

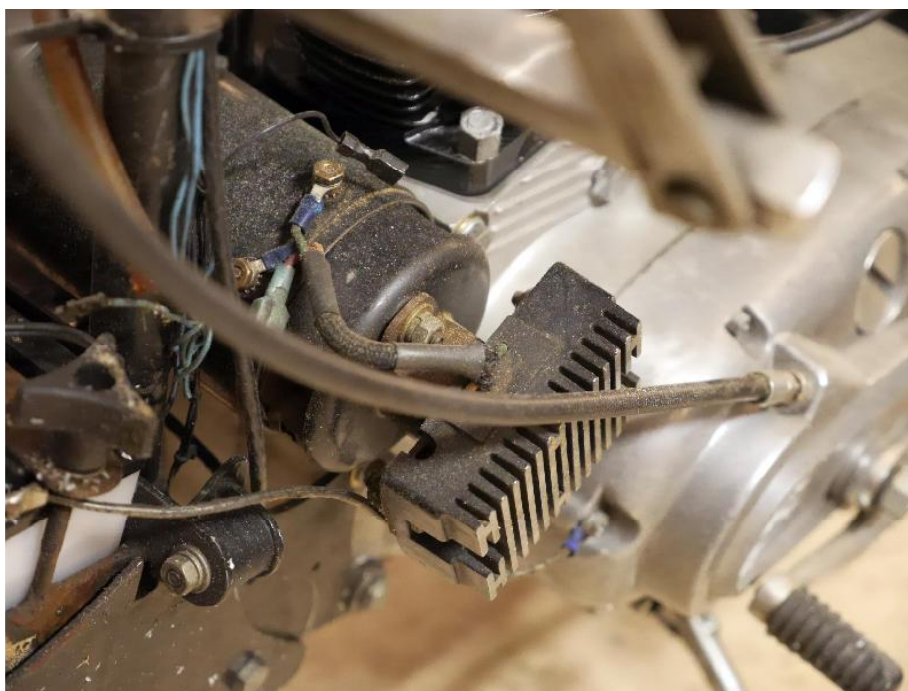
Voltage regulator bracket

Mount a Voltpak style regulator on the end of a generator.

I whipped this bracket out in a few minutes. Not only that, I still have all my fingers. I needed to replace a Frank's-style voltage regulator that mounts on the end of the generator with the old conventional Voltpak type of regulator.

Proper system partitioning does make it wise to make the regulator part of the generator subsystem. This way all 5 of my Iron Sportsters will have the same interface to the wiring harness and the harness need not have wires for the armature or field since these wires only go between the regulator and the generator.

This regulator will stay nice and cool and be more reliable mounted out in the airflow.

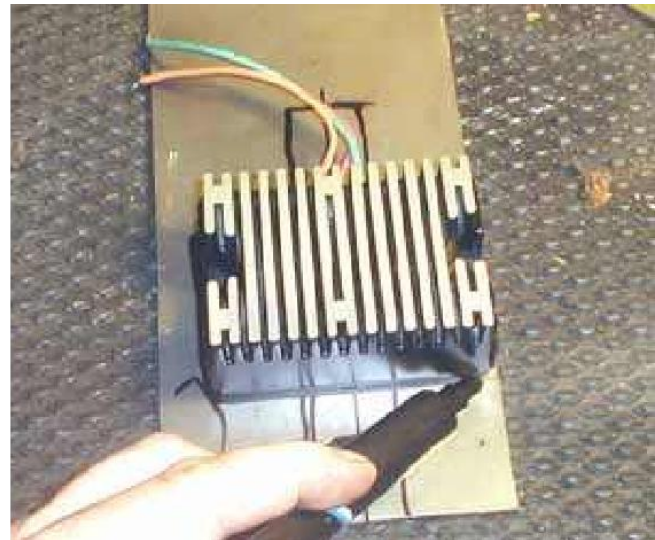




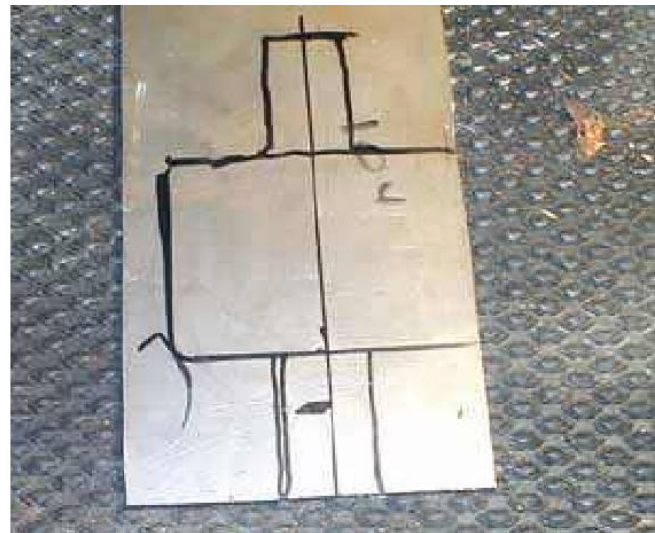
Measure the generator end bell to get an idea of the tab size on the bracket. These days I have a generator modeled in Solidworks 3D CAD program, so I could do this at a desk, but its really more fun to measure and mark things.



Also measure the height to provide for enough material for the bracket. You can see from the picture on the front page how the bracket has to zig and zag so its pretty easy to combine these two measurements in your head to rough out the size of the bracket. The hole locations have to be precise, but the overall outline of the part can be +/- 0.10



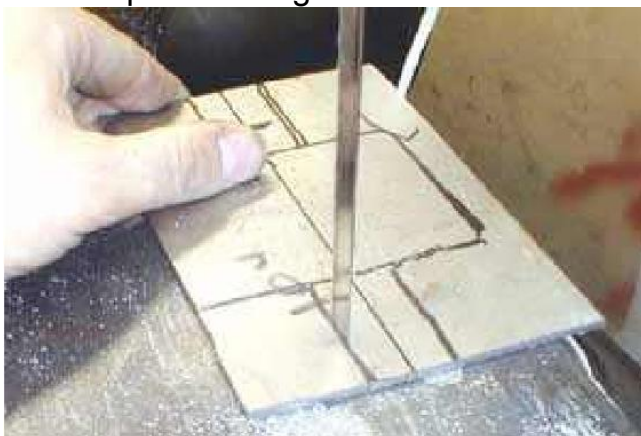
I find some nice thick steel in the materials crib. This is a fast project. I am using the old Detroit standard: Measure it a micrometer, mark it with a piece of chalk, cut it with an ax. After all that careful measurement I get a big thick juicy Marks-a-Lot and trace the new regulator out.



The first part of a custom installation like this is the "Cogitatin' and Calculatin" part. This takes far longer then the actual cutting and sawing and welding. The mount is traced out on the steel plate.



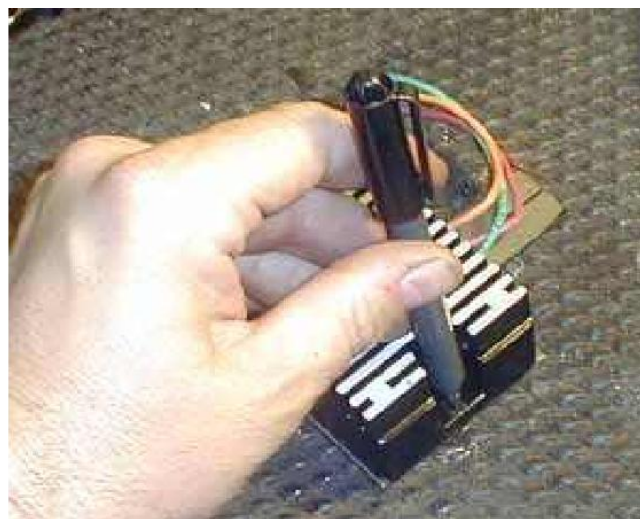
A trip to the trusty Jet Taiwan bandsaw and the plate is roughed out.



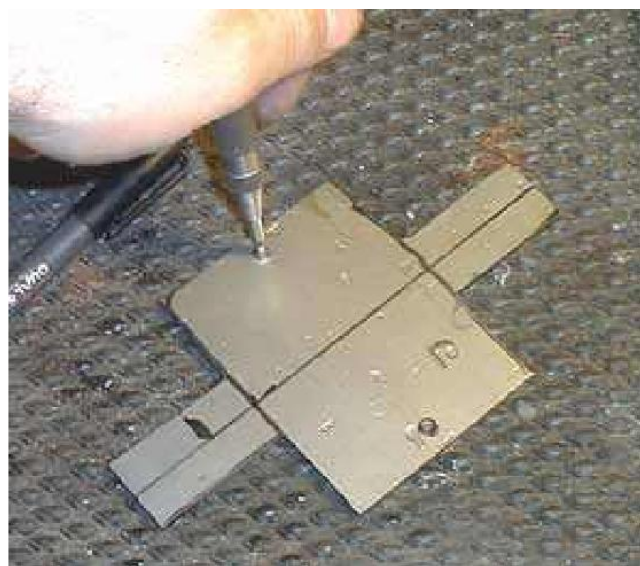
Now cut the little side squares out.



Keep your trusty bandsaw right next to the sink. Keep cooling the part off as you work.



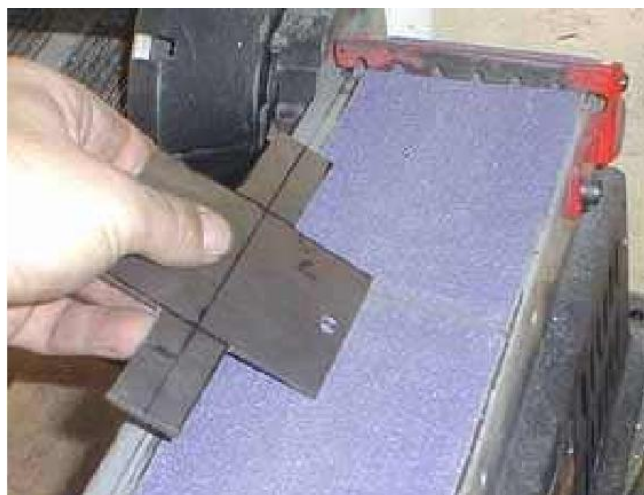
Lay the regulator on top of the plate and mark the mounting holes.



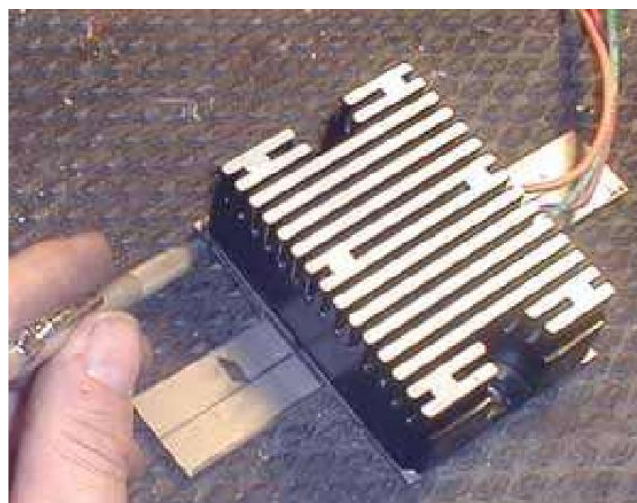
Center-punch that mysterious place you best feel represents the center of the ink blotch.



Always drill a small pilot hole even if you are in a mad rush like I am. Then drill the holes to the 1/4 inch final size. It wouldn't kill ya to run a countersink on both sides to take off the burr.



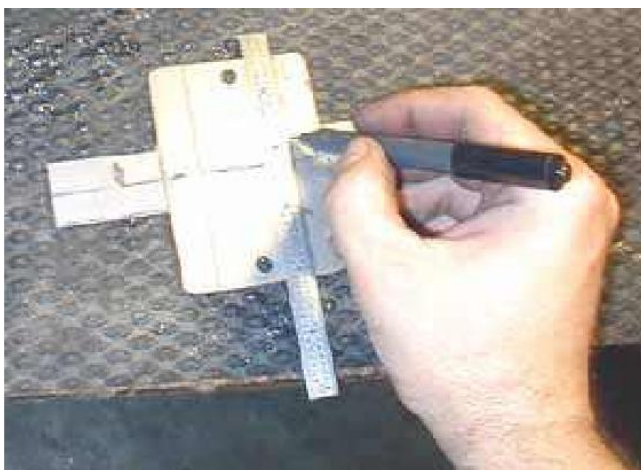
This is definitely a wino job. You can see nothing is square. I knock off all the burrs, true up the edges and make things a little more square as I go.



Here I am scribing the overhang of the bracket so I can grind it flush. You should be noticing a certain design issue right about now.



Here I am trimming off the overhang and squaring things up. See the problem yet?



Duh. The bracket can't bend down from the edge of the regulator and still be narrow enough to pick up the generator mounting bolts. ECO* approved, I draw new lines just wide enough to allow the end bell bearing to fit up in between the narrow tabs.

* Engineering Change Order.



OK, I went back the bandsaw and cut the 4 little areas out to narrow up the mount so it fits the generator. After cutting the 4 little squares out I bend the tabs down by hammering on them while the mount was in a vise. The distance between the tab is wide enough to clear the generator end bell bearing and here I am measuring for where the outward bend should be.



Now you see why I should have done this bend first. See how the tab is getting all bent out of shape as I hammer over the mount? Alternatively I could have pulled out the old Ox-Acetylene torch and heated the bend area to keep the rest of the tab from doing the macarena.



Duh. Not exactly mil-spec workmanship huh? Like I keep telling you, better a wino bracket on a bike that runs then a perfect unfinished project on a bike sitting broken in the garage.



This was the field expedient, so to speak. I used a drift to hammer the other side over. This way I could concentrate the blows so that the bracket would bend the way I wanted. It was quicker then hauling out the torch. I then bashed the other side as straight as I could.



Same as with the other holes, drill a small pilot hole first. If you don't want to lose a finger you should clamp the piece down unlike me. Then drill the 1/4 inch holes. De-burr them with a counterbore or file or something. It's your hands that get cut handling sharp parts.



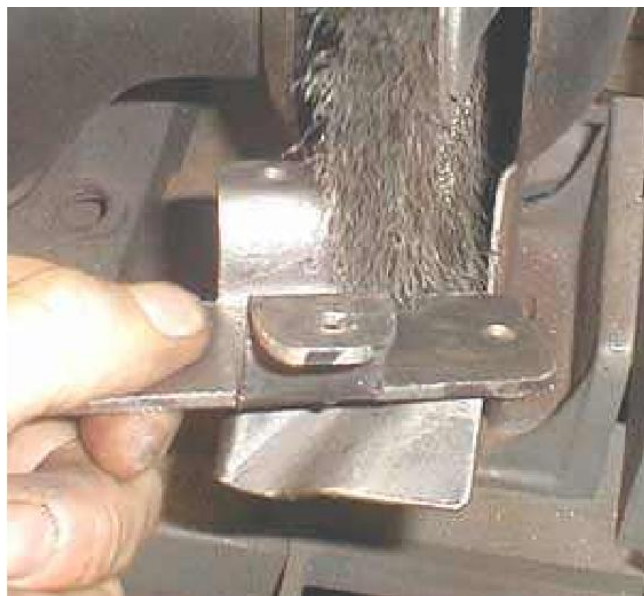
The tabs are way too long but that's no biggie when you have a Jet Taiwan bandsaw handy. I mark where the holes should be in the tabs. It sure is handy having a spare end bell to use as a gauge.



The Jet bandsaw has whacked off the long tabs and I am rounding them off and truing things up on the belt sander.



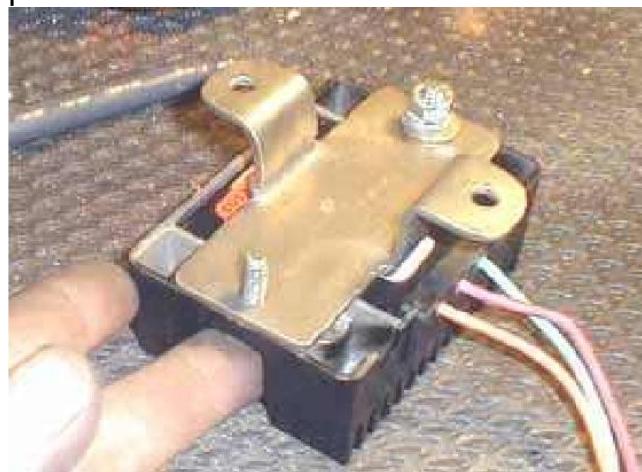
This thing is so wino out of square it isn't funny. This trues the bracket up a little. Notice how the band saw is adjusted so the belt runs on the edge so I can do this.



The wire wheel can remove a lot of burrs in hard to reach places. Please please please wear safety glasses. The wires routinely fly off the wheel and can punch a hole in your eye.



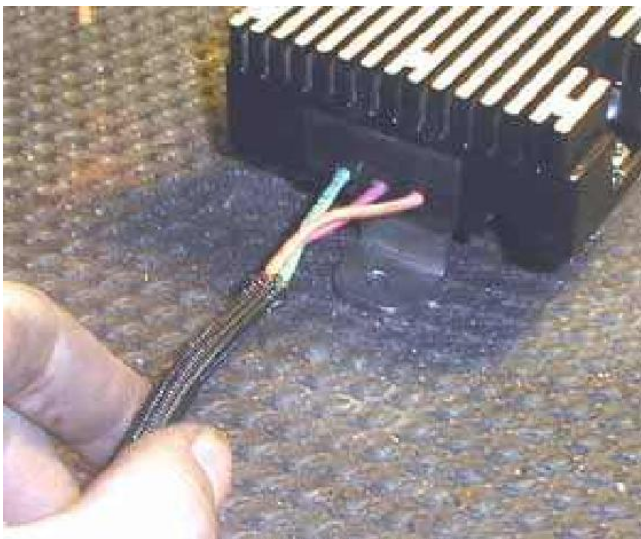
I have a countersink mounted in a file handle that I use to clean up the holes. You can use two hands since you are not using the dreaded Olympus 340 to take a picture.



Time to mount up the regulator. I used 1/4-20 bolts with a flat washer and nice new lockwashers so they stay put. Replace the lockwashers every time you take something apart. They cost less then a penny. I worked at a military contractor and saw the chart for how good lockwashers still work after repeated tightening. After about 5 times they are useless. A new one every time, even if you have to loosen something 20 seconds after you tightened it.



The Custom Chrome people assume you own a 7/16 socket because they did not provide clearance for a wrench. Same for Frank's and accel and everybody else. Would it kill then to make the cutout an 1/8 inch bigger?



I made the bracket so wino I got a little guilty so I am making a little harness to pretty up the wires coming off the regulator. I push the nylon braid over the 3 wires....



Put a length of shrink tubing over the braid for a professional look. You can get the braid at Digi-Key or Element-14.



Crimp on a 10-32 hole ring terminal for the armature (A) and field (F) connentions to the generator.



The factory uses prevailing torque, or so called ntloks to hold the end bell on. I replace them with plain 1/4-24 nuts and lockwashers.



Now I mount the regulator to the bike. I usually mount the wires down and bring them up and around the generator to the field and armature but the custom chrome people decided it would be a great way to save money by making the wires 6 inches shorter then everybody else. It is kind if nice how the wires come up right by the terminals but I still would rather have them pointed down.



Be careful not to strip out the brass 10-32 screws. Choke up on the wrench when you tighten them. Notice I did not trim the wires to the shortest possible length. This would be a wino play. You have to leave a "service loop" as it is called. That way if a crimp terminal breaks off you still will have enough wire to replace the wire terminal and have it reach the generator terminal.



I use a 1/4 inch spade connector for the connection to the bike harness on all of my Iron Sportsters. These types are shrouded on both sides so I don't need to cover them with tape or anything.



You can see I mount the battery in front which a lot of people give me crap for. All I know is: 1) It's close to the generator. 2) It's not heated up by the engine. and 3) It's far enough away that it does not ruin every pair of blue jeans I own with acid holes. If the bike was an electric start, the battery would be too big to go in front and it should be kept close to the starter anyway. Oh yeah, I guess I didn't get around to painting the bracket much less chroming it. I'll think about that while I ride around tonight.



Here is a nice shot from my Panasonic GH3 camera. I bought it for recording movies. Now that I am posting hi-res photos I thought I would add this shot so you can see how good things will look.