

Common Issues with Band Instruments

Identifying and Troubleshooting Basic Repairs

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Woodwinds



- Springs on Woodwinds
 - Can't play X note within a whole step of written note, normally a half step off
 - Spring
 - Use your spring hook to rehook the spring
 - "Floppy key"
 - Spring is too weak
 - Retension or replace the spring
 - Springs have a radius bend to give them tension. Avoid sharp angles, they create weak points and inconsistent action
 - Sluggish return
 - Spring has no tension
 - Spring is broken
 - Keywork is bent



- Bent Keys
 - Binding keywork
 - May prevent proper function of key and keys related to it
 - Rods may also be bent
 - Intonation Issues
 - Keys may open too far, bringing pitch up
 - The inverse also applies - Key height too low can cause “stiffness” and non-responsiveness, as well as bringing pitch down
- Regulation Issues
 - Keys that are supposed to close together, don’t
 - You can use blue painters tape or medical tape to build up missing/worn key corks and felts.
- Typical regulation spots to check
 - E/B + F/C keys on Clarinet, Bass Clarinet
 - Check with LH E/B lever
 - Squeaky or stuffy middle B
 - Adjust at crow’s foot
 - Register mechanism for Bass Clarinet
 - Manifests as a squawky/resistant lower midrange and up
 - Thumb-F# for bass clarinet
 - If the thumb is not closing all the way, it is **impossible** to play G above the staff or higher, even though everything else will feel “okay” to the student
 - Bridge regulation on all woodwinds
 - Bridge is what connects left hand/upper stack to right hand/lower stack

- D-F#, F-F#, A-Bb for flutes
 - There are adjustment screws underneath or on top of the D, E, F, and A pad cups
- A-Bis for saxes
 - Will make it impossible to play below A
 - Both must close simultaneously
 - If the A is closing before the Bis, you can layer blue tape over the Bis pad cup until they close together.
 - If the Bis is closing first, put a popsicle stick between the Bis tonehole and pad and press down on the A pad cup. Get it close, and then you can fine tune it with painter's tape on the bis pad cup.
- Neck 8ve on saxes
 - Bend it back so that it is closed when playing middle register D-G#, and open when playing middle register A and above
- Table keys for Saxes
 - Low C#, B, + Bb do not play, but low C does
 - Check regulation from F#-G#. G# is most likely lifting.
 - Adjusted with the upper bridge adjustment screw. Play a low D and flutter the G# lever while making the adjustments. It is correct when the D does not waver in pitch.
- Tenon Cork/Neck Cork Failing
 - Wrap with blue painters tape or Teflon plumber's tape.

Brass

2nd Valve Slide Damage



It is very common for the second valve slide on trumpets and cornets to push into the valve casing at the knuckles, seizing the piston altogether or jamming it during its stroke. The solution is to grab the 2nd slide as shown, flexing it outward to alleviate the stress at the casing. Some will use the first valve slide to gain leverage for the procedure, but it increases the chances for breaking the outer valve slide tube solder joints - creating more work.

MN State College – SE Technical

Section 3: 9

Band Instrument Repair Program
www.southeastmn.edu

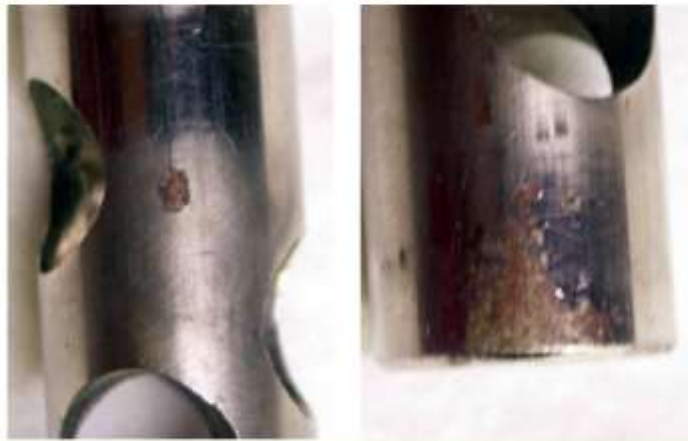
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This happens frequently when students put their music folders on top of their trumpets in the case. Also common on the 4th casing in Yamaha YBB-321 tubas (the looped tuning slide) when the slide is placed in the tuba with the wrap facing AWAY from the player, towards the top of the interior of the case. Closing the case will distort the casing. Reversing the slide and flexing it in the opposite direction it is bent should relieve the tension, freeing the piston.

¹ Huth, John. "Inspecting Brasswinds for Repair - Redwingmusicrepair.org." Southeastern MN Technical College Band Repair Program. MN State College – SE Technical. Accessed September 30, 2021.
http://redwingmusicrepair.org/portfolios/JHuth/pdfs/BIR_Brass_Manual_inspecting_brasswinds.pdf.

Flaking/Missing Plating



Three solutions: Replace the piston, buff the edges smooth, or re-plate/re-fit the piston

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Normally caused by age or improper plating application at the factory.

- Bent Piston Stem
 - Common on Euphoniums and Tubas
 - Make sure it's fully screwed in. Slowly apply force in the opposite direction of the bend, centering the stem in the top cap. Go ever so slightly beyond where it needs to end up, metal memory will bring it back.
 - Piston stops partway down it's travel, usually with a metallic clank
 - Can be repaired while the piston is still in the casing, with the top cap screwed in.
- Piston spins in casing
 - Check valve guide for damage/wear
 - Adjust or replace the valve guide
- Piston hitches during travel
 - Make sure casing and piston are clean
 - Dirt/buildup/biofilms will impede instrument function.
 - Regular cleaning + encouragement to drink water before and during band can slow or eliminate build up
 - Clean shared instruments yearly with soap + water. Ultrasonic cleaning/acid baths can be done every 2-3 years to give you a fresh slate

² Ibid



- Damaged mouthpiece shank
 - Makes it even easier for mouthpiece to get stuck
 - Can impact response + feel



- Use your mouthpiece truing tool and a chime mallet, position the mouthpiece as shown with one of the high spots facing directly at you

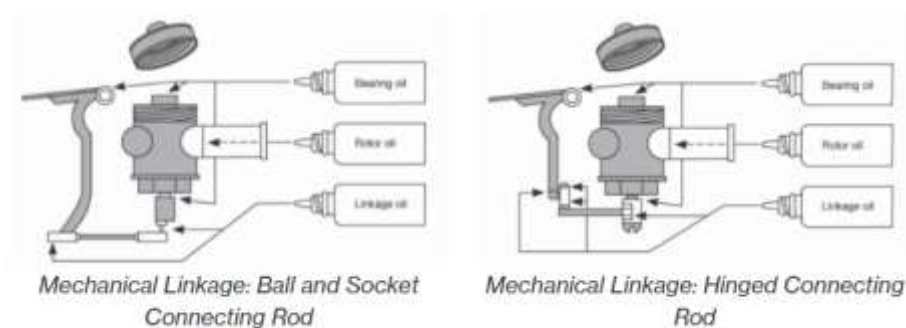


- Strike it as shown
- Repeat on other high spot, alternating and blending until it's fixed. It only takes a few reps to get the hang of this

- Waterkey Cork is missing/leaking
 - Check key to make sure it's properly covering the nipple
 - Adjust if necessary
 - Remove the old waterkey cork by heating up the keycup and using a pad prick to pop it out
 - Replace with properly fitting cork/synthetic alternative, gluing in with a hot-melt adhesive of some sort. I primarily use JLS "straw" hot melt, available from JL Smith (see resources at end)
 - Float the cork on a bed of glue in the keycup, letting the spring tension seat the pad
 - You can use wadded up paper towels in an emergency, but they may fall out or leak.

- Rotors are stuck
 - Try turning the stop arm instead of using the paddles
 - Lubricate the stem + back bearing with bearing + linkage oil in a needle oiler

LUBRICATION OF THE VALVE MECHANISM



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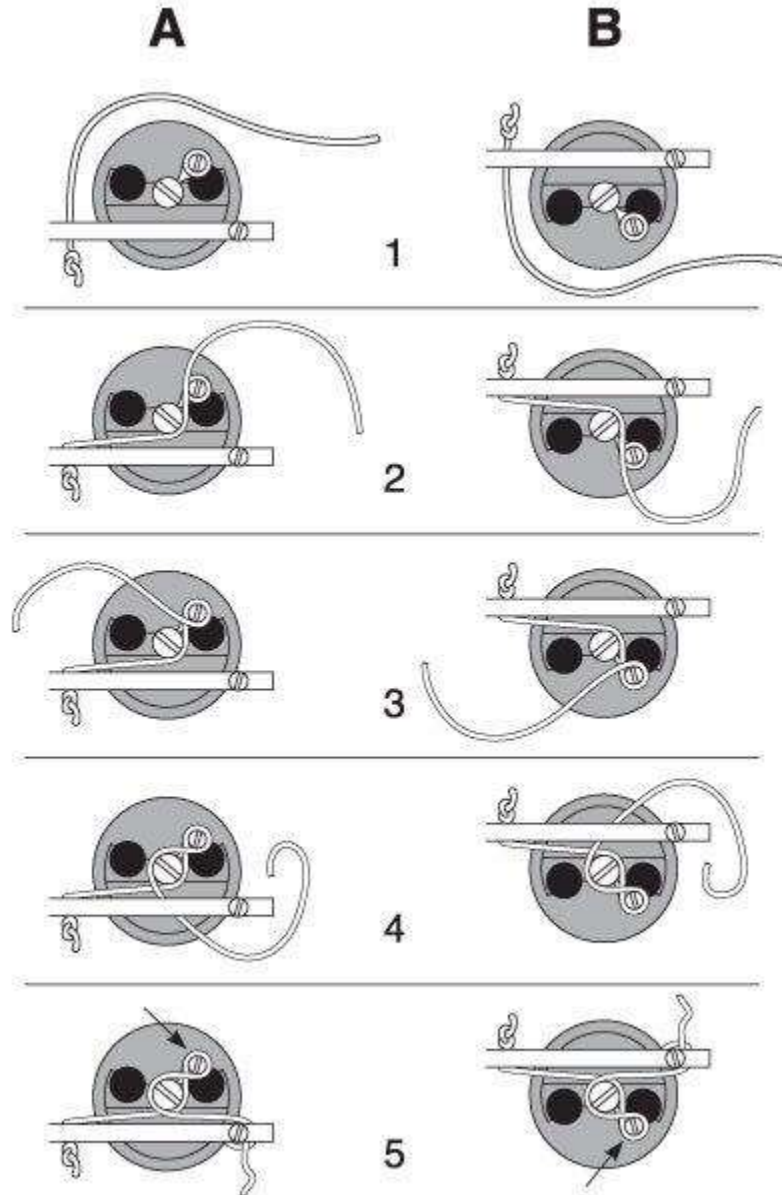
- They probably need to be removed + cleaned, casing and tubing cleaned as well.
- Slides are stuck
 - Inspect instrument for broken or loose solder joints before proceeding
 - Use penetrating oil and a heat source on the exposed end of the slide at the point where the inner and outer tubes meet
 - Walk the heat source over the outer tubing to draw the oil up inside
 - Use a leather strip, candle wick material, or a slide pulling tool to attempt to "shock" the slide free
 - You can use a formable/moldable plastic such as InstaMorph® and form it to the inside radius of the stuck slide's crook, then tap on it with a chime mallet to break it free

³ De Souza, Simon. "Care and Maintenance." Paxman Musical Instruments Ltd. Accessed September 30, 2021. <https://www.paxman.co.uk/care-and-maintenance>.

- The moment it starts to move from being struck, switch to pulling/pushing with your hands. Try to minimize the shock to the instrument
- Remove the buildup/corrosion before lubricating the slide
 - 600 grit 3M Polishing papers with clear packing tape behind it for the outer surface of the inside slide, stiff nylon bristle tube brush for the inside slide.
- Lubricate with a thick grease for slides that are supposed to stay in place, thin grease or thick oil for kick slides
 - In general, the longer the slide the thinner the oil/grease must be to make it easy to move. Using different viscosities on the 1st + 3rd kick slides can make them feel more similar in use.
 - Thick greases
 - Pure Lanolin
 - Hetman Slide Gel #7
 - Hetman Premium Slide Grease #8
 - Hetman's products can be mixed together to achieve "in-between" viscosities without gumming up or binding
 - Conn-Selmer Tuning Slide Grease
 - The Pink Stuff
 - Works great, goldilocks consistency
 - Thin Greases/Oils
 - Lanolin cut with mineral spirits to a "warm maple syrup" consistency
 - Play with the ratio until you like how it feels for kick slides
 - Hetman Light Slide Oil #4
 - For longer tight fitting kick slides, such as euphoniums equipped with a kick slide or rotary tuba 1st/3rd slides and tight tolerance professional level trumpets
 - Hetman Slide Oil #5
 - For most 1st + 3rd slides on smaller instruments
 - Hetman Heavy Slide Oil #6
 - Great for student level trumpets on the 1st kick slide
 - Herco Slide Cream

- Restringing a rotor

- The arrangement of the valve string bar relative to the cork stops may be in one of two positions and both are illustrated as **A** or **B**. Your horn may have all the valves the same or a mixture. Check and follow the diagram and instructions for whichever is appropriate. Be sure to pass cord underneath itself when looping around the stop arm and lever bar screws.



1. Take a length of valve cord (approx.. 7-8") and tie a double knot at one end. Cut a 45° angle on the other end, melting the end to keep from fraying. Pass through hole as shown.
2. Take the free end part-way round the stop arm (counter-clockwise for A, clock-wise for B) having loosened the retaining screw on the arm to fit the cord underneath.

3. Pass cord (clockwise for A, counter-clockwise for B) under the loosened screw, and adjust position of lever to approximate level desired for the paddle height. Tighten screw temporarily.
4. Carry the cord counter-clockwise for A, clockwise for B) around the collar, and pass along as shown to end-hole of bar and feed it through.
 - You will pass either underneath or over the cord you have already strung, depending on your instrument. Do whichever allows the rotor to rotate without rubbing cord on cord.
5. Hold stop arm against stop plate (as shown by arrow) and wind cord clockwise around end screw when taut. Tighten end screw. The level of the finger-plates may be adjusted by loosening the collar-spigot screw and then re-tightening. The screw at the end of the bar may then need a slight adjustment to take up any slack. Cut off the cord @ a 45° angle leaving about 1in spare for ease in subsequent re-threading, melting the end to reduce fraying.⁴

⁴ De Souza, Simon. "Care and Maintenance." Paxman Musical Instruments Ltd. Accessed September 30, 2021. <https://www.paxman.co.uk/care-and-maintenance>. Edited by Ian Hart after copy+paste

QUICK TIPS

- Lubricate the threads on your brass instruments with Lanolin/Heavy Slide Grease.
- Stuck top and bottom caps can normally be loosened with a persuasive tap from a chime mallet at a 45-degree angle on the crown of the cap. Use two mallets if space is tight – one resting on the crown and the other to strike with.
 - If this doesn't work, bring it in! Please don't use pliers.
- Stuck pistons can be removed by using another piston from the same instrument as a driver. Be extremely careful while doing this, pistons are hollow. Do not use a drumstick, do not use a screwdriver. *Pistons are hollow.*
- Lubricate your slides one tube at a time, rotating them as you insert. This will help spread the slide grease around entirety of the slide tube. Wipe of the excess with a finger or cloth.
- Use a light touch when checking keywork and pistons
 - There are six phases motion using a woodwind key or brass piston/rotor. Try to feel for each phase individually to diagnose where the issue is. There may be more than one issue.
 - Start
 - The initial press
 - Motion
 - Travel to the bottom of the stroke
 - Stop
 - End of the Stroke - the first moment the key hits the tonehole, fingerbutton hits the top cap felt, or rotor arm hits the bumper
 - Start
 - Start of the return
 - Motion
 - Travel to the top of the stroke
 - Stop
 - End of return stroke – the first moment the key foot hits the body, the valve stem felt contacts the underside of the top cap, or the rotor arm hits the bumper
- Have your own set of mouthpieces for play testing, but always inspect the student's mouthpiece and reed for chips, nicks, or other damage. For woodwinds, look at the table and bore of the mouthpiece as well. If it's disgusting, have them clean with cool to lukewarm soapy water and a mouthpiece brush / old soft bristle toothbrush. Each student should have their own – do not share cleaning materials unless properly disinfected
- Flute HJ Cork Placement is approximately the internal diameter of the large end of the headjoint away from the center of the embouchure hole, usually ~17.3mm. Adjust only if necessary.

RESOURCES FOR DIRECTORS

Bluemel, Christopher: Guide to Brass Musical Instrument Repair

<https://www.jwpepper.com/sheet-music/10316755.item#>

Thorpe, Reg: The Complete Woodwind Repair Manual

<https://napbirt.org/store/viewproduct.aspx?id=15265455>

Moss, Aaron D: Repairing, Maintaining, & Manufacturing Percussion Equipment

<https://napbirt.org/store/viewproduct.aspx?id=16514577>

JL Smith Co – Manufacturer of Valentino products, repair tools, supplies.

<https://www.jlsmithco.com/>

MusicMedic – Manufacturer of repair tools and supplies

<https://www.musicmedic.com/>

Ferree's Tools, Inc – Manufacturer and distributor of repair tools, parts and supplies

<https://www.ferreestoolsinc.com/>

Votaw Tool – Manufacturer and distributor of repair tools and supplies

<https://www.votawtool.com>