

Keywork & Padding

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While the body may be the true instrument and the keywork just “control devices,” modern woodwinds have come to depend on those devices to such a degree that neglecting them can negate any amount of effort put into perfecting the body.

Rollers:

Key rollers are a nuisance. They are perceived as a means of improving the movement of fingers from one key to an adjacent key. In reality, they can often be more detrimental than advantageous.

Little finger rollers often involve a stretch to access the further roller. There's not much that a repair technician can do to change the distance to the key without major work to alter the keys. Extending the roller spatulas further from the hinge can backfire. The longer radius results in a greater arc of movement at the end of the spatula. As the nearer key depresses further the further key becomes more difficult to access. The roller remains so much higher that it becomes more of a barrier than helper. Think twice before yielding to the pleas of a small handed bassoonist begging you to extend the keys.

In general for finger rollers, set the pair so that the further roller is slightly lower than the nearer roller. This will ease the movement from near to far without becoming a problem moving from far to near. Reversing this, with the further roller set higher than the near, can make movement from near to far difficult, or even impossible.

Rollers for the keys operated by the right thumb have their own problems. Most persons don't realize that the right thumb is not held flat against the keys but rather contacts the keys somewhat on its side. This makes movement from the pancake key down to the F# key so easy that a roller isn't really needed. However, movement up to the Bb is a different story. A roller in the thumb Bb key can easily become a barrier to the thumb. The lower to the body this key can be set the better. There is no musical reason for the existence of rollers between the thumb F# and G# keys. (There was once a reason that became moot after the F#/G# trill key became a standard part of every Heckel system bassoon, over a century ago.)

Right thumb rollers can be counter-productive because of size. In order to add a roller to any key the key must first be made larger. Most of the time this is not a problem. However, adding rollers to the right thumb keys demonstrates the worst case of this problem. The distance between the Bb and F# keys, with

two pairs of rollers added, becomes noticeably greater than without the rollers.

More than anything else, what rollers do best is to rattle. Rollers need to be lubricated. The bassoon was not really intended to be a percussion instrument. If you can hear the rollers, they need to be oiled.

Lever Keys:

The long lever keys of the wing and bass joints have potential for causing leaks. The great length of these keys relative to the short hinge length makes them very vulnerable to any slop in the hinge. Any lateral shifting resulting from hinge slop can translate into a pad that may not close in the same position each time it descends.

The particular keys involved include the high D, high C, high A and the C# keys of the wing joint, and the low C key of the bass joint. In addition, the low D key and the low B# and Bb levers of the bass joint, although they don't have pads they can feel insecure to the player when they have sloppy hinges.

The three high vent keys (high D, C and A) of the wing joint present the greatest problem. These are commonly padded with cork pads which often show the range of the hinge slop. When the key closes in different positions, the impression in the pad will become wider than the vent hole rim. Each different position can have a degree of leakage involved. These hinges must be tightened so that the pad always closes in the same position and the pad replaced.

The C# key on the wing and the low C key of the bass joint always use leather pads. Although the problem is similar the results are not quite so severe as with the high vent keys of the wing, it is the same problem and similar action should be taken to correct it. It is not uncommon to see the round hole of the low C key generate an oval impression in the pad.

The type of pad used in the high vent keys of the wing can be significant. Cork pads are the most common in use today. However, cork can fracture when pressed against the metal vent rim, causing a path for leakage and eventual failure. Cork is also somewhat noisy. Some German instruments come equipped with leather pads. These may have less impression problems and may be quieter but are more guaranteed to fail. The oxides that form on the rims of the metal vent liners tend to stick to the leather, eventually ripping the center from the pad leaving only felt to close the hole. Some synthetic pads may be the best for these holes. In particular, Valentino pads work quite well.

The guide posts that are used on all of these long lever keys can be a source of noise if the hinge is sloppy. It is a good idea to add something to keep the key from hitting the guide post. Automobile pin stripping is readily available as a tape and can be wrapped around the sides and bottom of the lever key inside the post.

One last item about the vent keys, particularly of the wing joint. One of the most familiar sights I see when first opening the case of a bassoon received for repair is of the wing lever keys bent askew. They should be lined up straight along the length of the wing. Normally, there should be a single straight line extending from the pad cup of the C# key up through the lengths of the C# key and the high C key. The lengths of the high A key and high D key should be parallel to this centerline of the wing joint.

Whisper Key:

The whisper key system presents a variety of adjustment problems. Coordinating the geometry of four keys plus a whisper key lock to close the vent hole of a bocal whose vent hole may be different from the next bocal to be used while not causing any difficulty in the closing of the low E key can be a daunting task. The solution to this is to make certain that each piece of the puzzle is correctly finished before starting with the next.

First, a bit of nomenclature. There are enough pieces to this puzzle be confusing. At the low end, the whisper key starts with the *Low E Key* or *Pancake Key*. At the upper end of the low E key, a *lift arm* activates the *bridge arm* of the *bridge key*. The bridge key is automatically activated either by the low E key for low notes or by its primary activator, the *whisper key spatula* of the wing joint, which lifts the *upper bridge key arm* of the bridge key. The upper arm of the bridge key in turn lifts the lower end of the *whisper key pad key* to close the pad. The lower end of the whisper key pad key has a “*camelback*” *casting* which usually includes a *two holed flat spring* secured with two screws intended to provide some accommodation for misadjustment. At the top of the whisper key pad key an offset rod allows the hinge to extend beyond the end of the wing joint to a pad cup [hopefully] positioned to close the *bocal button* or *pip* or *nipple* or *bocal vent* or *whisper key vent* on the *bocal* or *crook* or *esse* or *pipe*. With some much crazy nomenclature it’s no wonder the damned system is so much trouble! And of course, the next expert in line will have a different set of names for everything.

One of the most common problems causing whisper key problems is the assembly of the wing joint to the boot joint. If the wing is not lined up correctly the whisper key adjustment will be wrong. If the te-

non fits sloppily in the socket the adjustment may be unpredictable. Don’t waste time with the whisper key until the joints fit together properly. Settle any questions about the assembly of the wing, boot and bass joints, including any body lock, before starting with the whisper key.

A second common source of adjustment problems is sloppy pivot screw sockets in the keys. Any lateral movement of the hinges will degrade the action and proper adjustment of this system. Unfortunately, several of the castings on the ends of these keys are usually placed on the hinges in a way that makes the pivot sockets difficult to tighten.

1. Begin the adjustment with wing, boot and bass joints assembled and with the whisper key pad key removed.
2. The upper arm of the low E key should be kept as low as possible. Normally, this arm is not corked and should not touch the body. However some makes use this arm instead of a foot at the back of the pancake key touch to set the pad opening. If this arm is raised too high off the body the action of the key will be bad—key it low. The height of this arm may need to be modified to accommodate a whisper key lock.
3. The bridge key is adjusted next. Both the upper arm and the bridge arm must be in contact with the arms that lift them at the same time. The lateral angle of the bridge arm affects the amount of movement of the pad at the top of the system. If the bridge arm is close to the low E key’s hinge the movement will be small; if it is far the pad movement will be greater.
4. If the instrument is equipped with a right hand whisper key lock this is the time to adjust how it lifts the bridge arm. The lateral position of the bridge arm will need to be aligned with the lock. When engaged the lock should lift the bridge arm very slightly higher than the low E key will lift it. When disengaged the lock must not keep the bridge arm from being in contact with the low E key’s lift arm. Coordinating these events may require changing the height of the low E lift arm or altering the shape of the end of the bridge arm.
5. With the low E key, the bridge key and the spatula all coordinated, the whisper key pad key can finally be put in place. Examine the way the camelback contacts the upper arm of the bridge key. Keep the contacting parts as squared up with each other as possible. Check that the edge of the two holed flat spring doesn’t dig into the top of the bridge key’s lift arm. The pad should close with the bocal button square to and centered in the pad. Keep in mind that an overly thick pad can make this more difficult. The pad

position can be adjusted by rotating the pad arm on the offset hinge extension.

6. The pad should now close when the low E key is closed. The primary adjustment is made by twisting the length of the pad key between the camelback and the lower offset casting. Some adjustment can also be made by the radial position of the pad arm on the extension hinge or by raising or lowering the end of the camelback. There must be no resistance to closing the low E key. The pad opening of the whisper should be on the order of 3/32". Make sure that the amount of movement of the whisper key spatula is similar to the C# key beside it.

Of course there's always ways to make life more complicated. Whisper key locks are made in many forms that each have their own unique problems. Little finger whisper keys (rare) or right thumb whisper keys (very rare) add usually a very little nuisance. High A bridges which close the whisper key whenever the high A key is opened are desirable and becoming more common. The high A bridge is an arm added to the center of the whisper key pad key. At rest, both the camelback and the high A bridge arm must be in contact with their respective contacts at the same time. When the high A key is depressed the whisper key pad must close.

The two hole flat spring seems to be a highly misunderstood nuisance. Its purpose is to allow a small amount of space in the system to accommodate misadjustment. There needs to be a gap between the spring and the camelback casting behind it. This spring also tends to be a source of noise and benefits from a thin layer of ultrasuede applied to the spring.

The position of the bocal is certainly important to the adjustment of the whisper key. The bocal should not extend out square to the broad axis of the bassoon, but rather a bit outboard. Placing it above the high A vent hole is about right.

Some bocals, especially from East German makers, have the bocal button placed in an unusual position somewhat in the back of the bocal. Their instruments are made to suit this non-standard position. Getting a "normal" bocal from other makers with more standardized button positions to work on an East German bassoon is a major problem.

Nickel Silver Hinges

Many bassoons use nickel silver as the material for hinge arbors. This is somewhat unique to bassoons as most woodwinds use steel for these parts. Nickel silver can be a very good material for this purpose but there is really nothing about it that should make its use unique to bassoons.

One of the best features about nickel silver hinge arbors is the noise level. They're simply quieter than

steel. Experiments exchanging the hinge arbors which are in every way identical except for the material from which they are made have been consistent in their results. In dry unlubricated keys the difference is quite noticeable.

Nickel silver hinge arbors also seem less vulnerable to being bent. Keys with minor bends in the key and/or the hinge arbor don't seem to show as much resistance to movement as would be expected if the arbor was of steel.

Of course, everything about nickel silver hinge arbors isn't ideal. It is not as easy to straighten a bent hinge arbor in nickel silver as it is in steel. Often, they seem to simply refuse to straighten. Nickel silver isn't as strong as steel either, and small diameter arbors are better made in steel.

In the same area, another hinge detail also somewhat unique to bassoons are the unthreaded hinge pins that are used in many shorter hinges. These are just simple straight pieces of nickel silver rod with a curl at the end that shows outside of the post. They are held in place simply by friction. Be careful not to loose these. They are becoming hard to replace. Obtaining the correct diameter stock for making hinge pins is nearly impossible.

Boot Action Rods

The action rods or pins going through the boot joint shouldn't be as confusing as they seem to be to some persons. There's nothing sacred about them. Apparently, some persons must believe that the original pins were perfect and that the maker has a carefully designed perfect length for each pin. Nope.

Pins should be made from a lightweight material that presents little or no friction to the walls of the hole through which it moves. 3/32" black nylon rod is readily available and makes excellent pins. The length of the pin is determined by the results. Make sure that the closed pads are not held open (Bb, High G Ring, G#) by a too long rod and that the pad on the A tone hole is open the correct amount.

The most common problem with these pins is that the corking on the keys at each end of the pins wears away too soon. Cork is useless for this purpose. Ultrasuede is my favorite material for the purpose. Some leathers also work well.

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