

INSTALLATION MANUAL

Silent retrofit system MOTUS 2

(Version 22/02/2019)

-Upright piano-

-Keyboard sensors installation.

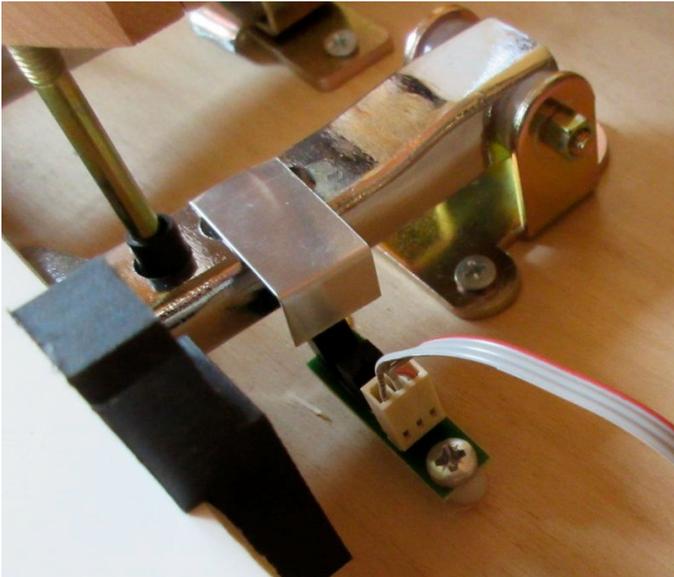
Remove all keys. The edge of the sensor rail should be about 5mm from the sharps plank, pictured below. Cables backwards. Use the sharps near the ends of each sensor circuit to ensure the best lateral centering, place yourself vertically on the keyboard and visually center the circuits to have the most equal distance possible between the key and the 2 neighboring sensors located on the screen. and other. Use 5 attachment points at approximately equal distances (unused holes are provided for grand pianos). Point and drill through the 10 mounting holes of the rail, drill diameter 2.5mm. Fix the 10 height adjustment springs on the rear face of the rail, the insertion is easily done by an counterclockwise rotation. The rail attaches to the board with wood screws between 3x20 and 3x40 depending on the chassis heights, only 3x40 are provided, these screws passing through the springs to adjust the height. For chassis with very little height under keyboard, type Kawai or Schimmel, make a recess 5mm deep on the previous hole of 2.5mm using a drill diameter 8mm with stop ring, in which will be housed the spring that will have to be cut in this case. Use the oval hole circuit fasteners on the rail for precise lateral adjustment.



Then slightly tighten the circuits of fixing screws to immobilize temporarily adjust the height so that the above sensors to be about 3mm below the black keys in the depressed position without compressing the front rail washer. This corresponds to 4mm distance approximately relative to the printed circuit. Place the connectors 12 lines connecting the circuits, metal pellets up. (See above photo) Keep on keyboard only sharps the nearest of height adjustment screw, the white keys will be put in place later.

Place the control unit under the keyboard on the right, connect the gray cable and the Midi IN connector to the small interface card to place into the piano, connect the output of P4 sensor circuit to the card with the cable 7 multicolored lines. Do not pull the cables to disconnect, switch the nails on the side recesses provided for this purpose.

-Pedals sensors.

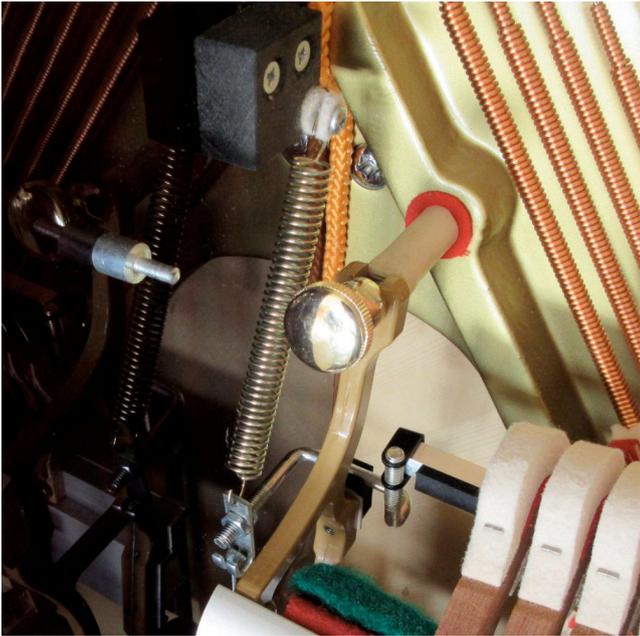


Screw the sensor with his white washer as shown on photo, use the aluminum part provided, cut and ply, glue with neoprene glue on top of the pedal, the vertical part has to go exactly in the center of optical fork. In the up position the sensor must be free opened. Connect the cable 1x6 table for two pedals, the pink wire indicating the left soft pedal. The two slides on connector must be toward the optical fork sensor, if the connection is inverted, the pedal does not function.

-Hammers shanks stopper.

A system with aluminum square of 8mm x 8mm was adopted rather than an aluminum profile, the disadvantage of the profile being to restrain the space of the dampers on certain pianos, moreover, this square in solid aluminum is less noisy than a profile and the cutting job at crossing is deleted.

Remove the damper bar. Place the 4 hinges to be screwed to the positions of the damper bar, with their respective brackets clipped, treble (photo 6 to 9), medium using the provided adjustable bracket, medium low U-shaped (photo 7) and low with its return spring (photo 6), respect the direction indicated on the photos. Cut the square aluminum to the length of each section, tighten it with the rings at the end of the stirrups, screw side dampers, according to photos below. Fix the catch of the return spring following photo 6.



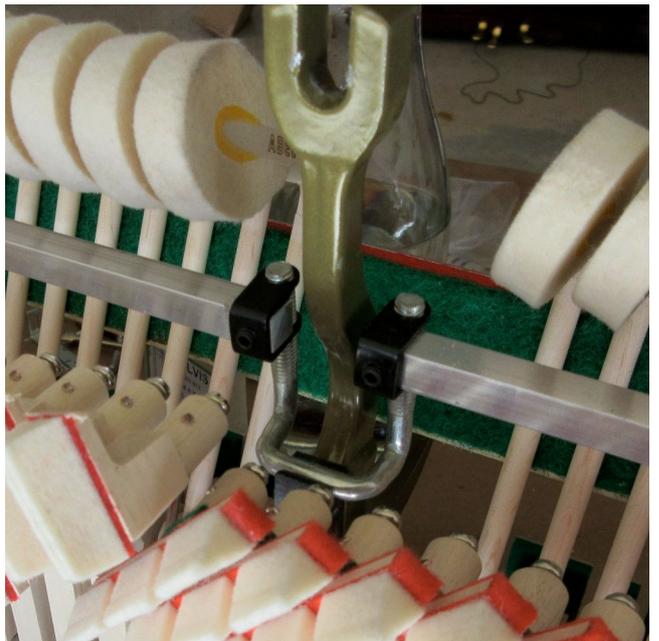
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Glue the rubber band with contact neoprene glue. With the oval holes in the hinges, place the blocker next to the hammers.

Adjust the hammers blocking point at 4 mm of strings, verify that this distance is constant over all notes, if it is not the case, placing wedges under the hinges to equalize the blocking point. Disable the blocker to return to acoustic mode, bringing the first medium hammer on the strings, in this position, the blocker must

be at around **1 mm of the hammer shank** to allow the maximum space to dampers stroke at the passage. If this distance is greater, reduce the stroke by adding a felt thickness above the center pedal.

On some pianos, the first damper mediums may abut the blocker, in this case shorten the damper button screw, if this is not enough, you have to shorten the damper button itself.

Place the non-return lock washer on the axis of treble bracket to prevent lateral movement of the blocker. Enable hammers blocker. Then adjust the let-off point just on the blocker without any cracking. For proper operation silencer rapid repetition, it is necessary to minimize the strap space, top of jack must be almost in contact with the hammer butt-notch pad with around 0.2mm space only. Also checks adjustment should be closer to the strings with a distance of around 10mm.

-Fixing the sound card for the Bluetooth version.

Remove the stickers from the 4 supports and fix the card vertically inside the piano on the right side at the bottom of the piano, photo below. Shift it forward to facilitate the possible connection of a conventional Midi DIN5 connector to the back, note that this type of old connector is not useful for connecting a computer to the system, the USB output providing this function. Once the 4 supports glued, the card can withdraw by pressing the pin of the high part of the supports with a small clamp.

Drill down the corner of the handkerchief a 10mm hole for the passage of the power cable, the cable 7 lines of the keyboard sensors connects metal pellets to the outside opposite the card, the headphone extender on the connector right jack, the left jack is an audio line out for connecting an external amp. Connect the pedal connector and the on / off switch (see photo below).

Connect the USB extension cable to the top right, the headphone and USB outlets can be placed in the front under the tray or under the right cheek for more discretion, use cable ties and black adhesive felt to hide the cables.

At this point you need to set up your Android Smartphone, turn on the power to pair your Smartphone, go to: Settings → Bluetooth, enable Bluetooth and run the scan, after a few seconds MOTUS is displayed , touch to start pairing and validate the proposed password. Then go to Google Play Store with the keywords CHAVANNE MOTUS to install the application. The display and functions of the buttons are identical to the housing version.

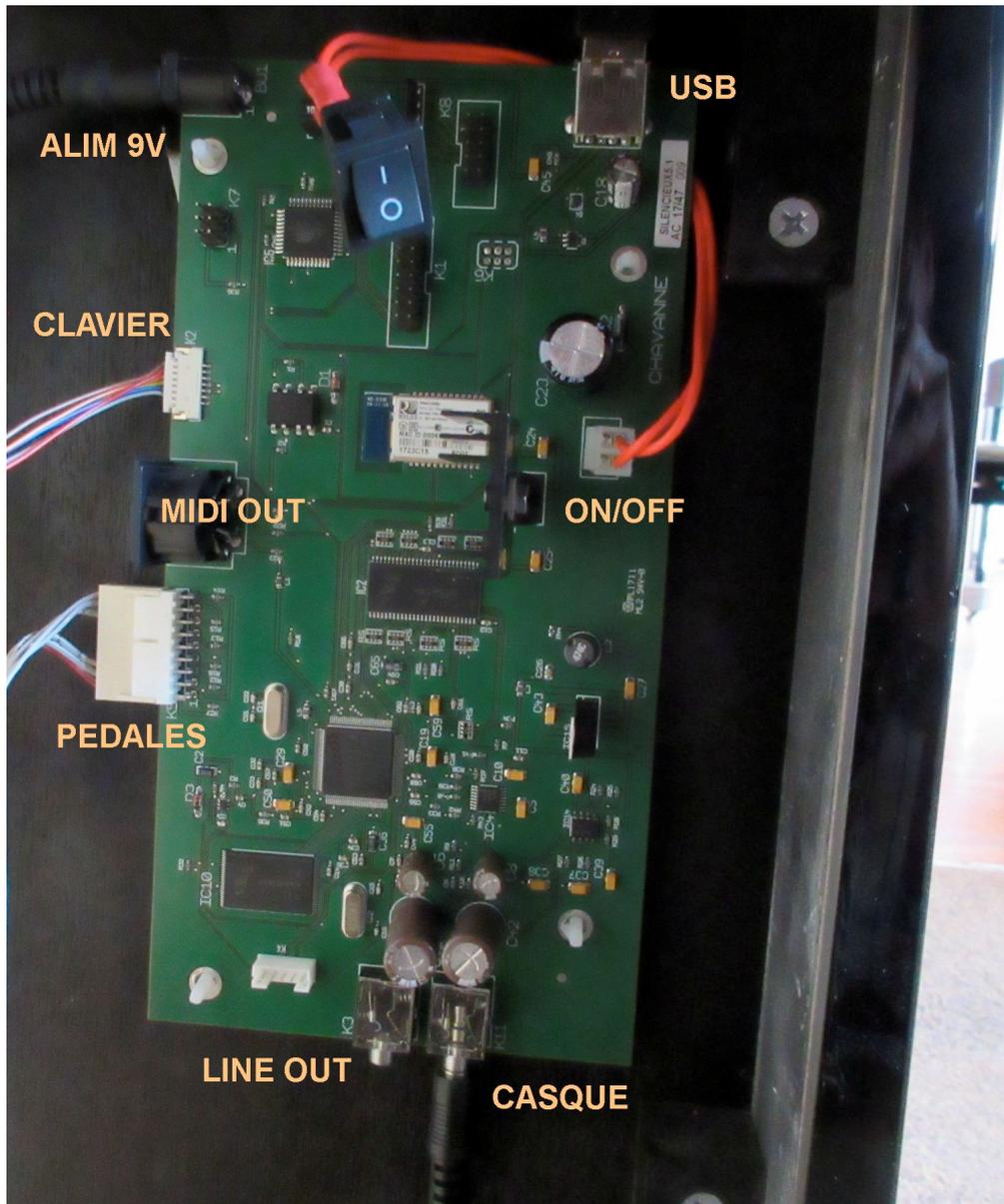
When installing a new Motus 2 Bluetooth, you will have to cancel the previous pairing in order to connect your Smartphone to the new module, to do this go to Settings → Bluetooth, MOTUS is displayed, open its "Tools" icon and validate "Unlink", then cancel the Smartphone Bluetooth function, then revalidate to start the search for the new module, then start step ...

Turn on the system at the socket or with the sound card switch, launch the application, "Recherche..." is displayed, wait a few seconds, the connection is established when the instrument is displayed. Approaching the smartphone to the sound card decreases the connection time.

-Fixing the standard version control box unit.

The box is fixed under the tray on the right, drill at 3mm and fix with 4x16 screws. Leave a gap of about 1 cm from the front of the tray. The 7-line cable of the keyboard sensors connects metal pellets upward to the opposite of the sound card.

Bluetooth sound card connections



- Step 1: Setting of the sensors height.

Switch to parameter display mode, to do this, hold down the last 3 keys, No. 86, 87 and 88, after 2 seconds, the screen below appears.

N: 74	R: 34	P: 42
FC: 192		H: 16

The system detects and displays a pressed key parameters, N is the note number, R is the reflection level of the optical sensor hundredth of Volt, P is the position (the origin is not the rest position but is situated above), FC is the end of stroke that will be stored in a subsequent step, and finally H is the distance between the underside of the key and the top of the sensor, in tenth of mm. Hold the sharp key near the down position adjusting screw medium pressure, adjust the height for H = 16 is 1.6 mm distance is the distance required for the sharps. If the sensors are too close or below 13 or 1.3 mm XX sign appears.

White will automatically be a little higher, on the order of 22 is 2.2 mm, it will depend on the type of keyboard. The height adjustment screws will not have exactly the adjustment value of 1.6 mm, this is due to the irregularity of the keyboard and does not matter in the final operation. Insofar as this is done disassembled keyboard, too much ambient light as a sunny room or direct radiation from a projector can inadvertently trigger the sensors, it will not reflect a flicker of the screen, this step should be carried out in a medium light. Also, do not replace keys while the screen displays the settings for the sensors interpret new keys placed as played and the display is unstable. You must turn off the system to reset once all the keys in place. After adjusting the height, turn off the system, wait five seconds before turning it on again.

Step 2: Memorization of the dynamics and ends of stroke.

Reassemble all the keys as well as the mechanics to be in normal conditions of use. Disable hammer blocker, the next setting being in acoustic mode.

Hold the last 4 keys pressed, No 85, 86, 87 and 88, for 2 seconds, release, "INIT ..." appears.

You must at this stage play all the notes chromatically "pianissimo" to avoid front baize compression. This should be done slowly at a rate of one note per second played with one finger. This step memorizes the end position of each note "Fc" and its dynamic coefficient "Co". When the key is returned, the saved parameters are displayed, screen below.



No 1 MEMO
Fc 224 Co 875

Once the operation is complete, your must turn off the system to reset.

Step 3: Individual adjustment .

Press the "Menu" followed by the "+" key until you see "REGLAGES" on screen, confirm again by pressing "Menu," "Clavier ..." should appear. Playing a key, the following screen appears.



N:52 V:72 M:56
I%:100 G%:80

N is the number of the note played, V is the speed of depression of the key, M is the Midi sound level audible to the headphones, calculated by the software according to the speed V, I% is the setting of the individual volume of the note for reducing or increasing the value of M at equal driving speed. G% adjusts the overall dynamic range of the entire keyboard.

The individual setting compensates for any irregularities. Perform a slow chromatic scale "Mezzo forte", if a note seems stronger or weaker, stop on it, its number is displayed, use the keys + or - (automatic scrolling) to change the volume. Press the Menu key to switch to the G setting with the + and - keys, a new press returns to the I setting. The G coefficient is the same for all notes, when you play "Strong" the value of M must not saturate with 127, but must be around 110 or so.

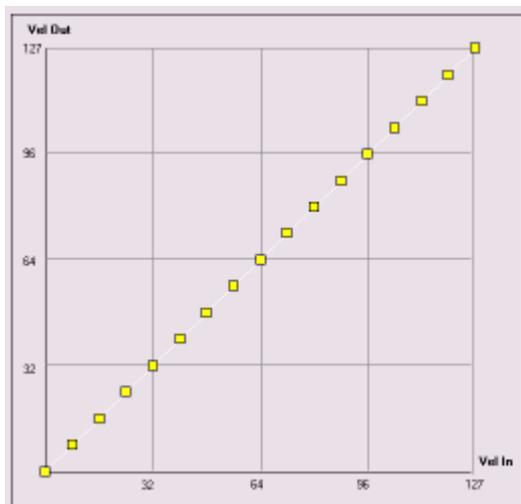
This tuning mode is intended to play one note at a time, or arpeggios to facilitate equalization, playing chords or even playing too fast can result in unexpected "loud" notes, do not play faster only one note per half second, and only one at a time. Press "STOP" to exit the settings mode.

Touch adjustment.

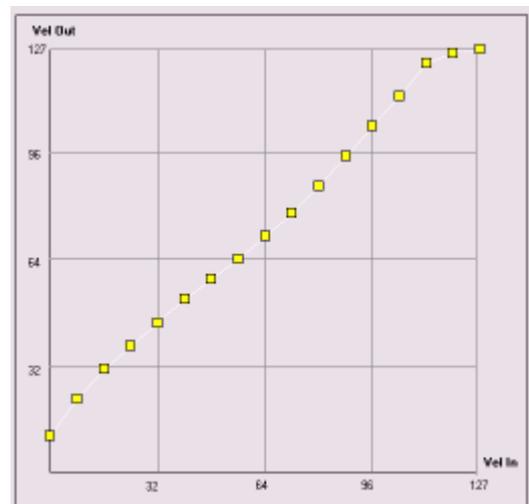
Press the "Menu" button followed by the "+" button until "CURVE" is displayed, confirm by pressing "Menu" again. By default the dynamic slope coefficient is set to 0, this may be suitable for a very flexible keyboard, for a firmer keyboard, it is possible to define 4 dynamic curves from 0 to 3 using the "+" keys and "-". Having a higher value reduces the dynamic range of the Pianissimo to the Forte, and the volume is increased in Mezzo, playing the piano by varying the value and validate the most realistic touch by pressing "Menu". The individual adjustment made in step 3 must always be done with the default curve equal to 0 in order to have a maximum range of variation and a better accuracy in the equalization.

COURBE 1

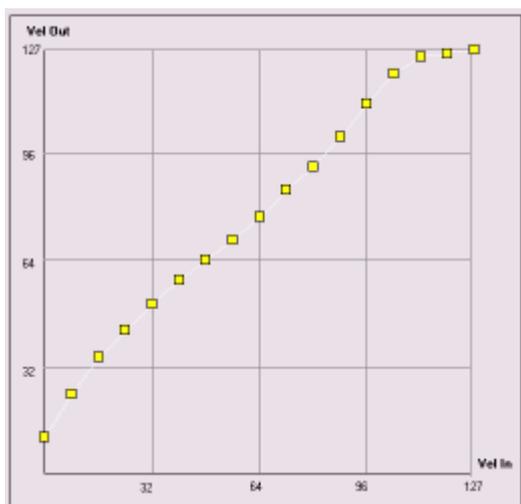
Explanation of the 4 curves.



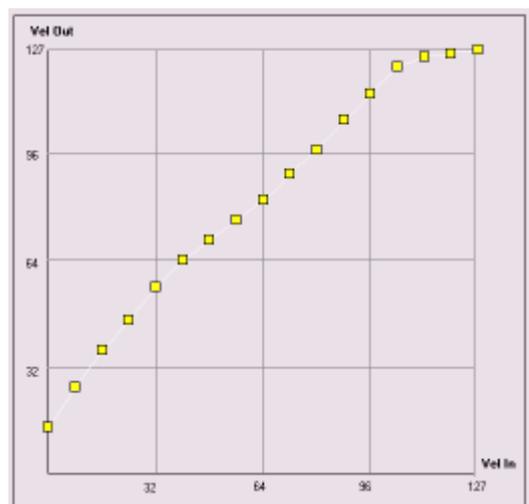
COURBE 0



COURBE 1



COURBE 2



COURBE 3

-Fixing the command lever .

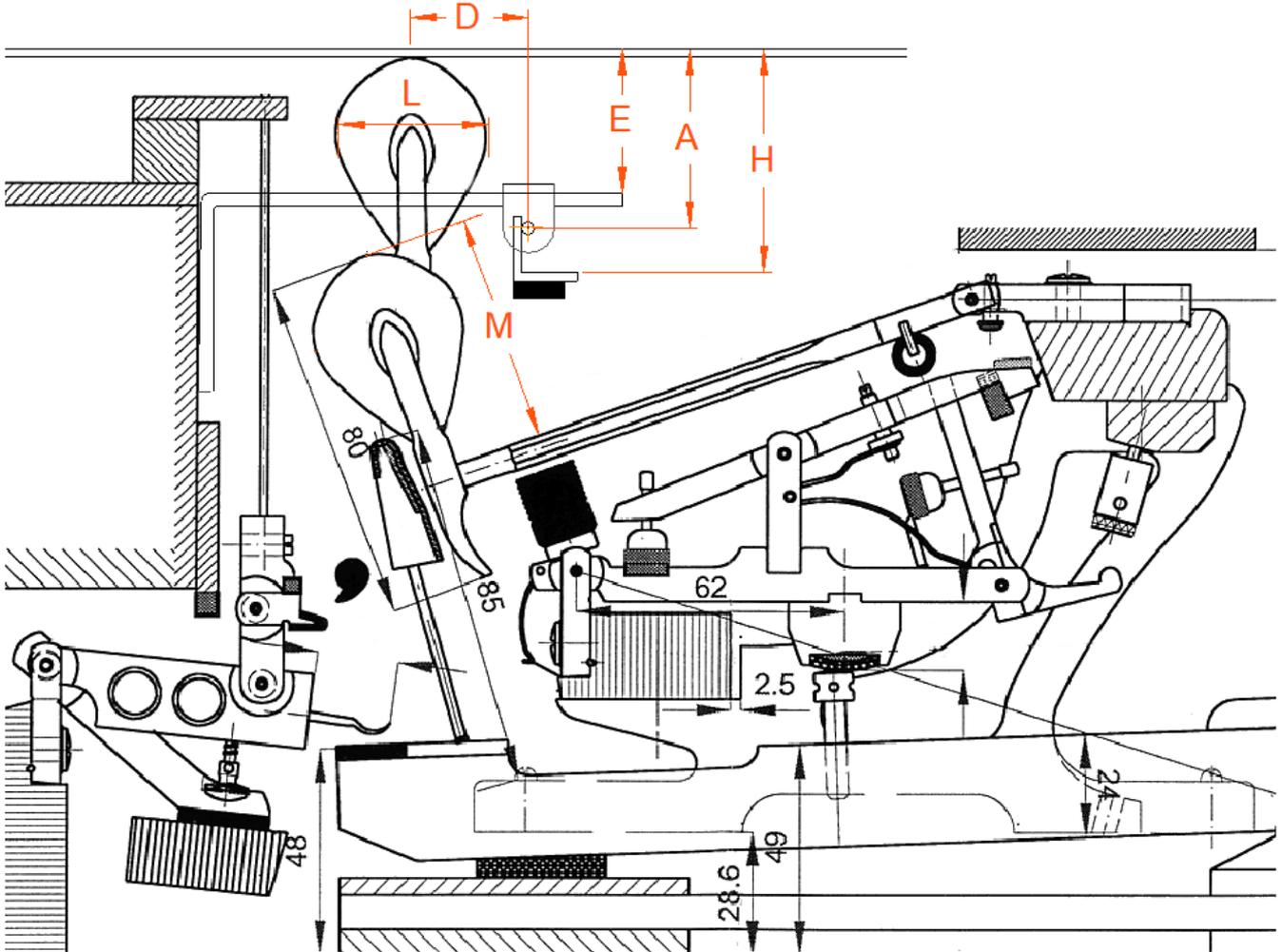


The control lever is fixed under the plate, the adjuster is placed approximately 10 cm from the axis of the lever. In the ON position, the lever must protrude by about 10 degrees from the traction axis and come to be pressurized by the tension of the cable on the oval stop as shown in the photo above. In the OFF position, the oval black backstop is used to adjust the cable stroke, in this position, the hammer coming into contact with the strings, the handle must be about 1mm from the blocker to allow the maximum clearance to the dampers. The screw adjuster allows a fine adjustment of the stop point of hammers on the blocker. Drill the underside of the plate to 3mm, ensure the verticality of the drilling, place the washer wide side tray, use the long 3x30mm screw to fix the lever, tighten slightly so that the lever returns naturally by pulling the return spring on the stop OFF.

-Grand piano-

-Fixing the hammers stopper.

The diagram below shows the measurements for the placement of the brackets. The angle bracket here in the locking position pivots 90 ° forward to release the hammers.



Begin by measuring the value M, distance from the top of the neck to the top of the hammers, make this measurement on the first and last hammer of the bass, as well as on the first hammer of the midrange, then the first hammer of the passage mediums, high mediums , and finally the last hammer No. 88. Note these values M1, M2, M3 and M4.

Calculate and record then the 4 values of H ie H1, H2, H3 and H4 with the following formula in mm:

$$H = M + b + d - 6$$

Or "b" is the locking distance of the hammers from the underside of the rope, usually 4mm and "d" the diameter of the rope concerned. H is the distance from the top of the rope to the top of the aluminum angle in blocking position.

At this stage you can deduce the 4 values of E according to H, ie E1, E2, E3 and E4 with:

$$E = H - 18$$

E is the distance from the top of the square to the top of the rope (see diagram above). Calculate and record the value of A for the first hammer of mediums M3, ie A3 with:

$$A = H - 10$$

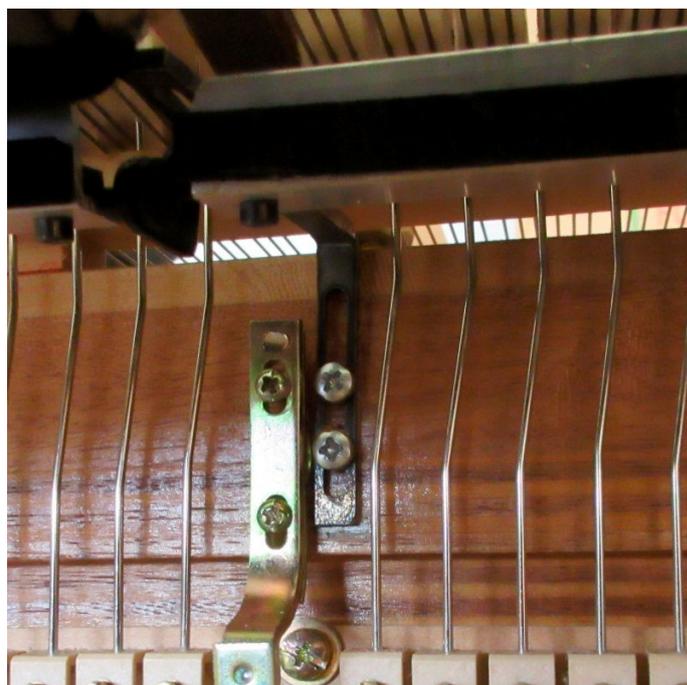
This value A3 will be useful for drilling the horn of the frame at low midrange where appropriate.

Fixing the brackets.

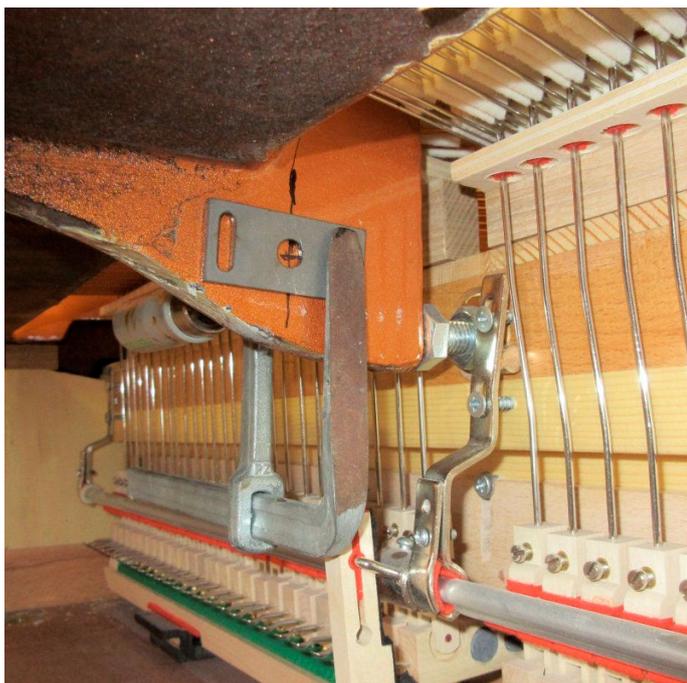
You can now temporarily place the oval brackets, value E1 for the first bass bracket about 30mm from the dam (photo 1), E2 for the second at the low midrange in the case of a frame without horn, then E3 (photo 2) and finally the last with E4 at 20mm from the dam, this square will sometimes have to be cut and ground by twisting to fit the pediment (photo 4). Use to measure E the tail of a caliper whose base is placed on the top of the rope. Place the brackets 2 and 3 to the right of the tonal pedal support (photo 2). Point and drill with a 3mm drill in the center of the oval. Secure the brackets with a single 4x16 screw for now.



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If the frame has a horn in the way (photo 3), a plate will be used instead of the square. Mark with the felt on the rope the point of impact by bringing the hammer M2 on the rope, measure the width L of this hammer (see diagram), mark on the frame the distance $L / 2$ (half hammer) + 10mm from the point striking (value D on the diagram), mark with the felt on the horn a vertical line from this point. Then use the tail of the caliper, base placed on the top of the rope to mark a horizontal line value $A2$ previously calculated. The intersection of the 2 lines will be the location of the axis of the blocker.

The wafer will be used as a drilling template, tighten the wafer with an attached clamp, center hole centered on the intersection of the lines (photo 3). Drill with a 7mm drill, then replace the clamp seal drill with a 4mm drill in the center of the 2 ovals. Drill the 7mm hole with a 12mm drill bit to keep a margin of adjustment of the locking point. Insert the rubber grommet in the center of the plate. Fix the plate with the 2 screws plus nuts 4x20 with washers on both sides of the plate as well as nut side, thin face of the wire pass side horn. If the last bass hammer is close to the horn, remove the protruding part of the nut.

Adjust and tighten temporarily the axes of each square, knowing that in the low the axis of the blocker is about 10mm from the hammer, against in the treble must be closer to the nearest to allow the release of the rotary blocker. Place the mechanism in the piano and make sure that no hammer hangs the brackets, if necessary, remove the square and offset it to the vises by folding side to its base (photo 5).

Once the brackets are in place in the piano, place the aluminum angles between each square, mark with felt to cut them to the required length. The angle coming to the edge of the rubber thread on the left side, and leaves closer to the square to the right without touching it in rotation, see photo 8 to understand the markings to be made. The hole for tightening the black shaft clamp is on the vertical flange of the angle in the locking position, you have in the kit an angle already pierced right for the bass, a left for the midrange, and the last right for treble. Then saw the angles on the not pierced side, drill with a drill of 3mm the end using another square already pierced opposite as drilling template by placing them flush with vises vis-à-vis (photo 6).



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Remove the brackets and mount the complete blocker assembly (photo 9). First, tighten the pin in the groove of the shaft clamp, then firmly tighten the locking screw (Allen key 2.5), making sure that the axis is straight with respect to the angle (photo 8). Place the control bracket at approximately 30° to the vertical (photo 7). Glue the rubber bands to the neoprene glue. To replace the blocker, in the case of a frame with horn, the assembly is done in 2 parts, low and medium treble, the axis of the basses at the level of the horn tightening in the piano. Adjust the locking point of the sliding calipers with the value H, if necessary, an

accurate final adjustment can be made by marking on the pediment and rectification of the position of the brackets. Doubling to finish the fixing screws of each square for more strength.

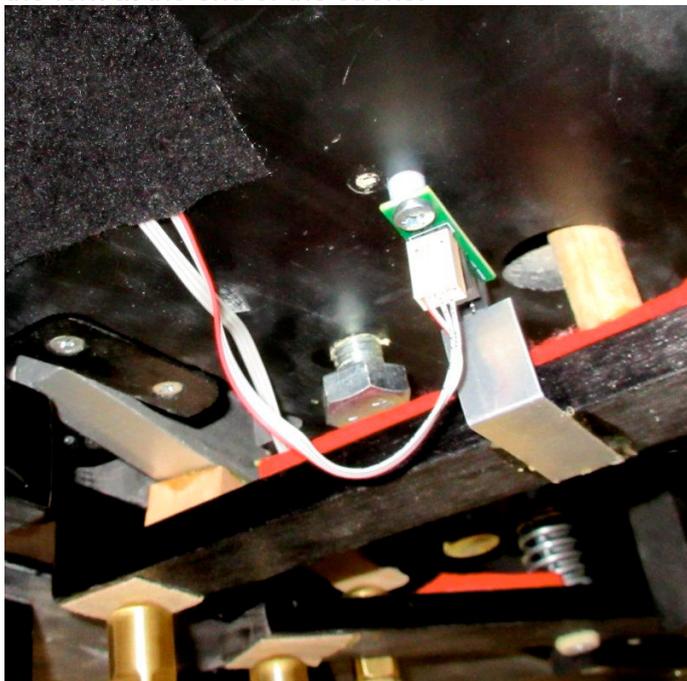
Install the control lever.

Take marks on the outside of the piano, with respect to the front of the board and width of the side, drill from below, drill 6mm with an angle of about 30 ° to the front of the piano, the sheath to go out slightly inclined and ideally closer to the side of the piano, see photo 1 above. Fix the lever under the plate with 2 4x16 screws and 3mm drilling (photo 13). Bend the end of the rope at a right angle to 1cm, insert it through the 2mm hole of the angle control lever, adjust the correct lateral twist so that it stays in place naturally in the lever.

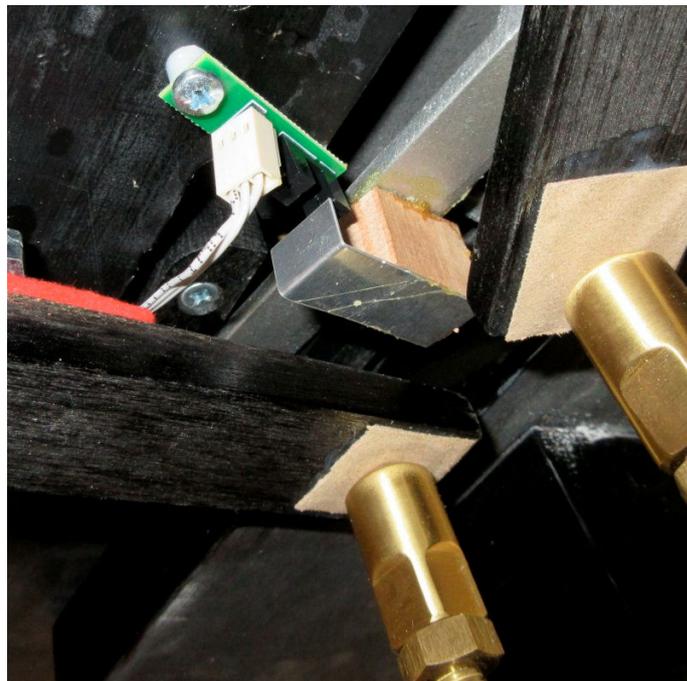
The run of the angle must be 90 °, moreover, the rubber must be horizontal in the locked position. Fasten the aluminum retaining collar of the sheath, adjust the ideal stroke by moving the sheath in this collar. If necessary adjust the angle of the control angle, the optimum effortless travel is achieved with a 135 ° rope angle (see photo 1). The angle must never come into abutment on the frame at the end of the race, otherwise the race may be out of order, so if the race is too important, place the black stop spacer on the race of the lever. For safety, add a second collar next to the first, firmly tighten the 2, the sheath must remain perfectly immobile at this place to avoid any misalignment of the race. Fix the sheath under the piano with the remaining collars.

Installation of pedal sensors.

The sensors are placed closest to the pedal levers where the stroke is about 1cm, set on spacer, 4x16 screws and 3mm drilling. Glue the aluminum strip to the neoprene glue after folding to the correct length, ensure that the aluminum strip is properly centered on the optical fork, and the aluminum must not touch the fork at the end of the stroke.

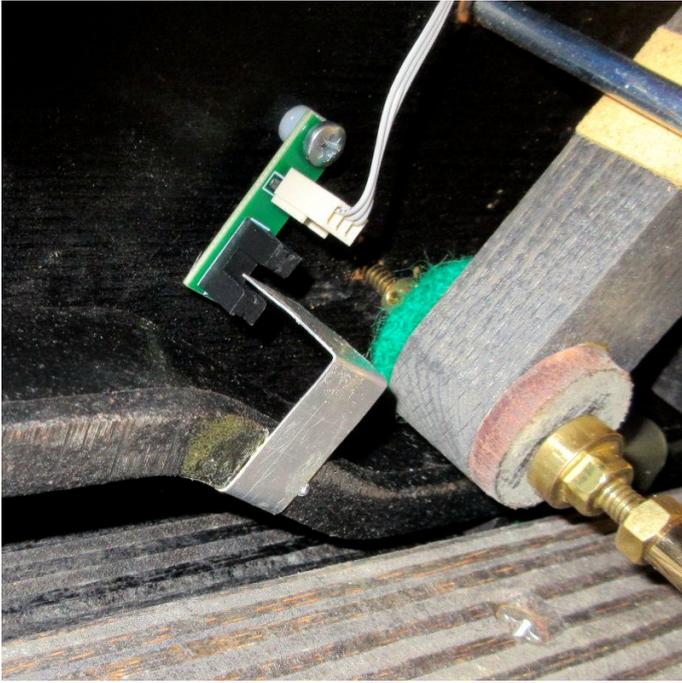


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11

La photo 10 montre une installation typique sur pédale forte, pour le type de pédale douce de la photo 11, l'ajout d'une cale en CTP sur le levier est nécessaire. Connecter le câble en nappe 1x6 pour les 2 pédales, le fil rose indiquant la pédale forte. Les 2 petits décrochements sur une face du connecteur beige sont coté capteur, si le branchement est inversé la pédale ne fonctionnera pas. Utiliser l'adhésif pour fixer les câbles



12



13

The picture shows a soft pedal sensor on cast iron lever, the aluminum strip is glued in L to the neoprene glue on the back side and the bottom.

-Installing keyboard sensors.

The principle of laying the sensor rail as well as the dynamic adjustment protocol are identical to the upright piano (see the beginning).

The casing attaches to the right under the keypad, to the left of the right foot for easy connection of the power cable. Make a 10mm hole in the treble space beyond the keyboard frame to pass the sensor cable to the case. Stick this cable on the right side of the piano, above the pedal spring of the soft pedal by a strip of adhesive felt, leave enough slack to easily disconnect the cable at the sensors by slightly removing the mechanism.

You can also introduce the excess length of the pedal cable through this hole for more discretion and seal with a strip of felt.