

# String Repairs: Shop

- **Open Seams:** An open seam is simply an opening somewhere between the ribs (the sides) of the instrument and the face and/or back. Open seams are one of the most common repairs and are usually VERY simple and relatively quick repairs when done correctly. Open seams are fixed with melted hide glue, an extremely strong and water-soluble substance that allows for instruments to be easily taken apart and put back together. Hide glue can set in as few as 4 hours, although leaving clamps on for 24 hours is pretty standard. The only time open seams can be a problem is if they've been open a very long time in intemperate conditions that may have caused the wood to warp. Warped wood can be a problem if the plates/ribs no longer fit together well or there's a stress point at the seam wanted to pull itself open again. Still, even a warped open seam is repairable, just may require the face or back of the instrument to be removed and re-glued.
- **Crack in the Face:** Cracks in the face, back, or ribs of a violin can be more serious than an open seam. Like a broken arm, a crack may be an incomplete fracture or a complete break/crack through the wood. Either way, cracks can be delicately filled or glued/clamped back together with special clamps that arch across the top or back of the instrument.
- **Cracked Scrollbox:** Here's a fairly common and frustrating malady. The pegs, which are held in place by friction in the scrollbox/pegbox can put so much pressure on the scrollbox (especially if pushed or forced in too hard), that the wood can crack on the edge of hole the peg fits in. It's a challenging spot to glue because it's such a stress point. If gluing or splinting the scrollbox doesn't hold, the entire neck and scroll may need to be replaced.
- **Loose or Detached Fingerboard:** A very simple fix. Old glue is removed or scraped off and the fingerboard is reset in place with hide glue.
- **Cracked Chinrest:** Depending on the location of the crack, the chinrest can either be glued and sanded so the crack is nearly invisible, or if the crack is around the brackets at a stress point, the chinrest can easily be replaced.
- **Scratches:** Scratches can be buffed out, touched up with a matching varnish color, or filled with wood filler or clear coat. Fine scratches are very easy to buff out with micromesh or pumice/rottenstone polishing powders mixed with paraffin oil on a soft cloth.
- **Chipped Corners/Edges:** If the wood chip or corner isn't lost, it can easily be glued back in place. If the piece is lost, a new piece of wood could be carved or shaped to replace it. If the chip, gouge, or hole is small, wood filler could also be used to fill in the gap. Gouges or chips in ebony surfaced can actually be filled with ebony dust mixed with clear glue, then carved and sanded until level and smooth.
- **Warped Bridges:** Especially in humid conditions, bridges warp over time from the pressure of the strings forcing down on them. Tuning strings over time also pulls the bridge forward (towards your face as you hold it in playing position). It's important to occasionally eyeball your bridge from the side and pull it back to standing perpendicular to the instrument face. Warped bridges can actually be boiled, pressed, flattened, and dried back into shape, but replacing the bridge is usually the simple and affordable fix.
- **Nut with Grooves Too Deep/Wide:** Nuts, the small shaped block of ebony with four string grooves at the top of the fingerboard, are necessary. Sometimes the grooves in the nut get too deep and/or too wide, and strings buzz across them over time. If the strings are too low you may end up with strings buzzing against the fingerboard. This is a quick and easy fix.
- **The soundpost** of your instrument falls down (causing it to rattle around noisily inside your instrument). This can happen for a variety of reasons: the instrument may have been dropped or hit against something jarring; the strings may have lost their tension all at once (note: when changing your strings, be sure to replace just one string at a time); or the instrument may have been exposed to a drastic change in ambient humidity.  
**If your soundpost falls down:** First, loosen all of the strings to take the tension off of the instrument. Bring the instrument to a trusted repair shop where a luthier or qualified repair person can set the post back up. In some cases, a new soundpost may have to be cut.

**The instrument is "buzzing".** Check for: open seams; a loose fingerboard; loose and rattling fine tuners; old, fraying strings; a loose chinrest, or a chinrest which is making contact with the tailpiece; or some combination of these. Check for things which need tightening first: you may be able to correct the problem easily. Bring the instrument to a qualified repair shop if you are unable to solve the buzzing

**A peg is slipping,** causing the string to go out of tune, or is sticking, making tuning very difficult. If a peg keeps slipping or sticking, remove the peg and apply [Hill's Peg Compound](#) to the shiny parts of the removed peg. The product, made especially for pegs, will provide the traction needed for slipping pegs, or the lubricant needed for sticking pegs. Bear in mind that changes in humidity have a significant impact on pegs, causing them to swell or shrink. Players often must push the peg in a bit more firmly on days when the air is dry, or pull out the peg slightly on very humid days. Continued problems with pegs may mean that the pegs no longer fit well in the holes of the peg box. Bring your instrument to a luthier to see whether the pegs need replacing.

**String Replacement:** [https://www.youtube.com/watch?feature=player\\_embedded&v=6Dzg8QuX6Go](https://www.youtube.com/watch?feature=player_embedded&v=6Dzg8QuX6Go)

- Do not remove all strings at once; this could cause the bridge to move out of optimal playing position.
- Remember to wind the X before winding all the way to the edge of the peg box
- Hold the string for tension after placing the tailpiece end of the string so to not unwind the string from the peg box

The most popular strings are the mid-priced synthetic-core strings.

Thomastik Dominates are a great choice for players with lessons

Players often start with the medium gauge or tension of strings (when offered a choice) to see how their instrument responds to the manufacturer's generally balanced tension, before experimenting with different gauges and tensions.

### **Chin rest replacement/ tightening**

- Cheapest tool is a paper clip, however it will only work one or two times
- Using a small screw driver make for eye glasses is a great tool to keep around
- Remember to make equal turns on each leg, going back and forth between the two.
- The chinrest should not be touching anything except the feet of the rest to the body of the instrument (this is a main cause of rattling)

### **Fine Tuners**

Take off old one when it becomes too hard to turn for student (we want our students to be able to turn them, not just us) Keep approx. ten fine tuners per Violin/Viola and Cello on hand.

**The bridge falls.** First, check the top of the instrument to make sure that no cracks have formed. If there is a crack in the top, or in the bridge, or if the bridge is warped, take the instrument to a trusted repair shop for immediate repair. If you don't see any cracks, you may choose to attempt setting it back up yourself.

If your bridge falls: Loosen the strings just a little bit (do not take the tension of all of the strings all the way down, as that may cause the soundpost to fall down--see above). Using two hands bring the bridge slowly back up in to place, with the bridge feet aligned with the f-hole notches. The strings should be centered over the fingerboard. As you tune the strings up to pitch, take care that the top of the bridge is not being pulled forward too much towards the scroll. Gently, with two hands, bring the bridge to a straight position.

## Taking care of the bridge

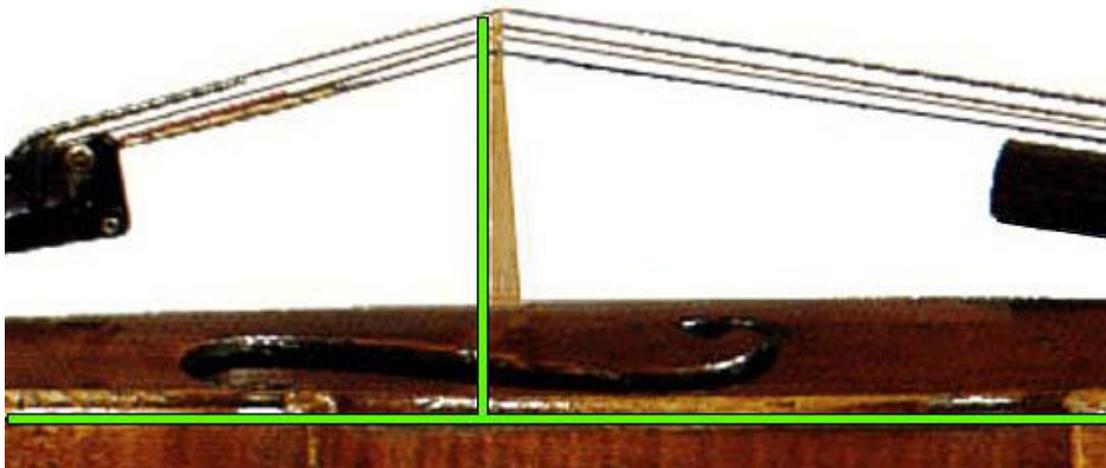
A bridge should always be kept vertical and straight. It is a natural tendency of the bridge to tip forward as strings are tightened during tuning. Once a bridge has become bent through neglect, the cell structure of the wood is crushed and the bridge is permanently damaged. A little bit of regular attention will prevent this damage and the need to replace it. This applies to any bowed string instrument. A well-maintained bridge will last generations.



Here is a bridge that is in serious trouble. Uh-oh! Someone has **not** been paying enough attention!



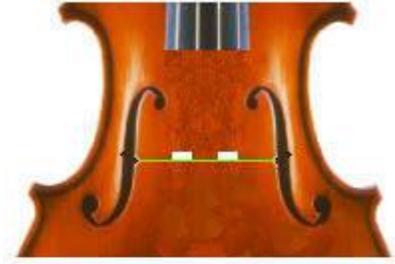
A correctly aligned bridge should have its back face (the one facing the tailpiece) at a 90° angle to the line where the sides meet the face of the instrument. Since the bridge itself is somewhat wedge-shaped, and sits on a curved surface, use its *back* face and that line of the body as references. It will thus seem to lean back just a bit. Here's a close-up:



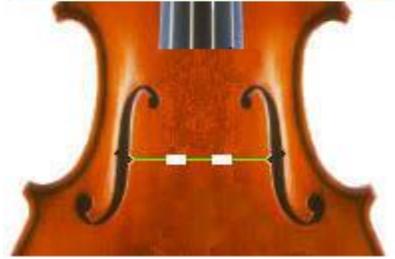
It is essential that the bridge feet make 100% complete contact with the top - and not be tipped on an edge.

The other critical adjustment is the placement of the feet of the bridge. Depending on the instrument's history, this will be in one of two standard places:

1) Ideally, the backs of the bridge feet should rest against an imaginary line drawn between the two inside nicks of the f-holes.



2) Often, a bridge has obviously always rested centered over that imaginary line, as evidenced by existing marks on the top. It is advisable to leave it that way.



Since it is done with strings at full tension, adjusting the foot placement and verticality of a bridge requires some caution and skill. In either case, a side-to-side adjustment must first ensure that the strings are well-centered over the fingerboard. Great care must be taken to not allow the bridge feet to slip suddenly, or to allow the bridge to flop over.

To adjust a violin or viola bridge, the instrument should be placed in the lap, scroll pointed away from you. Grip the base of the bridge firmly between the thumbs and middle fingers of both hands, and adjust the top gently with the index fingers. Ordinarily this involves gently nudging the top of the bridge back toward the tailpiece.

With cellos and basses, the string tension is rather great - though with care the average player can straighten a cello bridge as follows: with the instrument lying safely on a soft surface, grip the top of the bridge with thumb and fingertips at the top, by each string, and tug it back gently but firmly, a little bit by each string, one then another, over and over until the bridge is again vertical. If the feet of the bridge fit properly, they will be snug on the top when the bridge is straight up.

If something doesn't seem right, or you're not certain you can deal with it, get some help. See a competent violin luthier, or ask your teacher for help. Bridges are expensive to replace, so preventive maintenance is a good idea.

## I. Getting started

a. Know some brands of instruments

-Knilling, Lewis, Sherl and Roth, Eastman, Glaesel

-Online stores

Shar Music (<http://www.sharmusic.com/>)

Southwest Strings (<http://www.swstrings.com/>)

b. Remind parents to look for instruments with brand names and serial numbers. Also remind them that price does matter with strings and bows.

## II. Instrument set-up

a. What size instrument?

Have kids move to a full size before their rental contract runs out. The hardest thing is to get a student who has purchased a smaller instrument to move to a full size. Stress that their tone will improve, physically they can injure themselves playing on a too small instrument.

**Violins** - Hand should wrap around the scroll comfortably. Measure from the neck to the palm of hand.

23" and up - 4/4

22-23 - 3/4

**Violas** - Viola sizes refer to the actual length of the instrument's body, in inches. It is important that the student is comfortable holding and playing the viola or physical problems may develop. Measure from the neck to the palm.

27" and up – 16.5 viola

26" -27" – 16" viola

25"-26" – 15.5 viola

24" – 25" – 15 viola

23"-24" – 14 viola (also called intermediate viola)

21"-23" – 12-13 viola (also called junior viola)

**Cellos** - Measure from shoulder socket to tip of middle finger (left arm) or size by height.

24" and up is 4/4, Height - 5 ft and up

22"-23" is 3/4, Height - 4 ½ ft-5 ft.

20"-21" is 1/2. Height - 4 ft to 4 ½ ft.

Even smaller sizes are available.

You can also measure the distance between the tip of the index finger to the tip of the pinky (left hand) 6" and up 4/4, 5"-6" – ¾.

**Bass** - Generally elementary students and 6th graders are on ½ basses, middle school students can handle a 3/4 bass, high school students larger. (Really it is what your school has)

b. Is the instrument in good working order?

**Pegs** - Make sure the pegs can move freely and stay in place. Use peg compound to keep pegs from slipping.

**Bridge** - Check that the bridge isn't bent, and is lined up with the notches of the sound holes. Many times the bridge might not be fitted to the instrument properly and then the strings sit too high above the fingerboard. Bridges are not attached to the body. Don't glue them on no matter how much you want to.

**Body** - Watch where the neck goes into the body for cello and bass. They can come apart. Also watch for cracks.

**Strings** - Even if the string isn't broken, they may need to be replaced. Look for wear or unraveling. E strings need to be replaced the most. Good idea to replace E strings a couple weeks before a concert.

c. Things string players should have or do.

**Shoulder Rests!!** - Violins and viola must have a shoulder rest! No exceptions, do not accept any excuses. So many choices. Look in any catalog. Kun, Zaret, Everest, etc...

**Rock Stops** - Cellos and basses need rock stops. **Xeros strap stops are the best.** Stoppin or Slip- Stop are good for basses

**Rosin** - All rosin is not the same. Get appropriate rosin for the different instruments. (I prefer the dark rosin) Wipe off extra.

### **III. Tuning:**

a. Make sure violin, viola, and cellos all have fine tuners or built in fine tuners. They are cheap and easy to put on. Watch them and unscrew them when they are all the way down. Then tune with the pegs.

c. When a student says they hear a rattling sound, check the fine tuners first. Usually they are loose.

### **IV. Holding the instrument**

*Always stress posture. Sit up straight, both feet on the floor, shoulders relaxed, and head up.*

**Violin/Viola:** Must have a shoulder rest!

-Vampires!!!

-Hold instrument over your head with the scroll in your left hand, lower the instrument onto your left shoulder, place the chin rest under your jaw **left of the center of your chin**, keep instrument level with the floor. (Keep eyes forward- do not allow them to look at the scroll)

#### **Cello**

Adjust the endpin 2 ways:

1. Gently stand on scroll and bring endpin out to your eyes. Gently turn over.

2. Hold the cello in your lap; pull endpin out the width of your fully stretched hand span plus one inch. The scroll should be about chin height when standing.

- Sit on edge of chair, place left hand on the left shoulder of the cello, arms length away. Lean cello back so it rests against the body, mid chest high. The inside of the knees should touch the side of the cello. Fit the cello to the body not the other way around.

-The right foot should be slightly in front of the left foot.

#### **Bass**

Endpin height:

Bridge even with knuckles when arm is at your side. The nut should be at the middle of the forehead.

Holding the bass: Feet shoulder width apart, using left hand hold bass an arm's length away, bring the bass toward you and turn it to a 45-degree angle to your body. The corner of the bass should rest on the left thigh.

### **V. Bow Hold**

Bow holds should be natural, and relaxed. Always begin bow hold on a pencil before the bow. Every method has great pictures of bow holds. There are also many aides you can buy to help form bow holds. You can also make them.

#### **Violin/viola/cello/bass French bow**

Elephant Bow story: *"Three elephants came to a river with a log across it. They put their trunks into the river to drink. They put their trunks in just enough to get to the water and not under the log. There was a little bird that perched on the log next to the elephants (for cellos this is a baby elephant too small to reach the water). Swimming below the log in the river was an alligator. He wants to eat the bird (or baby elephant), but knows if he touches the elephants they will stomp on him. So he bends himself and hides under the log. Then the elephant lean toward the left to relax. Remember elephants are large and wouldn't be touching each other."*

**Bass German bow. (If possible, use the French bow instead- same hold as the cello)**

-Make an “eyeglass” with your right hand thumb and first finger with your palm facing up. Place the screw through the eyeglass, place tip of 2nd and 4th fingers under the bow and let the 3rd finger float in air.

**VI. Producing sound/Problems and solutions**

*All of this should be done on open strings first.*

a. **Begin with Pizzicato!** (plucking) This is so important, bad pizzicato is really bad.

i. Violin/ violas – Right thumb on the corner of the fingerboard, index finger up (Losers), other fingers closed (like they’re hold the bow). Pluck with the fleshy part of finger not the nail.

ii. Cello/bass – Right thumb on side of fingerboard, point index finger toward bridge, close fingers, pluck with side of finger.

b. **Getting started with the bow:**

i. Use toilet paper tube. Violins/ Violas over the shoulder; cello/Basses arm length down below belly button.

ii. Imagine pulling the bow in both directions. Paint with hand before using bow.

iii. Say PULL, PUSH instead of UP, DOWN in the beginning.

c. **First time on the string:** Place bow on string and push down on string. When ready pull and there should be an explosion of sound. Go until arm is straight. But shoulder hasn’t moved. Push back to frog.

d. **Beginning Bow hold:** For younger (elementary students) Find the balance point on the bow and form bow hold there. Do all the other steps above. Gradually move to frog, but go back if bow starts to “skate or curve”. (This teaches straight bow without weight and usage of full bow)

e. **Bowing lanes:** Bow should be in the middle between the fingerboard and bridge. Think highway lanes. (Use straws placed in the f holes of violin and viola- in small cellos, milkshake straws work)

Use straws that bend at the top so they can be joined together (for cello and basses use the thick type pixy sticks (empty), a thin circular plastic tubing, or wooden dowel that will fit in the F hole of the instrument), place the straws in the holes and put bow on string between the straws and the bridge. Analyze how it feels. What do they have to do to keep the bow straight?

f. **Problems:** Bow flopping over fingerboard, bow curving around head, bow not staying straight.

i. Stand with bow arm against a wall making sure the shoulder is touching the wall. Then bow. They will only be able to move their elbow.

ii. Make sure wrist is bending. For violins and violas the wrist should point to their nose when at the frog and bend the other direction when at the tip. With cello and bass the wrist should point to the fingerboard when at the frog. Think “mountains and valleys”

iii. Imagine painting with fingers or running fingers through the water to get wrists to move.

## VII. Left Hand

**Violin/viola:** The most important thing is that the wrist stays flat and does not bend backward.

-The left hand touches the instrument with the pad of the left thumb and at the base of the first finger. The thumb should be relaxed. Knuckles of the left hand parallel with the fingerboard and fingers form boxes over the strings

-Left hand on left shoulder of instrument and imagine the instrument pushing hand and arm to the scroll.

-Draw eyes on the tip of the left thumb and a mouth on the pad of the thumb. Make sure the thumb is looking at the ceiling not the pegs and the mouth is closed against the instrument.

-Stress natural position (no one walks around with their hand bent backwards)

-Spoon technique: Place a spoon on the inside of their left wrist where the large part of the spoon is resting in the bottom of their palm, Secure around the wrist with a rubber band or hair tie.

-“Worm Hole” When the left hand is place correctly and all fingers are curved and making contact with the string, a small opening should be seen between the webbed fleshy part of the hand between the thumb and first finger. The opening should be large enough to place a pencil (or worm) through it. Perhaps use a gummy worm?

**Cello:** Arm and wrist is flat and straight.

-Place hand 3-4” from the nut, thumb on the back of the neck opposite the 2nd finger (hidden from view- place sticker or corn pad there). Left arm at a 45-degree angle. (Hand is natural, like holding a soda can)

-Pat the belly of the instrument with open hand, bounce up to fingerboard.

**Bass:** Elbow out, not resting on instrument.

-Place hand 4-5” from nut, thumb hidden from view opposite the 2nd finger.

-Fingers never touch.

-Bass face: Thumb in ear, first finger on eyebrow, 2nd on nose, 3<sup>rd</sup>/4th on mouth.

-Come from above: Hand on head, hand on top of scroll hand into position. (helps keep the elbow up)

## VIII. Intonation:

a. Tapes or not: I say yes!

-Use auto pinstripes (auto stores), purchases ones from SWstrings or Shar- or cut strips of masking tape (scotch tape is too clear and hard to get off)

o Violins and Violas: I only put first finger, 3rd finger and 4th finger. They need learn early on that the 2nd finger moves.

o Cellos: put on 1st, 3rd and 4th tapes.

o Basses: get 1st 4th, and then shift down on the G string C natural and D (C# is 2nd finger). If you can use different colors for the bass. (One for 1st position and another for the shift.)

b. Terms

-High and low fingers.

High means further away from the scroll and low is closer to the scroll (this can be a task for beginners).

High is sometimes marked with an arrow pointing up on the music, and low the opposite. High 2 means 2nd finger touching the 3rd finger, and low 2 means 2nd finger next to the first. (beginner cellos use 2<sup>nd</sup> and 3<sup>rd</sup> finger to play the high and low “2nd” F#/F C#/C)

-Have violins and violas practice moving finger back and forth.