

# COIL SHUNTS/COILS IN PARALLEL

## **HUMBUCKERS!**

There are three popular types of humbuckers. There are single-coil-sized stacked-coil humbuckers; hot-rails and other single-coil-sized side-by-side humbuckers; both typically made for Strats and Teles. Then there are the traditional full-sized side-by-side-coil humbuckers, which have the look that we all associate with the term "humbucker." Since I personally have only a little experience with single-coil-sized humbuckers, for the remainder of this document, we will concern ourselves strictly with traditional side-by-side humbuckers – think, Gibson....

A traditional humbucking pickup is comprised of two separate coils, which are (usually) wired in series. Commonly, one of the coils will have adjustable “screw” pole pieces (designed to give an adjustment for string-to-string balance), and the other coil will have non-adjustable “slug” pole pieces. These two coils are connected out of phase, AND are reverse (magnetic) polarity from each other - which means they are IN phase sonically, so magnetic energy from the string's vibration is created in phase, but the out of phase wiring of the two coils will cancel most non-magnetic radio-frequency noise, hum and interference.

Electronically, the two coils LOOK like one coil, with twice the windings. No wonder humbuckers are characterized as having that "warm" tone!

## **WHAT IS A COIL-SHUNT?**

A coil-shunt mod is a scheme (usually accomplished by a switch) that allows the current's path to bypass one coil of a two-coil pickup. Remember, electricity ALWAYS takes the path of least resistance, so if you give it a “short cut” around a coil, that coil will effectively not add to the circuit load (or pickup's tone). Usually, a jumper is added that routes the series connection to ground (or hot), bypassing ("shunting") one coil's effect on the tone and volume of the pickup. Hence, the name: coil-shunt. A humbucker played with one coil shunted will have a brighter tone and (typically) less output. Coil-shunts are an easy option to give another voice to your instrument; for example, to get a "Fender-ish" tone from a "Gibson-ish" guitar, to breathe a little air into a tone that is too dark, or just to find a better place for your guitar to sit in the mix.

## **A LOOK AT SOME HUMBUCKING PICKUPS:**

Every manufacture seems to have come up with their own color code and coil arrangement. Most have settled on calling the coil that connects to ground the south coil (for the south pole of the magnet), and the coil that connects to hot the north coil. Before doing any mods, is important to have the correct color code for the specific model pickup you are wiring, and know the arrangement. Seymour Duncan has a nice chart for many of the popular brands of pickups:

**[http://www.seymourduncan.com/support/wiringdiagrams/schematics.php?schematic=color\\_codes](http://www.seymourduncan.com/support/wiringdiagrams/schematics.php?schematic=color_codes)**

If you cannot find the information about your pickup, please see the document “**Unknown Color Code.**”

On your typical aftermarket/custom four-conductor humbucker, there are two leads from each coil (and typically a fifth conductor, a bare ground/shield drain wire). To hook up this humbucker for "regular" humbucking tone, on the south coil, one lead ("-") goes to ground and the other lead ("+") goes to the series connection to the north coil. On the north coil, one lead ("-") is tied to the first coil's "+", and one lead ("+") goes to the output, typically a pickup selector switch or volume pot. The two leads that are soldered together at the series connection are commonly called the “series pair”.

To coil-shunt this pickup, a "jumper" is added to the junction of the series pair. This jumper then goes to a switch, which allows it to either be OPEN (disconnected) or closed (connected). Open, and the pup stays a humbucker; closed, and the pup is in coil-shunt - one coil is "bypassed." The closed connection path can be to ground, or to the output (hot) of the pickup. If the connection goes to ground, the south coil is shunted, and the north coil stays active. If the connection goes to the hot, the north coil is shunted, and the south coil stays active.

### **A FEW SPECIFIC HUMBUCKING PICKUPS:**

Take a look at a **Gibson** pickup's color code, below. Notice that the way Gibson wires their pickups, the **SCREW** coil is "south" – the screw coil's negative lead is connected to ground. This means that you must run the coil-shunt jumper to the hot side of the pickup's output to keep the screw coil active. So, you wind up with a jumper that goes out to the input lug of the volume pot for that pickup. It can get a bit messy, so everybody just shunts to **GROUND**, which leaves the slug coil active. There are a few good things to be said for that arrangement. Usually, the slug coils are the two closest together, so you'd get the best "quack" or "cluck" out of the pair. And, the slug coil is usually the farthest from the bridge on the bridge pup, so it sees the most kinetic energy. This is also the case for Seymour Duncan and DiMarzio pickups.

### **A HUMBUCKER'S TWO COILS, RUN PARALLEL:**

I generally find that coil-shunting a neck pup usually gives you a fabulous new tone. However, a bridge pup can lose a bit too much "oomph" and sound weak or dull when coil-shunt. A remedy for this (for me, at least) is to give the bridge pup a coils-in-parallel option. Even though this further reduces the impedance, the resulting tone will have more "sonic color" than a regular coil-shunt. Like a coil shunt, it's brighter than a full (series) humbucker, but can have a bit more character, and has the added advantage of still giving the pickup noise-canceling properties. An example of this idea in use is the Gretsch Filtertron – its coils are wired in parallel, resulting in a brighter tone from a humbucking pickup.

To accomplish parallel coils wiring on a Gibson-style humbucker, you must **break** the series connection between the two coils, and give each coil its own path to hot and ground. Where as you can coil-shunt two pickups on a single DP/DT switch, this mod requires both poles of a DP/DT switch, so each switch can only run one pickup. If I'm short on switches, this is a mod I prefer on the bridge pup. As I said, most neck pups will sound pretty nice with just your standard coil-shunt, but if you have lots of switches, you can try this on the neck pup, too.

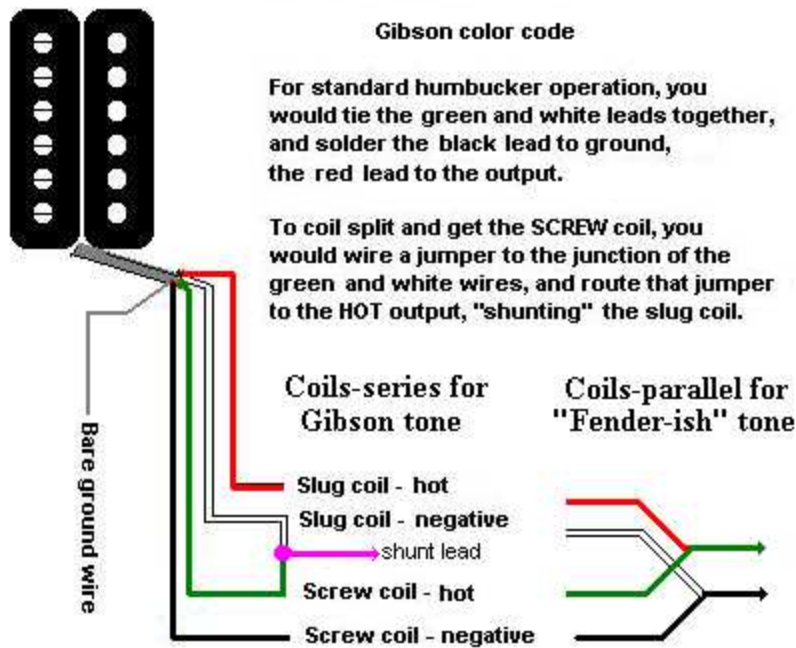
If I only have two switches to play with, my favorite trick is to have one a coil-shunt (both pups) and the other a coils-parallel option for the bridge pup. I wire the two switches in such a manner that the coils-parallel switch will override the coil-shunt option for the bridge pickup. I find this to be quite a usable setup to manage coil-shunts and splits. If you look at my ES-333 scheme, you will see how I accomplish this.

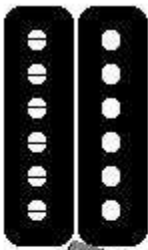
### **THE DEAF EDDIE "PERSONAL TOUCHES":**

When using a pair of humbuckers, I have started shunting one pickup to ground, and one to hot. This leaves a noise-canceling pair of coils, when both coil-shunted pups are played together.

I have also been turning the bridge pickup around 180 degrees, so that the slug coil is closest to the bridge, making the bridge pup's screw coil the **INNER** coil. Shunting this pickup to **HOT**, as described above, leaves the screw coil active, and a perfect noise-canceling mate to the neck pup's slug coil – and, the pair are the two inside coils, for the best quack..

The latest adjustment I have been trying (and liking!) is to LOWER the bridge pup and RAISE the pole piece screws. I typically have them poking up 1/8" to 3/8" out of the top of the bobbin. To my mind, this adjustment (along with the physics of the "rotated" pickup described above) can go a long way towards making the screw coil hotter than the slug coil, which has TWO benefits: first, it makes the coil-shunted output from the bridge pickup even stronger, so that it's not such a drop in perceived output/sound; and second, unbalanced coils make a humbucker sound more open and sweeter (that was part of the charm of the much-sought-after PAF humbucker: unbalanced coils). You can also try to get the same effect on the neck pup, by **lowering** the pole pieces as far as you can down into the bobbin, and raising the pickup a bit. The neck pup's polepieces get adjusted the opposite way (in, not out), as it is the slug coil that is playing when you shunt it, not the screw coil.

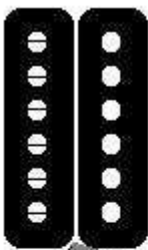
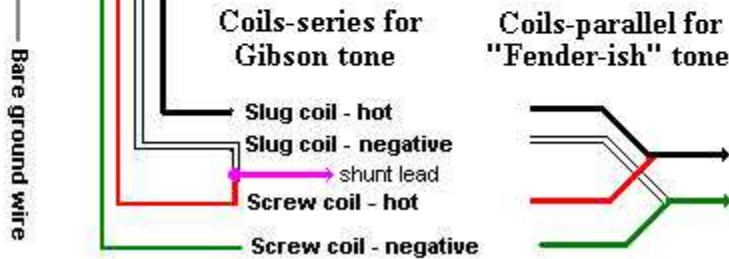




Here's a typical Seymour Duncan pup...  
I use the Seymour Duncan wire color code for all my drawings.

For standard humbucker operation, you would tie the red and white leads together, and solder the green lead to ground, the black lead to the output.

To coil split and get the SCREW coil, you would wire a jumper to the junction of the red and white wires, and route that jumper to the HOT output, "shunting" the slug coil.



Here's a typical DiMarzio pup...

For standard humbucker operation, you would tie the black and white leads together, and solder the green lead to ground, the red lead to the output.

To coil split and get the SCREW coil, you would wire a jumper to the junction of the black and white wires, and route that jumper to the HOT output, "shunting" the slug coil.

**NOTE:**  
I use the Seymour Duncan wire color code for all my drawings, NOT DiMarzio

