101 Ways To Save Money on Band Instrument Repairs

Repair Technicians Tell All!

Michael Webb and Barbara Kremer

National Association of Professional Band Instrument Repair Technicians

Contents

GENERAL INFORMATION

WHY WE'RE DOING THIS

After several years of seeing the same kinds of preventable problems with band instruments, and teachers, students, and players saying "I never knew that!" we decided to find a way to help people avoid as many instrument pitfalls as possible. With all of the problems the player/teacher has in the daily routine, the last thing you need is a mechanical problem. Our goal is to help you avoid as many problems as possible by using preventive maintenance.

OUR MISSION

Our repair shop is dedicated to the following:

The finest customer service

The highest quality repair

The longest lasting repair

The lowest prices consistent with high quality work

During our presentations and the preparation of this booklet, our opinions and recommendations are based on these principles.

One of the most important things that we can say is that about 70% of our repair is caused by improper handling and maintenance of instruments. Simple math tells you that a very small amount of our work is preventive maintenance and regular service. These figures also tell you that a lot of money is spent on repairing damage that should not have occurred.

BACKGROUND

Barb and Mike both earned Doctorates from Florida State University in flute performance and trombone performance, respectively. Mike performed for the Walt Disney World Co. and in the Central Florida area, toured with the Duke Ellington Special Orchestra, and then taught college in South Georgia. After discovering the fun of instrument repair, and years of apprenticeship, both are now repair technicians. Barb does woodwind repair and is certified in Straubinger flute repair. She has served as the librarian for the National Association of Professional Band Instrument Repair Technicians (NAPBIRT) and editor of the NAPBIRT journal TechniCom. Mike repairs brass, woodwind, and percussion instruments, is a certified Straubinger repair technician, and has served as regional director and master clinician for NAPBIRT. Barb and Mike have worked as repair technicians in Florida, Alabama, Kansas, Missouri, North Carolina, and Texas.

Michael Webb & Barbara Kremer

CAVEATS

We attempt to offer as much hard data as possible when offering advice to friends and customers, but sometimes someone will object to what we say. If you put five technicians in a room you will hear six opinions. We will try to stick to verifiable facts unless otherwise stated.

AUDITION YOUR TECHNICIAN

Don't be afraid to see if a repair technician can do what they claim they can do. If you are going to entrust your instruments to a technician, it is obviously in your best interest to make sure that technician can deliver the desired results. If you are in a new situation, ask other teachers and players about local technicians, and give the shop a couple of horns to evaluate their work.

RELY ON YOUR TECHNICIANS

You can't have enough tools and parts on hand to adequately keep your instruments in top shape, so stay in touch with your favorite shop and let them help you avoid problems and provide you with emergency supplies. We encourage our customers to visit our shop. If you want to spend some time observing, call us. Also remember that some shops do not like visitors.

MAINTENANCE AGREEMENTS

Encourage your students and parents to get maintenance and repair with their rent-to-own instruments. The additional few dollars a month is money well spent when an instrument is dropped or a slide is crushed. Here is an example: if maintenance is five dollars a month for thirty months on a trombone rental, the total cost is $150.00. One of our customers found themselves with a trombone slide bent in half and without maintenance. The replacement slide cost them $425.00. Parents often object to the additional cost of maintenance, but you can help by using this kind of example to encourage them. You can also remind the parents that even if their child does a good job of taking care of their instrument, most of the rest of the kids in the beginning band are knuckleheads!

LOANER INSTRUMENTS

Someone always asks us if we will come to the band room and do repair there. We do not advocate on site repair because we can't transport the $50,000 worth of tools necessary to do the job correctly. The most we can do is replace a water key cork or something similar. To avoid having a child in band with no instrument, try to acquire a few of your own loaner horns if possible. Solicit donations from former band members who have an extra horn in the attic. If you have loaners, you can always have instruments in the shop without taking instruments away from the students.

SACRED COWS DON'T ALWAYS MAKE THE BEST BAR-B-QUE

Under most circumstances, we advise people to purchase the newest instruments possible. There are exceptions to this advice, especially with some professional instruments. The newest computer technology and manufacturing techniques are producing amazing instruments, both in quality and consistency. Remember that a 1960 instrument was built using the same technology that built the 1960 automobile. This is fine for a collector, but I would not want to drive a thousand miles in my first car!

While on the subject of older instruments, use caution when overhauling instruments or buying overhauls. Brass instruments corrode from the inside out as well as from the outside in. The older metal can be brittle and the overhaul process can thin the metal to the point of cracking. Technicians that rebuild and relacquer instruments can do beautiful work, but make sure the instrument is worth the money to overhaul. If you are not sure, ask your favorite technician for their opinion.

MARCHING WITH PROFESSIONAL INSTRUMENTS

When your students purchase step-up or professional instruments we encourage them to keep their beginner horns for marching band. Marching band is where more instruments get damaged, and while we can repair damaged instruments, we can't make them look like new again. F-attachment trombones are especially susceptible to damage because of a structural weak spot in the tubing by the rotor. Energetic horn motions will bend the tubing and the rotor casing. Finally, if there is an accident and a horn gets mangled, better the student model than the pro line horn.

DENT BAGS

Often called "gig bags," we refer to these items as "dent bags." About half of the catastrophic damage we see in band instruments occurs in the soft side cases. While we will gladly repair these badly damaged instruments, we do not want to see your instrument, your concert, or your budget damaged by lack of protection. We also have limited time to console irate parents who were never told that these cases offer no protection to their child's new horn. There are better options. Many companies now offer lightweight cases that have the protection of a hard side case and weigh about as much as the soft cases. Talk to your music dealer about these cases because many of them have come on the market fairly recently. In our shop we advise parents not to buy the soft cases and we advise music teachers to simply outlaw them in the band room. You might have to trust us on this, but when you see a $3000.00 trumpet folded in half in a gig bag, you will understand.

OTHER GENERAL INFORMATION

1. Don't use super glue on solder joints. It doesn't work and it costs more to repair when we have to clean it off.

2. Use mouthpiece pullers (only!) for stuck mouthpieces. We always pull mouthpieces for free, so don't let dad use the pliers.

3. Don't let kids put music on the horn in the case. I know you know, but I had to say it.

4. Remember to tell students and parents to get to the repair shop in May, June, or July. If you wait until August or later, the wait can be three weeks or more. Some technicians have a six week wait in the fall!

BRASS STUFF

MIKE'S PREFACE

When I was learning the business of instrument repair, I decided to test my mettle (or was it my metal?) by rebuilding my own trombones. I found that my rotor was worn out and leaky from lack of oil, and my hand slide crook and lead pipe were rotting away from lack of washing. Additionally, in the ensuing years I have discovered that a great deal of my work involves the repair of problems caused by lack of lubrication and/or lack of washing. The following suggestions are offered based on these experiences.

OILING PISTON VALVES

New metals and manufacturing techniques mean better instruments, but the instruments need to be oiled correctly to function well and prevent corrosion. My recommendation is **one drop, per piston, per day**, applied to the top of the valve. Piston oil will evaporate, fall out the bottom of the valve, run down the slides, and otherwise disappear. I have spilled some brands of piston oil and seen it evaporate in 24 hours. Regardless of the brand of piston oil you prefer, I have found that this kind of oil needs to be applied every day to make sure you don't have problems.

OILING ROTARY VALVES

I use Hetman Rotor oil almost exclusively on rotors. It is the right viscosity and it never evaporates. I have found that using this oil 1 or 2 times a week will keep valves in perfect shape. The valves move freely with no build up of corrosion inside the valve.

I have been drilling holes in the back bearings of rotors since about 1995. I stole the idea from two people who build very expensive handmade French horns for a very impressive clientele. This simple modification will remove most of your sticky rotor problems forever.

Rotors need to be oiled on the front and back bearings, and in the main body of the rotor.

GREASE TUNING SLIDES ABOUT ONCE EVERY TWO WEEKS

I prefer Hetman tuning slide lubricant because they are long lasting synthetic lubricants available in a comprehensive array of viscosities. The Hetman products range from low viscosity oils for trumpet throw slides to thick greases for tuning slides. The lubricant still needs to be applied on a regular schedule, but the synthetics are vastly superior to the older lubricants.

STORING VALVED INSTRUMENTS

When you store valved instruments for long periods, like during the summer or marching season; put heavier oil on the valves to prevent corrosion and sticking. I like Hetman Rotor Oil, sewing machine oil, or gun oil. While valve oil will evaporate quickly, the thicker oils will stay in the instrument for a long period of time and protect them. Normally you need only apply valve oil after storage and you are ready to play, but it might be necessary to wipe off the thicker oil in some instances.

WASH YOUR INSTRUMENT ABOUT ONCE A MONTH

Washing brass instruments will allow the horn to function well and last longer. I have seen instruments with as little as 2 years of use were being damaged by lack of washing, and instruments needing major repairs after 4 years. If a manufacturer uses cheaper materials to build the instrument this problem is even worse.

I advise my customers to use whatever liquid dish soap that mom uses in the kitchen and use warm (not hot) water. During marching band wash the instruments more often to get rid of the dirt and sweat that go with football season. The other important reason to wash your instruments is, of course, that it is usually cheaper to repair a clean horn than a dirty horn.

Washing French horns can be a little different, so I cover that in a section below.

DEZINCIFICATION (RED ROT)

Brass is an alloy of copper and zinc in varying percentages. The zinc will oxidize out of the alloy before the copper, leaving a pink, brittle area, which is the copper remnant known as red rot. You can see red rot on brass instruments as small pink spots on lacquered surfaces, or as bumps on silver or nickel plated surfaces. Lead pipes, trombone slides, and trumpet tuning slides are the most likely places to find these spots. Once the dezincification has started, the parts will become brittle and porous and have to be replaced, presenting expensive problems. The buffing and thinning of the metal during the overhaul process accelerates the demise of many older instruments because of the red rot already in the horn. Fortunately, red rot can be prevented by washing the instrument. Instrument manufacturers are also helping by making lead pipes with a higher copper content. Look at newer student model trumpets and you will see the dark red color of the metal.

A CELLO STRING MAKES A GOOD FRENCH HORN LEADPIPE CLEANER

Most of the cleaning problems in French Horns occur in the lead pipe, so using a swab to clean the lead pipe and tuning slide will help prevent dezincification in these areas. One quick and easy way to make a swab is to use a cello string with the little brass ball from the loop removed. Put a 2” X 2” piece of cloth or paper towel in the loop and pull the whole assembly through the pipe from the tuning slide through the receiver. When in doubt, use a smaller rather than a larger piece of cloth. Do this once a week and the horn will play better and last longer. If cellos in your school start losing strings, I disavow this method.

SILVER FINISHES ON BRASS INSTRUMENTS LASTS LONGER

For school instruments a silver finish will last longer and take repair better than lacquered brass. It is cheaper to disassemble silver instruments because the silver doesn’t burn like lacquer during the soldering process. The initial cost for silver is higher, but the repair costs over ten to twenty years will be much less. Some instruments are not available with a silver finish, but those that are will be more attractive for much longer.

FRENCH HORN FINGER HOOKS AND HAND RESTS

If you have French horn player that experiences pain in the left hand and arm, it might be necessary to move the finger hook to fit the player. If the finger hook is in the right place, the hand moves easier and things like carpal tunnel syndrome and tendonitis are less likely to happen. Women with smaller hands are the most likely to have this problem. Another attachment that helps free the finger movement is the hand rest. This rest is soldered on the horn above the index finger knuckle and puts the weight of the horn on top of the hand instead of on the smallest finger. As with the moving the hook, the hand rest is a quick, easy way take care of left hand pain and fatigue.

FRENCH HORN ROTOR STRINGS

If you need to retie rotor strings, you can figure out the pattern by looking at another valve. If you have never done this, take a working horn and untie and retie a rotor several times until you get the hang of it. Do not bend the levers to make them level with each other, use the lever string adjustment to level the rotors. Too much bending will break the levers. Two other things to remember are: burn the end of the string to make it easier to thread through the hole, and don't over tighten the string or the valve will drag. It's a horn, not a guitar!

YAMAHA VALVE GUIDES

Sometimes younger players can loosen the stems on Yamaha low brass instruments, causing the valve guide to slide to the wrong place. The players also break the plastic guides when they try to use their fist to get the valve back in place. I have included an assembly diagram at the end of this booklet to help sort out the parts puzzle if you have to put the valve back together. I have always liked the plastic valve guide because it is quick and quiet, but kids sometimes have other ideas as to what to do with plastic pieces. As of October 1999, Yamaha has introduced a metal version of this guide which can be installed with a spot of solder to keep it from moving.

OTHER ITEMS

1. Do the trombone slide test. Unlock the slide and see of the slide will fall by itself. If it will not move without force, send it to the repair shop.

2. A touch of slide grease on mouthpiece shanks will help keep mouthpieces from sticking.

3. Did I mention oiling the valves every day?

WOODWIND CONCERNS

BARB'S PREFACE

Many times students will bring an instrument to the shop after some well intentioned person has tried to fix it first. This rarely, if ever works, and this is why: For example, a young flute player is having a problem with D and E-flat. So, in an attempt to repair the problem, someone plays with the adjusting screws by the d key (ring finger, right hand). But the student still cannot play a D or E-flat. At that point, they are told to take the instrument to the shop. Why didn't the attempt succeed? It was unsuccessful because the location of the symptom (D and E-flat) is very often NOT the source of the problem. In this example, the D and E-flat could be difficult to play due to a loose mechanism in the ft hand set of keys, on the opposite end of the flute! The other issue is that now I have no idea what originally caused the problem. Woodwinds are often counter-intuitive, so if you are going to attempt an adjustment, proceed with caution.

I began my repair career with flute repair. Having a doctorate in flute, I thought it would be a breeze. The third time the boss handed the same flute back to me because I still didn't have it fixed properly, I realized that I knew nothing about the mechanics of woodwinds, and a new adventure began.

WOODWINDS NEED A CHECK UP EVERY 12 MONTHS

We have found that woodwind keys bend during normal use (and misuse) and need an adjustment about once a year, sometimes more often for professional players. Because of this, our woodwind repair work is designed to last the average player about one year, with the exception of emergency repairs and flutes dropped in the homecoming parade. We recommend that you take your instrument to the shop during vacation times so you don't have a crisis the night before the concert. This 12 month adjustment is a problem that plagues only the delicate (and obviously-superior-to-anyone-else-so-don't-look-so-surprised) woodwinds, so plan accordingly.

WOODWIND SCREWS

Woodwind screws are an entire subject unto themselves. Some screws back themselves out, some just look like they are coming out and some won't come out without thermonuclear persuasion. If you have a screw that keeps backing out, show it to your technician. If the screw looks wrong, ask your technician. If you are not sure what the screw does, ask the technician. You have to think backwards and sideways to adjust woodwinds and one screw adjustment on a flute or oboe can wreck the entire system. This is not an effort to discourage do-it-yourselfers, just understand that this is a rather tricky business.

FLUTE AND CLARINET ASSEMBLY

When assembling flutes, do not touch the keys, and keep the tubes parallel. Also, use a twisting motion, not a rocking motion. Just touch the collar of the body and the end of the foot joint. One of the first things we do with flute players is ask them to put together their instrument. Whether beginners, high school players, or college level players, most grab the middle of the joints and twist. Using this method will ruin a flute mechanism in just under five seconds.

For clarinets, you must hold the upper ring key down to avoid damaging the bridge key, but don't touch the bottom joint keys. Grabbing the keys and rods on the clarinet will achieve the same results as flute (see above). Please note: Our records show that 90% of our first time customers assemble their instruments incorrectly. **The next time you see a group of woodwind players; do your own informal survey.**

MARCHING BAND PICCOLOS

When choosing marching band piccolos, we recommend using metal body instruments if possible. The screws tend to strip out of the wood and plastic body instruments in the vigorous and exciting world of marching. The stripped screws can be repaired, but the soldered assembly of the metal instrument tends to hold up better in outdoor use.

MARCHING WITH WOODEN INSTRUMENTS

Occasionally we find that some people like to use expensive wooden instruments in the marching band to "enhance the tonal spectrum of the ensemble." We have also seen these instruments deteriorate quickly because of the exposure to the extremes of the outdoor environment. The sweat causes the key mechanisms to bind, and the wood develops large and small cracks like an old fence post. As usual, we can repair these problems, but the repair involves lots of time and money. Composites and plastics are simply better in the marching band.

DO NOT USE SILVER POLISH ON FLUTES

If you get silver polish on flute pads they will be ruined, and polish in the mechanism will lock up the whole works. Use a soft, dry cloth to wipe of the body and tops of the keys. Don't try to get under the keys or rods because you might snag a spring or tear a pad as well as bend the keys or rods.

USE CORK GREASE EVERY DAY

When assembling clarinets and oboes, or putting mouthpieces on saxophones, use a little bit of cork grease every day. Cork grease tends to dry out and leave you with dry cork (just waiting to rip). It doesn't take much grease, but you need to use it every day. Also remember to use a twisting motion for woodwind assembly.

PAD SAVERS

Pad Savers are products that are designed to be placed in woodwind instruments while they are not being played. Their purpose is to wick moisture away from the pads, extending pad life. The manufacturer of Pad Savers recommends swabbing the instrument after playing then inserting the Pad Saver before putting the instrument in the case. The new Pad Savers have improved wicking action and do not shed fibers into the instrument's action. If you have students who never swab, a Pad Saver is better than nothing.

STRAUBINGER PADS FOR FLUTE AND CLARINET

David Straubinger has devised a new system for pad manufacture that results in a firmer, more stable pad that holds its adjustments far better than traditional pads. For upper model flutes, there is a remarkable difference in performance after the Straubinger overhaul and should be seriously

considered by advancing flutists. Barb Kremer is a certified Straubinger technician and flutist, so call her for a serious flute talk.

SEND THE ENTIRE INSTRUMENT TO THE SHOP

When you send a woodwind to the shop, send all the parts except the reed. If we have to fit the mouthpiece cork we need the mouthpiece, and since we play test every instrument, we need the necks, bells, bocals, etc.

UNFOLD WOODWIND SWABS

Special attention should be given to double reed swabs. Make sure that they are **completely** unrolled or unfolded and have no knots in the cloth or the string. When we see a stuck swab in an instrument, it means that someone forgot this first rule of double reed swabbing. (Rule no. 2 is quit pulling if the swab gets stuck. Rule no. 3 is to tell dad about rule no. 2.) Another trick is to swab the double reed instruments from the little end to the big end. If the swab gets stuck, there will always be something to pull back out of the horn.

OTHER WOODWIND CONCERNS

1. For flute cleaning swabs, use a thin, absorbent cloth like a cotton handkerchief. When putting the flute in the case, fold the swab and lay it on top of the instrument. You should not have to force the case closed. Forcing the case closed with an oversized swab will bend the keys.

2. Wash woodwind mouthpieces in warm (not hot) soapy water about once a month. Use the appropriate brush on the inside.

SOME NOTES ON METALS

Brass:	A copper alloy consisting of about 70% copper and 30% zinc, also known as yellow brass.
Red Brass:	A copper alloy consisting of about 90% copper and 10% zinc, also known as rose brass.
Gold Brass:	A copper alloy consisting of about 87.5% copper and 12.5% zinc.
Nickel Silver:	A copper alloy consisting of about 65% copper, 10-18% nickel, and the remainder zinc.
Monel:	An alloy consisting of about 67% nickel, 32% copper, and 1% iron. This material is used in piston valves and allows a more consistent finish, closer tolerances, and eliminates plating problems. Contrary to some claims, Monel must be oiled every time you play, and when the horn is put in storage.

Sterling Silver: A silver alloy with at least 92.5% silver.

Solid Silver: A non-specific silver alloy.

FINAL NOTES

When in doubt, call us. That's why we're here.