

***** Bushing Replacement Procedure *****

There are two methods which you can use to replace the bushings on your Pratt-Read (P-R) keyboard. I will outline both procedures as performed on a 61-note Oberheim OB-series synth, but it will be basically the same for all P-R mechanisms, such as the one found in the Minimoog, etc.. The first technique does NOT involve the disassembly of the key mechanism, and is the preferred method. The second method should only be considered if you are having difficulty removing the old bushings.

Both methods begin by first removing the keybed from the instrument case. In the case of the Oberheim, there are 5 screws used to fasten the keybed to the bottom of the instrument, 3 in the front, and 2 in the back. Once the keybed is mechanically free, unplug the ribbon cable connector, marking the position of pin 1 for reference during re-assembling.

Once the keybed is free, place it right side up on a flat surface. Next, remove each white and black plastic key cap from its metal key carrier. This is accomplished by removing the small black wood screw found at the rear of each key, pulling up on the rear of the key cap, and sliding it forward. Do the white keys first, as this will make the removal of the black keys easier. [Note- It is helpful to have an assortment of small parts containers and boxes available, to keep the different parts segregated as you remove them. This makes re-assembling much easier...] Once the key caps are all removed, they can be cleaned in a mild detergent solution.

Now you have a choice as to how to proceed with the bushing replacement:

Method 1- (Preferred), Bushing replacement without key mechanism disassembly

With the key caps removed, and the front of the key mechanisms facing you, prop up the front of the keybed approx. 4", using a wood block, etc. Now, pry out the old rubber bushings from inside the metal key carrier. Using a dental pick or solder tool which resembles a dental pick, wedge the tool tip between the bushing being removed and the metal retainer bar it is attached to, and twist out the old bushing. The old bushings are often stuck to the retainer and have become brittle with age, so you may have to extract pieces of the bushing with forceps or tweezers if it does not come out whole. Often it is beneficial to turn the keybed over and, using a razor knife, slit the original rubber bushings via the thin slot formed where the metal key carrier halves meet. Repeat until all the old bushings have been removed, then use a strong light source to check that there are no residual bushing pieces stuck to the retainers. Now you can install the new bushings on the retainers, in the same position as the originals. [Note- the bushings are pre-lubricated with a silicon lubricant, GC Electronics part # 10-8101, Type Z5 Silicone Compound. This is the only lubricant that should be used with P-R bushings, and they will be damaged by other substances, such as petroleum jelly, etc..] Orient the bushing with the same concave "Y" facing up, (the 2 "Y"s are slightly different). After completing the installation of the new bushings, check each key action by pushing down on the metal key carrier, ensuring that there is no binding or mechanical noise, then re-install the plastic key caps, black keys first. That's it!

Method 2- (non-preferred) Bushing replacement with key mechanism disassembly

***** CAUTION- WEAR EYE PROTECTION WHEN HANDLING KEY SPRINGS.
THE SPRINGS TEND TO "POP" FREE WHEN INSTALLING OR REMOVING,
AND COULD ACCIDENTALLY HIT YOU IN THE EYE *****

This procedure takes considerably longer than Method 1, and requires much more dexterity to accomplish. Remove the keybed and plastic key caps as outlined above. Then, using needlenose pliers, remove each spring from the back of the key.

By grasping the spring at the 2nd or 3rd loop from the top, and applying pressure upward, you can easily slip the spring off its retaining hook. Keep each spring segregated as to which type of key it came off of,

(white or black). Typically the two spring types used, (white keys use stronger springs than black keys), will be different colors, but it is still helpful to keep them separated. I would suggest doing all the springs associated with either the white (long metal key carrier), or black (short), keys together as a group, before doing the other group.

Once the springs are removed, you can pull the metal key carrier out by first lifting the back of the key carrier off its fulcrum (pivot point), and then dipping the front of the key carrier down to clear the bushing retainer. If the key carrier seems stuck on the fulcrum, bend the fulcrum tab, which sticks out the top of the key carrier, slightly, i.e. twist it so that it now sits a bit catercornered in the rectangular slot. This will free the key carrier, and allow you to lift it up, and out. You will notice that the key carriers associated with the white keys are longer than the blacks. Keep them separated as you remove them, and mark the location of the short (black keys) key carriers as you remove them, using a grease pencil. This will also assist when re-assembling the keyboard. As the metal key carriers are removed, the plastic 'J'-wire actuator will pull free from the vertical bar under the carriage. Most will be retained by the 'J'-wire itself, but some may fall free. Don't lose these!

Now, with all the metal key carriers removed, you are finally ready to replace the bushings! Pull off all the old bushings, and discard. Install the new bushings in the same position. [Note- the bushings are prelubricated with a silicon lubricant, GC Electronics part # 10-8101, Type Z5 Silicone Compound. This is the only lubricant that should be used with P-R bushings, and they will be damaged by other substances, such as petroleum jelly, etc..] Orient so that same concave "Y" is facing up, (top & bottom Y's slightly different heights).

Once all the bushings are replaced, begin re-installing the metal key carriers, doing all the short ones (black keys) first. Place each short carrier over the marks made earlier, then re-install each spring, (weak style). The spring is installed by grasping the top of the closed loop side with the tip of your needlenose. Insert the open hook found on the other side of the spring into the hole in the metal chassis, and pull up, slipping the closed loop end over the retainer hook found on the underside of the metal key carrier. This step is a little tricky, and it may take a while to get the hang of it, without launching the spring into space, (REMEMBER- WEAR EYE PROTECTION!). Once the spring is in place, try the key action, (no plastic key cap yet installed), and make sure it feels smooth, and doesn't bind. Check that the fulcrum point on the key carrier is firmly seated at the bottom of the 'V' notch. If any binding is noticed, and/or the key carrier is not seated at the bottom of the 'V' notch, give the tab a slight twist, as outlined during the removal procedure above. Once you have completed installing the short metal key carriers, now repeat the procedure with the long (white) key carriers.

You're almost finished at this point. Next re-install the key caps, black ones first. Finally, turn the keybed over, and re-install the plastic 'J'-wire actuators on the vertical metal bars, ensuring that the vertical bar does not hit metal frame where it passes through, (bend it slightly if it does hit). Check the clearance of the bar, and the proper operation of the 'J'- wire itself, by pushing down on the keycap. The 'J'-wire should not make contact with the gold bus bar until the key is depressed approximately 2/3's of its full travel. Gently bend the 'J'-wire at the midpoint to achieve this. You may want to re-insert the keyboard cable temporarily (NOTE- PROPER POLARITY OF CONNECTOR), with the keyboard exposed, and test that each key is working correctly. This is also a good time to replace any broken 'J'-wires by tack soldering in a new 'J'-wire unto the remaining stub of the broken 'J'-wire.

Methods 1 & 2- Final Steps

Re-install the keybed into the instrument's chassis, and re-insert the keyboard cable (NOTE- PROPER POLARITY OF CONNECTOR) in the socket.

Your keyboard rebuild is complete!