



Exclusive Review/DIY Guide

The Essentials...		RAV4OZ.com
Review Type:	DIY Guide	
SUBJECT:	Building your own Custom +12V Distribution Block	
Reference ID: <i>(Ref ID is provided by the RAV4OZ.com Team)</i>	R4O-DIY-ACC-002	
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Benefits of doing Mod/product:	<ul style="list-style-type: none">• More neater "single" wire to battery• Easily accessible distribution block that sits behind gear shaft for a handy +12V source for accessories	
Duration of Installation:	Max. 4 hours	
Difficulty Rating [Scale 1 to 5]: <i>(1= easiest, 5 = most difficult)</i>	3.5 – Needs a fair bit of determination and creative thinking, some Electrical knowledge will be beneficial	
Satisfaction Rating [Scale 1 to 5]: <i>(1= Don't Bother, 5 = RAV4 Essential)</i>	5	

Introduction

Sick and tired of having to hunt for an additional +12V supply when installing an accessory?

What also prompted me to go ahead with this was to tidy up existing wiring to the Alarm, Spotlights and Subwoofer Amp into a single location and then take a single "thick" cable back to the +12V Supply on the battery. While -12V is available by just tapping off the Chassis Ground, +12V is hard to come by and most Auto Electricians opt to "tapping" off other existing +12V supplies thus adding more load to a fuse supplying +12V to that device.

My design also accommodates plenty of spare inputs to the distribution block to allow for future accessories I might be installing. Once you have completed this mod you won't ever have to worry about hunting for an additional +12V supply ever again.

Please Note: I have made some suggestions to this DIY which are an expansion to this project which I did quite a few months back. I highly recommend that you read my suggestions on how you should improve this project to ensure that not just you, but also all equipment hanging off the distribution block are protected.

I would appreciate that you read through this entire document first before going out and buying the goodies listed below as you might get some ideas yourself on how you can improve this project to suit your taste.

Material and Tools Required

Below is a very general list of stuff that you will need, refer the appendix for suggestions on locations in which this equipment can be purchased.

Material

- A Small Black Plastic PCB Box (or Jiffy box, Approx Dimensions L 110mm, H 30mm, W 50mm)
- 4 Gauge (AWG) Power Cable (or something of equivalent size, I used 16mm² Building cable), Approximately 3 Meters
- Brass Distribution Bar (this bar is usually used in Electrical Cabinets to Ground Equipment)
- Gold / Tin Lugs to match 4 Gauge cables, with 8mm Eye on Lug, 2 Pieces (one for each end of the 4G Cable).





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- Heat Shrink Tubing (to fit 4G Cable)
- 8mm Nut and Bolt
- High Amperage "in-line" Fuse holder (with 4 Gauge input and output terminals) *
- Multiple "in-line" Fuse holders for each accessory you want to hook up to distribution block *

*** Note :** These optional items have not been used by me when I built my project but its important for you to incorporate them in your project for safety reasons.

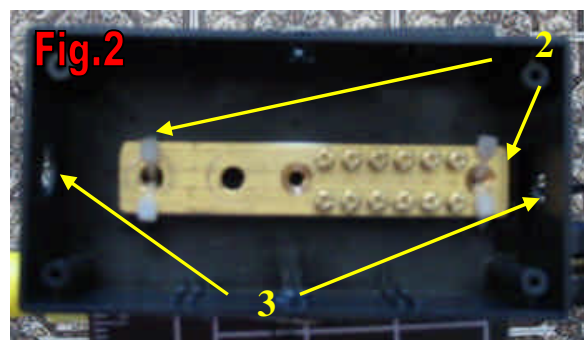
Tools

- Screwdrivers (assorted sizes)
- Electric Drill with some assorted Drill Bits (Preferable something big enough to drill a hole for the 4G cable)
- Pen Knife
- Wire Cutters / Strippers
- Electrical Tape
- Cable Ties (Small ones will do)
- Silicone Sealant (and relevant device needed to apply sealant)
- Cable Crimper to Crimp Lugs onto 4G Cable (or be creative and use a hammer)
- Heat Gun (if heat shrink tubing is to be used)

Building and Installing the Distribution Box

First things first we need to build the distribution box, this is easy and wont take you more than 10 minutes to do.

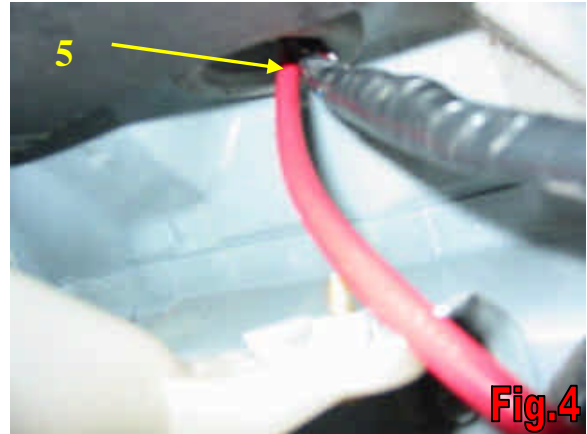
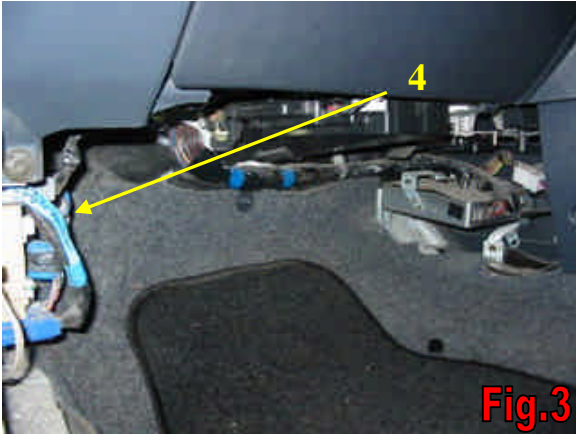
- 1) Figure 1 shows the Brass Distribution block placed inside the box to start off with.
- 2) Mark some holes next to the top and bottom holes and run some cable ties through those holes and secure the bar in place as shown in Figure 2.
- 3) Next Drill some holes using a 10mm Drill bit on either side of the box as shown in Figure 2, This is for the cables entering and leaving the box.



Now that you have completed the easy part, time to get your hands dirty. The Installation procedure was written for a RAV4.1 (since I own one) but if you own a RAV4.2 you can get some ideas as to how to run the cable across from your battery to the inside of your RAV4 by reading some of the other DIY's available on the RAV4OZ.com website.

- 4) Remove all the internal panelling on the passenger side as shown in Figure 3. The cable out into the engine bay will be passing through a rubber grommet on the left side of the inside of the passenger foot area. You will have to stick your head inside near the foot area and look for a bunch of wires leaving the passenger area though a rubber nipple through to the underneath of the splash shield of the left front wheel.





- 5) If you have a stock RAV4.1 you will just see a black bunch of wires entering the rubber grommet as shown in Figure 4. The rubber grommet has two nipples, one is used up by the black set of stock wires shown above but the other one is unused and this is what we will be using. The red wire shown in Figure 4 is the wire that we will be running through.



- 6) Turn the steering wheel all the way to the right so that you will have some working space. Then remove the screws holding the wheel splash shield as well as the small plastic side panel. Create an opening that you can slide your hand through between the chassis and the splash shield. Don't worry too much about breaking the plastic splash shield as it is quite flexible. It would ideally be best to remove the thing altogether but this means taking the tyre off and I didn't want to go through all the trouble.
- 7) I bet you were wondering why I asked you to get some rigid small wire as part of the "tools", I'm sure you will understand why when you look at Figure 6. The small wire will be used as a guide for the larger wire in getting it through the rubber grommet.
- 8) Next take your penknife and snip off the top of the spare nipple as shown in Figure 7.
- 9) Now attach the red 4G wire to the small guide wire and send the small guide wire through the spare nipple and keep pulling the small guide wire from within the passenger feet area (Figure 1). You will need a bit of persistence in getting the red 4G wire through the nipple but once its in, then its easier to pull it through. Figure 8 shows the 4G wire just getting into the nipple.



- 10) Once you are done sending enough cable through, use either the silicon sealant or some electrical tape and loop a few rounds of tape around the cable and half of the nipple. This is to somewhat protect any moisture from entering through the firewall, the cable itself will be a tight fit so its up to you if you want to use the electrical tape.



- 11) Next bring one end of the cable through the hole in the chassis next to the battery.
- 12) Cut off the excess cable running and crimp one of the lugs onto the end of the cable. I used electrical tape here to insulate the exposed copper from the elements. However, I suggest that you use some silicon sealant and some heat shrink for a neater job (surround the contact points of the lug and the copper cable with silicon sealant and run a piece of heat-shrink tubing over it and apply some heat with a heat gun). Do NOT connect it to the battery yet.





- 13) OK so we are nearing the completion of this project so hang in there. The next few steps involve the usage of some of the additional components I spoke of. Yes, that's right, FUSES. Figure 11 shows a high amperage in line fuse that accepts 4G wire in and out. I suggest you get one of these fuses and whack it in the anywhere in the middle of the 4G cable shown in Figure 13. Figure 13 shows the cable running from the rubber grommet. I used some cable ties to secure the cable with the huge wiring loom so that it doesn't move around.
- 14) Figures 13 and 14 show the completed project. Once you have crimped the end of the 4G cable with the lug and insulated it either using heat-shrink or electrical tape (as mentioned in Step 12) use a nut and bolt and secure the lug inside the box onto the brass bar.
- 15) Once you have completed the above steps, you can hook the cable onto the +12V on the battery (make sure you disconnect the negative terminal of the battery before you start hooking things up, failing to do so will result in some serious damage to yourself)
- 16) That's about it for our project then. Just remember that you should use individual small fuses as shown in Figure 12 when connecting equipment to the brass block. This will ensure that your equipment stays safe in the event something should happen.

Useful References/Links

RAV4OZ.com – Australia's PREMIER RAV4 Network (need I say more?)
<http://www.rav4oz.com>

Jaycar Electronics – This is where I got my jiffy box from. They generally have all the electronic stuff that you will need for RAV4OZ.com projects.
<http://www.jaycar.com.au>

Altronics – An alternate supplier of electronic components, they might be cheaper than Jaycar.
<http://www.altronics.com.au>

Your Local Electrical Store – You will need to visit them to purchase the brass bar. When going in make sure you take a printout of the bar shown here. They are commonly referred to as "Neutral Bars" or "Grounding Bars" and are made of Brass



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Any information provided in this document for informative purposes only. It is not meant to be comprehensive and if you are inexperienced in carrying out DIY projects or unsure of your abilities, you should always seek expert advice and assistance.

You are personally fully responsible for the safety of your equipment and work environment and that you are of a sufficient level of skill for the work involved.

Appendices: What is the Reference ID?

To help with identifying and categorising all RAV4OZ contributions, we have developed a simple referencing system, and all document contributions will be given a unique Reference ID:

R4O-DIY-COS-001

- 1) R4O indicates that this is a RAV4OZ.com exclusive document
- 2) Specifies whether the document is a DIY guide, or a Product Review
 - "DIY": Do-It-Yourself Guide
 - "PRD": Contributor Review of a OEM/Aftermarket Product
- 3) Specifies whether the document relates to improving engine performance, cosmetic appearance, interior appearance, or interior functionality.
 - "ENG": Engine Performance, including exhaust modifications
 - "COS": External cosmetic appearance
 - "INT": Interior cosmetic appearance
 - "ACC": Accessories and Miscellaneous mods (not falling under above categories), including mods related to interior functionality
- 4) Lastly, a unique numerical identifier for all RAV4OZ.com document contributions

