

"Full" conversion of voltage regulator to solid state

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[Link to CF Thread](#)

I got talked into doing another one of these for a pal that is heading for judging quite soon (his original crapped the bed last week)...The goal is to invisibly convert an old mechanical, "vibrating points" Delco Remy 12V DC voltage regulator to a solid state equivalent. Pictured is a lightly used Wells VR-715 solid state regulator and a used (dead), but original, "512", "2J"-dated, 1963 regulator. The cost was \$20 for the Wells and \$50 for the original V/R.

Most conversion are done by just putting the original top Delco-Remy case on the VR-715's solid state unit's base. This is easily detectable under some light scrutiny. So an invisible conversion will require housing the VR-715's circuit board completely inside the Delco-Remy case (both top and dated and numbered base section)...

Here is what I'm working with:





The first step is to remove the covers on both units which require taking the screws out of the original Delco-Remy unit and drilling out the rivets holding the VR-715 top case onto the base...

With the covers removed it's time to remove the circuit board from the VR-715 SS regulator; using an appropriately sized drill bit, drill out the 5 rivets holding the solid state circuit board.

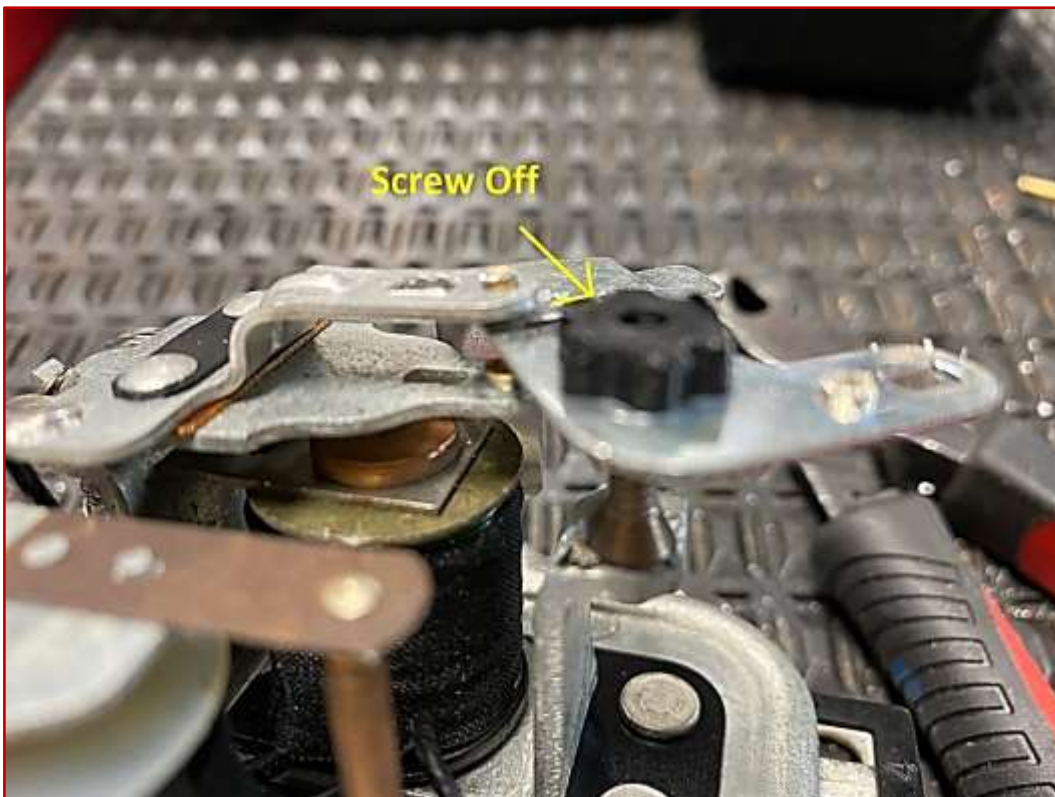
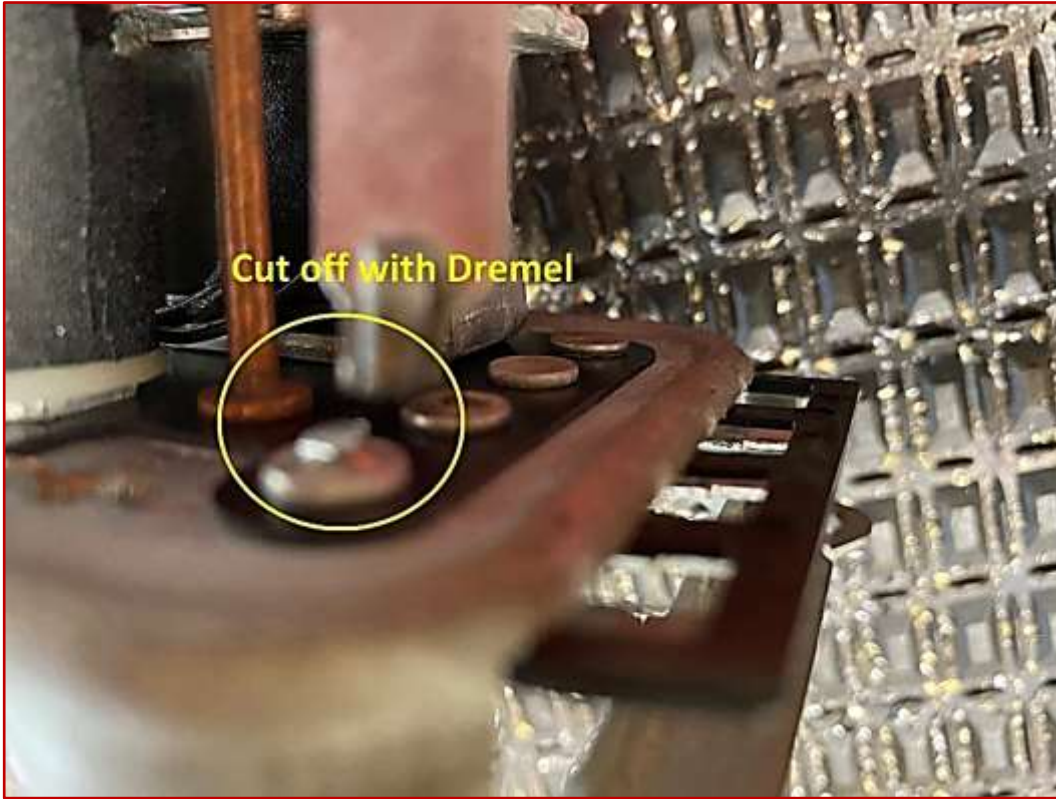


Next, and the worst part of the conversion, is "prepping" the base of the original Delco-Remy unit. The goal is to convert this base to support the solid-state circuit board while preserving the back face where possible to make it appear original. To wit, try to keep the two wire wound approx. 1" long resistors on the rear.

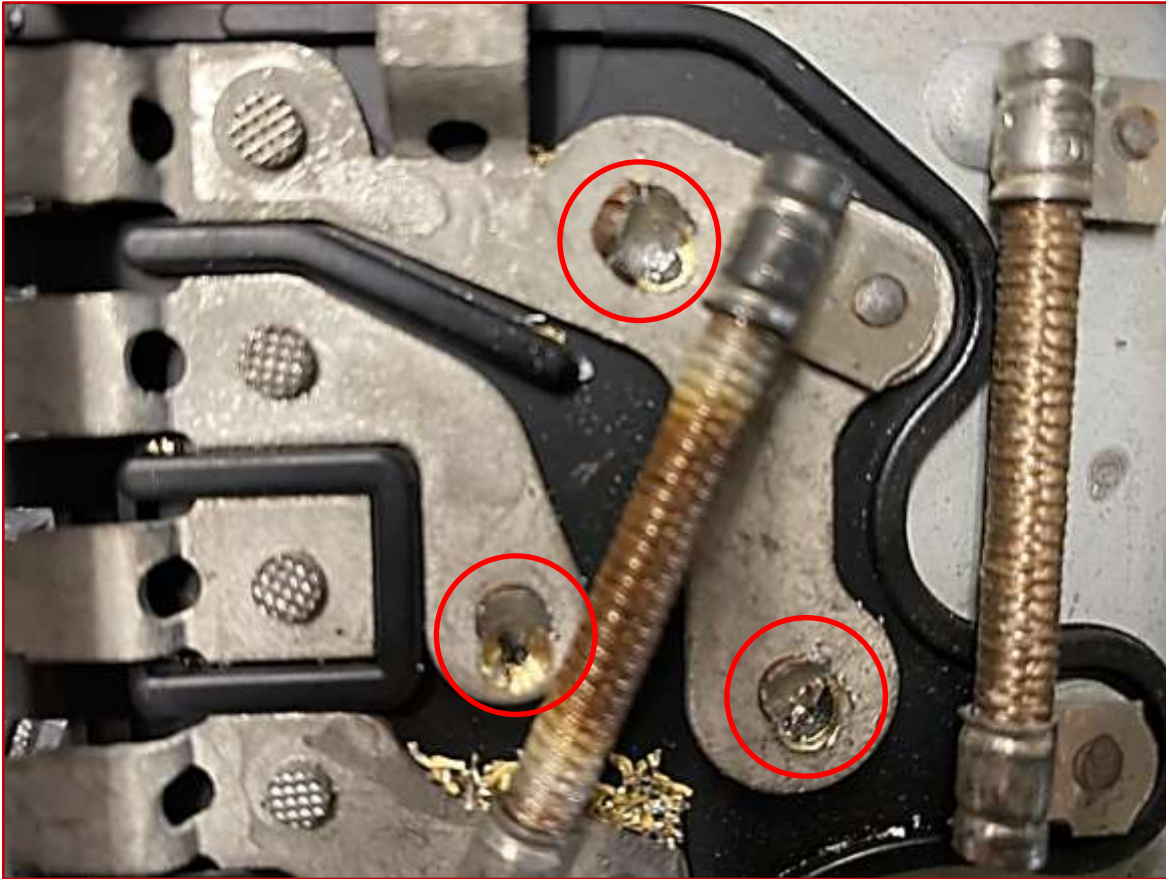
So, the prep requires first snipping all of the small leads off the base rivets.



Then the adjustment arm must be removed by cutting it off the post and removing the plastic adjustment thumb screw.



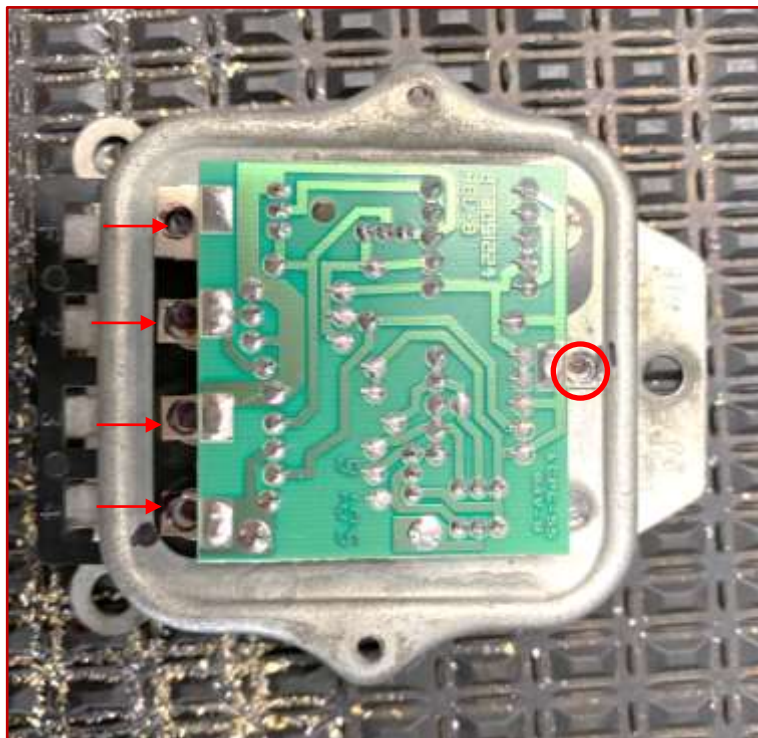
Next remove the two armatures by drilling out the copper rivets from the rear of the base...be patient, drill a little with an appropriately sized drill bit then lever the base of the armatures from the other side with a screwdriver to see when they'll come loose.



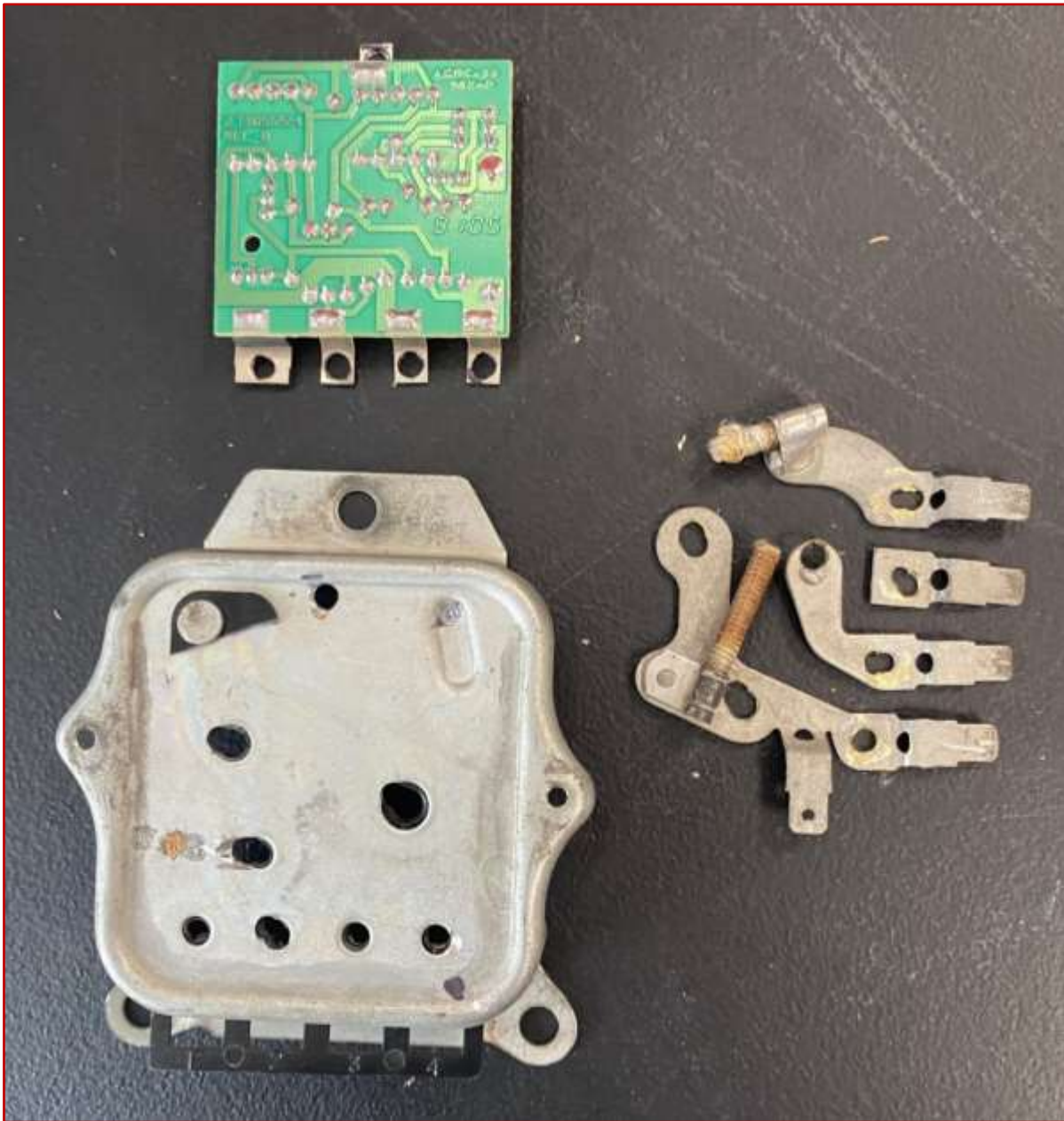
After that's done the copper stud must be removed by the same process. It's OK if the plastic insulator is nicked in a few places as it's going to be removed anyway. At this point the base should be clear of the old electrical components...



Now drill out (or grind off with a Dremel) the rivets holding the four original electrical spade terminals...mark the hole with a Sharpie (as shown) for the 5th hole (circled below) needed in the base for the upper circuit board terminal. A new screw will go there.



Remove any remnants of the black plastic insulator on the inside of the base and you should have a bare, original base with 5 holes drilled in it and the separate original terminals loose and separate (I “break” the one wire round resistor as shown on the rear– unlike the other one it may affect the operation of the circuit board).

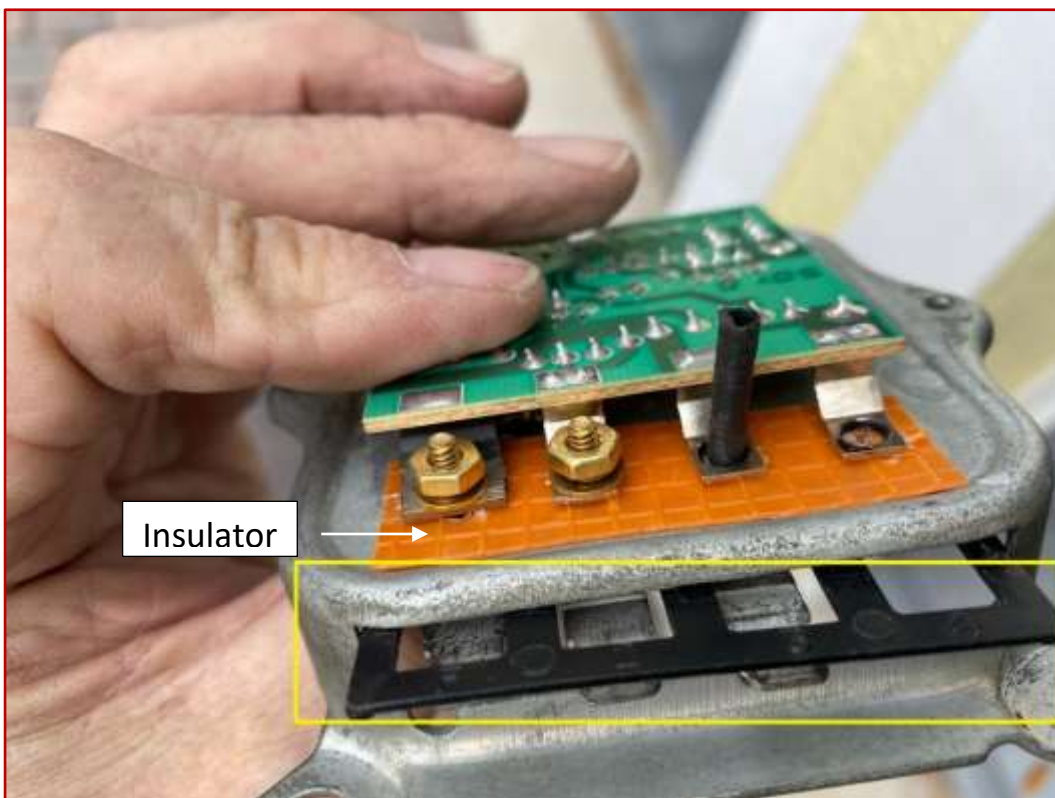


Original base is now prepped for the solid-state circuit board install.

NOTE: VR-715 solid state circuit boards may differ in size, appearance and components, but the conversion process is the same...

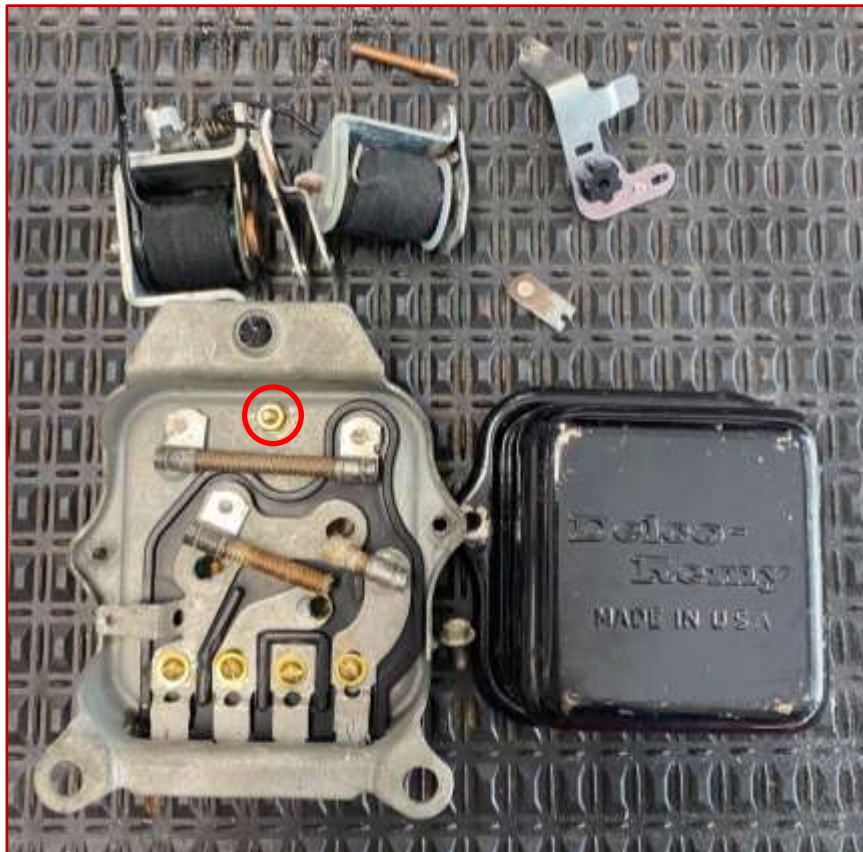
Now insulation of the circuit board and spade terminals is critical – I used a piece of an orange kitchen plastic, thin cutting board to insulate the circuit board connectors from the internal base’s metal (as shown - do NOT insulate under the top screw!). Brass #4-40 hardware (screws – as short as possible, washers, lock washers and nuts -- all from Ace Hardware) is used to make the electrical connections in place of the original rivets. Before you put the screws in decide now if your plastic electrical connector retainer strap is too old and brittle to keep on the converted unit (yellow rectangle in picture below), if so, then migrate the one off the solid state unit to the converted unit (this make take some trimming and creativity).

I used carefully selected, properly sized shrink wrap around the screw threads to isolate the metal base from the circuit board terminals (as shown). It’s a bit of a struggle to get the insulated screw through the original spade connector, original metal base, the plastic insulator and the new circuit board terminal but it ensures a solid, insulated electrical connection.





Note that the direction of the screw is reversed in the top 5th screw hole in the picture above to allow the original, Delco-Remy cover to seat completely onto the converted base.





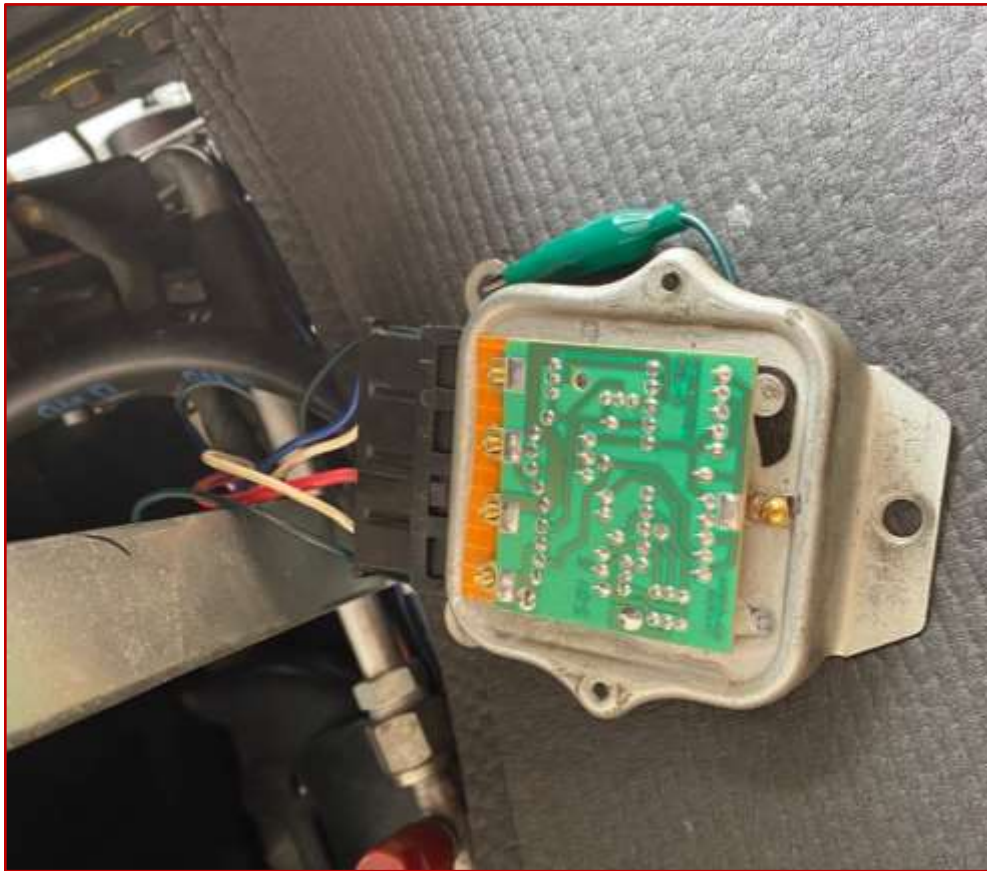
You may want to check out your insulation job with an ohmmeter ensuring the external spade connectors are connected to the circuit board and that the brass screws do not short to the metal base.

If that is good you can mount the V/R to the car with the original harness and original ground and the radio suppression capacitor if one exists. **At a fast idle a multimeter reading across the battery should be between 13.8V and 14.2V....as shown in the test of this converted unit attached to my car.**

This setup can handle up to 135 amps if your alternator has been upgraded for accessories.

When mounted and operating the new V/R is undetectable from an original...even for NCRS judging. Judges can't peer far enough to the back of the converted unit to see any differences and with the Delco-Remy lid and dated and numbered base it appears as factory.

The gauge on the dash will not show "snappy" or overly quick fluctuations of the needle as seems to be the myth. My conversion passed regional judging including ops checks. I've never done a PV but there is absolutely no reason why this conversion wouldn't pass that testing also.



Converted unit temporarily installed on my split window for testing.



Converted units output at about 1000 RPM.

Ha! Hardly - but with the paucity of original, working mechanical V/Rs for certain cars, and the latest non-adjustable repros, I think this will be a common mod (sorta like those modern AGM batteries hidden inside OEM-appearing Delco tar-top cases) and it's a "once and done" conversion. I've been running mine for 5 years now with Vintage Air A/C and an original alternator upgraded to produce 100 amps full out...and haven't touched it (or even thought about it) in all that time.

For \$70 and a couple of hours of my time this gent has a factory appearing V/R he'll prob never have to mess with again...

In the unlikely event this V/R should fail; it's a 40 minute job to replace the circuit board with a new VR-715 unit since everything is now held together with screws...

Maybe Dave Zuberer will pull all of this into a single PDF to make it less unwieldy...

Last edited by Frankie the Fink; Today at 09:08 AM.

PDF prep'd by Dave Z