



Road Repairs

By Gunnar Mossblad

The Essential Tools & Supplies For Emergency Repairs (Part 1)

I am not going to tell you to invest hundreds of dollars for specialty tools and supplies to fix a loose pivot screw on your saxophone. Nor do I intend to endorse the need to assemble a repair kit with a state-of-the-art set of 25 McRhino screwdrivers, a #23B Exacting knife, Supremo SuperX leak light #24576 (these are fictitious numbers and names by the way), \$50 dollars of pads, and imported cork from Spain all housed in a Italian leather carrying case. All for only 5 easy payments of \$39.99, call today! In reality you need three things to fix most small emergency repairs on the road.

First of all you must know how your instrument works. Then you need the necessary supplies and tools to do the job. I am not talking about a major repair, like what might happen by dropping your horn. I am talking about replacing a cork that has fallen off, making a key work even though a spring has broken, or getting a key to stop binding with some oil and a little steel wool. These kinds of repairs, while critical to the horn functioning properly, are easily fixed with just a few tools and supplies which can be assembled for very little money and easily stored in your case.

Frankly, if you regularly maintain your instrument the chances of needing to make a repair on the road is very small. Yet even the loss of the smallest cork can render your instrument unplayable, and if you take the time to assemble a small kit, hopefully you will never be stuck with an unplayable saxophone.

UNDERSTANDING THE MECHANICS OF A SAXOPHONE

The first, and most important tool to have on the road, is a knowledge of how the saxophone works. While it is important to have the tools and supplies necessary to fix a minor problem, if you do not know what is wrong with your instrument, or how to use the tools, even the finest handcrafted tools in the world will not be of any help. A basic understanding of saxophone repair can be learned by taking an introductory class in instrument repair. Classes are often available at local universities and community colleges. If there is no school offering a class, check with one of the local music stores. Music stores quite often offer mini-seminars in instrument repair geared for band directors.

Whether or not a class is available, you should get a repair manual and study it. One of the most thorough manuals and my personal favorite is the *Band Instrument Repair Manual* by Erick D. Brand. A more simplified, but also fine publication, is the *Practical band Instrument Repair Manual* by Layton H. Tiede.

Studying a repair manual will give you a general concept of how the horn works, but it does not substitute for a hands-on examination of the instrument. With a properly adjusted horn you should visually study the mechanics of



PHOTO 1

Precision Swivel Screwdrivers (from L-R) Ferree's large and medium "bench" screwdrivers, pin vise style swivel handle with large and small screwdriver attachments, small and medium micro jeweler screwdrivers, Wiha's small and medium swivel screw drivers.

that instrument to make an impression in your own mind on how things should be. Operate each key and notice what other keys move or are affected. Make note of where there are corks or felts, as well as their size and thickness. Determine the function of the material. Corks or felts suppress noise, adjust key height, make a connection to another key, or do a combination of the three things. Keep in mind the saxophone is a complex instrument and an adjustment or change in one cork or felt can affect several other key functions. It only takes one-thousandths of an inch too much or too little to make your horn worse than it was before you tried to repair it.

THE TOOLS YOU WILL NEED

- swivel screwdriver (with 2 straight blades)

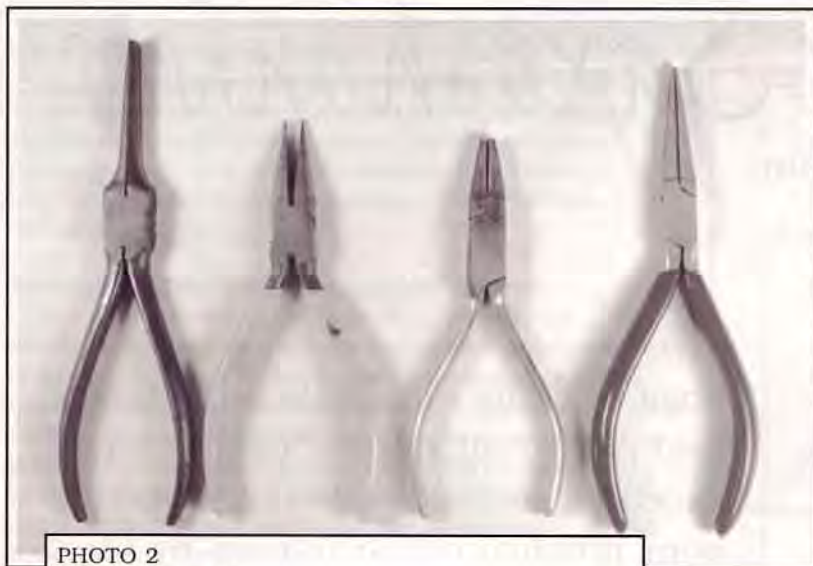


PHOTO 2

Pliers (from L-R)

Duckbill pliers without teeth, needle nose pliers with teeth, precision brass-lined needle nose flat pliers without teeth, precision extended needle nose without teeth.

- pair of pliers
- spring hook
- pad slick
- pin oiler
- razor knife
- small pen flashlight with string attached
- sewing needles

Selecting a tool is a very personal thing. It of course has to be the correct tool for the job, but it also must fit your hand properly. While I would love to have my complete shop with me on the road, I am always concerned about size and weight when it comes time to travel. Therefore, any repair kit will be a compromise on the size and number of tools you can include.

As I mentioned earlier, it is not necessary to spend a lot of money on the tools, but it is important that a good quality tool in the proper size is selected. Except for a couple specialized tools that I have indicated, most of the tools and supplies can be found at your local hardware store, hobby store, or even a general department store.

A GOOD SCREWDRIVER

A good screwdriver is really important. Most saxophones only need a straight blade, but there are usually two sizes of blades needed for each saxophone; one for the pivot screws and one for rod screws. Each kind of saxophone (soprano, alto, tenor, or baritone) also require slightly different size screwdrivers, so you should measure and pick a screwdriver with a blade size that is just slightly smaller than the width of the screws, and with a handle that is large enough to allow you to remove a stuck screw. A word of caution here, what are typically sold as "jeweler" screwdrivers usually have a blade that is too small, and more importantly too small of a swivel and grip to get torque on a stuck screw. They are designed for jewelry and watches. Photo 1 shows several possible screwdrivers and grips, good, and bad. The

larger grip and swivel on the *Ferree's* custom pin vise handle gives superior control and torque tough screws. The small micro screw drives are really designed for very light work and not preferred for repairing instruments. The *Wiha* screwdrivers have excellent steel in the blade and although plastic are very comfortable and functional.

THE PLIERS

The next important tool is the pliers. There are as many kinds of pliers as there are different screwdrivers. There are duckbill, needle nose, blunt nose, spring loaded-open, spring loaded-closed, cutters, with or without teeth, brass, steel, etc.. For this application I recommend a small, blunt, needle nose pliers with or without teeth. Another word of caution, the teeth in a pair of pliers can provide a grip on a stuck rod or slightly bent octave key, but it can also mar the surface of whatever it is gripping. So in some applications a rag or other protective material will need to be used to protect your saxophone. For this reason I prefer a toothless or smooth pair of pliers, however, it requires a little more skill to use these pliers in certain applications. There are even some pliers that have soft brass inserts in them which protect your horn. Photo 2 shows several different kinds of pliers.

In Part 2 we'll look at assorted razor knives, spring hooks, pad slick, precision oilers, pen lights, sewing needles, basic supplies, pads to include, quick fix substitutes, and what a complete emergency repair kit looks like.

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Note:

Gunnar is a master repair technician, having apprenticed with the flute maker, John R. Kilpatrick for over 5 years, and has worked professionally as a instrument repair technician and mouthpiece re-facer since 1980.

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The Essential Tools & Supplies For Emergency Repairs (Part 2)



In part 1 (March/April 2005 *Saxophone Journal*) we looked at what to avoid, understanding the mechanics of a saxophone, tools you need, good screwdrivers, and pliers.

In Part 2 (this issue) we'll look at assorted razor knives, spring hooks, pad slick, precision oilers, pen lights, sewing needles, basic supplies, pads to include, quick fix substitutes, and what a complete emergency repair kit looks like.

RAZOR KNIVES

Razor knives (see photo 1) come in many styles, and the best one for your kit is really an individual decision. I prefer something that is of course small, but has a long and narrow blade so that I can reach under keys and in small places. My only hard and fast rule is that there must be some way to close or cover the blade when not in use. Another caution is in order here, and that is to renew or sharpen the blade often. A dull knife causes more injuries than a sharp one.

SPRING HOOK AND PAD SLICK

A spring hook and pad slick (see photo 4) are specific to instrument repair and will need to be purchased through an instrument repair supply company. Without going into too much detail, the function of the spring hook is exactly what it sounds like. It is used to engage or disengage the springs on the saxophone.

A pad slick is used to help "nudge" a leaky pad into place. (I will let you read the manual or take the class before I explain that any further). These items (as well as the other tools and supplies) can be purchased through the *Ferree's Tool Company Inc.*, (www.ferreestools.com). Not only will they have these tools you may choose to get your other tools from them. They make very good quality tools at a reasonable price.

PRECISION OILER

The pin or precision oiler (also Photo 4) may also have to be purchased through an instrument supply company, but can quite often usually be found in hobby stores. The oiler is obviously used to lubricate your instrument. The pin oiler is unique because of its small size, and the precision point which allows you to apply just a tiny drop of oil in tight places.

A PEN FLASHLIGHT

A pen flashlight functions nicely as an emergency leak light. It is not as handy a long fluorescent light or a flexible light chain, but it takes care of the job in a pinch. If you are interested in the other lights, you can purchase a portable leak light from *Ferree's* as well as other suppliers,



PHOTO 1

Razor Knives (from L-R)

Traditional X-acto knives with small and larger handle and blade covers, folding razor knife with extra long blade, 2 Retractable/disposable razor knives.

but it is costly and I have found for this kind of application a small personal flashlight that focuses like the *Solitaire Mag* light (see photo 2) works just fine as a leak light as long as you have a string attached to it that is long enough to reach through your horn. It takes little or no room, it works anywhere because it is battery powered.

SEWING NEEDLES

The sewing needles are used to prick a pad or hold a piece of cork while you glue it in place. They are generally used as a less clumsy extension of your hand. They allow you to maneuver within the inner areas of the saxophone mechanism.

SUPPLIES (see photo 4)

- one tube of quick dry glue (gel form)
- 3 in 1 household oil
- ¼ sheet #400 grit wet/dry sandpaper
- ¼ sheet #220 grit wet/dry sandpaper
- ½ #000 Steel Wool
- two inch vinyl tubing
- one inch small square of leather
- one inch squares of various thickness of sheet cork
- tape
- pipe cleaners
- paper clips



PHOTO 2

A complete emergency repair Kit (from L-R)
TOP ROW

Wet dry sandpaper, sheet cork, tape, leather squares, baggies and steel wool, rubber bands, vinyl tubing, pipe cleaners

LOWER ROW

Sax pads in baggie, paper clips, pad slick, spring hook, folding razor knife, pliers, swivel screwdriver, extra screwdriver blade, pin oiler, quick dry glue, sewing needles.

- rubber bands
- pads (see below)

The reasons for having some of the supplies are obvious. The sheet cork, leather, and pads are used to replace what is on already on the instrument. Two or three squares of sheet cork, and leather in varying thicknesses (including enough to do a neck cork), provides you with replacement cork for anything that might fall off the horn. The specific thickness of each sheet (usually in thousands of an inch) needs to be determined by what is already installed on the horn.

PADS TO INCLUDE

The size and number of pads to include is difficult to determine. You really only need the pads that most commonly fail, and are not complex installations (pads that need to seal in combination with other pads). The critical pads are typically the smallest pads toward the top of the horn; the octave keys and palm key pads. These fail more often because they are closed at all times and the pad is constantly being pressed into the tone hole. This is also why I am not a big fan of the horn clamps that have not been adjusted by a qualified repair technician, but that is another story. These pads are also critical because they are at the top of the horn, and a leak there affects the entire rest of the horn. Other large pads can usually be temporarily patched, and if you needed to replace it would

require some more extensive adjustment to other corks and pads.

QUICK FIX SUBSTITUTES

Other supplies are used as substitutes or a way to quickly fix a problem. For instance paper clips can substitute for a lost pivot screw and rubber bands for a broken spring. You will be surprised how many uses you may find for a rubber band or paper clip. The pipe cleaners can clean out a clogged octave key or lock down a noisy or broken key guard. The vinyl tubing should be the size of the tubing used on the octave key and possibly the low C# or front F key. In a pinch, tape (scotch or masking) can be used in a variety of ways to make the horn work. It can hold a broken neck cork in place, or even cover a broken pad. A caution is in order here, tape left on a lacquered part of a horn for very long mars the surface when removed.

Quick drying glue, in gel form, takes the place of all the glue types normally used in instrument repair (Shellac and Silicone pad cement, contact cement, etc.). Please remember the repairs you do are a 'patch repair' not the real thing. The point is to get the horn working, and your repair is not intended as a permanent fix. Therefore, while it would be nice to carry several appropriate glues, the quick drying glue (in gel form only) works for all applications. Another caution, quick drying glue is just that. There is not much room for error when using quick drying glue so don't apply the glue until you are sure exactly what and where you need the glue. Avoid getting the glue on lacquered surfaces and especially on yourself. Fingernail polish remover or acetone is required to remove it, and you left that back at home.

The household 3 in 1 or sewing machine oil is obviously for the pin oiler. The sandpaper is used to make adjustments to corks and felts, and the steel wool can remove rust from a rusty screw so it won't bind, among other uses.

OTHER STUFF

- one soft-shell container
- small zipper baggies

Any soft-shell container that can be sealed, and fit the tools and supplies will serve nicely as a tool bad. Small containers from the size of mouthpiece up to a notebook size can be found in the discount bins at offices supply businesses or leather goods, even regular department stores. Zipper baggies can be used to organize the supplies and keep any glue or oil leak confined. Photo 4 shows the complete kit that fits in the 4" by 7" Bag shown in the photo.

MORE EXTENSIVE REPAIR KITS

If you will not be able to get to a repair technician for a long period of time, you may want to make the kit a little more extensive by adding:

- portable butane burner
- tiny soft brass hammer
- a set micro files
- more extensive leak light (electric or battery operated)
- clear finger nail polish
- stick shellac (or other 'proper' pad glue)
- container of pad treatment
- larger selection of pads
- various springs
- 2-3 pivot screws (that fit your horn)

OTHER REPAIR KITS

If you are interested in a more extensive repair kit, there are several manufacturers that assemble the kits for you. Ferree's Tools Inc., (www.ferreestools.com), one of the largest and finest instrument repair supply and tool manufacturers in the world, has a variety of repair kits starting at \$115. These kits include the tools and supplies to fix both brass and woodwind instruments, and are geared toward a band director or general repair technician. Music Medic (www.Musicmedic.com) has smaller repair kits specialized for specific instruments from around \$80.

CONCLUSION

You should be able to assemble your own kit for less, but you need to do the leg work. Whether you assemble your own or buy an existing kit remember, it is not going

to do you any good until you learn how the horn is supposed to function. And by the way, if you fly with your horns as a carry on, don't forget to pack the repair kit in your checked baggage. If you forget, it will be confiscated when you go through airport security.

Good luck!

Note:

Gunnar is a master repair technician, having apprenticed with the flute maker, John R. Kilpatrick for over 5 years, and has worked professional as a instrument repair technician and mouthpiece refacer since 1980.



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