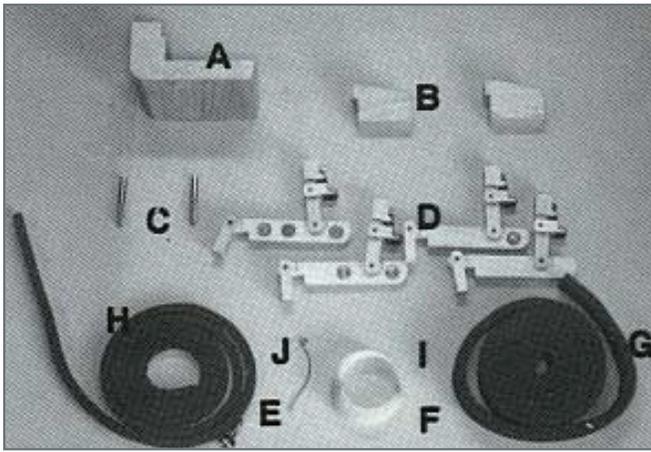


Introduction

The Damper Underlever System is a premier product of the Louis Renner Company in Stuttgart, Germany, and has been carefully designed to replace or retrofit many fine American grand piano damper back actions. We also strongly recommend the purchase of Renner USA's commercial grade, extended shank flange screw drill bit. It is essential for drilling the flange screw holes on the inside of the underlever tray. Ground from high speed steel stock, it will last for many underlever system replacements. In your kit, you should have received the following:



- A: Underlever Tray
- B: U.L. Tray Ending Blocks (2)
- C: U.L. Tray Pivot Pins (2)
- D: Set Underlevers*
- E: Set Combination Flange Screws
- F: Straight Wire Flange Keeps
- G: Tray Cushion Felt
- H: Liberty (Stop) Rail Cushion Felt
- I: Roll Mylar Tape
- J: Set Damper Lever Assist Springs

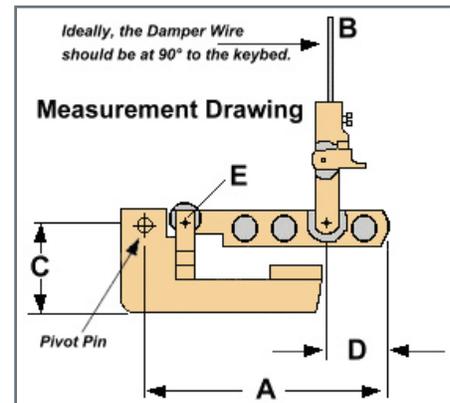
* The lead distribution (28 - 3 lead; 18 - 2 lead; 18 - 1 lead; 6 - 0 lead) may not exactly match the original assembly, and you may have to alter your lead count accordingly.

We would like to caution the first time installer of the Damper Underlever System to read this entire set of instructions before beginning the assembly process! Much grief and aggravation can be avoided if one understands the simple concepts behind the installation system before one makes a costly and time consuming mistake.

Basic Principles

Here are some basic principles behind damper action installations:

- A. The top post must be in the correct position under the damper wire guide rail hole. Side-to-side, there may be the familiar dog-leg offset, but the front-to-back alignment should be essentially a straight vertical drop from the guide rail hole to the top post drilling. This is dimension B in the Measurement Drawing.
- B. The height of the assembly is determined as follows: If a straight line (line E in the drawing) were to be drawn from the underlever flange centerpin to the balance punching of the key to which it is connected, that line would also bisect the point that the keyend lifter felt contacts the underlever nose when the key is depressed fully.



- C. Please keep in mind that our system for replacing damper action systems utilizes the original pivot blocks from the bellyrail gap. While in some rare cases, these pivot blocks will have to be replaced, using the original ones will eliminate the need for having to reengineer the entire system.
- D. The veneer sustenuto tab on some early pianos (esp. Steinway) does not stick out as far as the spring tab on your new Renner USA top posts. Make sure that you will have enough fore and aft room for the sustenuto pick-up rod on these older pianos!
- E. The in and out position of the damper action is determined by the position of the top post centerpin underneath the damper wire drillings in the guide rail (dimension B). The side-to-side position of the damper action is determined by the position of the lifter ends of the keys in their frame. The underlevers will be located on the treble side of the key end so, that when the keys are shifted during una-chorda operation, the key ends will still be able to lift their assigned dampers. Be sure that the key frame is in it's correct placement before making this evaluation!

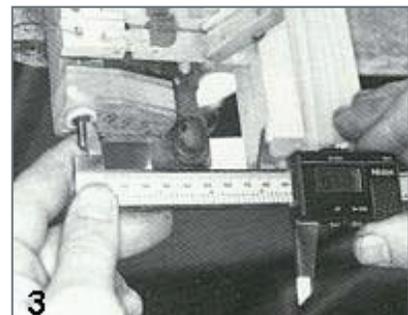
Assembly & Installation

1. Determine if the original installation was correct, or if it will require adjustments.

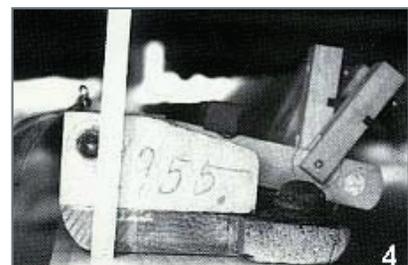
2. Is the distance from the nose end of the underlever to the top post centerpin the same on the original equipment as it is on your new Renner underlever? This is the distance in the drawing.



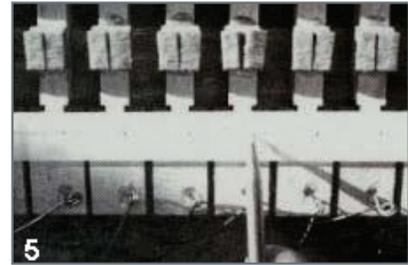
3. Measure and write down the distance from the nose end of the underlever to the pivot pin on the old underlever tray. This is the distance A in the drawing. Measure and record both treble and bass ends - they might be quite different! **The underlever must be horizontal (as it is in the drawing) when making this measurement!**



4. Measure the distance from the bottom of the old tray to the pivot pin. The bass and treble should, but may not, be the same. This is distance C in the drawing.



5. Make a scale rule or scale tape (with the mylar tape) from the old underlever tray or action rail from the subject piano. This tape will indicate the exact position for drilling each of the flange holes on your new backaction rail.



6. Place mylar tape over the score line provided for flange drilling on the beechwood damper tray, and centerpunch each of the markings on the tape. Note: don't confuse the recess for the flange keeper wire with the score line for drilling flange screws! Do this operation in the MIDDLE of the damper tray, leaving plenty of room on either end for trimming and for spring return extensions.



7. If you will be installing springs, place the mylar tape on the top of the damper tray, **being careful to index it so that the drillings will be directly over the drillings for the flange screws**. Renner USA has also provided a score line in the proper position for the underlever assist springs. With the mylar tape in the proper position, mark out with a prick punch the scale for the spring drillings.

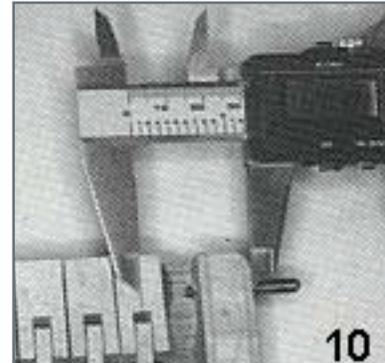


8. Drill for the assist springs with a #45 bit on the punched marks. Drill for the flange screws with the suggested Renner USA extended flange screw bit. We suggest performing this operation on a drill press.



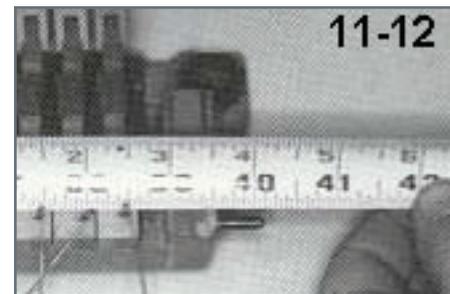
9. Temporarily mount the first and last underlevers onto your tray.

10. You will now prepare to cut the underlever tray to length. Early Steinways have leaf-spring projections on the treble end of the tray. Later Steinways have coil-spring nipples on the bass end of the tray. Recent Steinways have no projections, but have a coil-spring recess in the tenor/treble section break. Measure from the center of the flange to the outside of the shelf on the original equipment assembly, **on the end of the tray which has no spring projection!** Duplicate this measurement onto your Renner USA damper tray, and mark it off with a combination square.

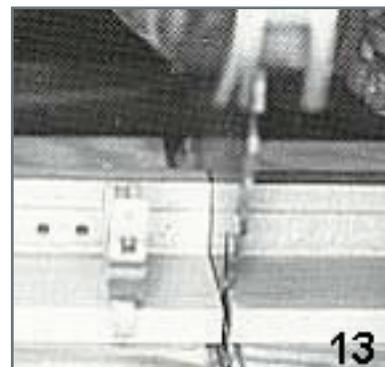


11. Measure twice, check it, and cut off the excess length square to the back of the tray rail. **Do not overlook this detail!**

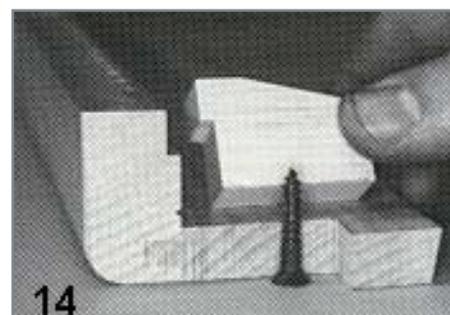
12. Measure the length of the original tray, from ending block to ending block. Duplicate this measurement onto your new Renner USA tray, and mark it off with your combination square. **At this time you will add the necessary dimension to provide for the tray spring return!**



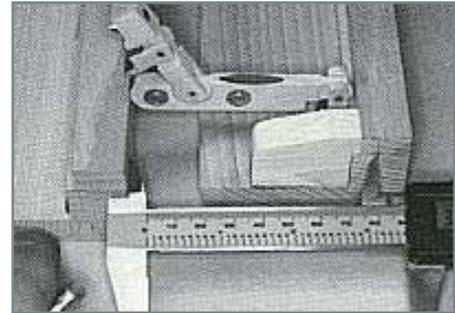
13. Measure twice, check it, and cut your new tray to length. Your new Renner USA tray should now be an exact duplicate of the original equipment tray in length, and positioning of underlevers.



14. Glue on the ending blocks, and fasten them with a wood screw inserted from the underside of the shelf.

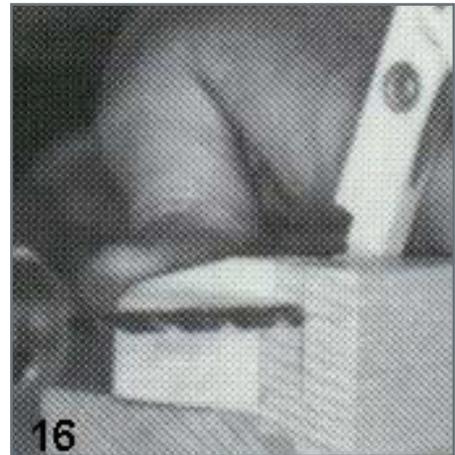


15. Using the measurements you obtained in steps 3 and 4 above, duplicate the vertical and horizontal measurements for the pivot pins in both ends of the new underlever tray. Remember that the treble and bass measurements may be substantially different.

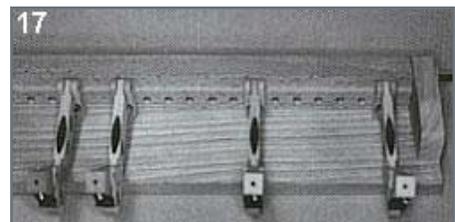


16. Using a #22 drill bit, drill the holes for the pivot pins in the ends of your new damper tray.

NOTE: When replacing late-model Steinway shortarm underlevers and teflon types only, the shelf pivot pin is located 3.562 inches from the nose of the underlever in its horizontal position (distance A in your drawing), and 1.326 inches from the bottom of the tray in its vertical position (distance C in the drawing). The pins will have the same measurement on both the treble and bass ends of the back action tray. These are the measurements which must be used when short-arm type underlevers are replaced with the NEW Renner back action kit. **THEY WILL NOT MATCH THE MEASUREMENTS FROM THE ORIGINAL EQUIPMENT WHICH YOU ARE REPLACING.**

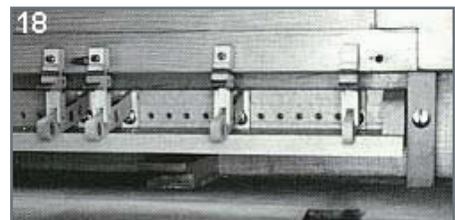


17. Install several sample underlevers onto your back action tray.

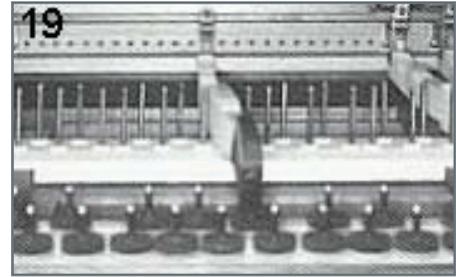


18. Mount the back action into the bellyrail gap with original equipment pivot blocks.

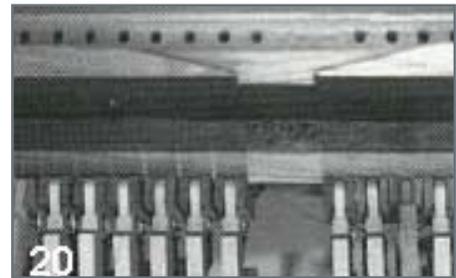
NOTE: On older Steinway pianos the back of the treble end of the tray may need to be planed or jointed to fit into the gap without binding on the lower bellyrail!



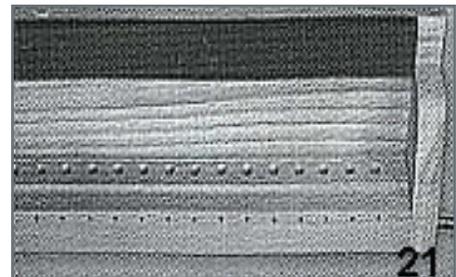
19. Insert keyframe into action gap, and check alignment of keys with your new back action. Make note of needed changes in fore and aft as well as up and down, and side-to-side positions. Don't forget that your action needs to shift for the una-chorda function. You must be sure that the action is in exactly the correct position before making these determinations.



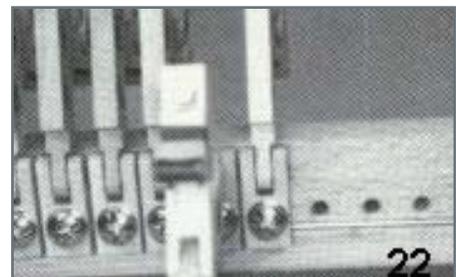
20. Note where the relief has been cut into the original tray for the sostenuto monkey. Duplicate this relief onto the new Renner, USA tray.



21. Remove assembly from the piano and install the tray cushion felt, gluing it only at the back.

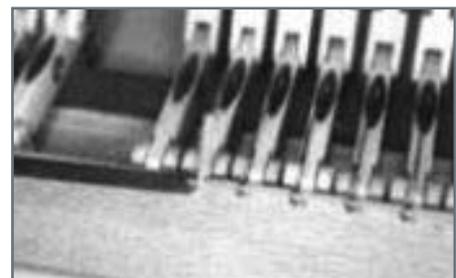


22. Install the balance of the underlevers according to the best match of leaded units that can be obtained with the ones supplied with your replacement kit. **Do not forget to put the flange keeper wire in place before screwing down all the underlevers to the flange rail!**



23. Attend to the usual spacing, traveling, and squaring operations.

24. Install the underlever assist springs by applying glue in holes with a toothpick, then inserting the shank end of the spring, then wedging it in place by driving a dry toothpick into the hole. Use a steel ruler or shim stock under the spring coil when driving the toothpick to prevent the coil from bottoming out against the top of the back action rail. Break off the excess toothpick.



25. After the underlevers have been assembled onto the back action tray and the springs have been installed, it will be necessary to regulate the spring tension on the underlevers. We make the following suggestions for setting the tension, using an appropriate gram resistance gauge:

Underlevers	Low	High
1-10g	29g	32g
11-20g	28g	30g
21-30g	27g	29g
31-40g	26g	28g
41-50g	25g	27g
51-54g	23g	25g

The larger pianos tended to have the stronger springs, the smaller pianos the lighter springs. Some later models (styles B and D) had springs only to number 28. In those pianos, the taper would be faster, progressing from 30 grams at the lowest bass note to 25 grams at the last sprung underlever (#28). Some later model pianos in the smaller sizes had no springs at all, notably the styles S, M, and L. This arrangement was most commonly connected with the short-arm type underlever.

26. A thin felt strip is included which may be used to replace the hard to find cushion on the damper liberty or "stop" rail.

27. Install your new Renner USA underlever tray assembly, and then proceed to regulate the dampers!

