

# Guitar Technical Services

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## Technical Advice for Purchasers of a New - Steel Strung Acoustic Guitar

**This test will not work for Spanish & Classical Guitars** as the action is intended to be higher. These guitars are built differently and fingerboards set to create the correct action. Do not be fooled by the 3 bass strings which look like steel but are in fact nylon strands wrapped in a silver plated copper ribbon.

### Steel Strung Acoustic Guitars.

Buying an acoustic guitar is always difficult, whether it is brand new or second hand, because the layman can find it difficult to work out the good from the bad. The first question is - does it sound good? If it does, then the biggest concern is whether the geometry is correct.

The main issues are:

#### **1. Checking for Relief or Curve in the Neck**

Sighting the neck from the headstock towards the body can be difficult but if you have keen eyesight you should be able to tell if there is a curve in the neck by pressing the 1st or the 6th string down at the 1st and 12th frets. There should then be the thickness of a sheet of paper between the string and the 6th fret – this is less than the thickness of an 8 gauge plain string! Adjusting the truss rod can rectify some curve/bow in the neck but too much curve may require straightening the neck with heat – a job for a skilled technician. If this test is OK, move on to the 2nd Test.

#### **2 Checking for an Up-turn Fretboard over the Body Section**

Again, using both the 1st and 6th strings, fret the first and last frets and see if a gap appears underneath the 12th fret (it should be just touching). This test will determine either a bent neck (see 1st test) and/or an up-turn at the end of the fretboard. There may be a different reading on the treble side to the bass caused by a twist in the neck.

If you send me measurements from under the string and above the fret they need to be in millimetres or 1/64<sup>th</sup> of an inch for me to give an opinion.

The opposite situation may occur, where the fretboard dips away towards the body. There are a few Internet articles about the “14<sup>th</sup> fret hump” and this is not in itself a problem, unless the frets are high in this area, which can be seen from our following test. Normally a slight dipping away/fall-away is caused by the clamping of the fretboard to the sound-board in manufacture and is OK because, as the frets get nearer the bridge, they do not impede the string vibration. Remedying an upturn can be done by removal of the frets in the upper section, reducing the fingerboard wood and then refretting BUT this exercise is pointless if “Check No. 3” also fails, so do test 3 (below) as well before making a decision!

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### 3. Now for the worst - Checking the Neck to Body angle

If the following test is incorrect you will have a high action which may cost a fortune to put right. The best way to check this is to slide an 18 inch steel ruler along the frets until the underside touches the top of the bridge-plate but as most shops and sellers would have a fit over this act, we will use the following, alternative method!

#### **Method without steel straight-edge.**

Use the 1st and the 6th strings alternately to assess whether the neck is at the correct angle. Previously I only suggested using one or the other string but have since found that it can be good on the one side but bad on the other. Test one side and then the other. So, by slackening one of the strings enough for it to be pressed down in front of the saddle, all the way down to the wooden bridge-plate and then, at the same time fretting the same string at the first fret, allows the string to be used as a straight-edge. You may wish to use a capo on the first fret for ease. You may have to slacken more string to get it to stretch down to the wooden plate. So on the way down, if the string touches the 12<sup>th</sup> fret you're ok, depending on how high the saddle already is.

#### Saddle too tall.

Occasionally the fitted saddle may be too tall for the bridge-plate and if this happens or the saddle needs to be taller, you are in trouble as the strings will pull the saddle forwards.

#### Saddle too low

If the string does not touch the 12<sup>th</sup> fret and the saddle is already low it may show the need to reduce the height of the wooden bridge-plate in order to lower the saddle. On Ovation and Takamine bridge plate types lowering it is not an option so there is no remedy.

With a gap showing at the 12th fret, pressing the string in front of the bridge-plate wood will show how much the wood needs to be reduced for it to be rectified. Some bridge-plates are too thin to start with and in this case it would be 'game over'.

[Again, If you send me measurements from under the string and above the 12<sup>th</sup> fret they need to be in millimetres or 1/64<sup>th</sup> of an inch for me to give an opinion.](#)

For the purpose of this article I am assuming the guitar is new. For older guitars, the neck may well have been fitted correctly at manufacture but, over time, the use of heavy gauge strings - like 13 to 56 - and humidity may have caused the sound board to belly up, causing a high action. In this case, the body has 'technically' moved but it will most likely still require a neck-reset to correct the matter.

**If point 2, above, is already wrong it will cause this test to be inaccurate as the string will be touching the end of the fingerboard rather than the 12th fret.** Therefore, push the slackened string down and sideways so it runs along the side of the fingerboard. This will give an indication of:

- How much upturn there is from the 12th fret to the end of the fingerboard - and
- A rough idea of how much wood will need to be taken off the bridge plate to rectify.

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Correcting an upturn at the end of the fingerboard may be difficult to impossible due to special inlays at the end of the fretboard, fretboard binding and whether there is access via the sound hole for refretting techniques.

Generally only a small amount of milling the frets should be required but if it indicates that half or a whole fret height needs to be reduced to get the string down to the 12th fret, it shows that there is something seriously wrong.

### **Neck to body angle rectification.**

The neck to body angle can be rectified by removing the neck and re-fitting it, however many mass produced necks are not made to be taken apart and doing so is likely to cause serious damage, which means rectification of that in addition to the 'neck reset'. This comment does not apply to necks bolted on like Taylor and Simon & Patrick etc. which make easy work of neck angle rectification.

### **Finally - Humidity affects guitar action.**

Acoustic guitars should have their humidity regulated.

I have set-up guitars that have not had their humidity properly maintained - how am I to know this? This results in a phone call after the set-up - saying that either the guitar buzzes because the action is too low OR the action has gradually become too high. So these changes have occurred after the set-up. It begs the question as to whether the guitar was correctly humidified when set-up or whether it was already too wet or dry. Unfortunately there is no way of telling the correct humidity once the guitar is assembled and manufacturing completed. So setting up a guitar that has not been humidified is like hitting a moving target. It can take a couple of months to ingress moisture into the guitar but it can lose it in a week!

Acoustic guitars should be approximately 50 %. If too dry, the action will drop. If too wet, the action will rise. Domestic houses can run at 12% humidity and in some cases 80% (especially if wood-burner stoves/ or gas fires are used). The best way to monitor this is by using a Hygrometer (small and cheap off eBay at £7 to £10). The [Planet Waves \(by D'Addario\)](#) do a [Humidipak Automatic Humidity Control System for Guitar](#). This is a very clever and patented design using two chemicals - one to induce water and one to take away, thus balancing the surrounding guitar. Alternatively, keeping guitars in a closed room with a humidifier set at 50% and monitored by Hygrometer allows all your guitars to be perfectly maintained and retain their tone!

**NOTE: A very dry guitar can result in splits in the top of the soundboard!**

**Hygrometer** is a device that measures water content in the air. They are often used in cigar boxes so can be quite small to fit inside a guitar case. A guitar case gives the guitar its own environment, allowing the use of humidifiers and such like devices. Gig bags don't provide a sealed environment.