Frequently Asked Questions of Balmar Technical Support

To All Balmar Partners and Customers:

January 4, 2016. We hope you like our new website! We are building an FAQ page over time as questions are asked of Tech Service. Please be patient with us as we build the library, and hopefully the answer to your question is already on this page. Thank you!

Please explain the difference between the various Belt Buddy products. I get confused with all the part numbers that look very similar.

The Universal Belt Buddy (UBB) is the combination of a Universal Adjustment Arm (UAA) and the Belt Buddy Adjustment Mechanism (BB). You can purchase the UAA and BB separately, but most people buy them as a set under the UBB part number. The BBU is just the Adjustment Mechanism (without the UAA) and is designed to bolt onto existing adjustment arms. The BBU has an additional shoulder on one end which wraps around the end of an existing adjustment arm (this is why it is not the same part number as the BB). The BBU can be employed when the UAA cannot be utilized on a particular engine. For example, the UAA cannot be used when there is a "kink" in the existing adjustment arm, thereby changing the mounting position in the "z" axis. One word of caution: Using the BBU will eliminate some "adjustment purchase" at the end of the adjustment arm, so make sure that your alternator does not sit fully outboard on the existing adjustment arm before purchasing the BBU.

If I purchase an AltMount Kit, how do I change-out the alternator pulley?

Balmar *recommends that you take the alternator to a qualified alternator repair shop who will use an impact wrench to decouple the existing pulley. An impact wrench is required because it is impossible to grip the rotor shaft. The new AltMount pulley must also be installed using an impact wrench with a torque setting of 45-50 foot pounds for 6-Series Alternators or 70 foot pounds for AT-Series Alternators. This process is described on Page 3 of the Installation Manual contained in your AltMount Pulley Kit package. If you are purchasing a new Balmar Alternator or Charging Kit along with your new AltMount Conversion Kit, then simply specify either a xxx-xxx-J10 or xxx-xxx-K6 Alternator or Charging Kit part number and Balmar will deliver the product with the appropriate pulley already installed. In this case, the alternator pulley contained in the AltMount Conversion Kit can be discarded.*

I want more amps out of my alternator, how do I turn up the amps?

Alternators are voltage control devices. We can't directly control the current, but we can indirectly control the current by manipulating the voltage. The whole thing is governed by Ohm's Law: current is equal to the voltage divided by the resistance. I=E/R. The resistance is the State of Charge of the battery. The voltage is from the alternator. So if we have 12 volts and 0.2 ohm of resistance in the battery, we get (12 ÷ 0.2) = 60 amps. If we raise the voltage to 14 volts we get (14 ÷ 0.2) = 70 amps. As batteries become more charged their resistance increases and the current will to go down. So as the State of Charge increases, the resistance will increase also to, let's say for 0.5 Ohm, (14 ÷ 0.5) = 28 amps. This is why a depleted battery (low resistance) draws higher current and a fully charged battery (high resistance) draws low current. So first check all connections to make sure they are clean and tight. A bad connection creates higher resistance which reduces the current flow. One way to increase current is to increase voltage. Balmar's ARS-5 and MC-614 regulators are programmable, which means you can adjust the voltage output for the alternator by making a simple adjustment from the Balmar regulator. If all the connections are good, then try increasing the voltage a tenth or two to increase the current flow.

Can I run my alternator, solar panels and/or wind generator at the same time and charge that much faster?

The problem with multiple charging sources is that they tend to fool one another. Say your solar panel (or wind generator) is charging the battery at 14 volts and pushing in 10 amps. You start the engine/alternator up and it sees not the true State of Charge of the battery but 14 volts from the solar panel. The alternator thinks the battery is fully charged and puts out the minimum current (only a few amps). The result is the alternator is not doing anything and the solar is putting in only 10 amps. This condition isn't damaging to the charging assets, but it is inefficient charging.

What gauge is the wire in the standard regulator harness and can I lengthen it?

The wire gauge in Balmar's regulator harnesses is 14 gauge. If you need to lengthen the harness, you might try our newly introduced extended wire harnesses, part numbers 1020 for the MC-614 (12v) and part number 1022 for the MC-624 (24v). The standard harnesses are 54" (4.5 feet) long, where these new extended harnesses are 120" (10 feet) long. If you need to extend the wires beyond 120" (10 feet) the wires will need to fully replaced with 12 gauge wires to account for voltage drops along the longer runs.

I have twin engines/alternators, but I'm not getting the combined output of both charging sources

The problem with multiple charging sources is they tend to fool one another. Say your battery is at 12 volts. You start one engine and its alternator begins charging the battery, raising the voltage to 14 volts. When the second engine/alternator starts up it sees not the true State of Charge of the battery (12 volts) but 14 volts from the other alternator. The second alternator thinks the battery is fully charged and puts out the minimum current possible. The result is only one alternator is doing all the work and the other is just coasting. This isn't damaging but it is inefficient charging. Balmar's CenterfielderII is designed to solve this problem by acting as a "traffic cop" and combine the output from both alternators.

Is a Multi-Stage Regulator worth the extra cost?

One of the common characteristics of Balmar high-output alternators is the need for an external voltage regulator. There's a really good reason for that. A smart, multi-stage regulator (like our Max Charge MC-614 or our ARS-5) lets us modify voltage throughout the charge cycle to enable our alternator to supply charging current in a manner that's most compatible to the battery being charged. In today's boating environment there are several different battery technologies – Gel Cell, AGM, Deep Cycle and Standard Flooded, Spiral Wound AGM – with others being developed and marketed with increasing frequency, and all share one common trait. None want to be charged the same way. This can be a real problem for the standard, manufacturer-installed alternator. Like the alternator you can find under the hood of your car, the typical OEM alternator is controlled by a very simple built-in voltage regulator. In nearly all cases, this built-in regulator is designed to charge at a non-adjustable, unchanging voltage. While that's a reasonable charging solution for a small battery that's normally being charged whenever it's being used, that just doesn't work well when you've got big deep cycle batteries to charge.

In comparison, alternators with external multi-stage voltage regulators are able to charge large, deep-cycle battery banks similarly to smart shore power chargers – by modifying charging voltage to meet the changing needs of the battery bank as the batteries become more fully charged. In addition, a smart regulator can be programmed to match the voltage requirements of a variety of battery technologies, as each battery type has a range of target voltages that ensures a safe and efficient charge profile.

The current generation of Balmar's multi-stage Max Charge and ARS-5 regulators have an additional feature that is critical to the health of Gel Cell, AGM and other sealed battery technologies. By adding an optional battery temperature sensor, the installer enables the Balmar regulator to monitor for changes in ambient battery temperature and modify charging voltage to compensate for warmer or colder temperatures. This allows the charging system to maintain optimal charging without damaging over- or under-charging. So … is the multi-stage regulator worth the extra cost? If your batteries represent a sizable investment, the answer is absolutely "YES".

Belt dusting and early belt failure – Is there any way to avoid it?

By nature, high-output alternators can be brutal on drive belts. If a serpentine pulley conversion kit is out of the question, are there other ways to minimize or eliminate messy black dust, or belt failures that can lead to a ruined boating trip? There are a number of ways that belt dusting can be addressed. The easiest way, when using our Max Charge or ARS-5 voltage regulators, is by adjusting the regulator's Belt Load Manager. This regulator adjustment feature enables the user to modify the regulator's field pulse bandwidth to reduce the horsepower load the alternator applies to the belt. The wider the pulse bandwidth, the less stress on the belt.

While the Belt Load Manager is very effective at reducing belt stress, it's always important to ensure that the problem is not a result of wear caused by poor pulley alignment. Pulley alignment can often be measured by placing a straightedge across the front of the alternator and crankshaft pulleys and identifying any mis-alignments. In addition, pulleys should be inspected for rust, nicks or other irregularities that could cause premature wear. Quite often, the source of excessive belt wear can be attributed to the geometry of the crank, alternator and water pump pulleys. If the amount of contact area between the belt and the alternator pulley is limited due to a less-than-ideal drive angle, the issue can be remedied by replacing the alternator pulley with a larger diameter pulley.

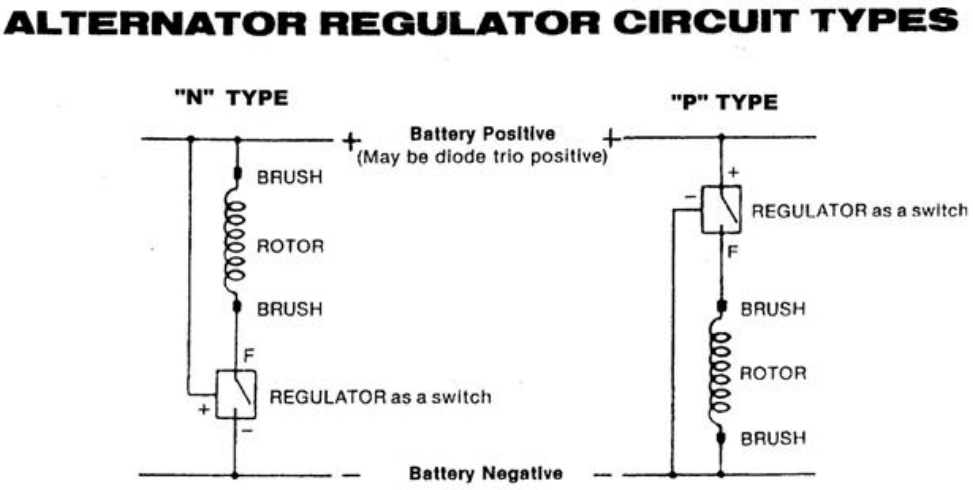
Another effective belt dusting solution may be replacing the standard belt with a higher capacity aftermarket belt. Notched Vee belts, like those sold under the Dayco Top Cog brand, may provide better "grab" than traditional smooth profile Vee belts, resulting in better power transfer and less premature wear. Newer belt technologies that integrate stronger, more stretch-resistant fibers may also provide a marked improvement over standard Vee belts. Even under the best conditions, belts do have a tendency to stretch. The best way to avoid dusting and premature belt failure is to closely monitor and correct belt tension. We recommend that you inspect your belts on a frequent and regular basis to ensure that your belt never has an opportunity to loosen and slip.

How do I make my new AT-Series or XT-Series Alternator work with my existing Tachometer?

A tachometer typically measures "pulses" from the stator poles of the alternator to count RPMs. Since the AT-Series Alternator has 16 stator poles instead of the usual 12 poles, some legacy tachometers are unable to adjust for this difference. First determine if your existing tachometer is "adjustable" for this situation. If your tach is not adjustable, Balmar provides a Tach Signal Stabilizer (part number 15-TSS) to adjust for stator pole count differences. Installation instructions for the 15-TSS are provided on the product page link.

Why does Balmar only sell regulators and alternators that are designed to regulate from the 'P-Side'? I would like to use a Balmar regulator with a standard 'N-Side' alternator.

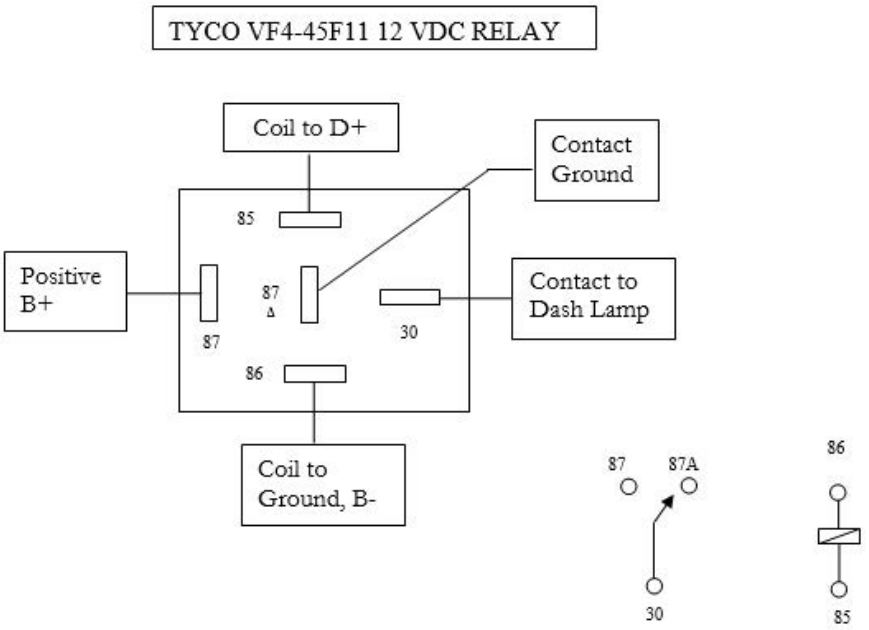
When regulating or controlling the output of an alternator, the regulator can be designed to work on either the Positive (P-Type) or Negative (N-Type) side of the alternator. With an N-Type design, if the field wire shorts to ground, or if the alternator internally shorts to ground, the alternator will immediately produce full output — both current and voltage. This output will continue regardless of the battery's state of charge or the temperature of the alternator. The result can be extreme overcharging of the battery and potential explosion. Overheating and subsequent damage to the alternator can present a fire hazard. It is for these reasons that all Balmar alternators are designed for P-Type regulation. If the field wire shorts to ground or the alternator develops an internal short, the included fuse on the field wire simply blows and the alternator stops all output. Most automotive or other internally regulated alternators are N-Type. When converting these units to be used with a Balmar external regulator, the alternator must also converted to P-Type for safety and compatibility with our regulators. The difference between P-Type and N-Type alternator circuits is shown below:



I've just installed a Balmar alternator on my Volvo engine and the alarm buzzer and light won't shut off. What's going on?

One of the problems we have encountered on some Volvo's is an incompatible D+ circuit. Some Volvo's require 2 or 3 amps of current from the D+ circuit to function. Here are some possible solutions:

1. If you have installed a 6 Series alternator on a Volvo engine, you can use an automotive style relay like the TYCO VF4-45F1. Connect the relay as shown in the drawing below to the alternator D+ circuit. Any relay with a 12 VDC coil which draws less that 500ma will work. The TYCO 12VDC coil will not work when connected to the A/C terminal of the alternator.



2. If you have installed any other Balmar Alternators that do not have a D+ circuit then you can use a 6 volt automotive style relay, like the Tyco VF4-15D11-C06 or an OMRON LY2 relay. Connect the relay as shown in the drawing below. The OMRON LY2 coil will work when connected to the A/C terminal on the alternator.