

Howdy!

In this Tech Tips Newsletter I would like to focus on the mechanical requirements associated with installing new pickups into Stratocaster style instruments.

Summary: The mechanical installation of pickups into strat style instruments is discussed in detail with emphasis on the proper distance of the top of the pickups to the strings and the required depth of the pickup cavities. The goal of this article is to provide information which will help you successfully install new pickups into a strat style instrument.

There are two methods commonly used to secure pickups into strat style instruments: mounting the pickups to a pickguard assembly (as shown in Figure 1, below) and direct mounting the pickups to the body of the instrument (Figure 2, below).



Figure 1. Pickups mounted to a pickguard assembly which is then secured to the body of the instrument. In this photo each of the three single coil pickups is connected to the pickguard using two 6-32 machine screws and either springs or flexible tubing to allow height adjustment of the pickups. Rotating the mounting screws clockwise will raise the pickups.



Figure 2. Pickups direct mounted to the body of the instrument. Each of the three pickups is secured to the body of the instrument using three wood screws. Tubing or springs can be used under the pickups at the location of the mounting screws and compressible foam can be placed under each pickup at the bottom of the pickup cavity. Rotating these mounting screws clockwise will lower the pickups.

In both cases the pickups are located in cavities prepared in the body of the instrument.

These pickup cavities are required as standard pickups are usually about $\frac{3}{4}$ " tall and if mounted to the top of a strat style instrument would interfere with the free vibration of the strings.

There are a wide range of pickups designed for use in strat style instruments including pickups with AlNiCo rod magnets, pickups with adjustable height pole pieces, blade style single coils and dual blade humbuckers to name a few. These pickups all generally conform to the width and length of a standard strat style single coil, but many vary in overall height or thickness. This difference in height can usually be accommodated by the height adjustment range offered by the pickup cavities in most modern strat style instrument. Some tall pickups and pickups with bar magnets under the coil may not fit into instruments which have shallow pickup cavities. Some early strat style instruments and some re-issue instruments have shallow pickup cavities which can cause installation issues for tall aftermarket pickups.

Some strat style instruments have a single large cavity sometimes called the “Swimming pool route” as shown in figure 3.



Figure 3. Strat style instrument with swimming pool route. A pickguard is normally used with this type of pickup cavity route to cover both the large pickup cavity and the controls cavity.



Figure 4. A strat size pickup (Model SP-90) measures just over $\frac{3}{4}$ " tall from the bottom of the bar magnets to the top of the adjustable pole pieces.

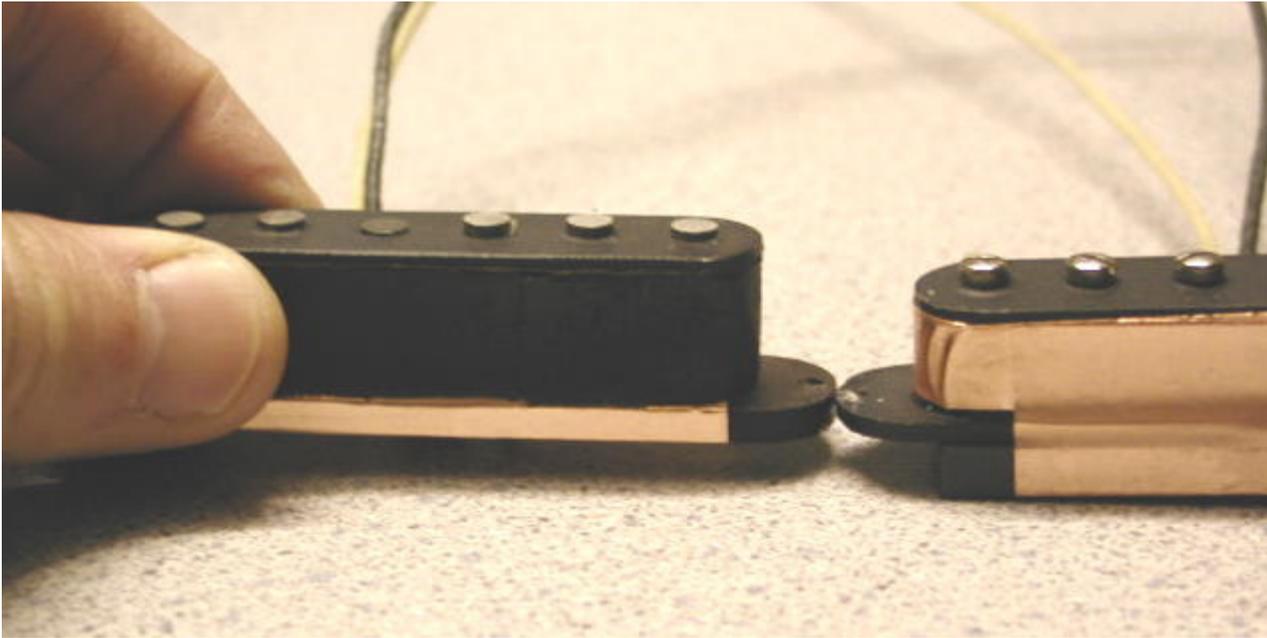


Figure 5. Note that not all strat size pickups have the same height and that some pickups have magnets under the bottom flange of the pickup.



Figure 6. In this photo a strat style single coil pickup has its height adjusted such that the pickup cover and pole pieces are above the top surface of the pickguard. This installation is typical.

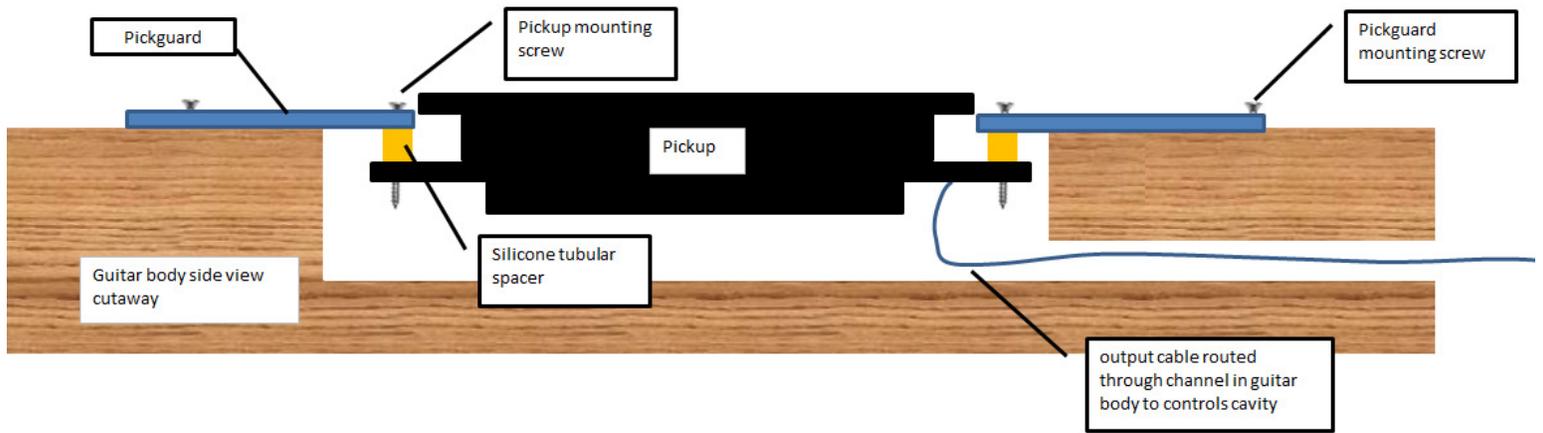


Figure 7. Cross section illustration of a pickup mounted to a pickguard.

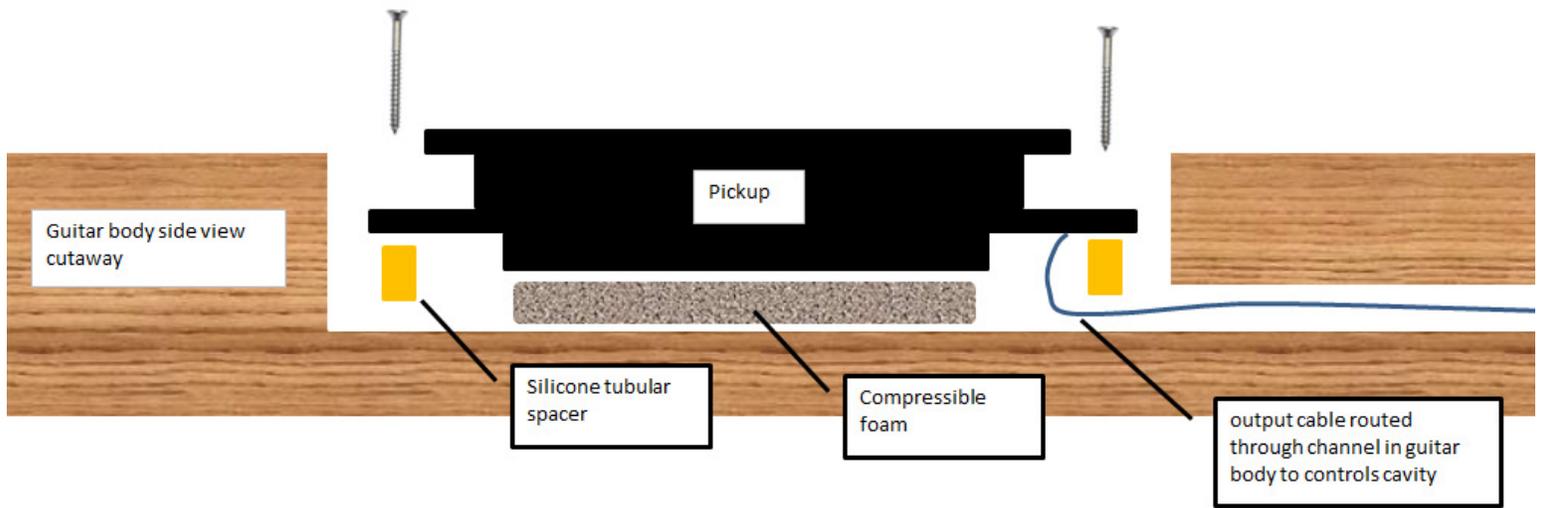


Figure 8. Cross section illustration of a pickup to be direct-mounted into a pickup cavity. One can use springs or silicon tubing under the bottom flange of the pickup at the location of the two mounting screws or compressible foam under the body of the pickup or one can use both. In some instances pickups are installed rigidly to the body of an instrument using neither springs or compressible foam; this hard mounting would require rigid shims under the pickups for height adjustment.

It is very important to adjust the distance between the pole pieces or rod magnets on the top of a pickup to the underside of the guitar strings. If this distance is too large the pickup will generate a very weak signal and the signal to noise ratio will be large. If the distance is too small one will experience odd sounding “Wolf Tones” and an erratic signal. Sustain of notes will be reduced by too close a proximity of the pickup to the strings and in extreme cases the strings will physically touch the pickup hampering their free vibration. I suggest starting with the neck & middle pickups just under 3/16 inch from the strings. I usually have the bass side of the pickup slightly closer to the strings than the treble side.

The bridge pickup can be closer to the strings than the middle & neck pickups; again, bass side slightly closer.

The best way to get the exact right height adjustment for your guitar is to plug into your amp & have a screwdriver handy. Play a little, make 1/4 turn adjustments of the mounting screws & repeat as required to get the right tone & balance.

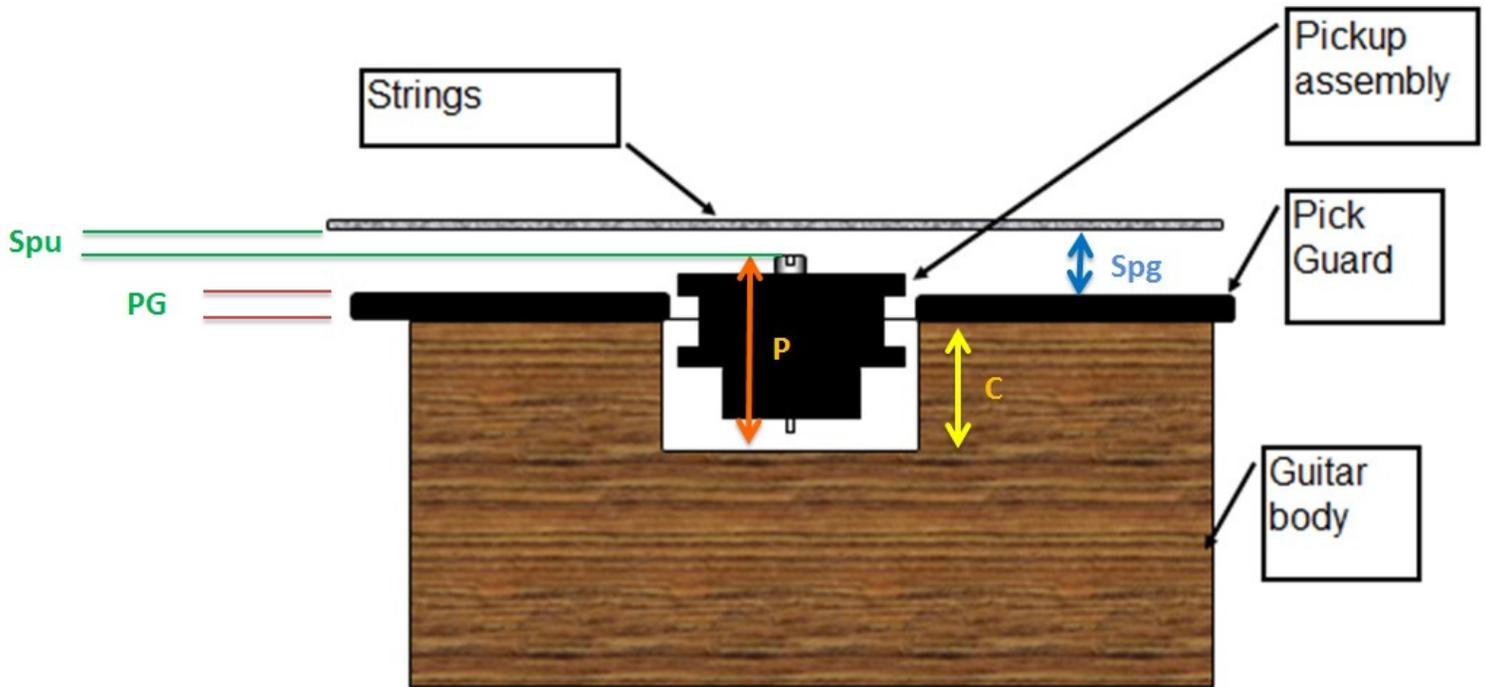


Figure 9. Illustration of a pickup mounted to a pickguard.

Where:

S_{pu} = average distance from the strings to the top of the pickup pole pieces with the strings fretted at the highest fret

PG = thickness of the pickguard

P = Height of the pickup

C = depth of the pickup cavity in the guitar body

S_{pg} = distance from the strings to the top of the pickguard

In Figure 9 the two most critical dimensions are C , the pickup cavity depth and S_{pu} , the distance from the top of the pickup poles (or magnets) to the strings. Dimension C must be large enough to allow the pickup to be installed with S_{pu} in the range of 3 to 5 mm.

Here is a typical example:

Let's assume the pickup is $\frac{3}{4}$ " tall (19.05 mm) and the pickguard is 0.120" thick (3.05 mm). If the optimal distance from the top of the pickup (Spg) is 3.00 mm, what is the minimum cavity depth?

The sum of the pickup height (P) and the spacing to the strings (Spg) minus the thickness of the pickguard (PG) should provide the minimum cavity depth (C).

$$19.05 \text{ mm} + 3.00 \text{ mm} - 3.05 \text{ mm} = 19.00 \text{ mm} \text{ (0.748" or just under } 3/4\text{")}$$

I have just completed updating drawings of my strat size single coil pickups and will post these on the Vintage Vibe Guitars website. A link to these drawings is provided at the bottom of the page containing detailed information on each specific pickup. For example, the link to a drawing for my Standard-S pickup is posted on:

<http://vintagevibeguitars.com/windows/singlecoilWin.html>

Dimensions (pdf)



Sound

Credit Card Form (MS Word)

Wiring diagram (pdf)

Select Pickup				
Part #	Description	Cost	Quantity	
SS-set 3 RH	Standard Strat Set (Right Hand) bridge pickup, middle pickup, and neck pickup (middle pickup RWRP)	\$230 set	1 <input type="text"/>	ADD TO CART

One last note: space should be provided for the output cables to exit the pickup cavities without bending or pinching the cables.

I hope you find this information useful.

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