



Repairing 6 Volt, Positive Ground, Alternators



(—with a little help from the *Magic Paper Clip*)

...Eric Shogren

The most common alternator used in a Model A is a Delco-Remy 10si or GM alternator. These were and still are very common alternators for GM cars. I recently had a bearing go bad in 6 volt, positive ground, 60 amp alternator and was faced with the prospect of having to haul to a repair shop for replacement. Now, I've replaced a few bearings in a Model A and I figured it couldn't be that hard in an alternator. I knew from past experience the problem was the brushes. They are spring loaded to ride on the commutator which is in the back of an alternator casing with no way to hold them in position when you pull the rotor out of the casing; or so I thought. Frustrated, I started doing a little searching on the Web. What I found was a very helpful website (http://www.midwesternmedicalmachine.com/~damonfg/alt_rebuild/index.html) addressing how to rebuild a Delco-Remy 10si alternator. That is where I learned about the "*Magic Paper Clip*" and it all became very easy.

1. To tear down one of these you remove the four screws on the back of the casing holding the two halves of the casing together as seen in **Figure 1**. Be sure to note the orientation of the two halves. This is important so that when you reassemble the alternator you have them in the correct relative orientation.



Figure 1



Figure 2

2. Next you remove the front half of the casing. You will have had to remove the pulley first. Once you have the front half of the casing off you see the rotor and the stator (windings) as shown in **Figure 2**. Be careful not to lift the rotor out of the rear of the housing at this point because you release the brushes. If you do, don't worry, there's still the "*Magic Paper Clip*".

To replace the front bearing you will see (**Figure 3**) a simple three screw bearing retainer that can be unscrewed and the bearing driven out. The replacement bearing is a NAPA 6203-2RSJ or equivalent. Press in the new bearing, screw on the retainer, slide the front half of the casing back on and you're done.

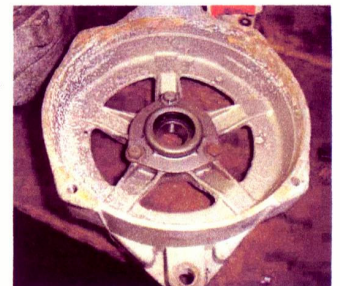


Figure 3

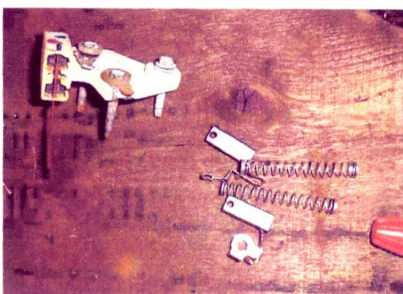


Figure 4

But what if you did like I did and unevenly pulled on the front casing and lifted the rotor out of the rear casing; releasing the brushes? Well now comes time for the "*Magic Paper Clip*". As seen in **Figure 4** the brushes are spring loaded and will come completely free of the brush holders. Well, the brush holder, as seen in the upper left of **Figure 4**, has a hole in both the top and bottom that is just made for a paper clip. You hold one brush in the holder and slide the paper clip through the hole in the brush holder and over the face of the brush. Then you hold in the second brush and slide the paper clip across the face of the second brush and into the hole on the other side of the brush holder. What makes this magic? There is a hole in the

rear casing of the alternator that once the alternator is assembled, the paper clip sticks out of that hole! Just grab it with your fingers and pull it out—you have a completely assembled alternator. One more thing that makes it a "*Magic Paper Clip*"; if you do like I did and try to use the alternator with the paper clip in place it won't charge worth a darn.

That's on repair. The next (and probably most common) repair comes when your alternator quits charging. Most of the components of an alternator you have to really work at to damage except for the voltage regulator. It is a solid state electronic gizmo seen in **Figure 5**. Like most things electronic, heat is the enemy, and failure of the voltage regulator is the most likely cause of the alternator failing to charge. On page 10, you'll learn how to replace a voltage regulator:

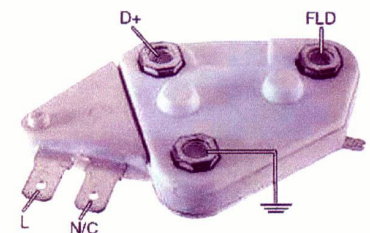


Figure 5





Figure 6

1. First, you remove the front half of the casing as noted in steps 1 and 2 above.
2. Next, you lift out the rotor (**Figure 6**) and look into the back half of the alternator casing (**Figure 7**).

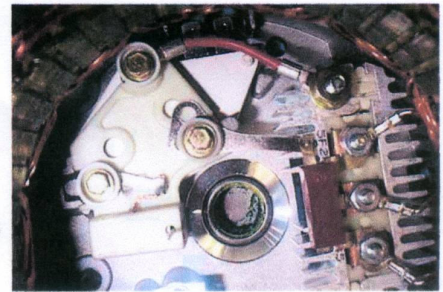


Figure 7

3. On the left of **Figure 7** you will see 3 bolts with insulator rings around them. They hold the brush holder on top of the voltage regulator and both the brush holder and the voltage regulator to the casing.

4. If you look back at **Figure 1** you see two spades of the voltage regulator sticking out the alternator casing. On a 6 volt, positive ground, alternator those two spades are probably covered by a square piece of rubber that can be easily pried off with a screw drive. Don't throw it away—you'll need to put it back on later.
5. Next you remove the three bolts holding the brush holder and the voltage regulator and remove the two.
6. The easiest place I found to get a replacement voltage regulator was at the Quick Start Automotive Electric website. The part number is Part No. D10SE61 and the link to the specific part is: (<http://store.alternatorparts.com/index.asp?PageAction=VIEWPROD&ProdID=1743>). It runs about \$25 plus shipping. You can also order a complete repair kit with instructions for about \$30. It is Part No. D110SiSE6VRK and the link to that product is: (<http://store.alternatorparts.com/index.asp?ageAction=VIEWPROD&ProdID=450>).
7. Once you have the replacement voltage regulator put the two brushes back in the brush holder and hold them in place with the "Magic Paper Clip" as seen in **Figure 4**.
8. Pass the three bolts with their insulators in place through the brush holder and the voltage regulator and screw them in place as seen in **Figure 7**.
9. At this point is also a great opportunity to apply some grease to the needle bearing in the back of the casing.
10. Set the rotor back in the casing as seen in **Figure 2**.
11. Put the front half of the casing back on and bolt it back up with four long bolts. Be sure to put the two halves back together in the same relative orientation as you found them.



Magic Paper Clip

Pull the "Magic Paper Clip" out the back of the housing.

When you install the alternator on the car you may have to "excite" the voltage regulator the first time to get it charging. Remember that square rubber plug we removed from the two spades of the voltage regulator? Well, if you look closely you will see and #1 and #2 stamped in the outside of the casing next to those two spades. To excite the voltage regulator, while the car is running with alternator installed, you momentarily touch a wire to the alternator casing to the spade with the #1 stamped next to it. The alternator should start charging . . . if you removed the "Magic Paper Clip."

P.S. Did I remember to tell you that first you must straighten the "Magic Paper Clip"??