

FACSIMILE TRANSMISSION

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NOTES:

Signed

Urgent

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FOREFINISHING NOTES

Definition; The process whereby action frames and keyboards are independantly located within the instrument, and then locked together as one unique assembly, resulting in uniqueness in "touch" from one piano to the other.

ACTION FRAME: Important factors of assembly

Action spread : Virtually locked in, unadjustable etc due to the drilling of 1/2 " holes and broaching . Each hanger being inspected on a checking fixture confirming the angled relationship between the three rails.

: older Steinways, contains much more space between the rail and the hanger. Therefore there is more room for inconsistency.

NOTE; pre '1984 = 4.381 inches
post '1984 = 4.395 inches

PLATE FITTING :

Plate fitting acheives the position of the plate within the case.

: front to back position, using agraffe to arm, and v-bar to arm dimensions.

: the string height is acheived by fraising top portion of wrestplank using plate webbing as the profile for cutting.

PLATE VARIABLE: On older Steinways, several plate manufacturers were used, and when Steinway was casting plates, (pre'mid 1940's), several patterns or moulds were used for similar plate styles.

Plate fitters historically had to acheive the best fit, using these variables and the variable of rim bending. Plate locations within the instrument may be differant from piano to piano. Today, with more accurate plates, the variables are fewer, allowing for keyboard to action relationships to be more closer to the 2 to 1 keyboard ratio.

RIM BENDING VARIABLE: This continues to be the greatest variable, and is the primary reason that MOST component parts of the piano must be custom fit within an individual rim. Mass production of similar sized parts can not be considered since

ONE SIZE DOES NOT FIT ALL. !!

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BELLY OPERATION VARIABLE; after Plate fitting, the bellyman establishes the heights of the acoustic dowels and the final bridge heights, in order to achieve the best possible downbearing. Although the webbing of the plate is secured to the wrestplank, the result of the soundboard installation and variable heights of the ACOUSTIC DOWELS will determine on the final string heights for an individual piano.

WHY SHOULD I KNOW ABOUT THIS ?

FOR THE TECHNICIAN, a general understanding of this is necessary when,

- A) replacing pinblocks, and changes in plate locations.
- B) installing new keyframes or new action frames.
- C) restoring worn out keyframes.
- D) restoring damaged keyboards. (Water, or Transit etc)
- E) understanding of why pianos of the same style may be different in touch.
- F) why, following EXACT specifications for the regulation may not achieve the BEST RESULTS.
- G) replacing action rails on an actionframe.

Items received by the forefinisher :

- : Blank keyboard
- : Strung piano
- : Walnut wood blocks

PLANING the KEYBED; the goal of this crucial operation is to develop a correctly profiled base for the keyboard, which is smooth and slick.

HINT: for accurate planing, wet down the surface area with KEROSENE. The plane blade will thinly slice the material resulting in a smooth surface with less tearing.

- A) **FRONT LIP;** (approx. 1/2") the front lip contains about 1/32 inch positive crown. The results should be rounded with no hollows or dips. PLANE AS NECESSARY. When completed, mark the lip with a pencil, to protect it from further planing. This bearing surface will contact the negative crown of the keyframe. The keyblocks screws will pull the keyframe downward, forming it to the keybed, ensuring a secure fit without gaps or knocking.
- B) **BIRCH END CAPS;** Plane straight, front to back.
- C) **CENTER RAILS;** BEHIND front lip, should be planed straight from bass to treble. EXTREME ends should have slight dip.
- D) **BACKRAIL;** Plane straight from bass to treble.
- E) **FRONT LIP TO BACKRAIL;** Should have a negative crown.

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SAND KEYBED SURFACE, with 180, then 220 grit paper. Later, the regulator will rub-in talcum powder directly into the keybed.

KEYFRAME PREPERATION

INSPECTION of CRITICAL ELEMENTS

- Profile of rails
- A) Front rail should have approx 1/32 to 1/16 inch reverse crown. No hollows within the arch is allowable.
 - B) Front lip (about 1/2 ") must protrude from the front rail.
 - C) Balance rail should be straight from bass to treble.
 - D) Back rail should be straight, from from bass to treble.
 - E) Back rail also contains a raised lip.
 - F) Entire keyframe should be crowned, from front to back.

Note: on older frames, if front lip is "gone", glue on a 1/2 wide by 1/16th inch maple veneer, which can be planed and sanded to the proper profile.

MARK KEYFRAMES

With all the keys on the keyframe, mark the following locations:

- A) keystone rail mounting blocks, between guide keys.
- B) action mounting blocks, using the sides of the guide keys, about 5/8 inches into the balance rail.
- C) cheek block cut outs.
- D) side rails of keyframe, by placing the walnut blocks next to #1 and #88 key. Check with SQUARE to front rail to ensure walnut blocks will be square.

MAKE SAW CUTS ON KEYFRAME after removing all the keys, cut for cheek blocks and bass/treble ends, by the wedges.

GLUE KEYSTOP RAIL MOUNTING BLOCKS; hot hyde glue

DRILL 3/8 HOLES in balance rail for mounting block insertion, from the awl punch marks .
: only drill through the balance rail itself and not the keyframe.

MARK and CUT BALANCE RAIL; by using the set of action mounting blocks, pencil line the balance rail for the needed rounded profile, of each wedge.

NOTE: each style keframe, SML, B, D have a unique set of blocks or wedges which are shaped to fit between the keys and under the action hanger.

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CHISEL OUT BALANCE RAIL for the mounting blocks using SHARP tool.

LEVEL ACTION FRAME

PLACE ACTION FRAME on keyframe, with keys removed.

- A) locate on bass and treble mounting blocks ONLY.
- B) by using a good straight edge on the hammershank flanges check for absolute straightness.
 - : if crowned, press downward to correct, then recheck.
 - : if hollow, remove stack and bend to correct, then recheck.

SET ACTION FRAME HEIGHT

IMPORTANT NOTE: the action stack height, as determined by the thickness of the mounting blocks. This action height is unique for each instrument, and is the result of the individual string height for a piano. String height variables are the result of the plate fitting and belly operations.

SET ADJUSTABLE GAUGE for string height at note # 62.

- : the gauge is set up in such a way that the relationship between the action stack and the string height is maintained.
- : this ensures,
 - A) the proper BLOW distance at the same time the hammershank is properly off the rest cushion.
 - B) the proper HAMMER ROTATION is needed to minimize overstriking or shallow striking condition.

: basic RELATIONSHIP,

A) models S-B: String height at #62 = 7 1/2 "
 Rep Flange = 3 1/4
 Hammer Flange = 5 3/4

B) model D : String height at #62 = 7 5/8 "
 Rep Flange = 3 1/4
 Hammer Flange = 5 3/4

NOTE; if string height is lower or higher than above, keep the relationship similar.

Note # 62 represents an AVERAGE STRING HEIGHT for the piano. String heights change from bass to treble usually in an arched or crowned manner.

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DETERMINE NEEDED HEIGHT OF MOUNTING BLOCKS

Plane bass and treble action mounting blocks so that the two flange centerpins are in alignment with the gauge's reference pts.

Fit center wedges so that the front and rear feet of each action hanger SLIGHTLY rests on the blocks, at the same time, maintaining the STRAIGHTNESS of the frame. Continually check for straightness with the straightedge on top of the hammershank flanges.

GLUE BASS END MOUNTING BLOCK**GLUE ON BACKRAIL FELT AND CLOTH**

The red cloth and green felt are glued onto the backrail. Only the one edge is glued down. Should additional cloth, or fibre board be needed to achieve a workable keyheight of $2 \frac{19}{32}$ " to $2 \frac{5}{8}$ ", it can be added without having to unglue the felt.

Then, place guide keys onto keyframe, locate the mounting blocks between the keys and use the blocks as a guide to trim the felt with a knife.

GLUE ON THE CENTER MOUNTING BLOCKS with the action stack and guide keys removed

LOCATE "SIDE TO SIDE" POSITION OF ACTION STACK

With several bass and treble keys located on the stack, position the action frame from bass to treble so that the back end of the keys are in alignment with the repetition flanges.

MARK the sides of the front and back feet of the treble action hanger on it's mounting block. Then use a large square from the front rail of the keyframe and mark where the treble end of the keyboard should be trimmed and planed to.

NOTE; this line will be the location of the treble end piece, which will lock-in the side to side position.

CUT and PLANE the treble side of the keyframe to this line.

GLUE treble end piece, onto the side of the treble mounting block.

GLUE bass and treble keystone rail mounts, which is also notched into the front portion of the balance rail.

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LOCATING KEYBOARD WITHIN CASE

LOCATE the keyboard into position within the instrument using a specific dimension from the FRONT OF THE KEYS TO THE FRONT OF THE ARMS. This dimension is the same in the bass as in the treble. The action stack will be sitting on the wedges at this pt.

FOR S-B styles = 13/16 inches
D styles = 25/32 inches

CLAMP the keyboard to the keybed.

POSITION THE ACTION STACK OVER THE KEYBOARD

"FLOAT" the action stack inwards and outwards in the bass and treble until the HAMMER STRIKE LINE is properly positioned at the correct distance from the agraffe and the v-bar.

NOTE; at note # 88, the strike pt is 11/64" from the v-bar. (for all grand models). This is the SET UP of the strike line, which may be ALTERED by the voicer to achieve the best tone.

; at note # 1, the strike pt is different for each style, from the agraffe.

DOUBLE CHECK the strike locations in bass and treble.

MARK the bass and treble ACTION MOUNTING BLOCKS at the point where the front edge of the action hangers touch their blocks.

NOTES; hammers are glued onto the hammershanks at the dimension of 5 1/8 inches from the centerpin of the hammershank flange to the center line of the hammer moulding .

ALSO; older Steinways may have strike lines which generally may be between 5 1/16 and 5 1/8 inches.

; Steinway provides for the technician Hammers Glued to Shanks and Flanges. We maintain the 5 1/8 dim.

REMOVE action and keyframe onto the bench.

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GLUE ON "FOR TO AFT" LOCATING BLOCKS to lock-in the front to back position on the keyboard.

The small blocks are glued only on the bass and treble action mounting blocks.

PLANE BASS SIDE OF KEYFRAME using large square from front rail.

PLANE TREBLE SIDE OF KEYFRAME, from the underside following the important contour of the frame going front to back.

TRIM ALL REMAINING BLOCKS, using a chisel and sandpaper. The bass and treble mounting blocks should be angled so the keyboard can slide into the instrument.

SHELLAC THE BLOCKS, except for the sides of the bass and treble where the keyframe will rest on the keyframe rest block in the bass, and where the shift spring touches the keyframe in the treble. These surfaces should be smoothly sanded.

LOCATE THE CAPSTAN SCREW location on # 1 and # 88 key.

The capstan location will be directly under the center of the repetition heel, at a point when the hammershank is in its rest position and above the hammer rest felt.

LOCATE THE BACKCHECK location on # 1 and # 88 key end block.

The backcheck wire insertion position is directly under the end of the hammershank, at the edge of the hammer tail, and when the shank is off the rest cushion.

IF the backchecks will be installed on an **ANGLE**, the dimension will be about 1/2 inches towards the capstan from this point.

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MARK KEYBOARD FOR BACKCHECK AND CAPSTAN LINES using a straightedge.

DRILL CAPSTAN AND BACKCHECK HOLES

Capstan, use # 22 drill bit
Backcheck, use # 38 drill bit

INSERT BACKCHECKS

There are two methods that are used.

- A) N.Y. pianos have a TAPERED backcheck height from bass to treble, the overall difference being $3/16$ inches.

Bass = $2 \frac{1}{2}$ inches from top of block.
Treble = $2 \frac{11}{16}$ inches " " "

- B) Hamburg method, adjusts the height of the backcheck for each section which is determined by the LET-OFF. In this case the top of the backcheck head should be about 2 mm below the hammertail, at let-off, before bending.

TOOL; for the technician, use the backcheck installation block.
; place a drop of hot hyde glue in the hole.

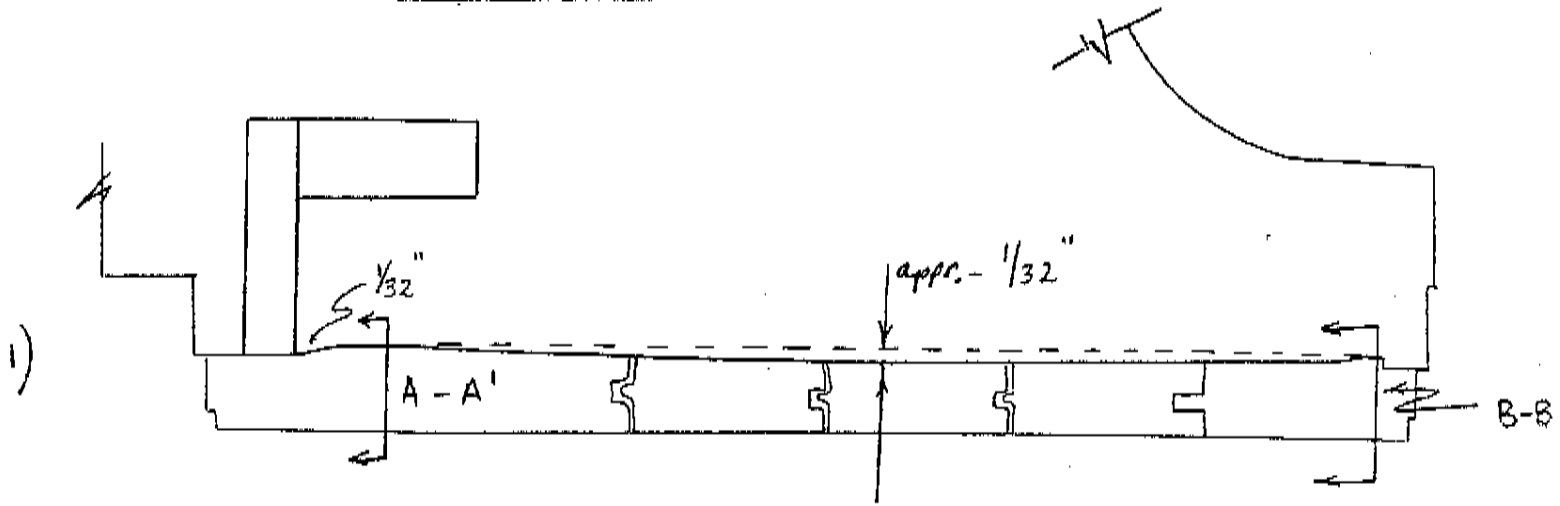
NOTE; the initial backcheck bend is approx, 72 degrees.

$\frac{18}{90}$

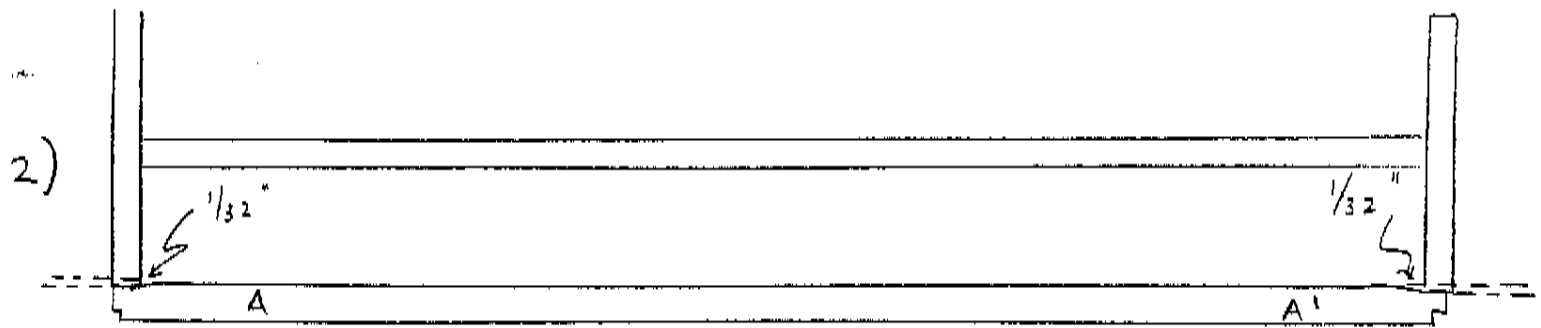
18° OFF PERPENDICULAR

Michael Mohr, 1995

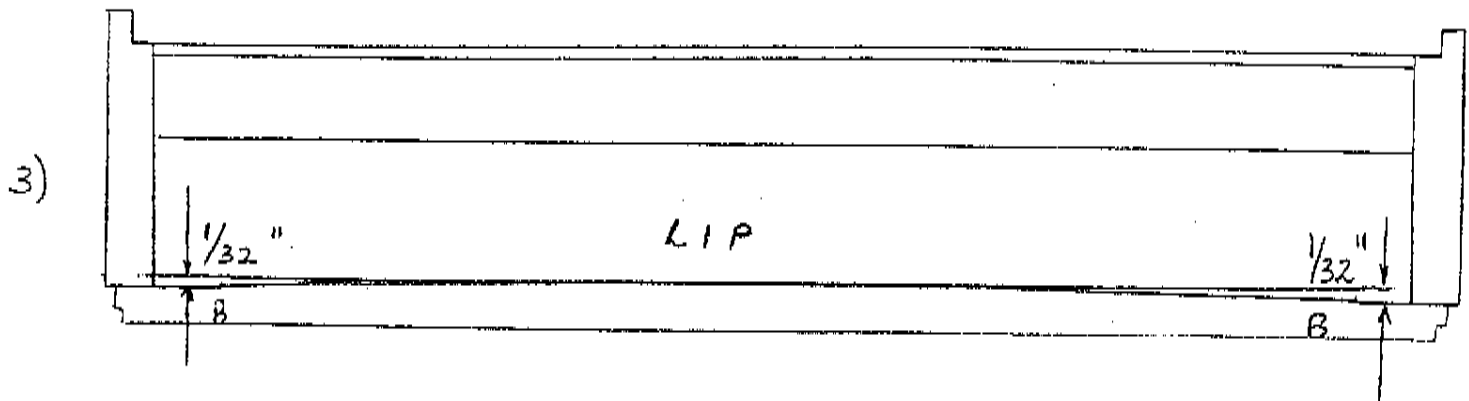
KEYBED PLANING



CROSS SECTION of KEYBED, SHOWING HOLLOWING

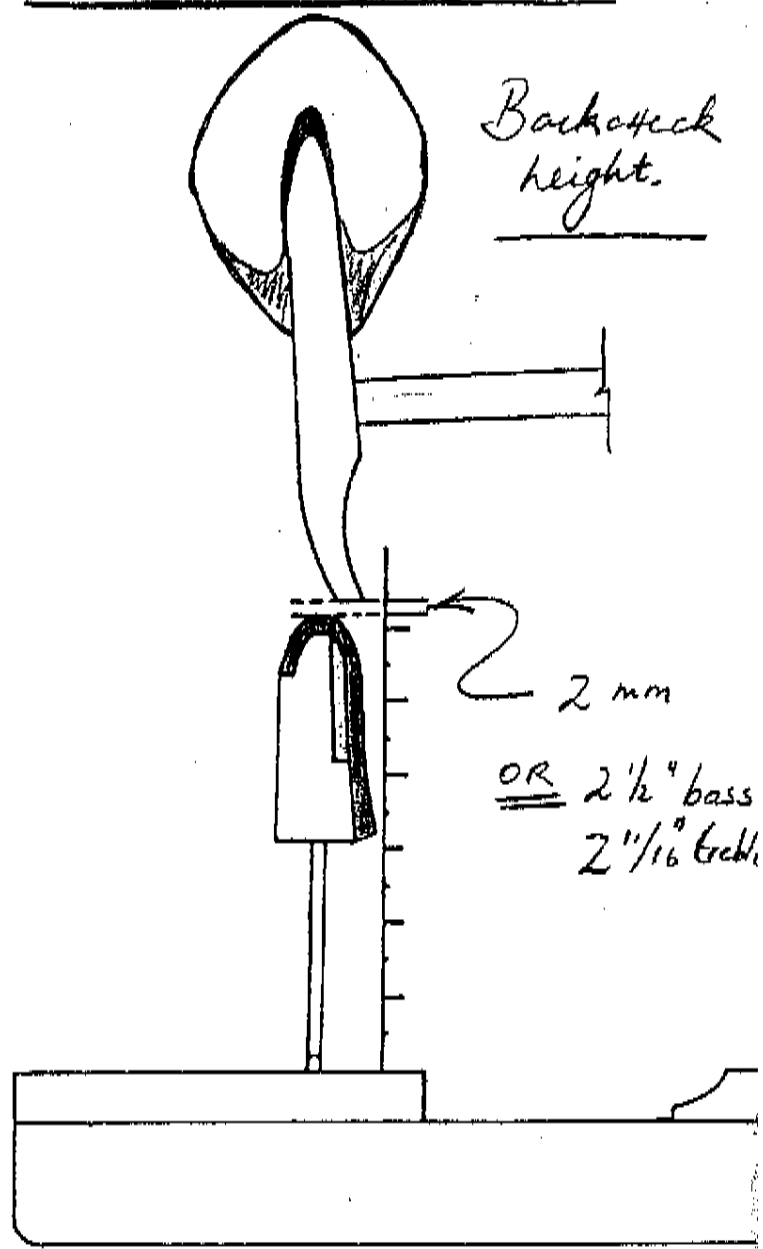
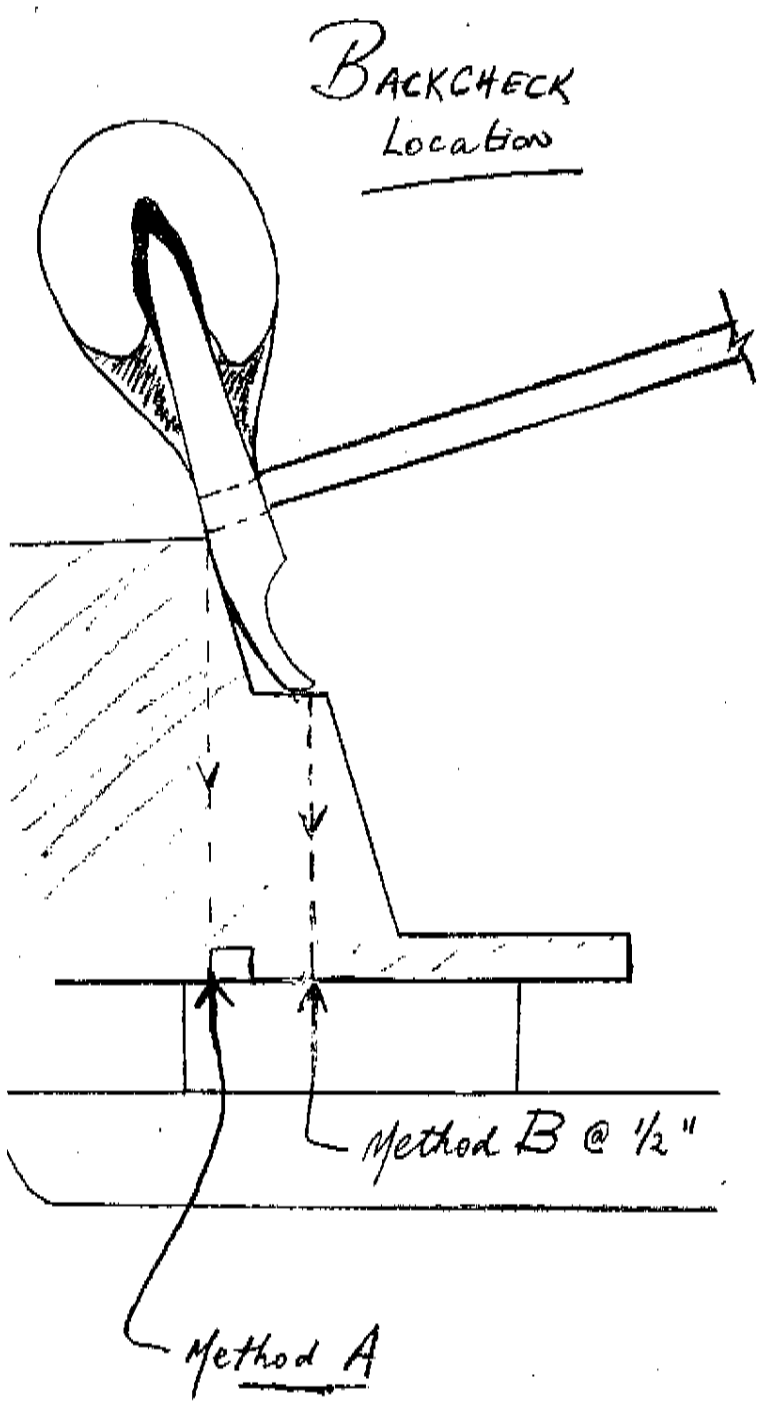


FRONT VIEW of REAR KEYBED RAIL, A-A', SHOWING ROUNDING of EDGES



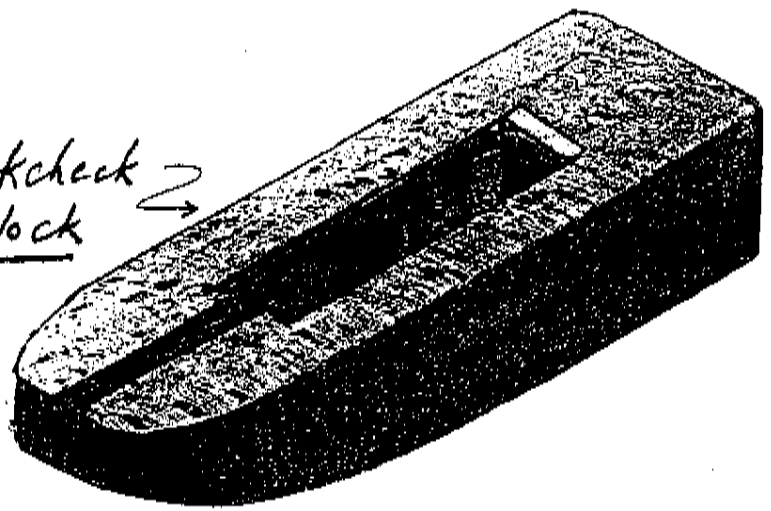
FRONT VIEW of FRONT RAIL B-B', SHOWING ROUNDING of CROWN

NOTE: Figures 1,2,3 indicates Keybed planing for secure fit and FREE MOVEMENT



Bending of Backcheck = 72°

Backcheck block



CAPSTAN LOCATION GAUGE

