

Autolite Group 27 Battery Rebuild

J I M W O O D S

This paper describes the procedure I used to salvage an expensive reproduction Autolite Gr. 27F wet cell battery that, after 6 years of occasional use, had developed a weak cell and would not hold a full charge. The goal is to gut the case and re-use it by installing a smaller battery inside. This procedure is more economical than buying a new replacement though it is somewhat tedious and probably results in a smaller battery in terms of cranking power. I say probably because the battery used to salvage the original is not rated in automotive terms like CCA (cold cranking amps).

The battery I am using is designed for applications like wheelchairs and is a sealed AGM design. It is important to find one that is good electrically and has threaded terminals rather than posts. You might be able to use one with posts, but I think it could cause interference issues. The common identification for a battery like this is #12350 though there may be a different number or a suffix to identify one with the threaded terminals. The battery I bought

looks just like a #12350 but is a SLA-1156 TI (I think TI may be threaded insert). It is an Interstate Power Patrol which I could have purchased locally for \$90 plus tax but I bought mine online for \$70, no sales tax, free shipping and received it in 2 days.

<http://www.everybatteryneed.com/>

I have used one like this in Gr. 24 size in my '66 Mustang for about 2 years with excellent results. Total cost of the project is under \$100, compared with almost \$300 for a new reproduction Autolite battery.



The first step is to discharge the battery as much as possible. I connected an old tail light to the battery with temporary leads and let the bulb burn around the clock. It took several days for this one to go "dead". Be careful about the surroundings during this phase as the bulb can get hot and you don't want to return to something melted or burning.

Second, I drained the battery of its acid. I did this by dumping the battery upside down in a plastic drain pan. Wear acid resistant gloves for this step! I transferred the acid to a plastic bottle for disposal.

To further neutralize the battery, I then filled it with a strong solution of baking powder and water. It will foam/fizz for a while. When it has calmed down, I dumped it out on the ground - it is just baking powder at this point - and repeated the process about 5 times, usually leaving it half a day or overnight between repeats.



The next step is to gut the battery case. If you are lucky enough to have a bandsaw, that would be the ideal tool. In my case, I used a hacksaw. You will find a ledge about 3/4" of an inch down from the top that is a convenient place to make the cut to remove the top lid of the case. You will need to saw completely through the wall of the case all the way around plus you must saw through the locations where the post and plates are connected. Make a note how the lid is oriented with respect to the case side markings so you can reinstall it correctly later. Here is what the case and lid look like once they have been separated.

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As you can see, there are two posts and five pairs of lead bars that must be separated with the saw. I also cut through a portion of some of the filler cap nipples, though this is not necessary in order to separate the lid from the case and represents extra work at this stage.

There are partitions in the case that separate the plates into six groups. These plate groups just slide out. Pry up enough to get access to the lugs and use a pair of pliers to lift them out. Wear your acid resistant gloves because these probably still contain some acid.



I placed the plates in a plastic bag for disposal. My local battery distributor will accept these plates and the bottle of acid at no charge and I assume they recycle the plates and safely dispose of the acid.



The case is now empty. Flush it out with water and begin removing the partition plates. These are very brittle and you can remove most of them by just twisting on them with a pair of pliers. In this particular case, I left one partition wall in place because the Gr. 27 case is large enough to hold the battery I am using without removing this partition and I thought it would be beneficial in holding the new battery in place. I have also done this procedure on a Gr. 24 case and it requires that you remove all partition walls.



The next step is one of the more tedious parts of the job. The goal is to remove and smooth the internal partitions and ribbing so that the new battery has something smooth to rest on and enough clearance to sit down fully into the case. After breaking off as much as I could with the pliers, I used a Dremel with a cutoff wheel to slice off as much as I could access. Be careful not to cut through the case walls, though functionally it would not be the end of the world if you did make a small break through. Finally, I used my Dremel with a grinding stone to smooth what I could not cut out with the wheel. This process makes an incredible amount of fine black dust that will get all over your clothes so plan accordingly. It is probably also a good idea to wear a painter's mask to keep this dust out of your nose. Here is the finished case. You may note that the remaining partition wall has been trimmed down about 2". The reason for this will be apparent later in the process.



I mentioned that you do not need to remove the fill cap nipples to remove the lid, but you may need to trim them down for battery clearance. I went ahead and cut the nipples off flush with the cut I had made to remove the lid. In these pictures, there are still two nipples that need to be trimmed. The cutoff wheel works great for this.

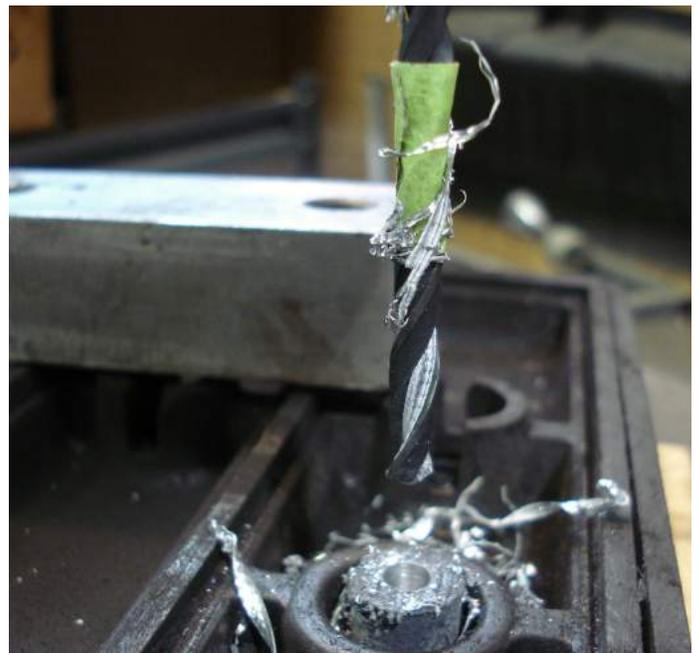
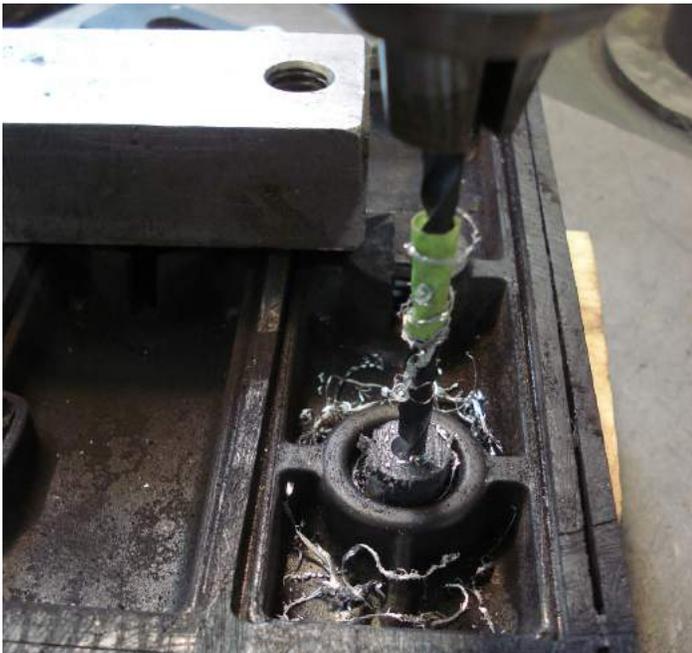


Here is the other tedious step in this process. You need to drill and tap a hole in the underside of the lead posts for a threaded stud. The word of caution here is that the lead is tricky to drill because the swarf tends to fill the flutes on the drill and can abruptly bind the drill bit in the hole. Don't even think about drilling a small pilot hole first, because this increases the risk that you will break off a drill bit if/when it binds.

I used a punch to make a center in the post, set the lid up on my drill press table so it was level and the post was supported, and drilled at the lowest speed of my drill press (300 RPM). I got a nice curl by feeding slowly but steadily but every time the curl got long, I stopped and cleaned off the bit. This takes a long time to complete, but is much better than trying to deal with a broken off drill bit in the soft lead material. Here is the setup I used to support the post.



I chose to drill the post for a 1/4" threaded stud. You could go to 5/16" on this, but I preferred to retain as much of the post as possible. Also, the connection to the new battery is 1/4" (actually 10mm) so I didn't see much benefit in going larger here. I used a #7 drill bit for the first one, as recommended for a 1/4-20 tap, but wasn't too happy with the depth of thread I obtained so for the second one I used a #9 drill bit. I don't know if the hole got a little sloppy because the material is so soft or if my press has a little runout (or both). If I were doing it over, I would probably use the bit in between these two, a #8 drill bit. I drilled to a depth of about 3/4" - 7/8". Here you can see the curl and the potential swarf issue of jamming the bit.



I then carefully hand tapped these holes with a 1/4-20 tap. Again, there are issues with the lead clogging the tap and binding it. I think if you try to do too much at a time, you risk the collected lead swarf actually removing some thread when you remove the tap, so tap a very short distance, remove and clean, repeat. Again, time consuming but this is an important step to get right. I don't have a bottoming tap, so could only get about 1/2" of good thread with my 7/8" deep hole.

You could use a bolt here but my concern is that if you have to put it in and out of the hole a couple of times you might lose the fit in the soft lead. I am using a stud made from a piece of 1/4" all thread and a jam nut. It just needs to be long enough to engage 1/2" into the post, then have room for the jam nut, battery cable lug, plus a flat washer/lockwasher/nut on top. When you tighten the jam nut it will deform the lead a little, making a secure connection. This needs to be tight to ensure it stays put, but don't strip the threads!



I had two 10" long battery leads made up using welding cable, which is fine strand copper wire and very flexible. The battery shop did this for me, using crimped connectors with a 1/4" diameter hole, for under \$10. There is plenty of room for cable in this Gr. 27 case, but if you are doing a Gr. 24 case you may need shorter cables to ensure you have enough room to stuff them into the small space around the new battery. They do have to be long enough to allow you to attach them to both the battery in the case and the lid and have some wiggle room to manipulate the lid afterwards.



Note that I trimmed the remaining case partition with the cutoff wheel to make it level with the case of the new battery. This is necessary so that there is clearance to route the cable. I also used some scrap styrofoam to fill the gaps between the new battery and the case so that it wouldn't slide around or rattle. I didn't bother with padding the top as I didn't want to interfere with the fit of the lid and I thought the chances of the new battery hopping up and down in the case was slim.

Now make the cable connections to the lid, paying attention to the orientation of the cable and connectors so it will all go down into the spaces in the case and not interfere with the fit of the lid. Make double sure these are tight because a poor connection here will be a hassle later. I used a flat washer and lock washer under the nut that retains the cable to the stud.



Now all that is left is to close up the case. I used a small amount of JB Weld all around the joint. This makes a pretty much permanent attachment, but I wanted something strong enough to be able lift the battery by the posts if necessary. You could probably use black RTV so long as you don't lift by the posts. My cables were stiff enough to make the lid misaligned with the case when I set it back on, so I strapped it together while it dried so it would stay put. I "centered" the lid by just feeling around the perimeter to ensure that the lid overlap was uniform all the way around. I could have used more JB to make a more complete joint, but didn't want to make a mess on the outside of the case.



About Jim Woods:

"Grew up in a family with a "car guy" father and grandfather and learned mechanical skills on my first car, a 1954 Ford. More American "iron" and some drag racing followed. I then veered into the sports car world, surrounded by them while growing up in South Florida and influenced by attending the Sebring 12-Hr. races throughout the 60's. Road raced with the SCCA in the 70's and returned to road racing in the 90's with a vintage Lotus Seven. A derelict '66 Mustang Fastback "found me" in 2003 and it has been Ford blue and early Mustangs ever since. I love the details and mechanical work, and learn something from the community of Mustang fanatics every day."

**A N G H E L
R E S T O R A T I O N S**

*Marcus Anghel
Scottsdale Arizona*

Phone: 602 628 2522
Website: www.anghelrestorations.com
E-mail: marcus@anghelrestorations.com

