Split Sockets

Chip Owen

Splits in the sockets of bassoons are not uncommon. Repairs to unlined sockets require special approaches because of the thin oily wood surrounding the splits. Lined sockets also have splitting problems that are, to some extent, the result of the liners themselves.

Unlined Socket Splits of the Boot and Bell:

Splits in the unlined bass socket of the boot joint are more serious than splits in the bell socket as the bass socket splits will have more effect on the performance of the instrument. Repairs to either socket are essentially the same.

Socket splits can be a source of leaks. Even though the split appears to be tightly closed, it may open unseen while the tenon is in place. During this period the splits acts as a bypass around the tenon wrapping allow a directly leak from the bore at the bottom of the socket to the outside at the end of the joint. Achieving an effective seal of a single joint is for naught if the assembly of that joint with another opens a leak.

The stress on a split caused by repeated widening of the split each time the joints are assembled can cause the split to extend itself. These splits are easier to fix while they do not extend past the band surrounding the socket. When they extend past the band a bit more effort may be required.

It is not possible to effectively glue the thin edges of wood so that they will be strong enough to withstand future stresses. Effective repair of this condition requires reinforcement of the area surrounding the split. This is done by removing the band, bonding fabric to the wood and carefully refitting the band.

Band Removal:

Bands are often easily removed. First remove any posts or screws that go through the band into the wood. Be careful: Some posts are soldered to the band and are not intended to be removed. Also, make an alignment mark crossing between the wood and metal under the pancake key rod. This will make it easier to align the band later. If you are very lucky (you—not the bassoon) the band will now simply fall off. More often the application of heat to the band is needed. Take care with the torch not to burn the finish on the wood. A piece of automobile inner tube rubber wrapped around the band will provide a good grip without getting your hands burned on the hot metal. It may be necessary to get the band hot enough that oil in the wood next to the band smokes and bubbles. Don't get it any hotter. In some circumstances a thin blade can be slid between the wood and the band to free the band.

In truly stubborn cases it may be necessary to use a gear puller to remove the band. A pair of lugs are soldered to the sides of the band and a piece of metal placed on the end of the joint for the puller to push against. Tightening the screw on the puller will remove even the most stubborn band. Using this technique on the bell or the wing joint bands will require a special fitting for the puller to push against. Unfortunately, the solder from the lugs may leave a shadow on the band that is hard to remove. This technique is best saved for when replating the band is also involved.

Straightening the band:

A common reason for socket splits is that the band has been bent. Dropped boot joints have a habit of landing on the most vulnerable side of the boot band. If a boot band is visibly bent into the bass side socket a split is almost certain to found. The band will need to be removed and straightened using whatever large diameter mandrel will do the job.

Straightening the socket:

Deformed sockets are even more common than split sockets. Be conservative about straightening them as the process of straightening them can also split them.

The procedure is based on steaming them back to shape. A mandrel needs to be turned with the correct taper and diameter for the socket. The mandrel is heated hot enough to rapidly boil water. The socket is dipped into water and then placed onto the mandrel. The steam softens and reshapes the wood. Be sure to keep everything in line; this can be done in the lathe between centers. Repeat this a few times, finally leaving it to cool on the mandrel.

This can be a stressful procedure. Bind the band tenon to resist any excess stresses that may make any crack worse. I like to use cotton string as it also acts as a reservoir for more water to produce additional steam.

Reinforcing the split:

Split sockets are fixed by reinforcing them. There is not enough wood to glue the edges together nor is there enough wood to even think about pinning the split. Any anyway, pinning isn't really effective with maple.

With the band removed and the tenon cleaned, a piece of cotton or silk fabric is wrapped around the tenon. At a minimum this fabric should extend about an inch to each side of the split the full width of the band tenon. The fabric can also be wrapped fully around the tenon if you choose. The fabric is bonded to the wood tenon with super glue, liberally applied. Strips of newspaper can be used to rub the fabric onto the wood and remove the excess super glue. Be sure to use plenty of ventilation while doing this.

If any parts of the fabric do not appear to be well bonded to the wood apply more glue and again use the newspaper strips to rub the fabric onto the wood.

Wide open splits:

Socket splits are often seen with gaps that must be filled. The best material to use is maple sanding dust. Fill the gap with the dust and with super glue at the same time as the fabric is being applied. The fabric and the band will hide any unevenness on the outer surface. Be sure to overfill the inner side in the socket so that it can later be cut down to be smooth with the rest of the band.

Refitting the band:

After everything else has been done, it is unlikely that the band fits correctly. The band tenon must be filed down so that the band fits accurately before gluing the band back into place.

It is difficult to know just how the band fits its tenon. A strip of paper used as a feeler gage between the band and tenon will help you know where it is too tight or too loose. Ideally, it should fit evenly all the way around. Don't expect that to happen but try to approach it. Be sure to keep the shoulder of the tenon clean so that the band butts up against it tightly. At this point the band should fit just loose enough to freely bottom against the shoulder.

A paper shim seems to benefit the fitting of the band to the joint. Cut a piece of newspaper to fit around the tenon without overlapping. The bottom edge should be carefully trimmed to closely match the shoulder. The top edge can be trimmed after the band is installed.

I prefer to use shellac to glue the band. I don't like to use flexible gap filling materials such as silicone. In my experience, a carefully fitted band with a paper shim all glued on with shellac works very well.

First paint on a coat of shellac and lay the paper directly into the wet shellac. Apply more shellac onto the paper and inside the band. The band can now be slid into place. It probably won't go fully to the shoulder because of the additional thickness of the paper. Wipe off the excess shellac before tapping the band fully into place with a mallet, taking care to get the alignment marks lined up. Avoid getting the shellac onto the finish as the alcohol in the shellac may damage some finishes.

After trimming off the excess paper sticking out the top of the band reinstall the any posts and other hardware, check for any more shellac oozing out and leave it to set overnight.

Socket Splits at lined sockets:

Splits can also occur by lined sockets. This most commonly occurs near the wing socket of the boot joint.

Socket liners can be a cause of splitting. The dimensions of the metal socket liner don't change even though the wood continually moves. If the wood shrinks around the liner the only way to relieve the stress is to split.

Usually these splits can be filled by removing the band and filling with maple dust and super glue. Rarely, the socket liner may also need to be pulled to effectively fill the split.

Cracks at the wing socket liner have a habit of heading toward the C♯ trill key tone hole. If this is the case it may be desirable to line the tone hole. Usually it will be sufficient to fill any gaps with maple dust and super glue.

Revised October 20, 2001