

**Stangeriffic2002**

As many of you know, upgrading the "Big 3" wires in your engine compartment can lower the overall resistance of your entire electrical system. The effects of the lower resistance are typically:

- 1) Reduced dimming and smaller voltage drops**
- 2) More stable voltage and better current flow**
- 3) Less strain on your vehicle's charging system**

So for those of you looking for a cheap and easy way to upgrade your system and help out your electrical system without adding a high output alternator or an aftermarket battery, this is the modification for you. If you have heavy dimming or are getting large voltage drops during loud bass hits, but you don't have the money to spend on a high output alternator or a battery, upgrading your vehicle's "Big 3" will usually help to reduce and sometimes even eliminate the problems. So without further ado, the "Big 3" wires are:

- 1) Battery negative to chassis**
- 2) Alternator to battery positive**
- 3) Chassis to engine**

Now, I suppose it would help if I explained what each of these wires does, and to do that I would like to paraphrase an explanation by IMTfox from a while ago: Think of your vehicle's charging system as two different circuits, one consisting of your amplifier and your battery, and the other consisting of your alternator and your battery. The current in your electrical system flows from your positive battery terminal to your amp, from your amp's ground to the chassis, and then from the chassis back to the negative battery terminal. But how does it get to the positive terminal in the first place? That's where the alternator comes in. Current in the second circuit flows from your alternator's positive post to the battery's positive terminal, then from the battery's negative terminal to the chassis, and from the chassis back to the block, which happens to be the grounding point for your alternator.

So, from your battery, you have the power wire going to the power terminal on your amplifier and then your amplifier is grounded to the chassis of the vehicle. From here the current needs a way to get back to the negative battery terminal, and that way is through the **first of the "Big 3,"** the battery negative to chassis wire. Upgrading this wire will "upgrade" the circuit between your battery and your amp by giving the current a larger path to flow through to get back to the battery.

Now, think of your alternator as the battery and your battery as the amp. From the positive post on your alternator, you have the **second of the "Big 3,"** the alternator to battery positive wire supplying "power" to your battery. From there the battery, just like your amp, is grounded to the chassis through the wire mentioned in the previous paragraph. Again, the current needs a way to get from the chassis back to the alternator's "negative terminal" and that way is through the **last of the "Big 3,"** the chassis to engine wire. Since your alternator is most likely mounted to your engine block using a metal or conductive mounting bracket, you can simply add your new wire from the chassis to one of the mounting posts for the alternator. Upgrading these two wires will "upgrade" the circuit between your alternator and your battery, again giving the current a larger path to flow through.

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Now that you understand exactly what the "Big 3" do, it's time to upgrade them to a larger gauge wire. You can use regular power wire from installing your car audio equipment, ring terminals, and crimping equipment just the same as you would for any other install. Let's start with the first of the "Big 3," the **battery negative to chassis wire:**

- 1) Disconnect your battery's negative terminal and get the stock wiring out of the way. You might have to cut it and crimp a new ring terminal onto it. I found it helpful to use aftermarket battery terminals with multiple ports on them also.

2) Scrape away the paint and drill the hole for your connection of the larger wire, or connect it to the stock grounding point. Either way you do it, make sure it is bare chassis metal, not covered by paint, and that the connection is as tight and secure as possible:



3) Secure the new wire to the chassis and reconnect the vehicle's stock chassis ground, but **DON'T reconnect the vehicle's negative battery terminal yet!** You may find it helpful to cover the negative battery terminal with a cloth or other non-conductive material and just lay the terminal on it until you're ready to reconnect it later.

Moving on to the next of the "Big 3," let's upgrade the **alternator to battery positive wire:**

4) Locate the vehicle's alternator and look for a terminal post connected to it. The post shouldn't be hard to find. It should have only one wire connected to it, and it should lead to the positive terminal on the battery, possibly through the fuse box.



5) Disconnect the stock alternator to battery positive wire from the positive post and connect it to the post again with the new wire added.

6) Run the wire either through your fuse box if applicable or through a fuse. **The fuse should be sized to match the max ampacity of your wire, not the output capability of your alternator.** As you can see I just went through the fuse box, so my upgrade is probably not making as much of a difference as it could if it were fused externally, but my alternator is capable of withstanding the draws anyway so I'm not particularly worried about it. If I ever begin to see a problem w/ current draws, I will probably fuse the wire externally with a 300A or so fuse...

7) From the fuse, connect the wire to the positive terminal on your battery, again, leaving the stock wiring connected when you're done. The picture below shows the alternator to battery positive wire run from the alternator through my fuse box to the positive battery terminal.



Last, let's move to the **chassis to engine wire**: (Again, because your alternator is grounded to the block, all you need to do is find a bolt somewhere on the block and connect it to the chassis. The alternator's mounting bracket is usually a good place to find these bolts).

8) Again, either drill a new hole or connect this wire to the stock chassis ground. From the chassis ground, run the wire back to one of the mounting posts for the alternator (or to a bolt on the engine block).



9) That's it! You're done. Reconnect the vehicle's negative battery terminal and check out the difference! Below is a shot of the "Big 3" upgraded in my car. The other wire you see coming out of the battery's positive terminal is obviously my amp's power wire.



Helpful hints:

- 1) Leave the stock wiring attached after you're done. Don't replace the stock wiring, add onto it. Current will take the path of least resistance anyway, so replacing the stock wire will only make more work for yourself.
- 2) When fusing your alternator to battery positive wire, fuse it toward the battery end

of the wire. As IMTfox points out later in this thread, the battery will explode if it's overloaded, while the alternator will only burn out its regulator which won't cause much damage except to the alternator itself. Exploding batteries are no fun!

3) When crimping large gauge terminals for 1/0awg and sometimes even 4awg, a vice works well. Crimp one side of the terminal at a time, creating an overlapping edge. Put the boot around this and then wrap it in electrical tape if you want. the most secure connections will occur in this way.



4) Lastly, prepare all your materials and tools BEFORE you are ready to upgrade. Know what you are doing before you start so you can be done as quick as possible. The majority of vehicles have computers that will reset after the battery is disconnected for a long time and they can cause older vehicles to do strange things if they reset.

Hopefully this clears up most of the questions you had about why we upgrade the "Big 3" and how it helps to stop dimming and other electrical problems. If not, please don't hesitate to send me a PM.

--Chris

## Stangeriffic2002

quote:

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Originally posted by fubar73:

**Great post Chris. Very good job on explaining everything. i only have one simple question though, and that is: you said make sure your fuse from the positive alternator to positive battery is the same amperage as your alternator? would it be a huge problem if my fuse was alot larger than that of my alternator? would that hurt anything or would i be fine? thanks a TON for this post**  
Greg

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As long as the stock wire is still there and still goes through the fuse box or a fusible link it should be alright. The only reason the fuse is there on that wire is so that if the system asks the alternator to produce way more current than it's designed to, it willblow the fuse instead of damaging itself.