

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. 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.

A traditional humbucking pickup is comprised of two separate coils, which are wired in series. Usually, one of the coils will have adjustable "screw" pole pieces (designed to adjust for string-to-string balance), and the other coil will have non-adjustable "slug" pole pieces. These two coils are wired to each other out of phase, AND are reverse (magnetic) polarity from each other - which means they are IN phase sonically, but the out of phase wiring of the two coils will cancel most (non-magnetic) radio-frequency noise, hum and interference.

Hey, two coils playing in series? Electronically, it LOOKS 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 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 both outputs of one coil the same side of the circuit, bypassing ("shunting") that coil's effect on the tone and volume of the pickup. Hence, the name... 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, breath 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:

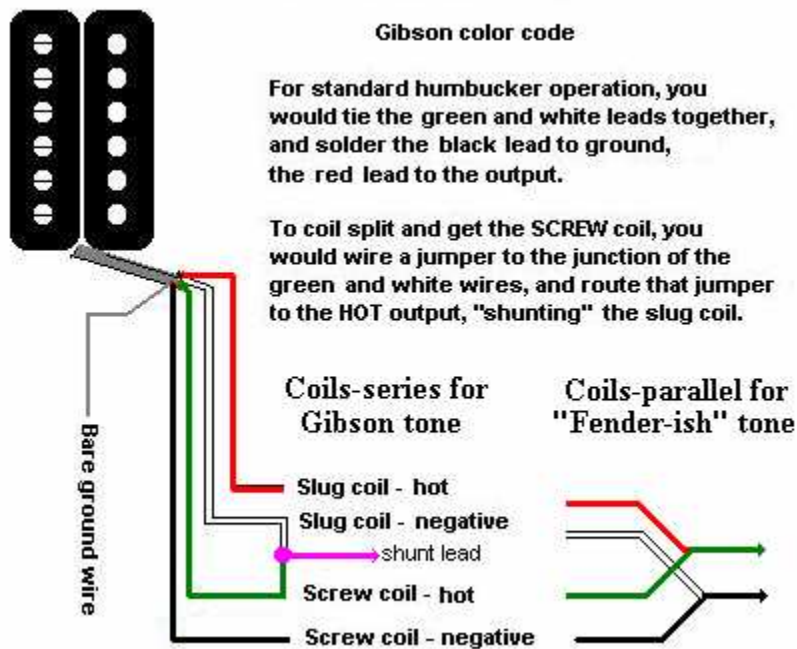
Every manufacture seems to have come up with their own color code and coil arrangement - I call the coil connected to ground the "first coil" and the coil connected to hot the "second coil" - just to help us keep track of the signal path. It is important to have the correct color code for the specific model pickup you are wiring, and know the arrangement. If you do not have this information about your pickup, please see the document "**Unknown Color Code.**"

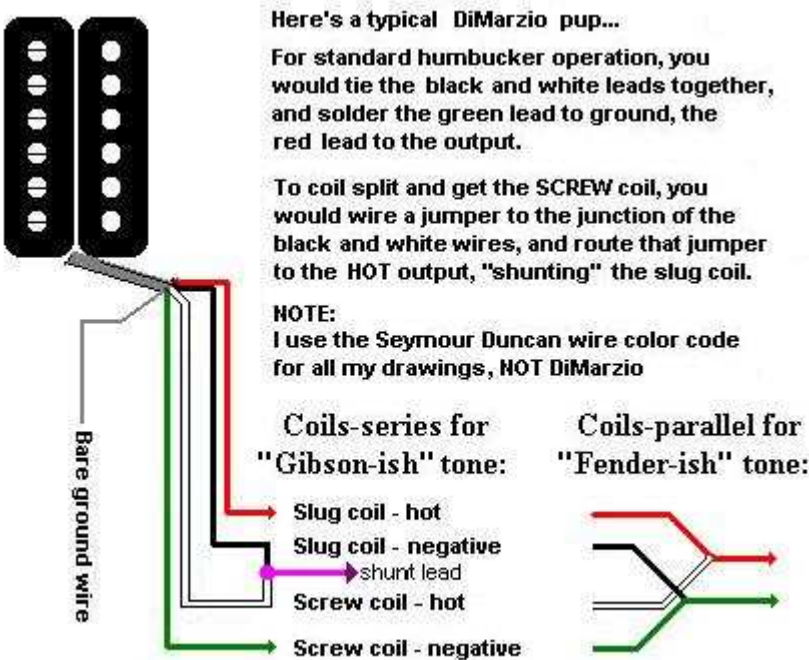
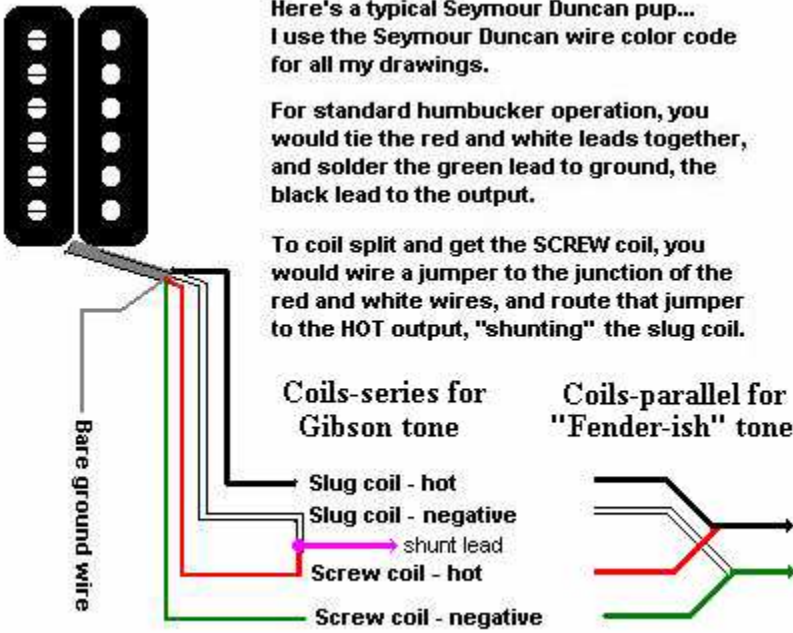
On your typical, aftermarket/custom four-conductor humbucker, there are two leads from each coil (and typically a fifth conductor, a bare ground/shield drain wire). To hook up this humbucker for "regular" humbucking tone, on the first coil, one lead ("-") goes to ground and the other lead ("+") goes to the other coil. On the second 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 are commonly called the "series pair".

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

A FEW SPECIFIC HUMBUCKING PICKUPS:

Take a look at a **Gibson** pickup's color code. Notice that the way Gibson wires their pickups, the **SCREW** coil is "first" – 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 GORUND, 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.





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 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..

One last thing 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 reverse 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 gets adjusted the other way as it is the slug coil that is playing, not the screw coil.

HUMBUCKER 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 when coil-shunt, even with the (above) adjustments made. Another 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 may have more presence 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. It's a win-win deal!

To accomplish this, you must **break** the 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 both a coil-shunt (both pups) and a coils-parallel option for the bridge pup, and wire the switches in such a manner that the coils-parallel switch will override the coil-shunt switch. 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.