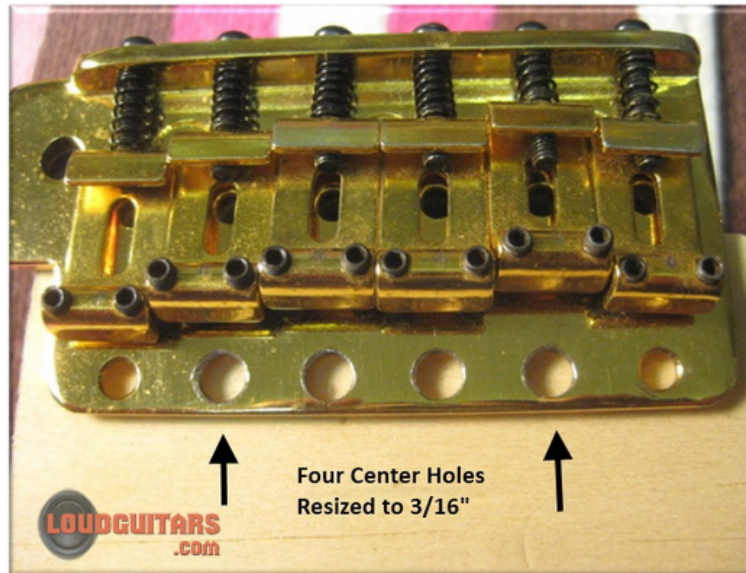


# VINTAGE TREMOLO MODIFICATIONS PART 1



This month I thought I would get away from the set up series and do something different. Since the next step in the set up series will have you taking the strings off your Axe I thought I would tackle Strat style tremolos. I get a lot of requests from players asking what they can do to improve their Strat tremolos and keep their guitars in tune after using it. In particular I'm talking about the vintage six screw style tremolos but many of these tips will also help with the new two post style of tremolos as well.

As a player, the first thing you need to recognize is that there are limitations in the original Strat Tremolo design. Remember it was conceived, designed and first built in the 1950's. Not that it is a poor design by any stretch of the imagination. Coming from an engineering background I can say the design is absolute genius. I would have loved to have been there when it was perfected by Leo, George and Freddie. (Friends, if you don't know who the last three guys are, look up there full names and learn some important history "Leo Fender", George Fullerton" and "Freddie Tavares"). Over the years the original design has gone through countless changes, some good, some bad (**Fu@k I** hate those crappy 70's cast metal bridge saddles from CBS). It has also spun off a whole series of aftermarket copies and improved tremolo designs based on the same principals of the fulcrum system. As far as its limitation go, Leo would have never dreamed that the tremolo would be used in the 1980's by Alex and other big hair bands to dive bomb and string vibrate the crap out of their Axes. Man those guys were only a gleam in the eye of their fathers when it was perfected. So if your style of playing includes that type of tremolo use go with a Floyd Rose or similar locking design for your choice of tremolo. But if you like the look of the vintage style or if you have a Strat style Axe and want to improve the playability of it, read on and I will go over what I have done to countless tremolos to improve their functionality.

**Notes of warning here** (This is where I cover my ass from getting tons of crappy e-mails from people that have tried these mods and have screwed up their Axe).

- I. **1. "Do Not"** I repeat **"Do Not"** make any of these changes to a vintage guitar. You will destroy its heritage, value and most important its vibe. If you have an old Strat and want to try these mods out go and purchase a replacement tremolo unit and modify it. That way the original unit can be re-installed if ever needed.
- II. **2.** Most of the mod's I will be describing here will require special tools like a drill press, a Rotary tool like a Dremel and special counter bore drill bits. If you are not familiar with these types of tools take your tremolo unit to a local machine shop and have them perform the different modifications. If you do the mods yourself make sure you wear the appropriate safety gear!

Before we start modifying your vintage style tremolo unit here's a few question you need to ask yourself. A) Why are there six screws holding this thing in place? I have looked high and far for the answer to this question and have never found a good answer as to why Leo used six screws. From an engineering standpoint the shear forces generated by both the strings and springs (forces

pulling the bridge towards the nut) are not high enough to warrant this many screws. In fact if you calculate it, you only need two screws. B) Do I want a true floating tremolo that allows the string pitch to be both raised and lowered? Or should I compromise and set the tremolo up to lower the pitch only. Keep in mind we are not talking about a locking style tremolo here and if you set your tremolo up as a floating unit and break a string your whole guitar will go out of tune. Whereas if you set the tremolo up to lower the pitch only you will be using the body of your Axe as a back stop and it will stay in tune if you break a string. Personally I recommend this option to most of my customers especially if they are gigging musicians. There is nothing worse than breaking a string in the middle of a song and having to change guitars just because the one you are playing is drastically out of tune. Ultimately the choice is yours and we will go over both setup options at the end of the series.

### **Remove That Hunk of Metal**

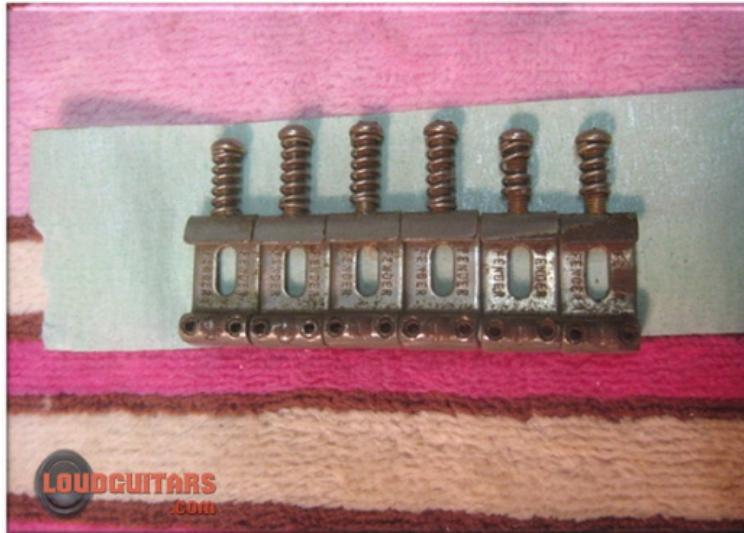
To do all of the modifications you will need to remove the tremolo from your guitar. I'm sure most of you have removed a tremolo before but for the benefit of those who haven't I will go over the removal quickly. Make sure you have a parts collector like a sealable Tupperware bowl nearby too keep all your screws, springs and parts in. There is nothing more frustrating than removing 10 screws only to find out one of them has decided to disappear when you start reassembling your Axe. Start by removing all of the strings off your guitar. Then remove the plate that covers the spring cavity from the back of your guitar. Here you will find the tension springs hooked to the tremolo block and a spring claw. Release the tension in the springs by loosening the two wood screws holding the claw. Do not remove the claw, just back the screws out enough to remove the springs. Be careful not to break the ground wire soldered to the claw. Now flip your Axe over and carefully remove the six screws holding it to the body. Be careful not to strip the Phillips head of the screw. There you go, put your Axe back in its case and let's get started.



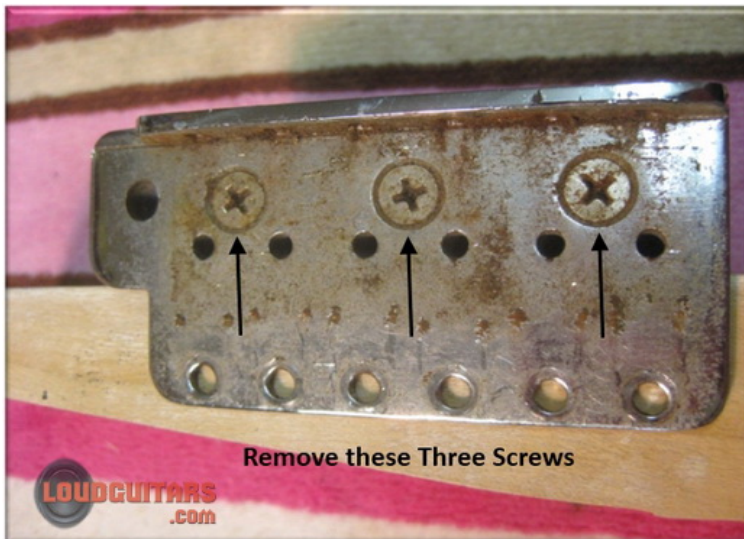
**Loosen these two screws to relieve the tension on the springs.**

### **Tear the block Apart**

So now that we have the tremolo unit out of the body we need to disassemble it. Start by removing each of the string saddles. Get some tape and stick each of the saddles to the tape in the same order that you removed them Bass E through Treble E. That way you can replace them in the same position later during reassembly. Once you have removed all the saddles you will need to remove the tailpiece block. To do this remove the three Phillips head machine screws holding the block to the top plate. Now put the block and string saddles aside because we will be working on the top plate for the next couple of modifications.



String Saddles Removed in order Bass E to Treble E.



Remove these three screws

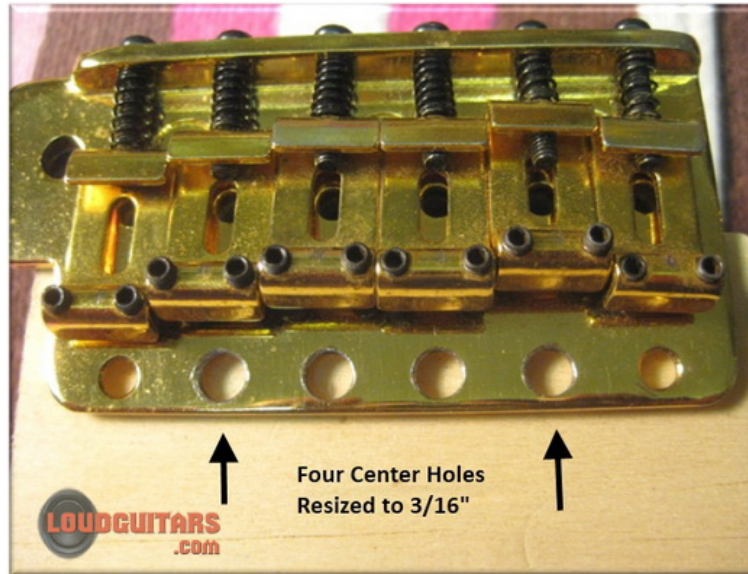
The three Phillips head machine screws that hold the tailpiece block to the top plate.



Top plate removed from the tailpiece block.

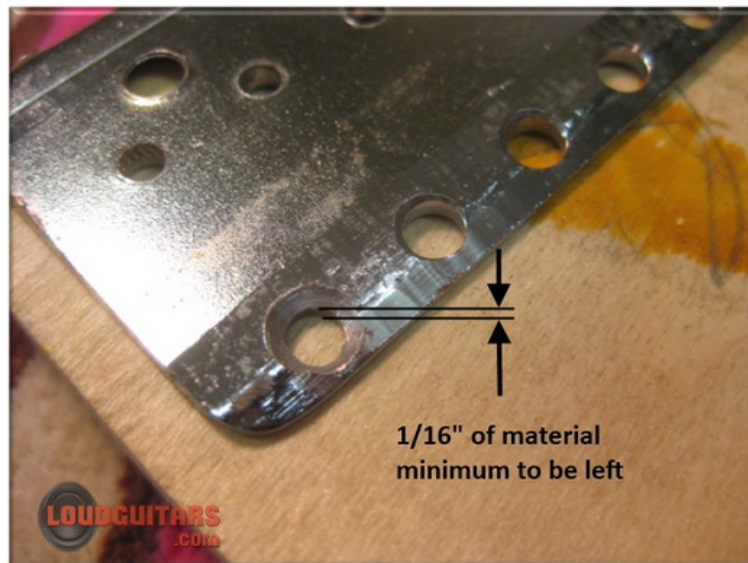
### Six Screws into Two

So as I stated earlier in the article you do not need six screws to hold a vintage tremolo in place, the shear tension generated by the strings and the tension springs is easily handled by the two screws of 9/64" diameter. So what we will do is modify the top plate so the tremolo works similar to a two point tremolo unit. This does the following for us. 1) It reduces the friction between the six holding screws and the top plate. 2) It takes any misalignment of the six screws out of the equation. This compensates for any bent screws or screws that were poorly installed (off center) either at the factory or after being replaced by someone. 3) It minimizes the potential for error when adjusting all six screws to the correct height during set up. The top plate modification is quite easy: all you need to do is oversize the four holes in the center of the plate. This will allow the tremolo to ride on the outside two screw holes only, thus eliminating the four center screws from the equation and converts the unit to a two point tremolo unit. Typically I use a 3/16" drill bit to oversize the four holes. This modification needs to be performed with a drill press to ensure a straight and centered hole in the top plate. When you reinstall the tremolo unit you will still install all six screws so it still looks like a vintage six screw unit but only two screws will be used keeping that vintage look most players like. We will cover screw installation and screw heights later when we talk about re-installing and tremolo.



The Four Center Holes Oversized to 3/16 of an Inch

The next thing we need to check is the countersink on the back side of the two holes that we are now going to use. Typically this is done at the factory but many times this is done quickly and in many cases the amount of countersink is not enough. What we are looking for is around 1/16" of material that the screw will ride on. Keep in mind (unless you have an aftermarket stainless steel top plate) most top plates are not made from hardened or heat treated metal so we can't have a true knife edge here. The hole would deform over time due to string tension and usage. Check and see how much material is left from the front face of the top plate to the back side of the countersink, if there is 1/16" of an inch leave it as is, no modifications are required. If there is more than 1/16" you will need to deepen the countersink. Use a No. 4 countersink bit and carefully remove some of the metal around the hole until you are left with at least 1/16" of an inch.



**1/16" material minimum to be left**

**Back side of Top Plate.**

### **Stop Breaking Those Strings**

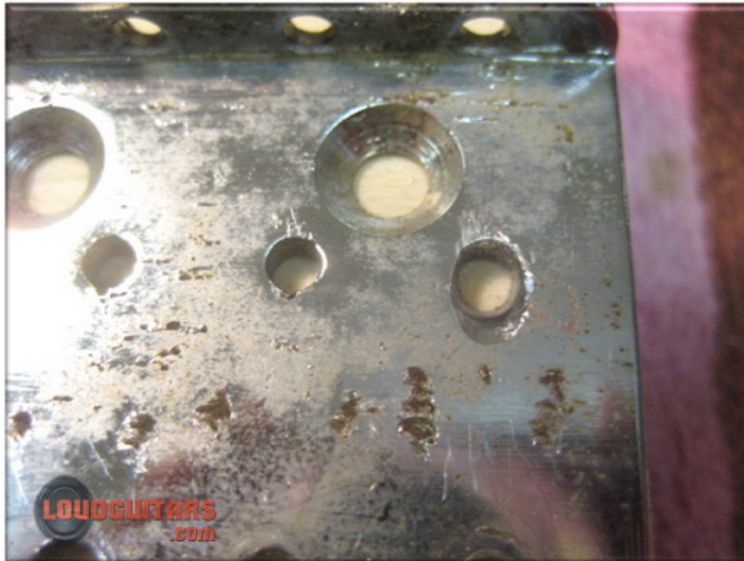
We are not finished with the top plate yet. Keep in mind every time you put a bend or a kink into a guitar string you are weakening it at that spot. An inherent problem with most vintage style tremolos is that when the string passes over the top plate and through the string saddle slot there are sharp bends created. Typically this is where your string will break under heavy playing. So we are going to remove some of the metal from the top plate and create a radius slot that will eliminate the sharp bent created by a stock unit.



**String Bends created by the top plate and the String Saddle.**

The photo above shows the two string bends, the first one up from the ball end is created when the string passed through the tremolo block and exits through the top plate. The second one is from where the string passes over the string saddle. To eliminate the first bend we will again need some special tools to modify the top plate. You will need a high speed rotary tool like a Dremel and a Dremel No. 9903 Tungsten Carbide Cutter. Again if you are not comfortable with using this type of tool take your top plate to someone that is and have them do the modification. Also keep in mind this modification can also be done with a tapered 1/8" metal hobby file. It will only take a lot longer to complete.

With the rotary tool work the front edge of the string exit hole on the top plate. Take your time and only do one string hole at a time. You are not trying to just cut a slot or groove in the top plate; you are trying to create a radius of about 3/32" of an inch (the thickness of the top plate) from the bottom of the plate to the top of the plate. Again take your time, you can remove a lot of metal in a short time, stop and check your progress regularly. Once you have finished one of the holes complete the others and do your best to make them all look the same. After you have roughed out the six holes you will need to polish the radius slots. Starting with 400 grit sandpaper tear off a thin strip and fold it over a few times until the sandpaper will fit in the hole. Then work it back and forth to polish the slot. Repeat the same process with finer grit sandpaper progressing up to 2000 grit. Once you have polished all of the holes it is time to re-install the tailpiece block to the top plate.



First slot roughed out. Note the grooves in the old string holes created by years of the strings being pulled back and forth over the top front edge of the top plate.



All six holes finished and polished, ready to re-install the tailpiece block.

So that's it for the first part of this article. Next month we will go over modifications to the string saddles, reassembly of the tremolo unit, checking the nut, string angles at the tuning pegs, where to lubricate your tremolo and strings and finally some set up tricks for both floating and fixed installations.

**I need to get something off my chest here;** you may have noticed that my web site has been down for the last month. That is because some "Jerk Wad" hacked through the protection and used it to distribute crap. "Leave the little guys alone you Dumb Fu@ks" we are only trying to make a living at something we love!!!! My site will be up again soon.

To the rest of you, hope you and your family have had a great holiday and have Great New Year (That if the world did not end on the 21st.)

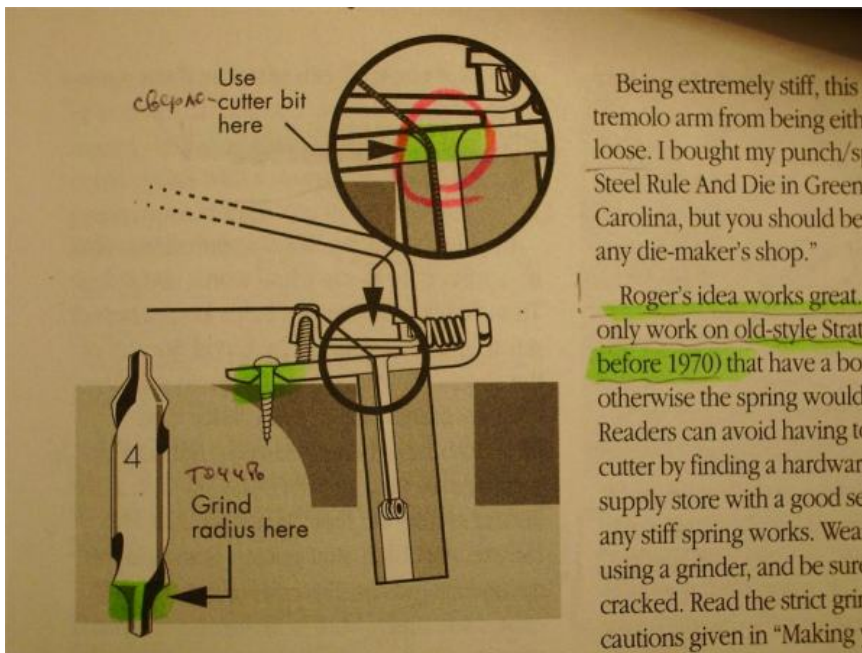
Cheers and remember

*"I've been imitated so well I've heard people copy my mistakes."*

**Jimi Hendrix**

Mark

To read more about Mark click [HERE](#)



...если вынуть четыре, то останется на двух, там об этом и говорят.. можно ещё снять фаску на оставшихся двух отверстиях, чтобы пятно контакта стало ещё меньше, об этом тоже говорят.. а на этом фото только скруглѐн выход струны из пластины..

....Более того ещё протачивал на двух крайних винтах под шляпками бороздки по принципу двух болтового тремоло.Само собой фаски на платформе на крайних отверстиях. .

...В варианте с рассверленными отверстиями большой минус , присущий всем двух стоечным тремоло , 3-4 струны в аккорде , " как из кастрюли " . На " примоченной " гитаре не так заметно , в акустике же - беда . ...