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## **Instrument Repair Workshop for Band Directors**

Welcome!

Please visit my web-site at [www.davidbaileymusicstudio.com](http://www.davidbaileymusicstudio.com) to learn more about instrument repair.

From the home page of my web-site on the left you can follow a link to Music Instrument Repairs, and on that page you will find links to several things of interest:

An explanation of instrument repair terms, an explanation of instrument care and maintenance procedures, a FAQ concerning instrument repairs, a powerpoint presentation on how to restring a rotary valve, and a link from which you can download a handbook of instrument repair procedures aimed at band directors and other instrumental teachers. There is also a link to some before and after pictures of some instruments which came to me with serious problems.

Please feel free to download the handbook of repair procedures and the powerpoint presentation on restringing a rotary valve, and also please feel free to share the link to the instrument care and maintenance procedures with your students. Those instrument maintenance procedures are included in the downloadable handbook and please feel free to photocopy them to share with your students.

I will be very happy to answer any questions you have, either by e-mail or by telephone, whether or not you wish to use my repair services.

## Outline of Instrument Repair Workshop

Don't attempt any repairs until you have practiced them on unimportant instruments. Don't attempt any repairs you're not comfortable with. Don't expect to master instrument repair quickly. A major purpose of this workshop is to help you better advise your students and to provide a better understanding of just what instrument repair entails. All of this is covered in greater detail in the Repair Procedures Handbook available at my website. This outline is not intended to be all-inclusive, but rather to serve as an outline for this morning's workshop.

1. Proper Use of Vocabulary
  - a. "Needs New Pads" implies a total repad, which is expensive
  - b. "Overhaul" implies not only a total repad but also cosmetic work, also expensive
  - c. "Welding" is not used on musical instruments typically
  - d. Refrain from telling students "It's an easy repair."
  - e. Refrain from telling students "That's an expensive repair."
  - f. Refrain from telling students "That's a quick repair."
    - i. The repair itself may well be quick, but if there are already 30 instruments in the queue, it won't necessarily be done as quickly as one would hope
  - g. Refrain from telling students "One of your keys leaks" or "your instrument has some leaks"
    - i. Be very specific about which notes start to give trouble
      - (1) Write a note and slip it into the case – students won't remember what you tell them by the time they get home if it's not written down
2. Supplies to keep on hand
  - a. Nylon tape that plumbers use works great to provide extra thickness for tenon and neck corks.
  - b. Dental floss works great to provide extra thickness for tenon corks
  - c. Valentino pads/corks
    - i. Be careful to use the correct thickness
  - d. Crazy glue
    - i. Be very careful how this is used – don't spill any!
  - e. Elmer's glue works great for a lot of things but takes longer to dry
  - f. Key guard screws – when one comes loose and falls off, the rest won't be far behind
  - g. Vaseline for tuning slides – petroleum is forever, and slides lubricated with vaseline are the easiest to get freed even when the instrument hasn't been used for months
  - h. Good quality valve oil – Denis Wick, Blue Juice, Ultra-Pure are among the best
    - i. Sometimes when valves start getting sluggish or seem never to move quite as easily when new, simply changing the valve oil can frequently resolve the issue
  - i. Key oil – automatic transmission fluid placed in a needle oiler is excellent and much less expensive than commercially purchased key oil and actually works better
  - j. Rotary Valve oil – not the same consistency as piston valve oil
  - k. Rotary Valve String
    - i. Download my powerpoint presentation for a clear depiction of the steps required in restringing a rotary valve
  - l. Pond's Cold Cream – works great on trombone slides when water is sprayed on. Cold Cream and water works much better than slide oil



- (2) If the head cork is in the correct position but problems persist, unscrew the crown and remove the head cork assembly – it should only come out of the head joint at the end where the head joint goes into the main body
  - (a) If the assembly pulls out the other end, change the head cork
  - (b) Once out of the head joint, make certain that the cork is securely tightened against both of the plates on the assembly, the fixed plate at the bottom as well as the plate that screws down to hold the cork in place
  - (c) If the cork has shrunk enough to come out the wrong end of the head joint and there isn't a replacement cork available, wrap one or two turns of plumber's nylon tape around the old cork and reinsert it
    - (i) Many people were taught to take a match or cigarette lighter to the head joint with the cork inside and head things so that the cork would stay
      - 1) sometimes this works but it's not ideal
- b. Small adjustments to woodwinds which have adjusting screws such as flutes and oboes and some saxophones
  - i. Be certain you've diagnosed the problem correctly
  - ii. Make tiny adjustments and check frequently
    - (1) remember what you've done so you can undo it if it doesn't resolve the problem
- c. Replacing pads
  - i. Make certain to use the correct diameter or at least one that is large enough to cover the tone hole
  - ii. Make certain to use the correct thickness
    - (1) Too thick or too thin means that not all of the pad will contact the tone hole or might not open far enough when the key is open and the instrument will either have a bad tone or play out of tune
- d. Unsticking brass instrument mouthpieces
  - i. Use the bobcat mouthpiece puller
    - (1) Use nothing else, no pliers on the mouthpiece!
    - (2) Tell the student not to let a parent try to get the mouthpiece out
- e. Unsticking some stuck slides
  - i. Check to see that all the braces are connected and that none have come loose
    - (1) If any braces are loose, do not attempt to free the slide
  - ii. Be very careful to check whether one side is actually free or not before trying to exert force on the slide
  - iii. Never have the student hold the instrument while you pull (or vice versa)
  - iv. Provide a little side-to-side twisting motion on the slide to try to crack the seal which has formed from the slide not having been moved for a long time
    - (1) Put some of the key oil (automatic transmission fluid) or other penetrating oil around the exposed edge of the outer slide first
  - v. If using the slide-removing pliers and rawhide mallet, make sure all braces are firmly soldered and haven't come loose before attempting that sort of repair
- f. Restring a rotary valve



- i. Stuck rotary valves – Yamaha french horns are notorious for this problem but other makes suffer the same problem occasionally
  - i. Use small pliers to grab the hub of one of the rotors and attempt to rotate it by hand
    - (1) Even if it feels like there's a rubbing taking place, move the rotor
  - ii. If possible remove the slide for that rotor and insert a few drops of rotary valve oil, holding the instrument so the oil flows down onto the sides of the rotor
  - iii. Keep trying to rotate the rotor using the small pliers
  - iv. Place a drop of rotor oil where the shaft comes through the casing at the hub
  - v. Unscrew the back cover and place a drop of rotor oil in the middle of the back bearing plate where the rotor sticks through and then replace the back cover
  - vi. If this hasn't solved the problem, it's bigger than most band directors should attempt to handle because it involved disassembling the rotor, cleaning it, reassembling and restringing it
- j. Stuck piston valves
  - i. Strike the piston with your fist to try to dislodge it from being stuck
    - (1) If it moves, work to get it out of the casing, clean the piston, clean the casing if possible, apply new valve oil and work the piston in and out from the bottom of the casing before inserting again the correct way
- k. Unsoldered braces
  - i. Glue will not work, don't use it ever because it makes the real repair much harder and therefore more expensive
  - ii. Duct tape might hold the instrument together for a short while but it won't last and doesn't provide any structural support
    - (1) Makes the real repair more expensive because the sticky residue has to be removed to complete the repair
  - iii. Get it repaired properly as quickly as possible
    - (1) One loose brace changes the stress on all the other braces and if not repaired can lead to the domino effect where first one brace fails and then another and another and then tubing starts to come apart and the instrument ends up as a puzzle in the case
- l. Unsoldered tubes
  - i. Tape can help get through a performance or rehearsal but makes the real repair more difficult
    - (1) some unsoldered tube repairs look like "the repair technician just has to resolder that tube, it won't take long and shouldn't cost very much" when in reality the repair takes a long time and is much more expensive than it might appear
      - (a) The joint has to be cleaned, both parts, and often this requires disassembling further
        - (i) If the joint isn't clean, the solder won't flow properly and there won't be an airtight seal
- m. Dents – No, it's not reasonable to expect yourself to get dents out
  - i. Dents are most often pushed back out from the inside of the tube
    - (1) The brass is pushed back and forth over a steel mandrel to flatten the dent

- (2) The brass is pushed over a steel rod with a steel dent ball to push out the dent
- (3) If there is at least one complete reverse bend in the tubing between the bell and the dent the instrument needs to be disassembled to where steps 1 or 2 can be accomplished
  - (a) Trumpet and cornet bell stem dents can be smoothed out using a flexible tool with small dent balls secured
- (4) Except in a certain few places and on non-professional level instruments in the hands of excellent players, most dents are merely cosmetic
  - (a) Leadpipe dents if big enough can cause playing problems
  - (b) valve slide dents, if big enough can cause intonation problems

Given the hectic work schedules that most music teachers have, it's not reasonable to expect to be able to solve all the repair issues your students' instruments may have. For many music teachers it's not even reasonable to expect to be able to do any repairs at all. However, having a better knowledge of what's entailed in doing these repairs can help you better advise your students and their families and can result in a much better relationship between you and your school's repair technician. Too many people look on instrument repair as some sort of "magic" and can fall prey either to a repair technician who overcharges or to ignorance which prevents the instrument from being properly repaired because they think the repair technician is overcharging. Working together as partners, a music teacher and a repair technician can ensure that the instruments are working well and thus the band will play better and everybody wins.

