



# How To Repair Cracks In Your Acoustic Guitar



If you own an acoustic guitar long enough, chances are good that you'll have to deal with the repair of a crack in the wood. Knowing how to evaluate the seriousness of a crack will allow you to determine whether to call a repair person immediately or whether it might be OK to leave it alone for a little while. In this article we'll take a look at how cracks form, how to evaluate the damage, and what a proper repair will entail.

## WHAT CAUSES CRACKS

The main causes of cracks in your guitar's body are low humidity and physical impact to the instrument. Low humidity causes the wood to shrink—we see a lot of these types of cracks in my Minneapolis shop during the dry winter months. Keeping your guitar storage room humidified as close to 45 percent humidity as possible or using a special guitar humidifier is excellent insurance against cracks caused by a dry environment (for more info on humidifying guitars, check out “It’s Not the Heat, It’s the Humidity,” from the February 2006 print edition).

Cracks caused by dropping or hitting the guitar can happen in many ways, and it doesn't necessarily take a very hard impact. One classic crack occurs when you play sitting down with your keys in a pants pocket—if they press against the side of the guitar just right, voilà, a crack appears! Dropping

the guitar in its case (especially an ill-fitting one that allows the guitar to move around inside) can do it, as can running into a mic stand or your partner's guitar. Many guitar tops crack if the instrument is placed only halfway in its case and the lid slams shut; watch out for those latches! Another classic crack is the so-called "pickguard crack," which is common on a lot of Martins built prior to 1985, when the company was still gluing its pickguards directly to the bare wood, rather than onto the finish. The pickguards on these guitars tend to shrink a small amount over the years, but due to their extremely strong adhesion, the top often cracks just behind the soundhole.

Sometimes what looks like a crack in the wood is actually just a crack in the guitar's finish. Most often, this will be caused by the finish reacting to extreme cold or rapid changes in temperature, resulting in what's generally referred to as "checking," a weblike spread of damage (many modern polyester-based finishes are immune to this damage, but nitrocellulose lacquer can be very sensitive in this regard).

## **EVALUATING THE DAMAGE**

How serious is it? The first thing to ascertain is whether your guitar is cracked all the way through the wood. Any crack in the wood is serious and can upset the delicate structural integrity of the instrument. One way that cracks can frequently be identified is that they tend to follow the grain (wood cracks that cross the grain usually come from a severe blow, and this will be obvious). Cracks in the top wood are of particular concern because the top is generally a softer wood than the back and sides, and a crack can interfere with the sound-producing ability of the guitar. The width or length of a wood crack doesn't affect whether it should be repaired or not, because even a small crack can "run" and get big-ger—get it fixed as soon as possible, because a delay could further compromise the guitar's condition (more on the repair process in a moment).

A finish crack tends to wander across the grain, and most often is best left alone. A repair of such damage is possible but very time-consuming, which usually makes it cost-prohibitive (it involves repeated applications of a strong solvent and often more lacquer, allowing it to dry for a month or more, then leveling and repolishing).

## THE REPAIR PROCESS

Once you've determined that there is a crack in the wood, what's next? Even though some cracks may seem like they'd be easy to fix, only an experienced tech will be able to tell how to best approach a repair. For example, edges that are out of register must be brought back level with each other, which can sometimes be done by simply pushing the pieces back in place. Other times, more force from a clamp or strong magnets is necessary to align the edges. A luthier will often use a caul (made of plastic glass or another flat, smooth material) in conjunction with various clamps to ensure that everything remains in line. Once all the pieces are back in place, glue (typically aliphatic resin glue [Titebond] or hot hide glue) is applied to the now closed crack—often by flexing the wood with gentle pressure from inside and rubbing the glue in from the outside.

If the damage has caused splinters or pieces have broken off, the luthier will have to put them back in their original positions, so it's important to save all the pieces—no matter how small. Putting those pieces back into place means that repairs will take longer, but the essential repair technique will be the same as described above.

Guitars cracked due to extended exposure to low humidity will have to be aggressively humidified (by placing at least two humidifiers into the case) before taking any of the repair steps above. In my shop, where we maintain a constant 45 percent humidity level, it usually takes about two to three weeks for a crack that's related to low humidity to close up. Once the crack is closed, it can be repaired like any other crack. Very old or dirty cracks may never fully close up. These may need to be filled with similar wood, and the repair will be especially visible.

## CLEATS ON THE INSIDE

The next step will be for the luthier to glue small wooden cleats inside the guitar that span the crack. These cleats are used as reinforcement and are clamped in place—using specialized clamps or, in recent years, extremely strong “rare earth” magnets—while the glue sets for maximum strength. The cleats should cover both ends of the crack to prevent it from getting longer, or “running.”

On curved surfaces that are difficult to cleat, glue-impregnated cloth such as muslin or silk may be used to reinforce the inside of a repaired crack.

## **FINISH TOUCH-UP**

Once the crack is glued and cleated the next step is finish touch-up. Generally this will be the most expensive part of the repair because it is very time intensive. Depending on the value of the instrument, this work may not be cost effective. And on vintage instruments, finish repairs may actually diminish the value of the guitar. In any case, it is unlikely that finish repair will significantly improve the structural integrity, the longevity, or the tone of the instrument, so it is important to discuss any questions you have about these issues with your repair person.

## **TONAL CONCERNS**

The good news is that a properly repaired crack should restore your guitar to full structural integrity and not degrade the tone. This is particularly true of cracks that run with the grain. Severe cross-grain cracks are more problematic, but when a guitar is well repaired and has all braces intact, its tone should not be noticeably impaired.