

How You Can Add An Aux Fuse Box To A C90 With Mod-3

By DrJones18LC

Note...This article *does not* explain how to perform Mod-3. It only explains how an aux fuse box can be added *in addition* to Mod-3

Those of you with a C90 that either have, or will, perform Mod-3 have a unique option/opportunity to install an aux fuse box.

Usually those of you who want an aux fuse box will take the power to feed it either directly from the positive battery terminal, or from the bolt where the positive battery cable attaches to the starter relay. It's just usually the easiest places to do it from.

Most do not realize that attaching an aux fuse box to either of these spots means that the current used by any load wired to the aux fuse box must pass through the main fuse on its way to the charging system. On a stock bike *and* on a bike where Mod-3 is performed *properly*, generally only the battery charging current passes through the main fuse. (the exceptions to this are key on bike not running, and some bikes that do not generate enough current *at idle* to satisfy the bike load)

If you're one of those folks that don't run much from an aux fuse box or power point (like a GPS or a cell phone charger) sending that tiny bit of extra current through the main fuse won't bother anything. However, if you're one of those running things like a stereo, light bar, heated grips or clothing, etc., that draw a lot of current you are setting yourself up for a *potential* inline main fuse holder failure. The weak link in the system after performing Mod-3 are the connections inside the inline main fuse holder. Keeping the current that passes through the inline fuse holder to a minimum goes a long way towards not stressing those connections, and reducing the possibility of leaving you stranded.

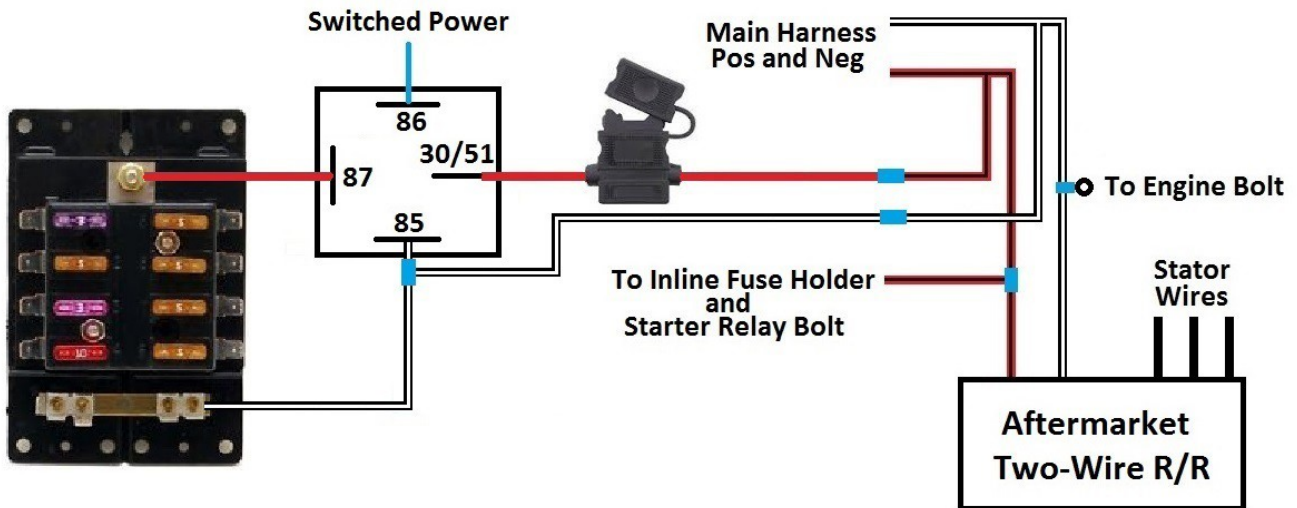
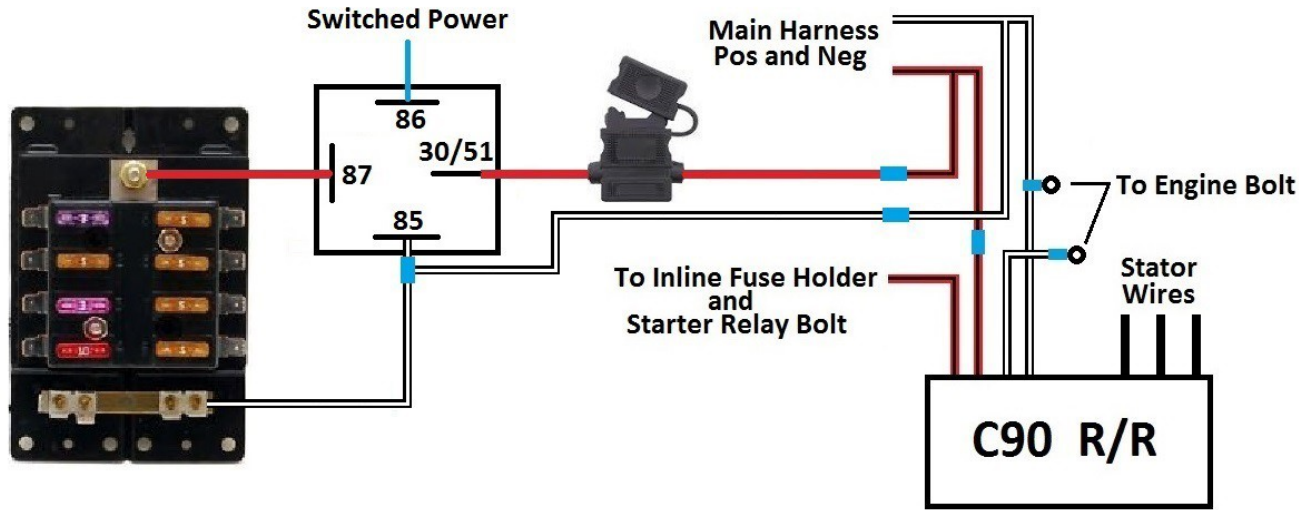
So...Where Is A Good Spot To Get Power From?

There are two positive and two negative wires that run between the OEM C90 R/R and the bikes main power harness. This was Suzuki's misguided fix for the melting R/R connector problem on the LC. I say "misguided" because even though there was a lot of *potential* for heat in the LC R/R-Stator connector (stator and power wires were all in the same connector) the reason for the failure was due mostly to the connector(s) not being weatherproof/waterproof. As soon as any contamination got into any of the connections you had resistance, heat, and eventually a melted connector plug. Instead of using a weatherproof/waterproof connector they decided to use separate connectors for the stator and R/R, and to use two sets of positive and negative wires instead of one set. Theoretically each wire carries half the current it would have and therefore produce less heat. Unfortunately since they still didn't use weatherproof/waterproof connectors they still ended up with the exact same problem. Go figure. Part of Mod-3 addresses this issue.

Mod-3 really only requires you to use one set of positive and negative wires. One set of wires is still properly sized to carry the bike load. This means with a little ingenuity we can use the second set of wires to feed an aux fuse box *without sending any excess current through the inline main fuse holder!* This can be done using either the four-wire OEM C90 R/R or a two-wire aftermarket R/R. They are just wired slightly different.

The diagrams below gives you an option for both the C90 R/R and the aftermarket R/R.

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Above we have two options depending on if you have a two-wire or four-wire R/R. At the top you see the two main harness wires, and how they split into the two positive and two negative wires that originally fed the OEM R/R. We still need to have one set of positive and negative wires connect to the main harness as per Mod-3. In the diagram on the top (C90 R/R) there is a blue splice that connects the positive from the R/R directly to the positive for the main harness. Where it says “to engine bolt” the top line points to an eyelet that connects the negative from the R/R directly to the negative for the main harness. This connection needs to be made to an engine bolt via the eyelet. (per Mod-3) The second lone negative wire also gets an eyelet and attaches to an engine bolt. You could put all three negative wires together if you wanted to but it's just easier to get a good connection with two wires.

The second positive wire from the R/R is the bypass wire that goes directly to the inline fuse holder and starter relay. (as per Mod-3) It doesn't get more direct than that.

That leaves one set of unused positive and negative wires that we can use to feed our new aux fuse box! Positive to the aux fuse box, negative to a common buss bar...or however you want to use them.

The diagram on the bottom (aftermarket R/R) shows the option for the two-wire R/R. The single negative from the R/R attaches to one of the negative main harness wires and then to an engine bolt. (per Mod-3) The single positive from the R/R attaches to both a positive main harness wire, and to the added bypass wire that feeds the inline fuse holder and starter relay bolt. (per Mod-3) The remaining two harness wires are used to feed the new aux fuse box/negative buss bar...or however you want to do it.

Things To Consider When Using These Options

Whether you use either of the above options the main thing to remember is the harness wires we're using to feed your new aux fuse box circuit are ***ALWAYS LIVE!*** (just as they would be if you went straight to the battery or used the starter relay bolt) This means you should stick to *some* version of the wiring scheme above using a relay to turn the juice to your new aux fuse box on and off with the ignition. It greatly lessens the chance you will leave anything connected to your new fuse box on and possibly drain your battery.

Another big thing to consider is that you will be running these wires to wherever you mount your new aux fuse box. This means the positive wire ***MUST*** be protected from shorting out against anything. Since we are tapped straight into the main harness (and that positive wire is *always live*) the only fuse in play protecting it is the bikes main fuse. (added Mod-3 inline fuse holder)

Even though we will not be sending extra current through the main fuse during use, if there is a short in the positive wire we're using to feed the aux fuse box the excess current drawn will come straight from the battery and through the main fuse. The main fuse will blow and will cut all power to your bike. Obviously it is important to avoid this.

The best way to avoid such a scenario is attaching an inline fuse between the positive main harness wire and the relay you're going to use to feed power to the aux fuse box. Use no more than a 20 amp fuse here. (15 amp would be better) You want that fuse to blow before the main fuse would. This way you only lose power to the aux fuse box instead of the entire bike.

The placement of this fuse is important. The *best* place to add it would be directly to the main harness wire under the bubble cover. A short anywhere downstream means you're protected. I realize this is impractical as most of you will want to put your new fuse where you can easily replace it if need be. So again, let me stress the importance of protecting your positive wire between the main harness and the inline fuse holder feeding your new (relay to) aux fuse box! Make it as short-proof as you possibly can.

At start up, all power for the bike comes directly from the battery. That means all current passes through the main fuse (Mod-3 added inline fuse holder) until you start the bike. When you first turn on the ignition switch there is a large inrush current that can easily be two or more times what the "normal" current would be before you start the bike. (this only lasts about a second or so) For this reason it is a good idea to turn off any large draw you have attached to your new fuse box until after you start the bike. No point in unnecessarily adding to the burden of either the main fuse connections or the load on the battery during start up.

It is also worth mentioning this will in no way increase the amount of current available to you. You are still limited by the amount of power available to you within the limits of the charging system. Keep an eye on those voltmeters and turn off those loads you don't need and help to keep your battery happy!