

This book is dedicated to Dixie and Roland (Buddy) Huthmaker

They spent their lives in the orchestra classroom....between the two of them, they taught for over 60 years.

Countless schools, thousands of students, and an unbelievable number of concerts.....

Needless to say, they loved music education with their whole hearts.

When they retired, their dream was to create a teacher-focused violin shop, where they could give back to their colleagues. This book was part of that. They wrote it together years ago and handed out copies to every teacher they met. We found a box of them in the back of the closet at the shop and knew that we needed to pay their kindness forward.

It is our hope that you learn from it and use it to save some of your repair budget so that you can give the gift of music to even more students.

Anna and Charles Huthmaker



Do I use bubble gum or duct tape?



Uncovering the Myths of String Instrument Repair

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String Instrument Repair

PRACTICAL
TIPS.
REAL
SOLUTIONS.
HAPPIER
INSTRUMENTS.



STRONGER
PLAYERS
BRIGHTER
MUSIC
♡

FIX
LEARN
PLAY
REPEAT
♡

A Repair Guide
for String Players/Teachers

By:

R.T. Huthmaker
Dixie Huthmaker

CARE
KNOWLEDGE
CONFIDENCE

INSTRUMENTS
PEOPLE
COMMUNITY

Luthier

Myth: The term 'luthier' means violinmaker.

This term can mean anyone who makes, repairs or restores string instruments.

It is used for lutes, guitars, mandolins, etc. But for our purposes, it is talking about violins, violas, 'celli and double basses.

The mystery and beauty of a string instrument begin when the maker first chooses the best wood for their project and begins to carve.

Balance.... Precise measurements.....Special tools.....Curves.....

Mathematical relationships.....

The exact placement of each part of the instrument. The goal is to create an instrument that not only looks beautiful but has a beautiful sound.

So how can a musician keep their instrument as beautiful as the day it left the maker's bench? How do they keep their instruments adjusted, repaired and sounding their very best?

While much work on the instrument must be done by an expert, there are many things that a teacher or player could do to assess repairs and do some of the work yourself. This guide is designed to help string players do just that.

So let's get started.....



The Pegs-Slipping/ Not Holding

Pegs on violins, violas and 'celli are, for the most part, tension pegs, also known as pressure-fit pegs. The luthier shaves the peg to match the exact taper used when reaming the peg holes in the peg box. The result is the peg fits into the hole, touching on all the surfaces. The taper is what makes the peg hold when it is turned and pushed in at the same time.

This taper has been used for hundreds of years and works *most* of the time... but what do you do when the Peg slips and/or won't hold. Here are several issues that cause pegs to fail....

1. First things first, check the placement of the string hole in the peg. Is it visible? Or has it disappeared into the peg box? As wood ages, it shrinks. Also, with cold and/or dry weather, wood shrinks. As the peg is pushed further into the peg box, the string hole goes into the far wall of the peg box. This keeps the peg from pushing in far enough and the peg will 'pop' out and not hold. .

Solution: You can take it to your luthier and have a new hole drilled in the peg.

But if you have a Dremel tool, or small drill, you can drill the hole yourself. Put a small drill bit (1/16 for violin, 3/32 for cello) in the Dremel tool. Using a pencil, draw a new hole on the shank (approximately halfway between the walls of the pegbox) and drill it through. Make sure the peg is on a surface that the drill can also go into (like a wooden block) to prevent splintering. Then, use a small rat tail file to soften the rim of the hole.

Pro Tip- use a pencil to 'lubricate' the new hole so that the string will slide smoothly on it.

2. In a more serious situation, you could have a crack in the peg box. Always check the peg box carefully for possible cracks and do not force a peg into a hole that has a crack in it. You could split the peg box and/or break off the scroll.

Solution: Take the instrument to the luthier repair shop for evaluation. The peg hole(s) may have to be bushed or the peg box cheeked. This is a job that should only be performed by an experienced luthier.

3. What time of the year is it? Winter? Abrupt changes in temperature plus the dryness from heated air—will cause the pegs to slip. The ebony shrinks with the cold and sometimes will completely release all the sudden. We joke at the violin shop that on a cold day, you can sit in the middle of the store and hear the pegs spin out.

Solution: Clean the peg with 0000 steel wool and apply a ribbon of peg dope to the area of the shank which is inside the walls of the peg box. To distribute the peg dope, turn the peg several times until you hear a 'click,' which signals a good grip. Wipe off excess with a paper towel.

4. How well do the pegs fit? As the wood ages, the circular peg hole becomes oval-shaped. When the peg no longer fits the hole, it will not hold. You'll know that this is the issue if, when you try to tune your instrument, the peg sticks in several places and won't smoothly turn. If you struggle to get it in tune because the peg won't stop and hold exactly where it needs to, this is why. It is grabbing and releasing, grabbing and releasing, because it is no longer round.

Solution: Take the instrument to the luthier. The holes in the peg box need to be reamed out and made round again, and you may also need the pegs rounded out as well, or you may need new pegs.

5. Pegs are hard to turn or frozen.

Solution: Use peg lube or peg dope on the peg.

Follow the directions in question #3. In an emergency (on stage before a concert): use graphite, i.e. a pencil. Take the peg out of the instrument, wipe it off with a paper towel to remove any old peg dope, and draw on the peg in the area that is in the wall of the peg box. In other words, when you put the peg back in, you should not be able to see it. Then, after the concert, clean the peg with steel wool and apply peg dope.

For frozen pegs, take the instrument to the luthier. Be careful trying to get them unstuck. You can easily break the peg off in the peg box and then you have a whole new problem!

6. Pegs which are not made from ebony or other traditional woods may not hold because of the poor quality of the wood. You will often see this with 'internet' violins, or what we lovingly call a V.S.O. (violin-shaped object). They will often have pegs that are made of balsa wood, or some other soft wood and painted black.

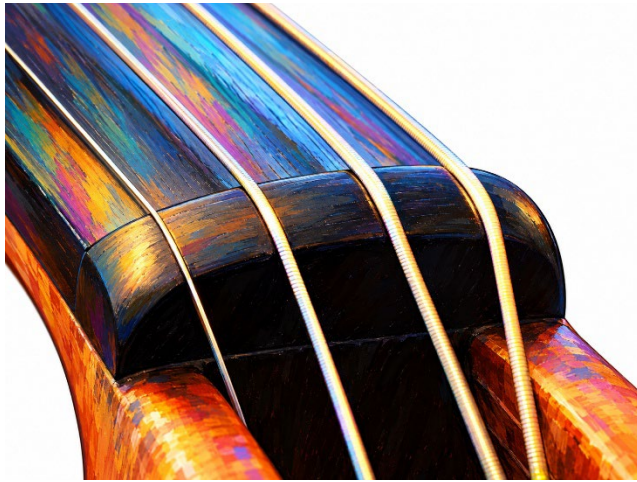
Myth: Chalk or pencil (graphite) will make pegs hold.

Never use chalk on pegs to get them to hold. The chalk will work for a couple of tunings, then it glazes and makes the pegs slip even more. Only in the case of emergency (minutes before a concert) should you use chalk, and even then, graphite is a better choice. With either, make sure that after the concert, clean and lubricate the peg.

Finally, be very careful when using peg dope. This is kind of a 'Goldilocks' situation. Too little won't work, and too much will

make the pegs slip. It may take some experimentation at first but after you have done a few pegs you'll start to learn by feel what the right amount is.





The Nut

The nut is a small piece of ebony at the very top of the fingerboard. Many people assume that it is part of the fingerboard, but the nut is a separate piece. And for such a simple little piece of wood, it can cause a whole lot of problems.

If you are having strings break frequently, or strings buzzing against the fingerboard, it could be the nut.

You will want to start by being sure that the string grooves are evenly spaced. For correct measurements, use the Stobel Handbook (see Toolbox). The depth of the groove should be half the diameter of the string.

Pro Tip: Each time you put strings on an instrument, use a pencil to lubricate the grooves of the nut with graphite. Your strings will last longer!

1. Problem: If the groove is too shallow, the string can come out of the groove, losing stability.

Solution: A rat-tail file will deepen the groove easily. Be cautious when filing. Do a small amount at a time and measure frequently. Remember, it is easy to take wood away, but you can't put it back.

2. Problem: If the groove is too deep, the string loses its vibrating power and may cause a buzz. A deep groove also pinches the string and shortens the life of the string. And if that deep groove has sharp corners, it may cut the string.

Solution: For a temporary repair, a mixture of ebony powder and superglue will fill the groove. Re-file when the mixture is sufficiently hardened. (To make ebony powder: use an old ebony peg and a Handy file.) Have a luthier fit a new nut as soon as possible.

Pro Tip: WEAR A MASK! Ebony dust can be quite bad for you. It acts like asbestos in the lungs and is considered carcinogenic. All wood dust is carcinogenic, so a smart luthier keeps a mask on hand for handling the dust that comes from so much of this work.

3. Problem: The nut has come unglued from the neck.

Solution: Use hide glue to re-glue the nut. Take off the old glue both on the nut and neck with some warm water. Apply a small ribbon of hide glue to the back of the nut. Making sure the nut is aligned with the neck and the fingerboard, clamp and allow it to dry.

Do not use white glue or superglue.

Those glues will attach the nut permanently. Removal may result in splitting the wood.

Note- Hide glue is the glue that is used in 99% of the work that luthiers do. It is an animal-based glue, and it is meant to give way if too much pressure is put on whatever it is gluing.

Think about it this way: if your instrument is exposed to some extreme temperature and the wood starts swelling or shrinking, you want the seams to give way. You do not want the wood to split! Hide glue allows that to happen.

It is also used so that the top can easily be taken off the violin without doing any damage to it. A luthier will normally use hide glue in the form of granules and a glue pot. For this job you can use the hide glue that you would buy at a hardware store.



The Fingerboard

The fingerboard of most violins is made of ebony. This wood is so hard that it can take the stresses of string pressure, fingernails, and making music for years. However, sooner or later all of that use will eventually take a toll on it. An unevenly worn fingerboard will impact intonation and tone quality, as well as make playing more challenging.

And it is not only use that can create fingerboard difficulties.

The surface of the fingerboard (lengthwise) should be slightly concave (scooped) to avoid string “buzzing.” If the scoop is not correct, it can cause all kinds of problems. Have you ever played an instrument that has impossibly high strings, but the string still buzzes against the fingerboard? That is a scoop issue. And remember those V.S.O. instruments we mentioned earlier? These are famous for having a convex or flat fingerboard which makes it impossible to have correct string clearance between the bridge and fingerboard.

1. Problem: When you have a fingered note which buzzes, you will need a luthier to check the "scoop" of the fingerboard. Remember that mathematical relationships between the height of the bridge, the angle of the strings, and the surface of the fingerboard must be accurate for the instrument to play well.

Solution: Take the instrument to the luthier.

2. Problem: The fingerboard has become unglued. Again, the fingerboard is glued on with a water-based, hide glue. And, sometimes, if an instrument is dropped, the fingerboard may 'pop' off.

We have an oft-repeated family story in which my brother was playing a gig on our father's Italian (very expensive) violin. The fingerboard came off at the dress rehearsal and, in a panic, he called dad. Dad told him to find some electrical tape and tape it on for the concert, and that afterwards he would fix it. He did just that and everything worked out fine. As they say, the show must go on, right?

Solution: Loosen the strings and take luthier for repairs. Go back and read that last part..... Loosen the strings. Without a fingerboard for stability, a violins neck can warp if the strings are at tension. If you ever have your fingerboard come off, loosening those strings is the very first thing you should do.

If you are tempted to glue it yourself, use a heated, hide glue. Hide glue is made fresh from hide granules and water, and heated will hold better than hide glue in a bottle.

Do not use white glue, superglue, or epoxy because the fingerboard will be attached to the neck forever.

Take off all the old glue on the neck and the underside of the fingerboard. Soaking a wet paper towel and letting it soften the old glue for a while will help. Apply the new glue and clamp the fingerboard in three directions.

(Some sort of padding or counterpart works best to protect the fingerboard and neck from clamp marks. If no counterpart is available, use a thick piece of felt or leather to protect the wood).

Clean off the excess glue and make sure that the fingerboard is perfectly aligned with the sides of the neck. When the glue is dry, take off the clamps and dress the sides of the neck with 0000 steel wool carefully. A warm, damp cloth will help clean up the glue leakage.

A note about finger tapes.... Do not use Scotch tape on an instrument. Scotch tape as finger guides becomes solidified and is extremely difficult to remove from the instrument. Tape or stickers of any type should never be used on the varnished surface of the string instrument.

If you would like to use finger tapes for your students, car pin-striping works best. It is easy to find, inexpensive, and is safe for the fingerboard. AND it comes in all kinds of fun colors!

Pro Tip: To make finger tapes last and keep them in the right place for as long as possible, make sure that the ends overlap on the back of the neck.





The Neck

The neck angle and alignment are best checked by a professional luthier.

1. Problem: The bridge seems very high.

Solution: Check where the heel of the neck fits into the block of the violin. Check the seam where the neck is fitted to the button. If the neck comes unglued, there will be separation between the button and the crook or heel of the neck.

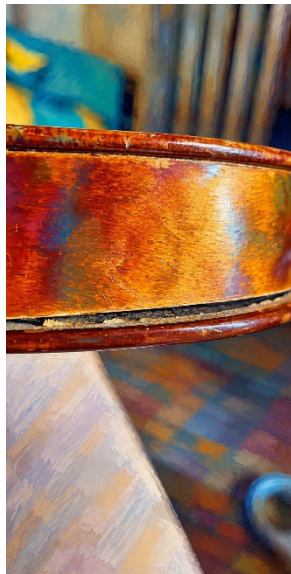
Immediately, loosen all the strings to take the tension off the neck.

Take the instrument to a luthier right away. Do not attempt to glue it yourself.

Instruments which have a neck that is pulled out, need to be repaired quickly as temperature changes may "re-glue" the neck—out of position.

When advising your students: Regluing a neck is not an expensive repair. However, if the button is broken off the back and is still attached to the crook or heel of the neck, this is an expensive repair and reduces the instrument's value significantly.





Seams

As we discussed earlier, the glue used in string instruments is a water-based hide glue. This glue is very susceptible to extremes in moisture, heat, and dryness. When the glue ages, it dries out and the seams will open. Sometimes, when those seams come open, the instrument will sound like it has a “cold”.

Open seams can be found by examining the instrument or tapping for sound measurements.

Any open seams on an instrument should be reglued as soon as possible by a luthier to avoid wood warping. This is especially crucial the larger the open seam. If you find an open seam on the top of the instrument, loosen the strings completely so that the pressure on the opening doesn't cause it to warp the top.

Do not use polish on an open seam (or crack)- the oil will make regluing difficult, if not impossible. An experienced luthier will carefully clean out the old glue, apply fresh glue, clean, clamp, and allow to dry.

The most common open seams appear where the violin or viola touches the player's body: upper right bouts (left hand) and lower left bouts (the neck). The warmth and moisture of the body create the perfect environment for hide glue softening and letting go.

1. Problem: Open seam(s).

Solution: Take the instrument to the luthier.

Using Dampits, Humitrons, or other humidifiers: During the winter months (when the heated air is so dry), musicians sometimes use a humidifying device to keep their instruments from becoming unglued. Please note that too much humidity will weaken the glue. Keep your Dampits damp, not wet, and after you put water in them, wipe the outside thoroughly so there is no chance of dripping happening inside of the instrument.

Myth: The best way to 'test' for an open seam is to slide a piece of paper into the seam.

Some seam openings are small and difficult to see, and definitely too tight for a piece of paper. Let the luthier judge the need for repair.

Myth 2: One of the best ways to see if a seam is open is to tap on it with your knuckle...all open seams will make a hollow sound.

This is also not always true. The larger open seams can make a strangely satisfying 'clunk' when you tap on them, but many times, there is no sound difference between an open seam and a completely glued one.

Myth 3: One of the best ways to tell if a seam (or a crack) is open is to spit on it.

Ewww. Gross. Just don't. The idea is that you can press on the seam (or crack) and see the spit go in and out of it. This is one of those old school things that get passed down from teacher to student. Let's just let this one die out.



Strings

Strings have become a very complicated subject. There are so many choices: steel, gut, perlon, and new variations of braided materials. By experimenting, many musicians are using a combination of these. Every issue of *Strad* or *Strings* seems to advertise a new brand, and you could spend all your time (and money!) trying them all! But they are a wonderful tool for getting different timbres and sound profiles out of your instrument.

String Care Basics

1. Keep the nut and bridge grooves lubricated with graphite (pencil lead) so that the strings move across them without tearing the wrapping.
2. Keep the strings clean. Rosin build up can keep the strings from vibrating properly.
3. When installing new strings on an instrument, tighten the strings to bring to pitch **slowly**.
4. Keep fingernails short.

Problem: If you or your student has a string which breaks prematurely, note where the string is breaking. In fact, at the violin shop, if a musician says they have broken several strings in a row, we will usually ask if they kept one of the broken strings..... that can help us find out the cause.

So, if the string breaks:

At the peg? The string hole may be cutting the string. This can be fixed by removing the peg, using your small rat tail file and smoothing out the edges of the string hole. Apply some graphite and you will be good to go.

At the nut? Check for sharp edges or pinching in the string groove. This can be fixed by removing the string, using your small rat tail file and lightly smoothing out the string groove on the nut. Apply some graphite and you will be good to go. (Are you noticing a pattern here?)

At the fine tuner? Check the tuner for sharp edges. Yep...you guessed right.... Take your small rat tail file and file the edges of the fine tuner where the string loop or ball touches it. There are often burrs, or sharp edges on the tuner and they can cause breakage.

At the bridge? Check the bridges for sharp areas and use bridge protectors (especially on the E string groove). And of course, this can be fixed by removing the string, using your small rat tail file and lightly smoothing out the string groove on the bridge. Apply some graphite and you will be good to go. Note- do not file too deeply into the bridge or you will create a new problem. If a string has cut down too far into the bridge, it will cause breakage as well.

The age of gut and perlon strings can also cause breakage.

Did you know that gut and perlon strings (such as Dominants, Corellis, Obligato, etc.) are constructed to be used without fine tuners- both for correct length (vibration ratios) and for the longevity of the string. The string center is soft, and fine tuners cut the string. Some tuners, such as the stable model, will work- sometimes. And some of the Whitner type tailpieces will work with perlon strings. Just remember that metal tailpieces do not enhance the sound quality. Finally, you can purchase fine tuners with a wide slot, and they might work with some perlon strings.

Myth: You can clean your strings with steel wool.

No. This will tear the wrappings and greatly shorten the life of your strings.

Myth: It is safe to clean your strings with alcohol.

Technically it is safe to clean your strings with alcohol. However, if any drips on the varnish of your instrument, it could do lasting and expensive damage.

If you insist on doing this, we recommend that you use the little alcohol squares that doctors use when they give you a shot. You can buy them at any drugstore. When you take it out of the wrapper, squeeze any excess alcohol off at all and then use your rosin cloth to cover the top of your instrument beneath your strings. This is the safest way to use alcohol.

Pro Tip: Many strings on the market today are counterfeit. When you buy your strings make sure to go to a reputable place. If the price is too good to be true, there is a reason.



Winding Strings on Peg

As illustrated in the graphic below, always wind the string from the string hole to the pegbox in an even row. You should wind in the direction toward the decorative end of the peg (or your hand). Winding to the pegbox helps the peg hold. Avoid bunching up the windings next to the pegbox and avoid wrapping the string on top of itself as much as possible. There is very little extra space in the peg box and wrapping the string on top of itself can cause it to bind the peg and make it very difficult to turn.





The Bridge

The bridge is critical to the sound of the instrument. The height, thickness and arching (curvature) are basic to both ease of playing and tone production. Bridges must be cut (by hand) to fit the top of the instrument and the angle of the fingerboard.

The hardness of the bridge wood is an important factor in both sound production and the life of the bridge. Cheap bridges are made from soft wood and are usually found on inexpensive instruments. These bridges will warp quickly and string grooves become deeper as the instrument is tuned.

Generally speaking, you will find that the amount of wood (thickness) left on the bridge is in relationship to the quality of the instrument. For example, the bridge on a student instrument is thicker than for a handmade instrument. This serves students well since the less wood in a bridge, the more delicate it is. However, you will also find that there is a direct correlation between the amount of wood in a bridge and the sound quality of an instrument. The less wood, the better the sound.

Bridge carving is something that luthiers spend years and years perfecting and the very best bridges can cost hundreds, if not thousands, of dollars. For a fun educational trip down a rabbit hole, visit <https://violinbridges.co.uk/> to see the International Violin Bridge Competition. They are so beautiful!

Bridge Basics:

Teachers should “eyeball” student’s bridges for leaning or warping. When you are tuning your students’ instruments, a quick glance from the side will show you if it is not straight. Bridges which are kept straight should not warp or fall. Eyeballing the bridge and straightening it as soon as you see it lean can help a bridge to last for years.

Periodically check the string grooves in the top of the bridge. Only half of the string should sit in the groove. Strings which have cut into the wood will not vibrate properly and can also break prematurely.

String grooves should be lubricated with graphite (use a pencil) so the string will move across the bridge easily.

When you look at a bridge from the side, you will notice that one side is flat. This is what we consider the ‘back’ of the bridge, and that is what faces the tailpiece. This is the side of the bridge that should be 90 degrees with the top of the violin. The other side has a curve carved into it and can cause an optical illusion, making it look like it is leaning, so you want to focus on the back side



1. **Problem:** Leaning bridges

Solution: Loosen strings slightly. Protecting both sides of the bridge with your fingers (to keep the bridge from falling or breaking) carefully straighten the bridge and reposition it in relation to the f-hole notches and the fingerboard. Check the Stroebe book for correct measurements.

2. **Problem:** Warped bridges

Solution: Make what we fondly refer to as “Bridge Soup”.

Put about 3-4 inches of water in a pan and bring to a boil.

Place the instrument on its back on a soft surface (a towel or cloth), loosen the strings and remove the bridge.

Note: If you don’t have a bridge jack, put a piece of cardboard or layers of cloth under the tailpiece to protect the instrument top. Leave the instrument on its back to keep the soundpost from falling. (If the soundpost falls, that might indicate that it is too short and needs replacing.)

Drop the bridge into boiling water for a minute or two. Check to see if the bridge straightened out. If not, boil for another minute.

Place something heavy on the bridge and allow it bridge to dry overnight before putting back on the instrument.

When retightening strings on an instrument, tighten each string slightly, checking the straightness of the bridge. Repeat until the string has reached the correct pitch. Constantly check the straightness of the bridge while tightening the strings.

Bridges can only be straightened once or twice before you must replace them.

3. **Problem:** Broken bridge

Solution: In an emergency you can, sometimes, reglue the bridge. Make sure you have plenty of wood surface to glue. Practice putting the bridge together without the glue so that you have the correct sides ready. Use a cyanoacrylate glue (aka Super glue) on the break and put the pieces together. Hold tightly for a minute or so. Be careful not to glue yourself to the bridge!





The Soundpost

Soundposts are extremely important for tone production. An experienced luthier will use a quality spruce for the post, cutting it so that all surfaces of both ends are in contact with the top and back of the instrument. Proper placement inside of the instrument is also extremely important for sound.

If you are interested in the exact measurements, you can use the Strobel handbook (see Toolbox) to study.

Because spruce shrinks with age, you should replace soundposts every few years.

Learning to set a soundpost is easy if you practice, use the correct tool, and have a well-fitted post. Sadly, this isn't always the case but trust us when we say that learning to put up soundposts in your classroom can be a big money and time savings.

Be aware of the angle of the ends of the post in relation to the angles of the top and back of the instrument.

All surfaces of the ends of the post must be in contact with the top and back of the instrument. Without strings on the instrument, the soundpost should be slightly snug.

When stabbing the sound post with the tool, place the soundpost on a block or table. It is very easy to stab yourself if you aren't careful.

Cautions:

Do not damage the f-holes while putting in a post. Use your fingers or a soft piece of leather to protect the wood from the metal of the soundpost setter.

Never force a post into position. You might split the top or back of the instrument.

1. Problem: Soundpost will not stay up.

Solution: Post is too short. Have a luthier cut a new post.

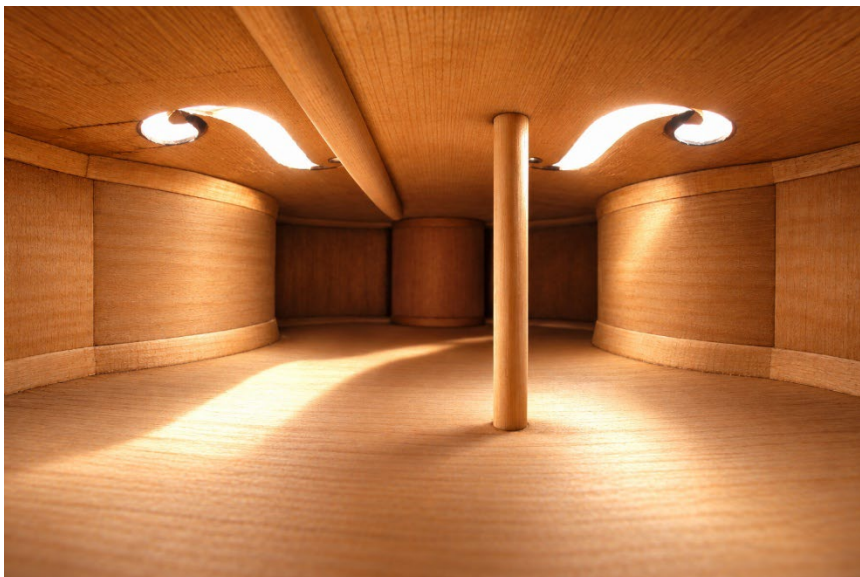
2. Problem: Soundpost cannot be placed behind the bridge foot.

Solution: Soundpost is too long. Have a luthier trim the post.

3. Problem: Soundpost turns while being put into position.

Solution: Ends of soundpost are incorrectly angled. Have a luthier make a new post.

A soundpost crack in the top and/or back of an instrument is very serious damage. The repair for this is both extensive and expensive. For a student instrument, the repair costs more than the value of the instrument usually. A repaired soundpost crack devalues the instrument significantly; a back soundpost repair more so than a top soundpost repair.





The Tailpiece

The position of the tailpiece and the length of the tailgut are very important for tone quality. There is a whole science to the precise measurements as to the center of the instrument and the distance of the tailpiece from the bridge, and careful attention to that can make an instrument sound its best. This type of adjustment, along with a correctly fitted and positioned bridge and soundpost is done by an experienced luthier.

But you can help your students with replacement if they have one break in class.

1. Problem: Crack in the tailpiece

Solution: New tailpiece. Tailpieces cannot be repaired by gluing.

Tailpieces should be made from the following woods: ebony, snakewood, or rosewood. A quality ebony is preferred for tonal properties. Boxwood is sometimes used for decorative purposes but not as strong as ebony.

Like our previous discussion about fingerboards, the fittings for cheap instruments are often made from a “mystery” wood which is stained or painted black to look like ebony.

Tailguts: Replacing a tailgut is fairly easy with the Sacconi-type tailguts. Simply unscrew one of the ‘locks’ on one end of the tailgut and thread it through the holes in the tailpiece. Put the tailpiece/tailgut on the instrument (without the strings) to estimate the correct length, using the measurements from the Strobel handbook. Final measurement must be made with the strings at

correct pitch. You can buy tailguts from any number of online outlets, and we have listed a few of our favorite at the end of this book.

The End Button

Endbuttons should be made from ebony for best tonal production and strength. Rosewood, boxwood and snake wood may also be used. Endbuttons must be fitted correctly by an experienced luthier.

The Endpin

Endpin units on 'celli and string basses should be installed by an experienced luthier.

- 1. Problem:** An endpin unit which is slightly loose in the hold. It often looks like these are slipping out of the bottom of the instrument.

Solution: It can be 'repaired' by putting a layer of sandpaper around the shank of the endpin housing. This will often keep a school instrument in commission for quite a while.

The proper repair would be to re-bush the lower block, and this must be done by an experienced luthier

- 2. Problem:** Bent endpins.

Solution: Put the endpin in a vise and bend it straight. Or have your luthier replace the endpin. Sometimes the rod can be removed and replaced by itself. Often luthiers will have rods from old broken endpins that can be put back to use in a different instrument.

- 3. Problem:** Stripped endpin screw.

Solution: First, you must ascertain whether the screw itself has stripped (the threads on the screw are worn down), or the inside of the screw hole has been stripped.

If it is the screw itself, ask your favorite luthier if they have any old screws that you can try. Not all end pin screws are the same gauge but if you can find one that fits, you can get more life out of that end pin.

If it is the inside of the end pin itself that is stripped. It's time for a new end pin. That's a job for an experienced luthier.

The Bass Bar

Bass bars are rarely a problem in a string instrument. If your instrument does have a bass bar which has become loose: watch for drastic changes in tone (with no apparent reason, i.e. no open seams) of the left side of the top begins to sink.

This is most common on school basses.

Cleaning and Polishing an Instrument

The truth is, if your students will wipe off the rosin after they're done playing every day, their instruments will look beautiful for years. You can get a gentle violin polish from your luthier if you want to remove fingerprints. But other than that, there is nothing that you should be using on the body of the instrument itself.

Once rosin gets hardened onto an instrument, Luthiers can use a variety of 'potions' to clean instruments. However, most of these solvents are special formulas which must be used by an expert.

Please do not advise students to use denatured alcohol. It should be used by a professional luthier only.

Pro Tip: Goo Gone (found in grocery and hardware stores) is great for removing finger tape residue and the caked-on bass rosin that accumulates on the top of a string bass. Use it outside to disperse the fumes.





Bows and Bow hair

While often overlooked due to its simplicity and size, the bow is every bit as important as the instrument. Maintaining bows in good condition will go a long way to making a student's experience positive.

Problem: Loose grip on a fiberglass bow

Solution: Move grip toward the tip of the bow. Wrap one or two layers of masking tape around the stick where the grip should be. Slide the grip back into place. The Grip should be snug. If not, add another layer of tape.

Problem: Separated or twisted hair

Solution: With the frog on the stick, use a fine-toothed comb and, starting at the tip, comb through the hair until the twisted area is visible. Leaving the comb in, use the fingers to separate the hair, carefully remove the frog and flip it back through the hair. You may find two or three twists, but these can be removed with a little patience.

Note: This is the best reason to tell your students to never take the frog off the stick. There is nothing they need to do that necessitates the frog coming off the stick in the classroom.

Problem: Loose/tight eyelet

Solution: Remove the frog from the stick, and using a small pair of pliers, turn the eyelet until the desired height is reached.

Never use the bow screw to turn the eyelet. This results in irreparable damage to the underslide.

Problem: Stripped eyelet

Solution: In an emergency, use a small pair of pliers and turn the eyelet one half turn. Sometimes reversing the direction that the screw enters the eyelet can give you an extra day of use. Then take the bow to your luthier.

Note: There are approximately 4,237,946 different sizes of eyelet, screw, frog mortise and stick mortise on a bow. It can be tempting to try and steal an eyelet from another bow, or buy a bunch of them online, but the chances of them working in your bow are akin to winning the lottery.

Problem: Dirty bow hair

Solution: Wash the hair. Set up two containers of water (large enough to immerse the bow hair easily) – one hot and one cold. In the hot water, put two cups of ammonia. Remove the frog from the bow stick. Holding the frog in one hand and the bow in the other, swish the hair gently in the ammonia water. Then rinse the hair in the cold water. Immediately put the frog back on the stick and hang the bow to dry. When dry, apply new rosin.

How often should I rehair my bow?

Once a year, assuming normal use. For musicians (students and professionals) who play more than an hour a day, more often may be necessary.

If you have a concert, recital or audition, have your bow rehaired four weeks before. This allows enough time for the player to adjust to the new hair and for the rosin to be evenly distributed through the hair.

What are bow bugs?

Bow bugs are cousins to the moth. They appear in instrument cases when the cases have not been opened for a while (like moths in a closet, bow bugs love darkness.) These bugs are tiny and will eat straight across the bow hair, so it looks like it has been cut by scissors.

To treat bow bugs, take the instrument and bow from the case, vacuum the case thoroughly, use a bug spray in the case and set it out in the sun (case open) for several hours. Moth balls also work but they leave a strong smell in the case.

The bow will need to be rehaired by a professional.

If you are going to leave your instrument unused for a period of time, take the bow(s) out, hang them on a nail (in a lighted area.) Bow bugs cannot survive the exposure to sun or light.

Note: They are only there for the rosin. You do not need to worry about them getting into the rest of your home.



Toolbox

We recommend getting a small tool box and keeping all of your luthier supplies together.

1. "0000" steel wool. Find it in a hardware store.
2. Rat-tail file for bridge and nut grooves. Find it in a hardware store.
3. Soundpost setter and soundpost scissors: Check with your luthier or mail order catalog.
4. Soundpost grabber for violin/viola/celli
5. Pencil
6. Small pair of pliers for bow repairs. Find it in a hardware store or a luthier supply place.
7. Bridge Jack(s). Check with your luthier or luthier supply place.
8. Small comb. A flea comb works well, especially a metal one.
9. A bottle of ammonia (lemon-scented)
10. Hide glue and Super glue: from a hardware store or art supply store
11. A tool grabber bass soundposts
12. Dremel Tool or small drill
13. Peg dope
14. Strobel Book of Measurements
15. Electric tape/Painters' tape

For correct measurements:

Useful Measurements for Violin Makers
A Reference for Shop Use (Fourth Edition)

By Henry A. Stroebe

10878 Mill Creek Dr.

Aumsville, OR 97325

www.hnerystroebe.com

Summer Classes in instrument repairs, violin making, bow making and bow rehairing:

Violin Craftmanship Institute (for all levels- great for beginners)

University of New Hampshire

www.learn.UNH.edu/violin

Violin Society of America

Oberlin College, Oberlin, Ohio (these are open to all levels but are quite advanced)

www.vsaweb.org/oberlin-summer-workshops

Luthier Supplies

International Violin – All the luthier tools you can need

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

Metropolitan Music- <https://www.metmusic.com/tools/>

We hope that this guide will help you with instrument maintenance and repair. For more information or questions, please call us or visit our shop.

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