


# The Big 3 Wiring Upgrade

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One aspect that is often overlooked when installing a high power mobile audio system is the current capacity of the factory wiring. The wiring put in place by automakers is just sufficient enough to support the current demands of the factory accessories and is rarely able to support much more than that. A fairly simple and inexpensive way to address this is to replace or augment the factory wiring with new, larger gauge wire. This will help greatly to support the extra current draw that a mobile audio system will demand. The **"Big 3"** name is because we will be upgrading three key wires in the vehicle. Here are the wires you need to upgrade:

**1. Ground wire from battery to frame:**

Use at least a 4 AWG wire and place it directly under the factory ground strap that runs from the negative battery post to the frame of the vehicle. Grind away any extra paint on the frame to bare metal to allow the new, larger ring terminal to make full contact with the frame.

**2. Ground wire from engine to frame:**

This will be almost the same as the "battery-to-frame" upgrade. Use at least a 4 AWG wire and place it directly under the ground strap that runs from the engine block to the frame. Grind away any extra paint on the frame down to bare metal to allow the new, larger ring terminal to make full contact with the frame. In some vehicles there may be a ground strap that runs from the alternator casing to the frame. It would be a good idea to upgrade this also if your vehicle has this.

**3. Power wire from alternator to battery:** Use at least a 4 AWG wire and place it under the factory ring terminal on the power stud that is on the side of the factory alternator. Run this wire to the positive battery post and be cautious not to route it where it will contact hot engine components or moving parts such as auxiliary belts. Fusing this wire near the alternator is a good idea as well for added protection in case it gets damaged. This will blow the fuse and still allow the factory system to continue to operate.

The **"Big 3"** upgrade can not only improve the performance of your audio system, it can also enhance the performance of the entire electrical system for your vehicle (which can lead to improved fuel economy or additional horsepower). In other words, upgrading the **"Big 3"** is almost always a good idea.

**Note:** For systems that will exceed 1500 watts (of actual power) it would be best to use larger wire for the upgrade such as 2 AWG or Ø (1/Ø) AWG. This much power may also require an upgraded alternator.

## A quick note about wires:

There are many companies offering wire that is a combination of copper and aluminum. Aluminum is not as conductive as copper. Aluminum is also less expensive than copper, so when comparing pricing and wire size it can be a bit misleading. You should only consider using true copper wiring, but if you want to consider the copper/aluminum wire, it is best to look at a wire size that is 2 AWG larger (smaller number) to ensure safety and proper conductivity.

Below is a chart that shows various different wire gauges using the AWG system (American Wire Gauge) as well as the cross sectional surface area. Please note that the area values listed are for solid copper wire. Of course, in mobile audio applications we use multi-stranded wire and solid copper wire is rarely if ever used. The cross sectional area of stranded wire can vary with the number of strands, so creating a valid chart for stranded wire would be either confusing or inaccurate. If you use the numbers listed below as a general guideline, you should be fine.

Ø (1/Ø)	53.5	8.251
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1	42.4	7.348
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2	33.6	6.544
4	21.2	5.189
6	13.3	4.115
8	8.37	3.264
10	5.26	2.588
12	3.31	2.053