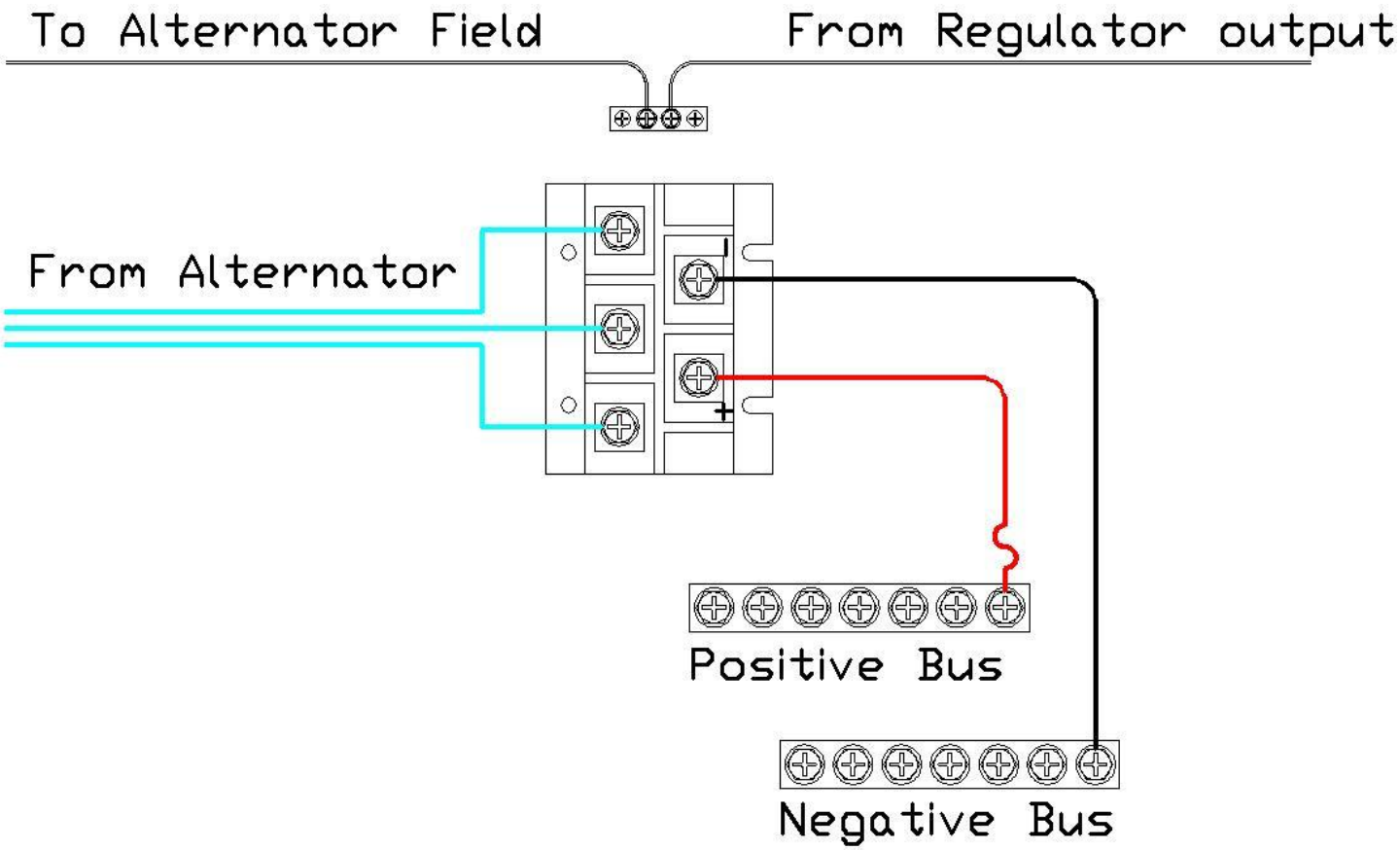
Preliminary Remote Rectifier Installation Instructions.

Thank

Quick notes for install:

As drawn below it is quite simple but here are things to know.

1. Install the alternator as before. The only hook connections on the alternator are:
    a. The tachometer stud if needed.
    b. The three phase output (# 6 wires)
    c. The field wire (#14 white)
2. Attach the 3 large and one small wire by some sort of strain relief to other cables or mounting points on the engine so that the point of cable flexing is not at the alternator as this will lead to premature failure of the insulation and then the wiring itself. The flex point must be at a point where it is the cable itself doing the flexing.
3. The rectifier can be mounted in any direction although long direction mounted vertically will aid somewhat to cooling due to natural convection.
4. After determining the length of cable and cutting to length remove 0.5” of insulation. Slide on a piece of shrink tubing an inch or more in length over the wire.
5. The supplied ring terminals are then crimped onto the bare wire.
    a. Please note a perfect crimp is, in my opinion, next to impossible. A perfect crimp is one that when completed there is a point in the crimp where the stranded wire no longer has any air gaps in between the strands. Too loose leads to corrosion and too tight is actually the start of pinching off the cable. I very much like to slightly under crimp and then solder the barrel shut.
    b. After cooling then slide the shrink tube over the barrel and shrink using an appropriate heat gum.
6. Install the ring terminal to the rectifier assembly under the existing ring terminal for the fan supply. It is important that the high current ring terminals are in contact with the metal surface on the rectifier.
7. Tighten the rectifier bolts to 6 lb/ft.
8. The red and black output cables need to be sized appropriately for their length and the current rating of the alternator using the chart below. The length is determined by adding the positive lead length to the negative lead length for a total distance. Please add 25% to the size as it must exceed the rating of the fuse below.
9. The positive lead needs to be fused at the battery end of the connection as shown below. It must be greater than the alternator rating but less than the cable rating.
10. The advanced regulator output must wire through the remote rectifier as shown. This is to protect from overheating the rectifier should the fan fail. NOTE: It is a ball bearing fan rated at 20,000 hours.


To Alternator Field
From Regulator output
From Alternator
Positive Bus
Negative Bus

Additional Installation Information

Sizing Battery Cables

The addition of a high-output alternator to your charging system may make it necessary to increase the size of your battery cables to increase the current carrying capacity. To determine the proper cable size, consider BOTH cable length and alternator output current capability. Both positive and negative wire runs must be included in your calculations.
In other words, when determining battery cable size, we need to consider the “round trip” distance. Wire size may be calculated with the formula CM=K x I x LE (whereas CM represents the circular mil area of the conductor, K represents the mil-foot resistance of copper, I represents current, and L represents the length, in feet, of the round-trip cable run and E represents voltage drop in volts). When using this equation, a K constant of 10.75 indicates copper’s mil-foot resistance and voltage drop should be calculated at 3% (the standard for critical functions affecting the safety of vessel passengers. <u>In most cases, it is much easier to use the following chart as your guide.</u>

FEET	5	10	15	20	25	30	40	50	75
AMPS									
75	8	6	4	2	2	1	0	2/0	3/0
100	8	4	2	2	1	0	1/0	3/0	
125	6	4	2	1	0	1/0	2/0		
150	6	2	1	0	1/0	2/0	3/0		
175	6	2	1	1/0	2/0	3/0	4/0		
200	4	2	0	1/0	3/0	4/0			
225	4	1	1/0	2/0	3/0	4/0			
250	4	1	1/0	3/0	4/0				
275	4	1	2/0	3/0	4/0				
300	2	1/0	2/0	4/0	4/0				
350	2	1/0	3/0	4/0					

Large Bank Cable layout

With battery banks getting larger consideration needs to be made for proper cable routing and additional fusing.

1. Note the ANL fuse on every battery. This protects the wiring from each battery to the bus.
2. Note the CLASS “T” fuse protecting the main feed which then goes to the power panel or in some cases simply to a power inverter. Because of the incredible amount of short circuit current available from a large bank of batteries an ANL fuse will not suffice. This fuse needs to be capable of greater arc suppression. A CLASS “T” fuse is recommended for this application and is available from us at Mark Grasser – DC Power Solutions.