

The Blue Guitar

Gibson Les Paul Junior mod: Adding Dummy Coil to P-90

An earlier article explained how I rewired a P-100 pickup in my Epi Paul Junior to get more authentic P-90 sounds. Well, in the P-90 mode the pickup was no longer humcancelling so my new project was to see if I could reduce the noise in a stock Gibson P-90 pickup without completely losing the P-90 vibe. Gibson has been using a dummy coil in their BluesHawk guitar so I thought that I would try something like that in my new LP Junior.

I had a few old Epiphone P-90 pickups around so I took one of them apart to get a coil to use. Construction details may vary but there were two screws holding the bottom plate to the bobbin; the six adjustment screws were not threaded into the bottom plate but you need to remove them anyway to convert an old P-90 pickup into a dummy coil. With the Epiphone P-90 pickups the two magnets were glued to the bottom with a contact cement so I had to pry them off. If the cable shield is soldered to the bottom plate you will need to desolder it. With the magnets and adjustment screws removed, the P-90 is now transformed into a dummy coil.

For my initial tests I just taped the dummy coil to the back of the guitar and used alligator clips to connect the wires in the LP Jr. control compartment. To cancel hum the windings of the dummy coil must be in the opposite direction of those in the "live" P-90 pickup. Rather than try to figure out which way the bobbins were wound, just flip the dummy coil over if it does not reduce the hum when you connect it to the P-90. If you have two conductor shielded cable connected to the dummy coil you can also reverse the leads. As for the physical orientation of the dummy coil, it needs to be mounted on a plane parallel to the P-90 coil; I tried moving the dummy coil around and rotating it, but that seemed to have no effect on the humcancelling effect.

The Gibson BluesHawk wires the dummy coil in series with the pickups so that is what I tried first. With the dummy coil wired in series you lose some of the high frequencies and dynamic range compared to a stock P-90 pickup; with the dummy coil wired in parallel the sound is a lot brighter. Since my Jr has only a single dog-ear P-90 pickup at the bridge it worked much with the dummy coil in series.

You will want to wire up the dummy coil to a switch because you will lose much of the charm of a P-90 pickup. The P-90 is fairly unique in how it responds to changes in the control settings on your guitar. From an expert on the subject, I was told that you raise the height of a soapbar P-90 until you start to get the nasty "Bad to the Bone" sound. With the height adjusted like that as you roll back the volume control the sound cleans up very nicely and actually becomes brighter- without having to add a cap across the volume

pot. Unfortunately with a dummy coil wired up in series or in parallel you lose that particular quality; when you back off the volume control, the sound gets muddy not crystal clear. So you will want to wire the dummy coil to a switch to remove it from the circuit when it is not needed or desired.

Using a dummy coil with a P-90 has its positive aspects as well, and not just the elimination of single coil noise. The compression added to the sound makes for a great lead guitar tone, especially if your amp is cranked up. On my LP Junior I like the way the dummy coil adds a second tonal option to the stock sounds. There are links to sound samples at the end of this article demonstrating the sounds and noise cancelling ability of my guitar.

Having decided that I definitely wanted to add the dummy coil to my guitar, the task remained of mounting it permanently. I figured that there should be enough room under the P-90 to mount the dummy coil but I did need to rout out the bottom of the cavity a bit. I used a Craftsman laminate trimmer since it is a lot easier to handle than a full-sized router. Put two layers of a good masking tape on the top of your guitar to protect the finish and you should be able to deepen the cavity free hand.

The next step is to shield the pickup cavity; I used copper foil tape but the conductive paint will work, too. After shielding the cavity the stock P-90 was less noisy, even without the dummy coil hooked up. After removing the two pots and jack for rewiring, I added another coat of conductive paint on top of the factory shielding in the control compartment.

Wiring up the dummy coil in series is fairly simple. For a Gibson P-90 you will have to replace the single-conductor shielded cable with something with two or more center conductors. The hot lead goes to the CW terminal of the volume pot and the other lead is connected to the push-pull pot, on the same terminal as the correct lead from the dummy coil. The other lead from the dummy coil is connected to ground as is the other terminal on the SPST push-pull pot. With the pot pushed down the signal from the P-90 pickup runs in series through the dummy coil; with the pot pulled up the P-90 is connected directly to ground, bypassing the dummy coil. If the dummy coil does not work properly in reducing hum, you will need to switch the two wires or flip the dummy coil over.

The 500k push-pull pot I used was one of the SPST ones with the long bushings intended for Les Pauls. The longer bushing is not needed with the LP Junior and I had to bend the two terminals over so that they would clear the control cavity cover. However I like to use these pots because they are full-sized and fit snugly in the hole. My LP Jr. came with a 300k volume pot and a 500k tone pot, and it was the tone pot that I replaced with the push-pull pot.

So what were my conclusions from this experiment? Number one, I think that the P-90 pickup with dummy coil sounds much better than the Gibson P-100 pickup. For my next experiment I want to try hooking up a dummy coil to a LP Jr Special with two P-90 pickups. I figured out a wiring scheme that would require more poles than are available on a regular LP switch; however, I believe that the master selector switch on a double-neck Gibson would work. Like the Gibson Blueshawk I would want the dummy coil wired up in series only for the bridge only and neck only positions as the middle position would already be humcancelling.

Enjoy!

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<http://www.blueguitar.org/>

Links:

Original article on my Epi Paul Jr:

http://www.blueguitar.org/new/articles/blue_gtr/gtr/paul_jr.pdf

Sound samples:

http://www.blueguitar.org/new/mp3/samples/p90dc_noise.mp3

http://www.blueguitar.org/new/mp3/samples/p90_w_dc.mp3