

# BASIC BALMAR REGULATOR INSTALLATION

1. Mount your regulator in a dry, well-ventilated place, well away from hoses and exhaust manifolds.
2. BALMAR regulators may be purchased with or without a wiring harness. The harness is 54" long. If you find it necessary to extend the length of the harness, 12 gauge wire should be used.
3. Attach BLACK wires (grounds) to alternator ground.
4. Attach RED wire (power and sense) to 12vdc Positive. This must see battery being charged and should be fused. The Balmar harness includes a 10 amp in-line fuse.
5. Attach BROWN wire (ignition) to a switched 12vdc source, key switch, independent oil pressure switch, etc.
6. Plug duplex plug with BLUE wire (field) into rear of alternator.
7. WHITE wire (stator) supplies signal for electric tachometer, if used. On the BRS II, this **must** be attached to one of the stator/tach studs on the regulator.

## ARS III OPERATION INSTRUCTIONS

This multi-stage, (3-step) regulator, is advantageous to users of larger banks of deep cycle lead acid or gel batteries which have been discharged to 50% and are being recharged to 85% capacity. This regulator also responds well when large D.C. loads are applied.

1. When the key switch is turned on, or after engine is started with oil pressure activated switches, the regulator waits for about 1 min. before activating. This gives the engine a chance to develop oil pressure and warm up a bit before the load of the alternator is applied. You will hear the 'whine' of the alternator and the engine 'load up a bit' when the alternator comes on line. The **A** (green) L.E.D. will light when initial (float reference) voltage is reached. This is factory set at 13.8 volts.
2. When the upper target voltage of 14.1 (factory setting for Gels) is sensed by the red wire, the **B** (green) L.E.D. will light. Flickering is normal, the voltage will be held constant, and the batteries which may not have reached max voltage will receive most of the current.
3. The absorption timer will start at this point, and if no large DC loads are placed on the system that bring the sensing voltage below the upper target voltage, about two hours later the **C** (yellow) L.E.D. will come on, indicating the regulator senses a "float" voltage of 13.8V. This timer can be adjusted from .5 to 5 hrs. The batteries must remain at the upper target voltage for the set timed period for this to occur. Once in float mode, the voltage will be limited to 13.8V "float" (or where you set it) until power to the brown key switch is removed. Factory pre set is 2 hours.

### Diagnostic LEDs

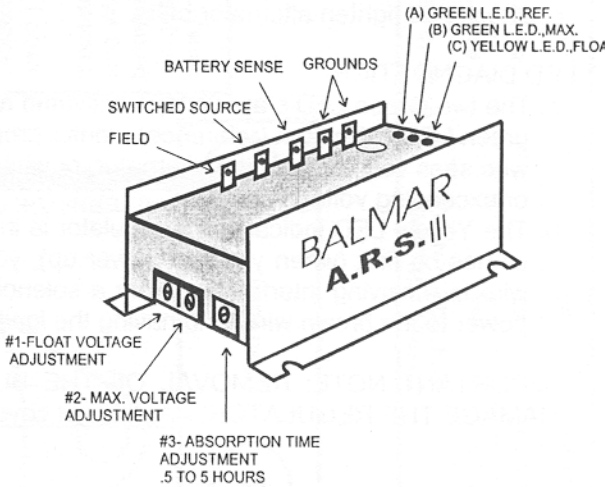
*When lit, the following circuits are operational:*

Green - Lights when float setting is first reached during ascent to upper target (Bulk) voltage.

2nd Green - Indicates Bulk Voltage Achieved

Yellow - Indicates end of Absorption Time. Indicates that regulator has settled to 3rd stage Float Mode.

Dimensions: 4"L x 3.25"W x 1.5"H



(A) GREEN L.E.D., REF.  
(B) GREEN L.E.D., MAX.  
(C) YELLOW L.E.D., FLOAT

BATTERY SENSE    GROUNDS

SWITCHED SOURCE    FIELD

#1-FLOAT VOLTAGE ADJUSTMENT

#2- MAX. VOLTAGE ADJUSTMENT

#3- ABSORPTION TIME ADJUSTMENT  
.5 TO 5 HOURS  
PRESET 2 HOURS

**ARS III ADJUSTMENTS:** The regulator is factory calibrated for Gel Cell batteries. A lower float voltage may be recommended for flooded (non Gel) batteries. Consult your battery supplier for your correct maximum and float voltage setting. If you feel you should adjust the output voltage, follow the procedure below.

Identify the correct pot. Float voltage is (#1) left pot, max (bulk) voltage is (#2) center pot, and absorption time (.5 to 5 hrs.) is the (#3) right pot.

There is a dab of protective coating over the screwdriver slot. Remove this (it's easy to scrape off with a small knife) and, using a small screwdriver, turn slowly clockwise to increase, or counter-clockwise to decrease voltage

or time. A small dab of TV Corona Dope or clear silicone can be applied after adjustments are made to provide protection against moisture intrusion into the pot. Do not turn past stops.

- a) After turning off all unnecessary electrical equipment, start engine.
- b) Attach the leads of your digital voltmeter to the battery terminals.
- c) Be sure the YELLOW light (C) on the ARS III is off.
- d) Turn the center pot (#2) clockwise to increase upper target voltage. Wait several minutes for the voltage to rise and for the center GREEN (B) light to turn on. This adjusts the absorption voltage and should be done with batteries near a full charge.
- e) Allow the engine to run until the YELLOW light (C) comes on. The batteries are now at the voltage level shown on the meter. To adjust the voltage down, you must apply enough load to bring the voltage of the battery down to the pre-set 13.8 V., then adjust.
- f) Using your meter as a guide, adjust the left #1 (float voltage) pot as needed. Your upper and lower voltages are now set. Note: the float (lower) voltage can only be adjusted down if the batteries are in a slightly discharged state. The right #3 pot increases the absorption time between the bulk and float voltages by clockwise rotation. Counter clockwise rotation decreases time.

**Do not force the adjustment pots past their stops. This will void all warranties on the regulator.**

**1. TEST EQUIPMENT:**

- a. A good test quality volt meter (preferably digital).
- b. In an emergency, a light bulb can verify power available or a working ground.
- c. A battery hydrometer with thermometer.
- d. An amp meter (not required but helpful).

**2. GENERAL CHECK OUT PROCEDURE:**

- a. Remove and clean all charging system electrical connections (this includes the ground side). Also check the harness for resistance. The wires or terminals may become corroded and need to be cleaned or replaced.
- b. Charge all batteries to their proper full charge state and determine if they are serviceable.
- c. Check and tighten alternator belts.

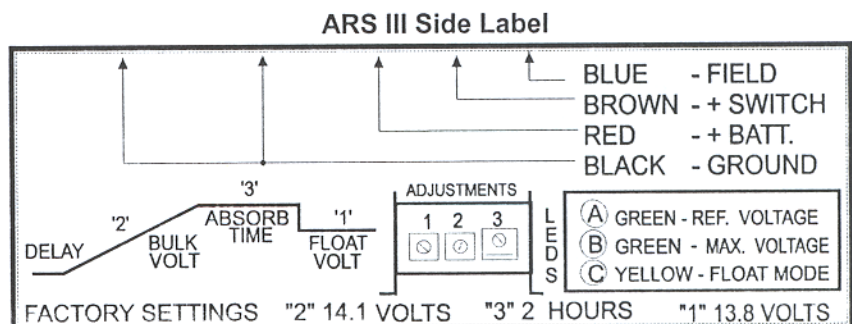
**3. LED DIAGNOSTICS:**

- a. The two Green LED's are voltage activated and correspond with the float and bulk rate settings. Out-side green LED (A) = float (reference), center green LED (B) = bulk (max). They will light when the red Sense wire sees voltage from the alternator, or when a shore side battery charger is providing voltage equal to or exceeding voltage setting.
- b. The Yellow LED indicates the regulator is in the float mode and is an 'on-off' light. If the yellow light (C) comes on first (when you first power up), you have a bad ground or the voltage to the brown Switched wire is receiving interference from a solenoid or similar device. Adding a 12-volt relay to supply clean power to the brown wire, and having the ignition wire activate this relay may solve the problem.

**IMPORTANT NOTE: REMOVAL OF THE BLACK WIRE WITH POWER ON THE REGULATOR WILL DAMAGE THE REGULATOR! - And is not covered under warranty.**

**COMMON SYSTEM PROBLEMS:**

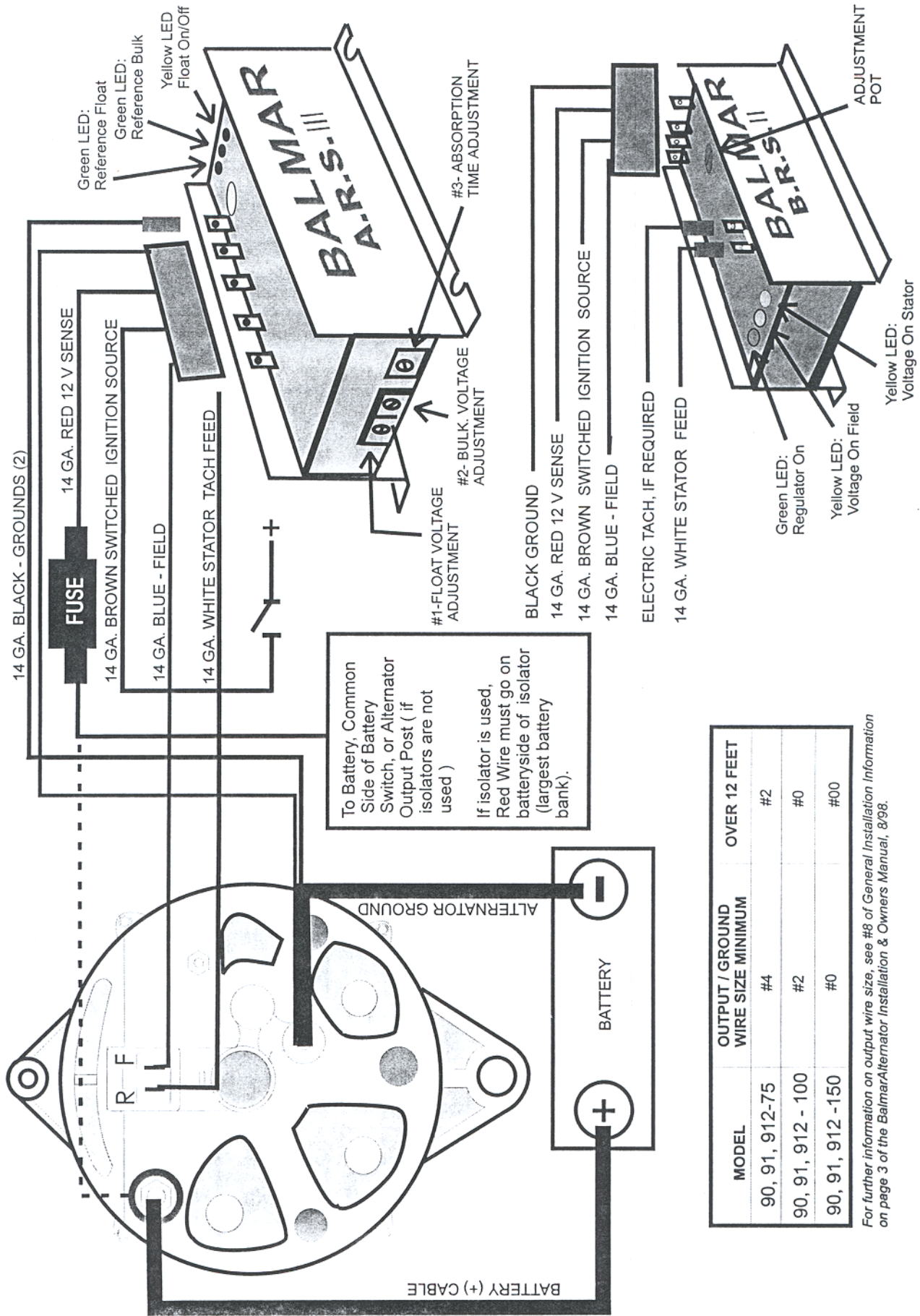
- \* **BAD GROUND SOMEWHERE IN SYSTEM**
- \* Poor or dirty battery cable connections.
- \* Improper wire size.
- \* Loose or poor quality alternator belts.
- \* Sulfated or worn out batteries.
- \* Failed regulator or harness connections.



**BALMAR**  
 SINGLE OUTPUT ALTERNATOR  
 90, 91, or 912 SERIES  
 DUAL OUTPUT SIMILAR

**ARS III and BRS II Regulators**  
 With #1010 Small Case Harness

Note: For Isolated Ground (DIG) models, be sure to hook all grounds to isolated negative terminal.



To Battery, Common Side of Battery Switch, or Alternator Output Post ( if isolators are not used )  
 If isolator is used, Red Wire must go on battery side of isolator (largest battery bank).

MODEL	OUTPUT / GROUND WIRE SIZE MINIMUM	OVER 12 FEET
90, 91, 912-75	#4	#2
90, 91, 912 - 100	#2	#0
90, 91, 912 - 150	#0	#00

For further information on output wire size, see #8 of General Installation Information on page 3 of the Balmar Alternator Installation & Owners Manual, 8/98.

## BRS II

The BRS II is a fully automatic, single-stage regulator with a field that's adjustable to meet specific battery conditions or requirements.

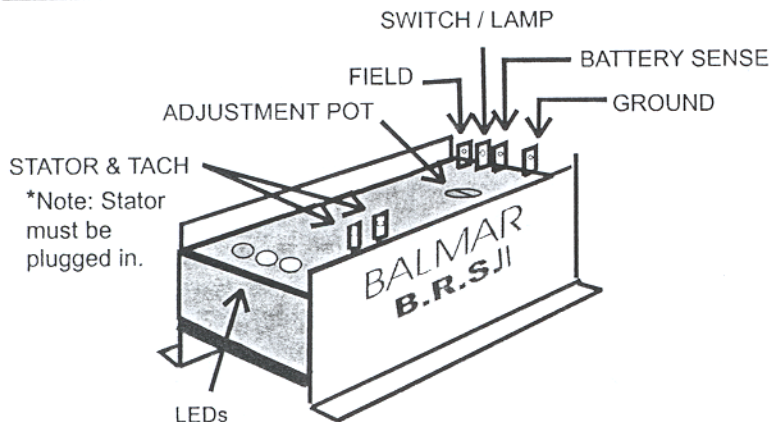
When the key switch or oil pressure switch is activated, the regulator waits for about 1 minute before it turns on. The amber L.E.D. lights to indicate that the regulator is operating. Flickering is normal. The unit is preset at 13.8 volts. Higher settings will reduce charging time, but create a risk of overcharging when there is prolonged engine use. Consult your battery supplier for specific settings.

An adjustment pot is provided to change voltage and should only be changed when the batteries are near full charge. There is a dab of protective coating over the screwdriver slot. Remove this and, using a small screwdriver, turn slowly clockwise to increase, or counter-clockwise to decrease voltage. Do not turn past stops.

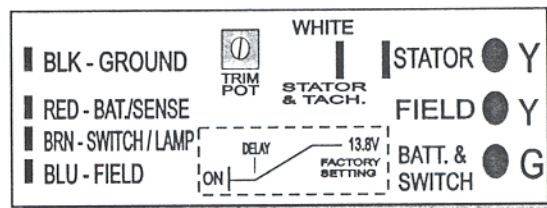
The BRS II requires that the stator (white) wire be plugged into either of the two (stator/tach) connectors available. **DO NOT HOOK A GROUND (BLACK) WIRE TO THESE CONNECTORS.**

The three diagnostic LEDs indicate the operational status of the regulator/alternator system.

<p><b>GREEN</b>                  (+) Battery Voltage on Red <b>Battery Sense</b> wire and Brown <b>Switched</b> wire.                  (-) Battery Voltage on Black <b>Ground</b> wire.</p>	<p><b>YELLOW</b>                  (+) DC Voltage (variable) on <b>Field</b> wire exciting alternator.</p>	<p><b>YELLOW</b>                  AC Voltage on <b>Stator</b> wire returning from alternator.</p>
---	---	---



**BRS II Side Label**



Overall BRS 2 Dimensions:  
4"L x 3.25"W x 1.5"H

### LIMITED PRODUCT WARRANTY

BALMAR warrants to the original consumer/purchaser the product is free from any defects in material or workmanship for a period of one year from the date of purchase. If any such defect is discovered within the warranty period, BALMAR will replace the regulator free of charge, subject to verification of the defect or malfunction upon delivery or shipping prepaid to BALMAR.

This warranty **DOES NOT** apply to defects or physical damage resulting from abuse, neglect, accident, improper repair, alteration, modification, or unreasonable use of the products resulting in breakdown, cracked or broken cases nor are parts damaged by fire, water, freezing, collision, theft, explosion, rust, corrosion or items damaged in shipment in route to BALMAR for repair. BALMAR assumes no responsibility for consequential damage or loss or expense arising from these products or any labor required for service or repair.

BALMAR WILL NOT repair or be held responsible for any product sent without proper identification and return address or RA number clearly marked on the package. You must include proof of date and place of purchase (photocopy of purchase invoice) or we cannot be responsible for repairs or replacement. In order to expedite warranty claims more efficiently, BALMAR asks that prior to returning a defective product for repair, you call their customer service department for a warranty return authorization number.

If factory service is required, you can contact our BALMAR Customer Service Department Monday through Thursday, 7:30 AM to 5:30 PM, (PST)1-360 435-6100 ext 304.

Material required for the repair or replacement for the defective part or product is to be supplied free of charge upon delivery of the defective regulator to BALMAR, 19009 61st Ave. NE, #4, Arlington, WA 98223. Customer is responsible for all return transportation charges and any air or rush delivery expense. BALMAR reserves the right to determine whether to repair or replace defective components.

**THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS. NO PERSON, AGENT, DEALER IS AUTHORIZED TO GIVE ANY WARRANTY**