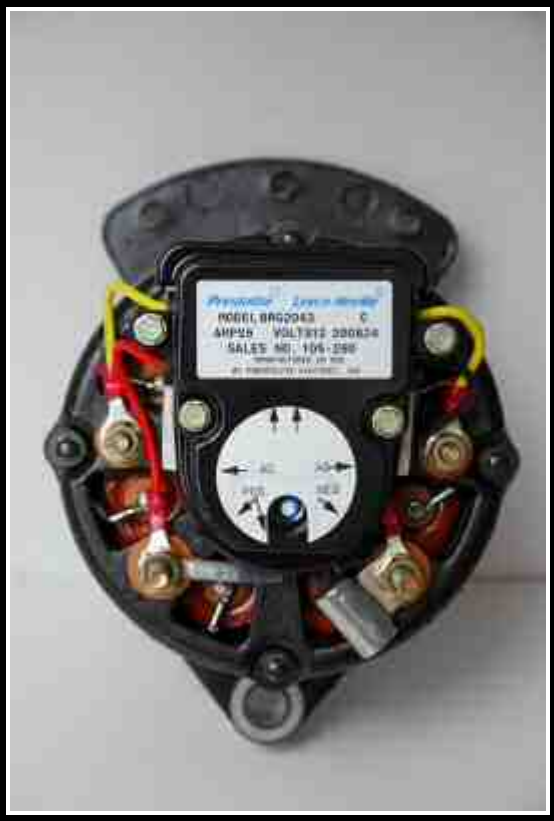
Leece-Neville 8MR Series Alternator External Regulation Conversion

previous page pages 1 2 next page

27-MAR-2009



The Stock Alternator

Many boats, specifically sailboats, come equipped or have have used the 5" case Motorola/Prestolite/Leece-Neville style alternator over the years of production.

This case style alternator today is built by Leece-Neville. They are specifically marinized for ignition protection and are called the 8MR series or marine series. They are available many outputs from 37 to 105 amps and in a 2" single foot, 1" single foot, and single ear and triple ear configurations. The regulators though are all the same design.

The regulators that comes stock on most new 8MR series alternators are voltage adjustable but still only single stage (really a two stage BULK & ABSORPTION) not a three stage regulator thus lacking temp sensing, float modes and a myriad of other features external regulators can offer.

According to Leece-Neville tech support this regulator has an adjustable output range from 13.8 - 14.6 V. It ships from the factory set at 14.2V.

This article will show you how to convert a Motorola/Leece-

Neville 8MR style alternator to external regulation. Once you have done this conversion you can then use a Balmar, Ample Power or other external three stage regulator.

My hands down favorite regulators are Balmar. Why? Because they offer more features and control options than any other regulator on the market. The Xantrex XAR regulator is also made by Balmar for Xantrex. I suggest buying a Balmar though because they have some of the absolute best support in the business. In regards to Xantrex customer support, well, let's just say search the net and figure it out for yourself..... You get what you pay for with a Balmar regulator.

This particular alternator is a 90 amp Leece-Neville 8MR2070TA with a 1" foot and triple adjusting ears. It fits many Universal and Westerbeke engines as well as many others.

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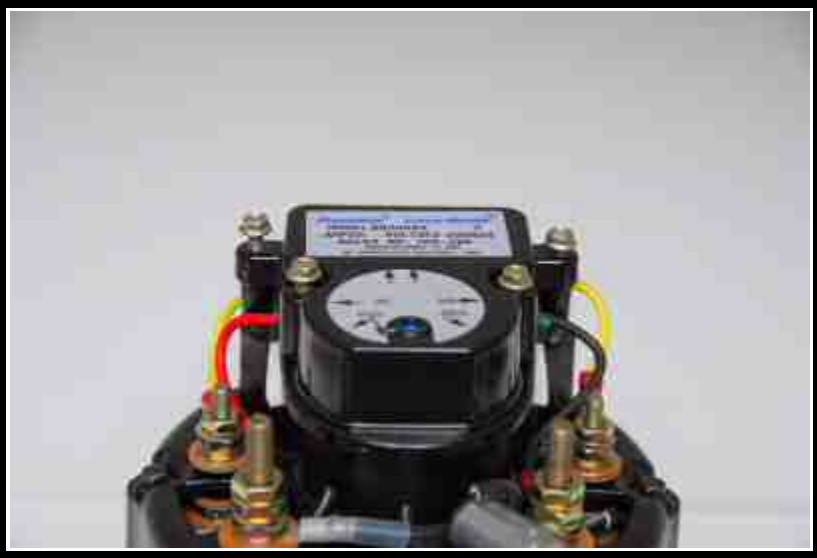
Remove Thee Four Screws



The first step in this conversion is to remove the four machine screws holding the regulator onto the alternator. They've been loosened so it's easy to see which ones they are.

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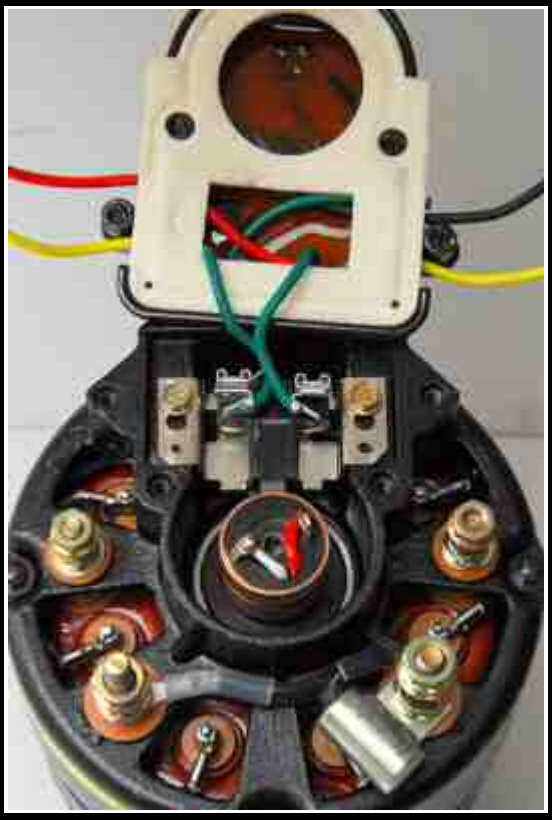
Flip The Regulator Over



The next step is to remove the four wires that connect the regulator to the alternator. this is as easy and straight forward as it sounds.

Once the wires are disconnected simply tilt the regulator up to expose the internal brush connections. You'll need a set of needle nose pliers to pull the connectors off the brushes. This is quite simple and takes about 20-30 seconds to do.

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Spark Arrestor Gasket

Aside from the epoxy coated finish and general marine construction of the 8MR series this gasket is what makes it USCG compliant and ignition protected. It prevents errant sparks from the brushes from igniting any potential fumes. With most diesels this is not really a huge concern but it's still a good idea to re-use this gasket upon reassembly.

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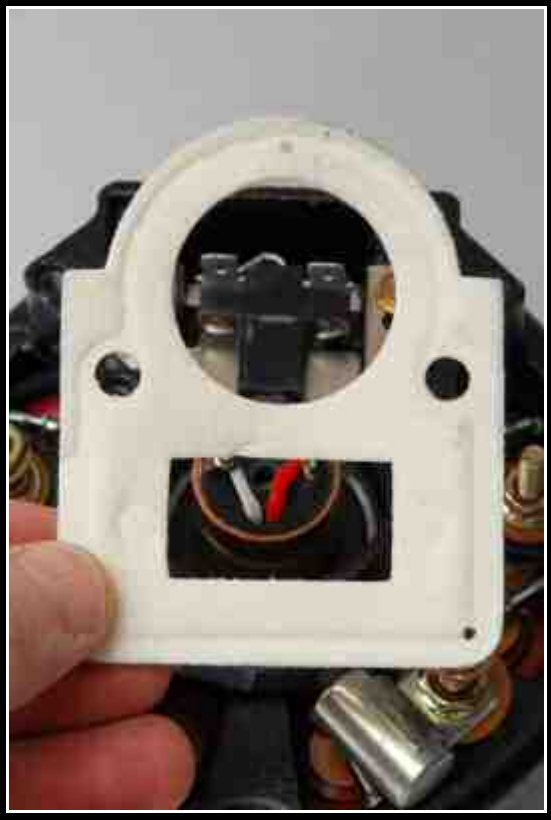
The Conversion Kit

Leece-Neville is nice enough to make an external regulation conversion kit for this series of alternator. It should be available from just about any Leece-Neville dealer.



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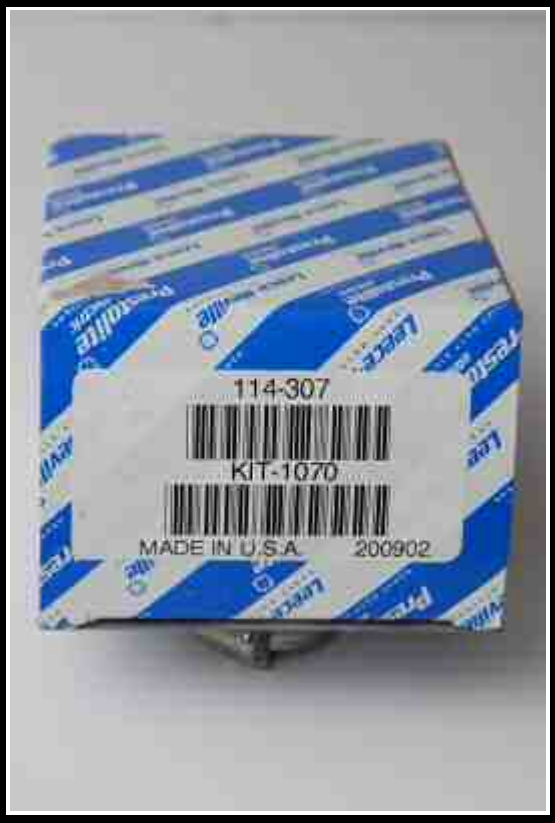

I ordered this conversion kit from my local alternator shop who is a Leece-Neville/Prestolite dealer. The total price for this 90 amp marine rated alternator with the conversion kit was about $325.00. About half the price of the Balmar Series 81 (which is now discontinued).

Please be careful when buying on-line as there are numerous Chinese made clones of these alternators. They are not nearly as well built nor as robust.

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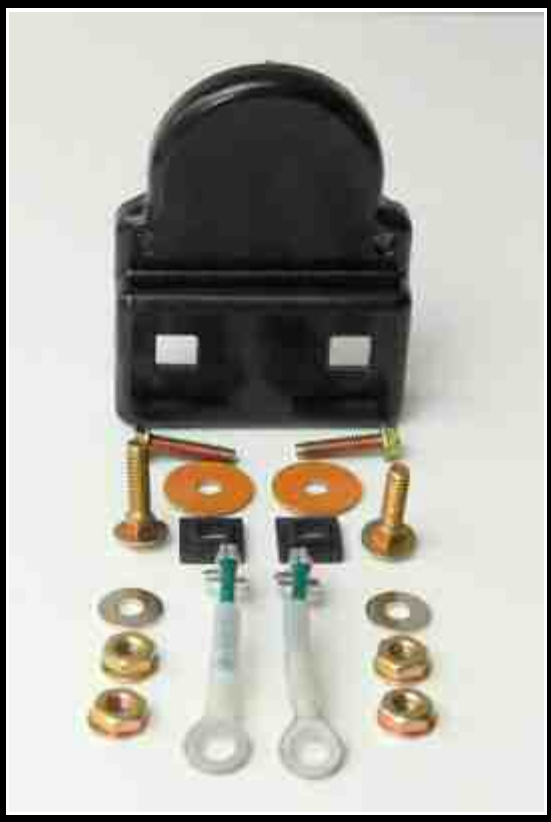
What's In The Box

The conversion kit comes with everything you'll need, including the wires, bolts and insulators, to make this a simple conversion.



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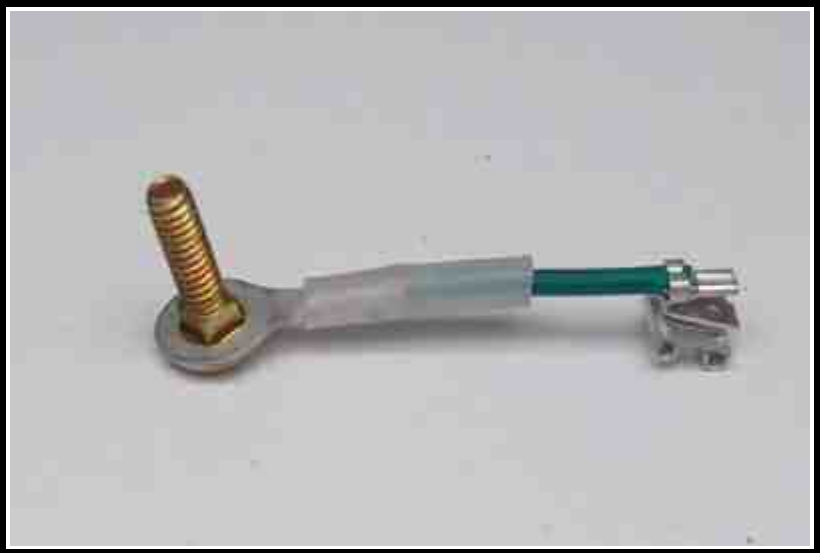

Step One

The first step in assembling the kit is to slide the ring end of the wires over the carriage bolts as shown here.

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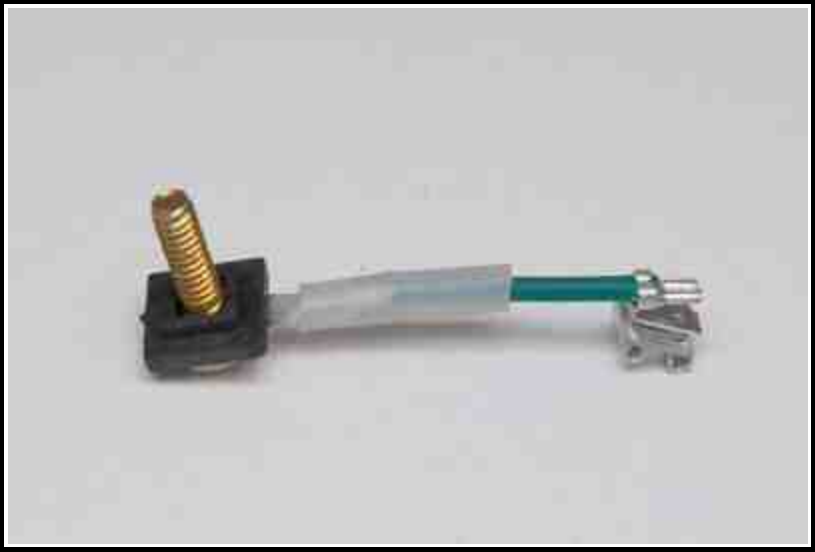
Step Two

In this step you slide the black plastic insulators over the carriage bolts with the flat side facing the ring and the side with the smaller square facing up as shown.



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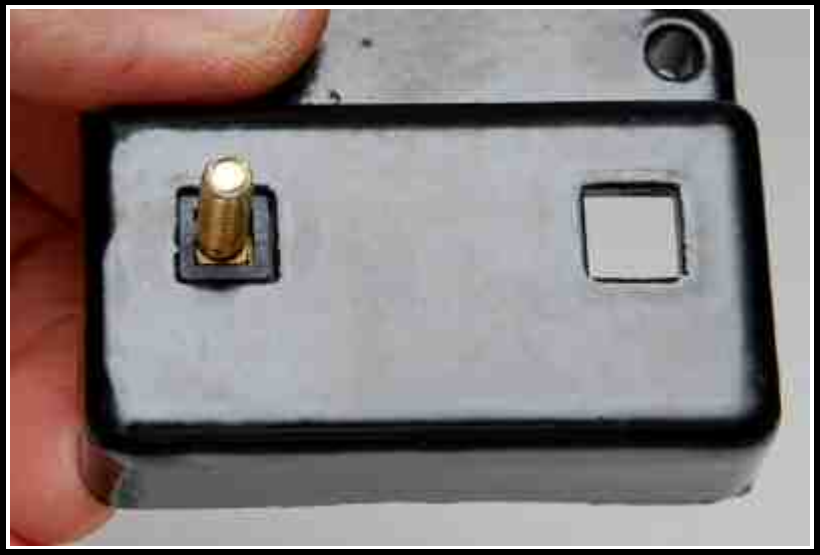

Step Three

Because voltage is running through these wires they must be installed and insulated correctly so they don't ground out on the aluminum plate. In this picture the small square is properly oriented to prevent the bolt from making contact with the cover plate and will be properly insulated.

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Back Side View

Here's what it looks like from the back.

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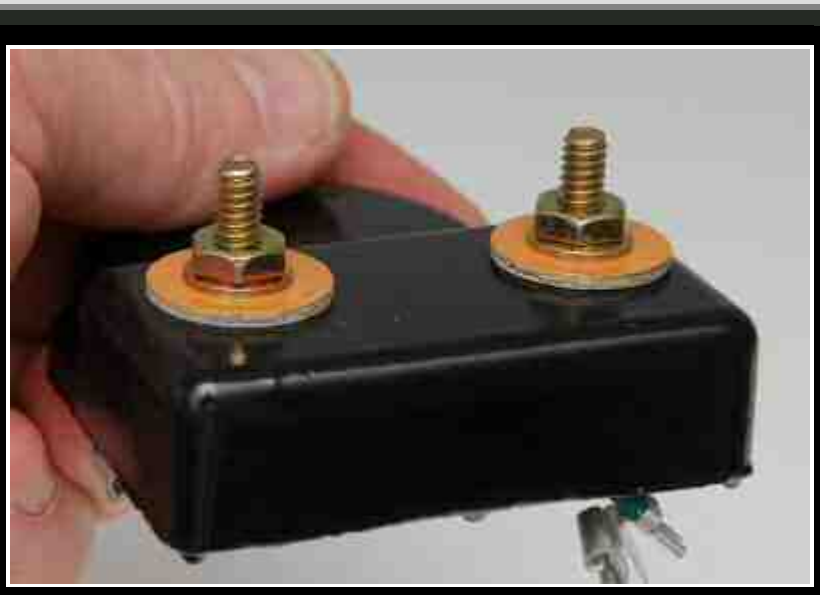

Add The External Insulators

With both bolts and internal insulators installed place the large insulating washers over the bolts. Next drop the two small washers supplied on top of the insulators, add the nuts and tighten them down.

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Inside View

Here's the view from inside the cover plate with everything torqued down and tight.

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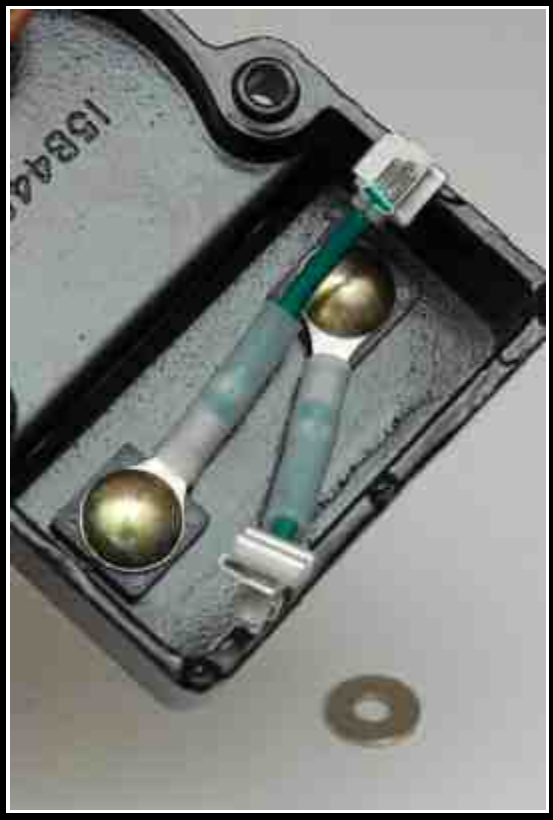

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previous page pages 1 2 next page

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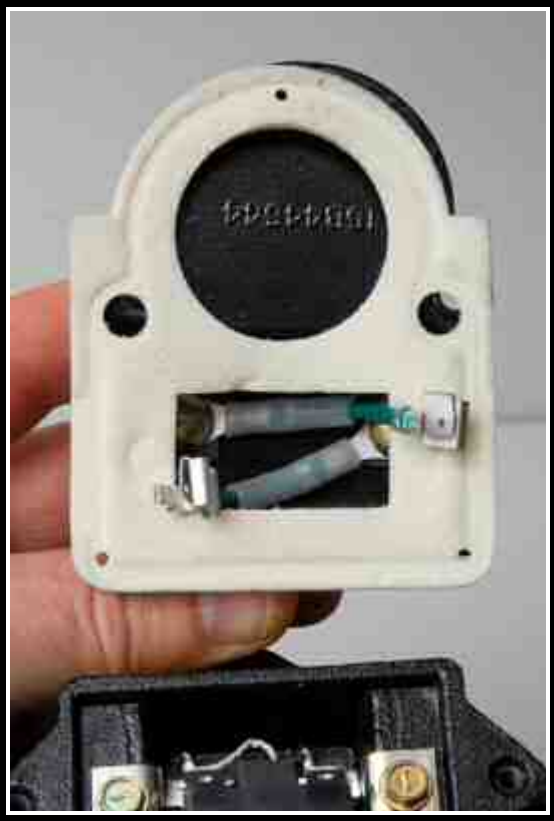
Install The Spark Arrestor



Place the spark arrestor gasket over the conversion plate before connecting the wires.

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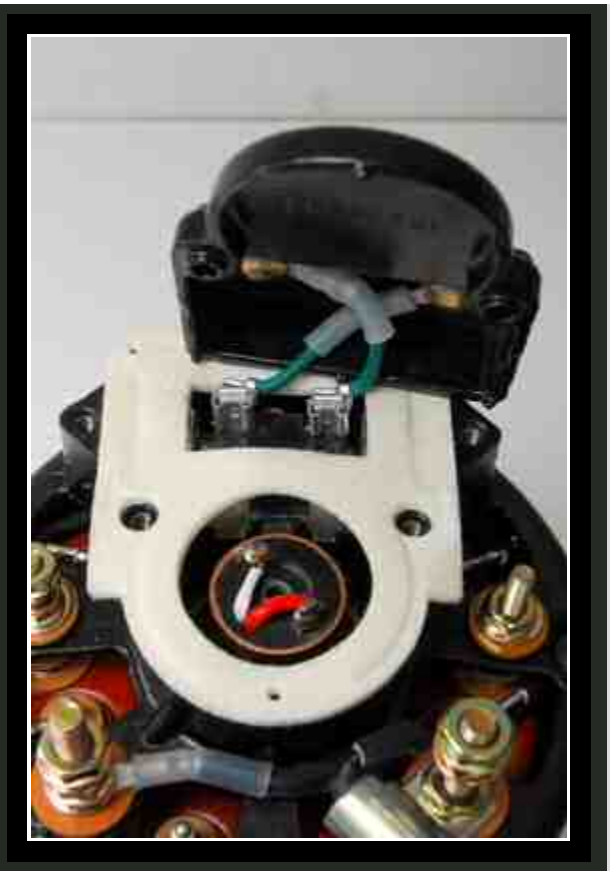
Slide The Connectors Onto The Brushes

Slide the contacts onto the brush studs. It does not matter which way you connect these green wires as one will become the field contact and the other will be grounded to the

alternators ground stud.



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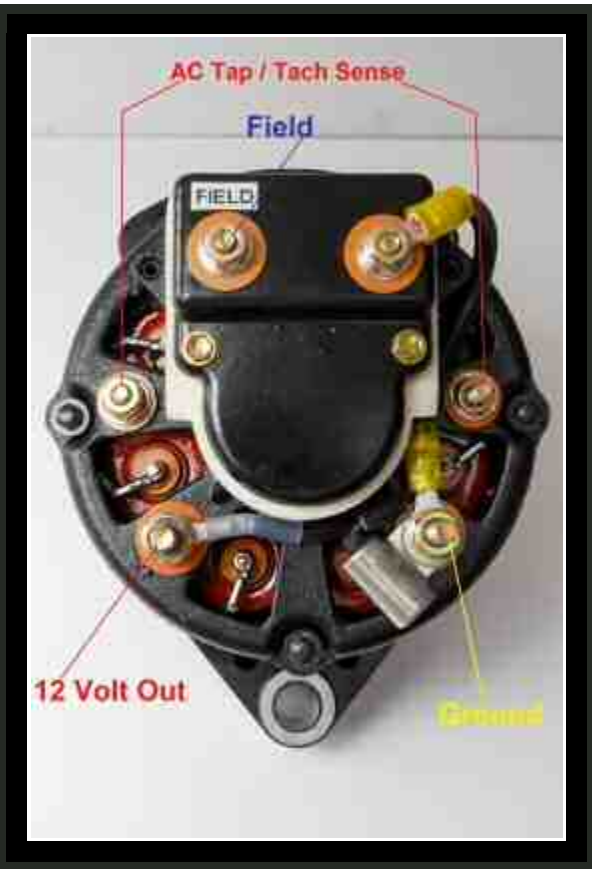
The Wiring

Here is the finished product. One last detail you will need to do is to create a jumper wire from one terminal of the plate to the ground stud on the alternator. This is the black wire in teh photo with the yellow crimp connectors.

Unfortunately my good heat shrink connectors & crimpers were on the boat when I took these photos so I made up a cheap jumper wire for illustrative purposes only.

Leece-Neville recommends a 12ga wire for this jumper. I recommend heat shrink crimp connectors & tinned 12ga wire. If you do not ground one of the cover plate studs to the alternators ground terminal the alternator will not work. The alternators ground terminal must also be grounded to the boats ground.

I also permanently labeled the field stud with my label maker so it is easy to wire and remember which is which. The 12V



output stud gets wired directly to the positive side of your boats electrical system . I recommend wiring this directly to a battery, such as the house bank, so you can't fry the alternator diodes by turning off the battery switch when the motor is running.

For your diesel engines tachometer sense simple wire to either of the studs marked AC Tap. You may need to recalibrate your tachometer after the installation of a new alternator. This is a 12 pole alternator.

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Done

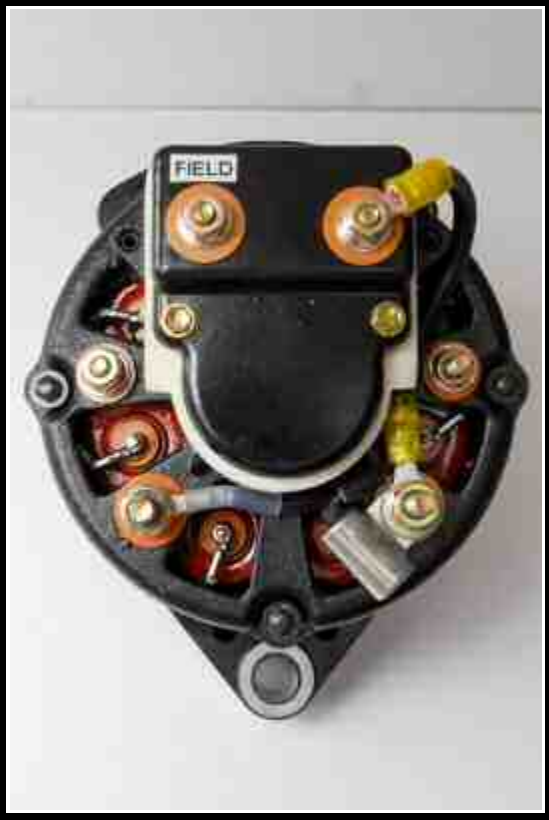
This 90 amp alternator is now ready to be installed and wired to an external three stage regulator. If installing this alternator and using it on a large flooded bank, AGM or GEL batteries you will want an alternator temp sensor.

These are decent little alternators but they are not a true high output continuous duty alternator. They can be quite reliable but when pushed hard will not last as long a as a purpose built high performance alternator.

You can build one of these for about $385.00 or half the price of a true high output marine duty alternator.. Once converted in this fashion the alternator will be a "P Type" or positive field alternator and can be used with external regulators such as Ample Power, Balmar, Xantrex & Sterling. My personal preference for external regulation is, hands down, Balmar.

***WARNING* - These alts, when converted for external**

regulation, MUST use alternator temp sensing or preferably *Amp Manager* or *Belt Manager* if using Balmar regulators to keep them from over heating. These are good alternators but they are NOT a true high performance alternator and thus must have proper protection from overheating events.



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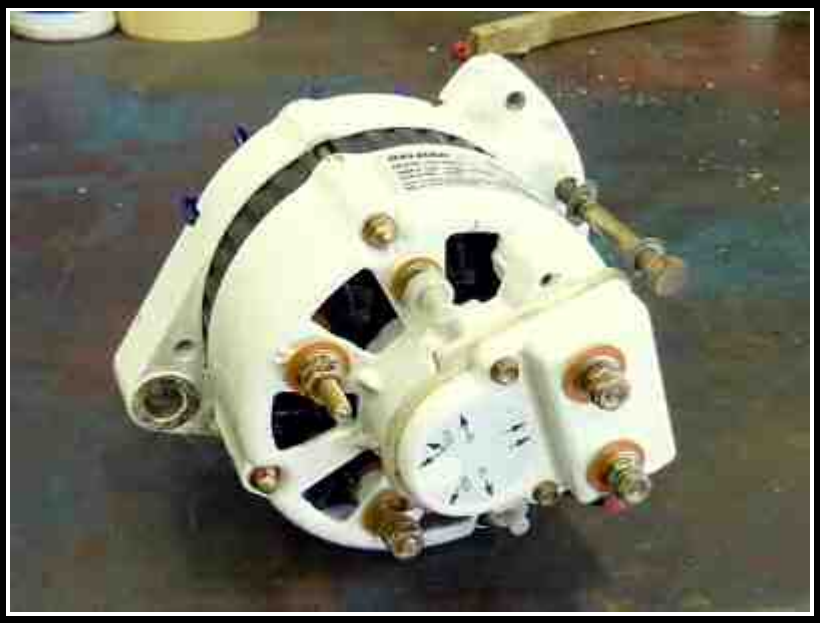

Look Familiar ?

Yes, this is a Balmar Model 81 not the alternator you saw above just painted white. I have had both a Model 81 and a Leece-Neville 8MR apart on the bench and they are virtually identical, on the inside and out even the bearing numbers are shared.

Balmar no longer makes the model 81 and it has been replaced by the newer 6 series alternator. The 6 series is a

very, very good alternator, with better performance, and a more robust build than these.

For many years Leece-Neville was one of the main suppliers to Balmar, perhaps they still are for some alternators, but most of them are now physically built by Balmar. The 8MR will run about $385.00. For the perfomance you get it is not a bad value..

If pushing an alternator hard with a large bank or you have AGM or GEL you would be wise to consider a beefier alternator.

The newer Balmar 6 series small case alternators are a big leap forward in terms of better cooling, and higher output for longer periods, but if you don't need that type of performance the 8MR is a decent low cost option to pair with a Balmar regulator when set up for external regulation.

When setting a regulator up for the 8MR I strongly recommend at least Balmar Belt Manager level 2 or 3. This will de-rate the available current output of this alternator and allow it to run into large loads for long periods of time without over heating. Running these alternators wide upon into large loads for hours on end WILL eventually cook them. Use alt temp sensing as added insurance and Balmar Belt Manager as your primary tool to keep these running cool..

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previous page pages 1 **2** next page

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