampers so they are seated squarely on the strings. Damper wires must be regulated in or out, allowing all dampers to lift evenly with the pedal.

Lift from Key: Damper should lift with the key when hammer is halfway through its travel. Bending the damper spoon toward the strings causes the damper to lift earlier.



Align dampers.



Adjust damper lift from key.

Bridle Straps and Wires

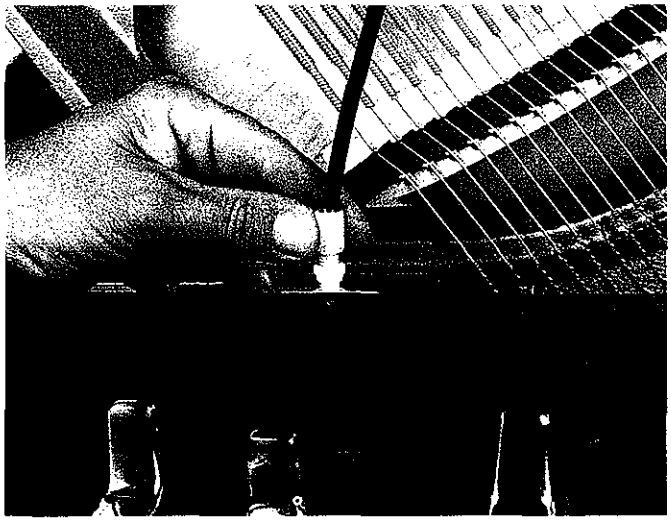
Bridle wires are adjusted so the jacks do not slip out from under the hammer butts when the action is removed and they do not lift the wippens when the soft pedal is depressed.

Pedals

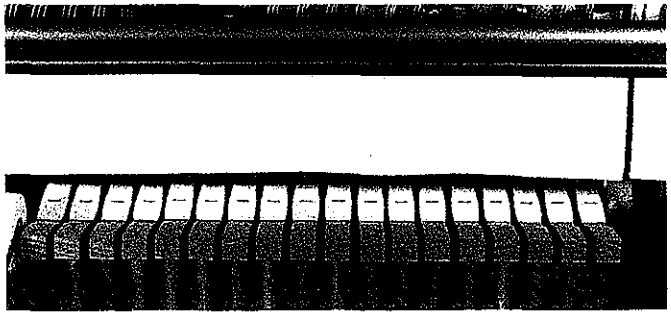
Damper and bass sustain: Adjust the damper pedal and bass sustain to allow slight lost motion before the dampers lift from the strings. The dampers should follow the string when the string is pushed lightly.

Soft pedal: Adjust until there is no lost motion.

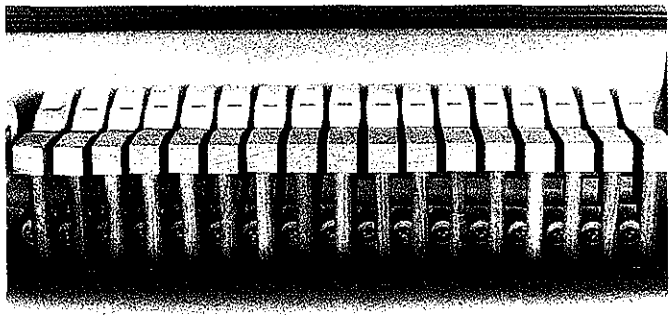
Muffler pedal: Regulate muffler pedal adjusting nut until muffler felt clears the hammers when disengaged and moves sufficiently in front of hammers to mute the sound of the piano when engaged.



Adjust muffler rail.



Muffler rail (disengaged).



Muffler rail (engaged).

Tone Regulation

The following suggestions are not a comprehensive guide to tone regulation, but are intended only as basic guidelines from which to build on.

Regulate Action - Must be complete and correct. No amount of voicing can replace proper piano preparation and a good solid tuning.

Filing - The hammers should be filed if they are grooved or cupped. Be careful to maintain the original shape of the hammer. **NOTE:** It is important to maintain proper hammer shape and keep string cuts to a minimum at all times.

String Level and Seating - Strings must be level to hammer and well seated at all termination points. **NOTE:** Tap bridge pins to make sure they are in firm contact with bottom of hole in bridge.

Hammer Dynamics - Tone color and dynamic range is greatly reduced as hammers become compacted. Resiliency in the felt will increase the longevity of the hammer. It will also decrease possible string breakage and greatly reduce the harshness that comes from hammer to string contact. In effect, we are controlling, among other things, how long the hammer will ultimately be in contact with the strings. Different effects can be achieved by:

1. Needling in different areas of the hammer.
2. The length of the needles you use or, in other words, how deeply you penetrate the hammers.

For example, needling in the low shoulders will increase volume if the shoulders are too hard and not resilient. It is also possible for shoulder needling to have a softening effect. The closer to the crown you get, the more pronounced the softening effect becomes.

Again, it must be emphasized that voicing cannot be taught in a manual. It must be practiced. Make it a point to do some voicing, no matter how minor, on every piano you service. Keep in mind, though, the responsibility you have to tread softly in uncharted waters. Competent voicing comes only after many thousands of hours of both voicing and listening to pianos that sound good!

CAUTION: When needling is necessary, do not needle in the crown area of the hammer. Also, be sure to support hammer tails when voicing.

DEALER PREP CHECKLIST

Grand Piano

__ Tighten Bolts and Screws
(Plate, Case, Action, Bench)

__ Settle String On Hitch Pins

__ Seat Coils On Tuning Pins

__ Raise Pitch

__ Settle Strings On Bridge/Agraffe

__ Tune to A-440

__ Tighten Action Screws

__ Clean Action and Keybed

__ Bed Top Action to Keyframe

__ Bed Keyframe to Keybed

__ Key Bushings

__ Balance Rail Hole

__ Action Centers

__ Strike Point

__ Fit Hammers to Strings

__ Travel Shanks and Flanges

__ Angle of Hammers

__ Align Hammers to Strings

__ Space and Square Keys

__ Set Height and Level White Keys

__ Set Height and Level Black Keys

__ White Key Dip

__ Center Jacks In Repitition Lever Windows

__ Align Wippens

__ Set Jack Position

__ Repitition Lever Height

__ Hammer Height

__ Hammer Rebound Rail

__ Let-Off

__ Black Key Dip

__ Hammer Drop

__ After Touch

__ Backchecks

__ Repitition Spring

__ Key Stop Rail

__ Dampers

__ Damper Guide Rail Bushing

__ Damper to String Alignment

__ Damper Lift With Key

__ Damper Lift With Tray

__ Damper Stop Rail

__ Damper Pedal

__ Damper Pedal Stop Capstan

__ Sostenuto Pedal

__ Shift Pedal

__ Pat On The Back!

DEALER PREP CHECKLIST

Vertical Piano

__ Tighten Bolts and Screws
(Plate, Case, Action, Bench)

__ Clean Action and Keybed

__ Seat Coils On Tuning Pins

__ Raise Pitch

__ Tune to A-440

__ Adjust Jack Stop/Let-Off Rail

__ Key Bushings

__ Balance Rail Hole

__ Action Centers

__ Fit Hammers to Strings

__ Angle of Hammers

__ Align Hammers

__ Space and Square Keys

__ Align Wippens

__ Set Height and Level White Keys

__ Set Height and Level Black Keys

__ White Key Dip

__ Hammer Blow Distance

__ Adjust Capstans

__ Let-Off

__ Black Key Dip

__ Backcheck Alignment and Catch

__ After Touch

__ Damper to String Alignment

__ Damper Lift With Key

__ Damper Lift With Pedal

__ Bridle Straps and Wires

__ Soft Pedal

__ Bass Sustain or Muffler Pedal
(Whichever is Present)

__ Damper Pedal

Kawai Upright Specifications

MODELS	CX-21	CX4-8 706-8	CE-10/11 CS-10/11	803/4 501/2 601/2	UST (All)	CS-9 CS-9E	NS (All) US (All) KL-70
Key Height	61.0	61.0	61.0	61.0	63.0	61.0	63.0
Blow Distance	46.0	46.0	46.0	46.0	46.0	46.0	46.0
Let Off - Bass	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Let Off - Midrange	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Let Off - Treble	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Key Dip	10.5	10.5	10.5	10.5	10.5	10.5	10.5
Back Check	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Down Weight (gr)	53.0	53.0	53.0	53.0	53.0	53.0	57.0

Kawai Grand Specifications

MODELS	GE-1	GE-2	KG-1D-3D KG-5	KG-1E-6E	KG-7	GS-30 GS-50
Key Height	65.0	65.0	65.0	65.0	65.0	65.0
Blow Distance	47.0	47.0	46.0	47.0	46.0	47.0
Let Off - Bass	2.0	2.0	2.5	2.0	2.0	2.0
Let Off - Midrange	1.5	1.5	2.0	1.5	1.5	1.5
Let Off - Treble	1.0	1.0	1.5	1.0	1.0	1.0
Hammer Drop - Bass	2.5	2.5	2.5	2.5	2.5	2.5
Hammer Drop - Mid	2.5	2.5	2.5	2.5	2.5	2.5
Hammer Drop - Treble	2.5	2.5	2.5	2.5	2.5	2.5
Key Dip	10.0	10.0	10.5	10.0	10.5	10.5
Backcheck - Bass	15.0	10.0	15.0	15.0	15.0	15.0
Backcheck - Mid	15.0	15.0	15.0	15.0	15.0	15.0
Backcheck - Treble	15.0	15.0	15.0	15.0	15.0	15.0
Down Weight - Bass	63.0	63.0	61.0	63.0	61.0	55.0
Down Weight - Tenor	61.0	61.0	61.0	61.0	61.0	55.0
Down Weight - Mid	60.0	60.0	60.0	60.0	60.0	54.0
Down Weight - Treble	59.0	59.0	59.0	59.0	59.0	53.0
Down Weight - High	57.0	57.0	59.0	57.0	59.0	53.0

(Down Weight in grams)

Kawai Grand Specifications

MODELS	GS-40 GS-60	GS-70 GS-80	R-1	RX-A	GS-100	EX
Key Height	65.0	67.0	67.0	67.0	67.0	67.0
Blow Distance	47.0	47.0	47.0	47.0	47.0	47.0
Let Off - Bass	2.0	2.0	2.0	2.0	2.0	2.0
Let Off - Midrange	1.5	1.5	1.5	1.5	1.5	1.5
Let Off - Treble	1.0	1.0	1.0	1.0	1.0	1.0
Hammer Drop - Bass	2.5	2.5	2.5	2.5	2.5	2.5
Hammer Drop - Mid	2.5	2.5	2.5	2.5	2.5	2.5
Hammer Drop - Treble	2.5	2.5	2.5	2.5	2.5	2.5
Key Dip	10.0	10.0	10.0	10.0	10.0	10.0
Backcheck - Bass	15.0	15.0	15.0	15.0	15.0	15.0
Backcheck - Mid	15.0	15.0	15.0	15.0	15.0	15.0
Backcheck - Treble	15.0	15.0	15.0	15.0	15.0	15.0
Down Weight - Bass	57.0	57.0	57.0	57.0	56.0	56.0
Down Weight - Tenor	57.0	57.0	57.0	57.0	55.0	55.0
Down Weight - Mid	56.0	56.0	57.0	57.0	54.0	54.0
Down Weight - Treble	55.0	56.0	57.0	57.0	53.0	53.0
Down Weight - High	53.0	55.0	57.0	57.0	52.0	52.0

(Down Weight in grams)

Bass and Treble String Scale - Grand Pianos

GE-1		GE-2		KG-1E		KG-2E		KG-3E	
Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12
13	13/14	13	13	13	13/14	13	13	13	13
14	15/16	14	14/15	14	15/16	14	14/15	14	14/15
15	17/18	15	16/17	15	17/18	15	16/17	15	16/17
16	19/20	16	18/19	16	19/20	16	18/19	16	18/19
17	21/22	17	20/21	17	21/22	17	20/21	17	20/21
18	23/24	18	22/23	18	23/24	18	22/23	18	22/23
19	25/26	19	24/25	19	25/26	19	24/25	19	24/25
20	27/28	20	26/27	20	27/28	20	26/27	20	26/27
21	29/30	21	28/29	21	29/30	21	28/29	21	28/29
22	31/32	22	30/31	22	31/32	22	30/31	22	30/31
23	33/34	23	32/33	23	33/34	23	32/33	23	32/33
24	35/36	24	34/35	24	35/36	24	34/35	24	34/35
25	37/38	25	36/37	25	37/38	25	36/37	25	36/37
26	39/40	26	38/39	26	39/40	26	38/39	26	38/39
27	41/42	27	40/41	27	41/42				
28	43/44	28	42/43	28	43/44				
29	45/46	29	44/45	29	45/46				
30	47/48			30	47/48				
--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--	
2	18.5	2	20	2	18	2	20	2	19
2	18	4	19	4	17.5	2	19	2	18.5
4	17.5	4	18	6	17	2	18.5	2	18
4	17	6	17.5	6	16.5	2	18	4	17.5
6	16.5	10	17	10	16	2	17.5	6	17
6	16	4	16.5	6	15.5	6	17	6	16.5
6	15.5	6	16	4	15	6	16.5	10	16
6	15	9	15.5	6	14.5	10	16	6	15.5
4	14.5	6	15	4	14	6	15.5	4	15
6	14	4	14.5	4	13.5	4	15	8	14.5
12	13.5	2	14	6	13	6	14.5	4	14
		2	13.5			4	14	4	13.5
						4	13.5	6	13
						6	13		

Order by Model, Serial Number and String Number

Bass and Treble String Scale - Grand Pianos

KG-6C BEFORE #1378387		KG-6C AFTER #1378387		KG-6E		GS-30, 40		GS-50, 60	
Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9/10	9	9/10	9	9	9	9	9	9
10	11/12	10	11/12	10	10	10	10	10	10
11	13/14	11	13/14	11	11/12	11	11	11	11/12
12	15/16	12	15/16	12	13/14	12	12	12	13/14
13	17/18	13	17/18	13	15/16	13	13	13	15/16
14	19/20	14	19/20	14	17/18	14	14/15	14	17/18
15	21/22	15	21/22	15	19/20	15	16/17	15	19/20
16	23/24	16	23/24	16	21/22	16	18/19	16	21/22
17	25/26	17	25/26	17	23/24	17	20/21	17	23/24
18	27/28	18	27/28	18	25/26	18	22/23	18	25/26
19	29/30	19	29/30	19	27/28	19	24/25	19	27/28
20	31/32	20	31/32	20	29/30	20	26/27	20	29/30
21	33/34	21	33/34	21	31/32	21	28/29	21	31/32
22	35/36	22	35/36	22	33/34	22	30/31	22	33/34
23	37/38	23	37/38	23	35/36	23	32/33	23	35/36
24	39/40	24	39/40	24	37/38	24	34/35	24	37/38
25	41/42	25	41/42	25	39/40	25	36/37	25	39/40
26	43/44	26	43/44	26	41/42	26	38/39	26	41/42
--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--	
2	19.5	4	20	2	19	6	18.5	2	19.5
4	19	2	19.5	2	18.5	4	18	2	19
4	18.5	4	19	2	18	4	17.5	4	18.5
4	18	2	18.5	4	17.5	4	17	4	18
6	17.5	8	18	6	17	6	16.5	6	17.5
6	17	4	17.5	6	16.5	4	16	4	17
6	16.5	4	17	10	16	6	15.5	4	16.5
6	16	4	16.5	6	15.5	6	15	8	16
6	15.5	4	16	4	15	6	14.5	10	15.5
4	15	6	15.5	6	14.5	6	14	4	15
8	14.5	6	15	4	14	10	13.5	4	14.5
6	14	4	14.5	4	13.5			4	14
		6	14	6	13			6	13.5
		4	13.5						

Order by Model, Serial Number and String Number

Bass and Treble String Scale - Grand Pianos

GS-80		R-1, RXA		KG-8C, GS-100	
Key No.	String No	Key No.	String No	Key No.	String No
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9/10
10	10/11	10	10	10	11/12
11	12/13	11	11	11	13/14
12	14/15	12	12	12	15/16
13	16/17	13	13	13	17/18
14	18/19	14	14/15	14	19/20/21
15	20/21	15	16/17	15	22/23/24
16	22/23	16	18/19	16	25/26/27
17	24/25	17	20/21	17	28/29/30
18	26/27	18	22/23	18	31/32/33
19	28/29/30	19	24/25	19	34/35/36
20	31/32/33	20	26/27	20	37/38/39
21	34/35/36	21	28/29		
22	37/38/39	22	30/31		
		23	32/33		
		24	34/35		
		25	36/37		
		26	38/39		
--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--	
4	21	2	19	4	21
6	20	2	18.5	6	20
4	19	2	18	7	19
4	18	4	17.5	6	18
2	17.5	6	17	8	17
4	17	6	16.5	6	16.5
6	16.5	10	16	6	16
10	16	6	15.5	9	15.5
8	15.5	4	15	4	15
6	15	6	14.5	4	14.5
4	14.5	4	14	4	14
4	14	4	13.5	4	13.5
4	13.5	6	13		

Order by Model, Serial Number and String Number

Bass and Treble String Scale - Vertical Pianos

CE7,701		CE-8; UST-6,7,8 SC-3; CS-9; CS-9E		CE-7N; 802 803; C-107		CX-21		US-6X, 50, 55 NS-35; KL-32,70	
Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12/13
13	13	13	13	13	13	13	13	13	14/15
14	14/15	14	14/15	14	14/15	14	14	14	16/17
15	16/17	15	16/17	15	16/17	15	15	15	18/19
16	18/19	16	18/19	16	18/19	16	16	16	20/21
17	20/21	17	20/21	17	20/21	17	17	17	22/23
18	22/23	18	22/23	18	22/23	18	18	18	24/25
19	24/35	19	24/25	19	24/25	19	19	19	26/27
20	26/27	20	26/27	20	26/27	20	20	20	28/29
21	28/29	21	28/29	21	28/29	21	21/22	21	30/31
22	30/31	22	30/31	22	30/31	22	23/24	22	32/33
23	32/33	23	32/33	23	32/33	23	25/26	23	34/35
24	34/35	24	34/35	24	34/35	24	27/28	24	36/37
25	36/37	25	36/37	25	36/37	25	29/30	25	38/39
26	38/39	26	38/39	26	38/39	26	31/32	26	40/41
27	40/41	27	40/41	27	40/41	27	33/34	27	42/43
28	42/43	28	42/43	28	42/43	28	35/36	28	44/45
29	44/45	29	44/45	29	44/45	29	37/38	29	46/47
30	46/47	30	46/47	30	46/47	30	39/40		
31	48/49			31	48/49				
32	50/51			32	50/51				
--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--	
2	19	2	21	2	20	4	21	2	20
2	18.5	2	20	2	19	2	20	2	19
2	18	4	19	2	18	4	19	2	18.5
4	17.5	4	18	4	17	2	18	6	18
6	17	4	17	4	16	2	17.5	4	17.5
8	16.5	6	16	2	15.5	2	17	8	17
8	16	6	15.5	4	15	18	16.5	4	16.5
6	15.5	6	15	4	14.5	4	16	6	16
6	15	8	14.5	4	14	4	15.5	4	15.5
4	14.5	8	14	6	13.5	6	15	4	15
4	14	8	13.5	12	13	4	14.5	6	14.5
4	13.5					2	14	6	14
						4	13.5	5	13.5

Order by Model, Serial Number and String Number

Bass and Treble String Scale - Vertical Pianos

NS-15, 20A, 30 KL-58, 502 KS-2F, 3F		CX-4, 4S, 5 501, 502, 601 602, 706, 708		CE-10, 804 CH-7		CS-11, CE-11		KL-702, 703 KL-704	
Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No	Key No.	String No
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12/13
13	13	13	13	13	13	13	13	13	14/15
14	14/15	14	14	14	14/15	14	14	14	16/17
15	16/17	15	15	15	16/17	15	15	15	18/19
16	18/19	16	16/17	16	18/19	16	16/17	16	20/21
17	20/21	17	18/19	17	20/21	17	18/19	17	22/23
18	22/23	18	20/21	18	22/23	18	20/21	18	24/25
19	24/25	19	22/23	19	24/25	19	22/23	19	26/27
20	26/27	20	24/25	20	26/27	20	24/25	20	28/29
21	28/29	21	26/27	21	28/29	21	26/27	21	30/31
22	30/31	22	28/29	22	30/31	22	28/29	22	32/33
23	32/33	23	30/31	23	32/33	23	30/31	23	34/35
24	34/35	24	32/33	24	34/35	24	32/33	24	36/37
25	36/37	25	34/35	25	36/37	25	34/35	25	38/39
26	38/39	26	36/37	26	38/39	26	36/37	26	40/41
27	40/41	27	38/39	27	40/41	27	38/39	27	42/43
28	42/43	28	40/41	28	42/43	28	40/41	28	44/45
29	44/45	29	42/43	29	44/45	29	42/43	29	46/47
30	46/47	30	44/45	30	46/47	30	44/45		
		31	46/47	31	48/49	31	46/47		
		32	48/49	32	50/51	32	48/49		
		33	50/51						
--PLAIN WIRE SIZE--		34	52/53	--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--		--PLAIN WIRE SIZE--	
4	20	--PLAIN WIRE SIZE--		2	20	2	18.5	2	21
2	19			2	19	2	18	2	20
4	18	2	20	2	18	2	17.5	2	19
4	17.5	2	19	4	17	4	17	2	18
4	17	2	18	4	16	8	16.5	2	17.5
4	16.5	4	17	2	15.5	8	16	2	17
4	16	6	16.5	4	15	10	15.5	2	16.5
6	15.5	4	16	4	14.5	6	15	2	16
4	15	6	15.5	4	14	6	14.5	4	15.5
6	14.5	4	15	6	13.5	4	14	14	15
4	14	6	14.5	12	13	4	13.5	4	14.5
4	13.5	6	14					4	14
6	13	6	13.5					6	13.5
		6	13					11	13

Order by Model, Serial Number and String Number

Bass and Treble String Scale - Vertical Pianos

NS-10, 20
BS-10, 20
CS-35, KX-20

Key No.	String No
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14/15
15	16/17
16	18/19
17	20/21
18	22/23
19	24/25
20	26/27
21	28/29
22	30/31
23	32/33
24	34/35
25	36/37
26	38/39
27	40/41
28	42/43
29	44/45
30	46/47

--PLAIN WIRE SIZE--	
4	20
2	19
4	18
4	17.5
4	17
4	16.5
6	16
6	15.5
4	15
6	14.5
4	14
4	13.5
6	13

Notes: