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Power Drive Systems

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AVR PR SERIES

(AUTOMATIC VOLTAGE REGULATOR)

PR1 OPEN CONSTRUCTION PCB ASSEMBLY MODEL
PR2 PLASTIC ENCLOSURE MODEL

This unit will replace the following AVR's:
Dunlite, PR102A, PR102B, RFS100, Robin, Honda,
Kawasaki, Modra, Stamford, Meccalte, Markon
and many more brush and brushless small Kva generators

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AVR PR1 & PR2 AUTOMATIC VOLTAGE REGULATOR

Warning:

Generators produce high voltage the same as mains voltage. All work should be carried out by a licensed electrician.

1. INTRODUCTION

The PR series of AVR are a solid state universal type for small generators, which is designed to give accurate and stable voltage regulation.

The AVR is suitable for regulating 50 or 60Hz brushless, rotating or stationary field alternators regardless of prime mover type and will replace most electronic regulators with or without separate excitation.

The AVR is suitable for one or three phase alternators and has two sensing ranges available. ie: 120 and 240V.

The AVR has several features:

- Voltage adjustment \pm 10% over each range
- Wide range of stability
- Stability potentiometer
- Fuse protection for overload and generator faults
- Easily adaptable as an alternative AVR
- Optional four pin plug and lead to suit Robin generators
- Made in Australia by the people who know generators and are generator manufacturers

2. OPERATION

The regulator senses the alternator output voltage or half tapping of main winding (240 - 120V) and derives the excitation power from the sub coil (excitation winding) which should be from 120-240V for full excitation power, alternatively excitation power can come from the output winding.

Note:

Some Japanese alternators have very low voltage sub coils (24V) and therefore the power to the field must come from the output see figure 3.

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3. CONSTRUCTION

There are two assembly types, the PR1 is an open PCB assemble and the PR2 is a plastic enclosure with a mounting flange which provides the necessary mechanical protection and is suitable to mount directly in the alternator terminal box or in separate control cubicle.

All components used are selected for stable operation in ambients ranging from -10 deg. to 70 deg. and severely capacity derated for high reliability.

The printed circuit board is a 1.5mm reinforced fiberglass with double sided tracks and plated through holes.

4. CONTROLS

There are 2 standard controls on each AVR.

a. STABILITY I

This potentiometer adjusts the stability and response of the alternator and should initially be set in a counter-clockwise position and rotate clockwise to give optimum stability and response characteristics. Once set, no further adjustment should be necessary.

Full CCW position gives maximum response, minimum stability.

Full CW position gives minimum response, maximum stability.

b. VOLTAGE ADJUST

This potentiometer varies the reference voltage and hence the amount of excitation of the alternator which adjusts the output voltage over a range of $\pm 10\%$.

5. ADJUSTMENTS

a. VOLTAGE

The AVR sensing voltage must be first selected for the required sensing voltage. Either 120 and 240 volts.

Note:

PR2 model, factory set at 240V with connector (red wire) and 120 volt red wire curled up in box alternative use one or the other. If replacing other electronic regulators for convenience use the same sensing connections if possible.

b. STABILITY

Rotate clockwise to increase stability.

c. OVERLOAD

7A fuse in series with field supply will blow if overload or earth fault on fields develops.

6. CONNECTIONS

As per following diagrams

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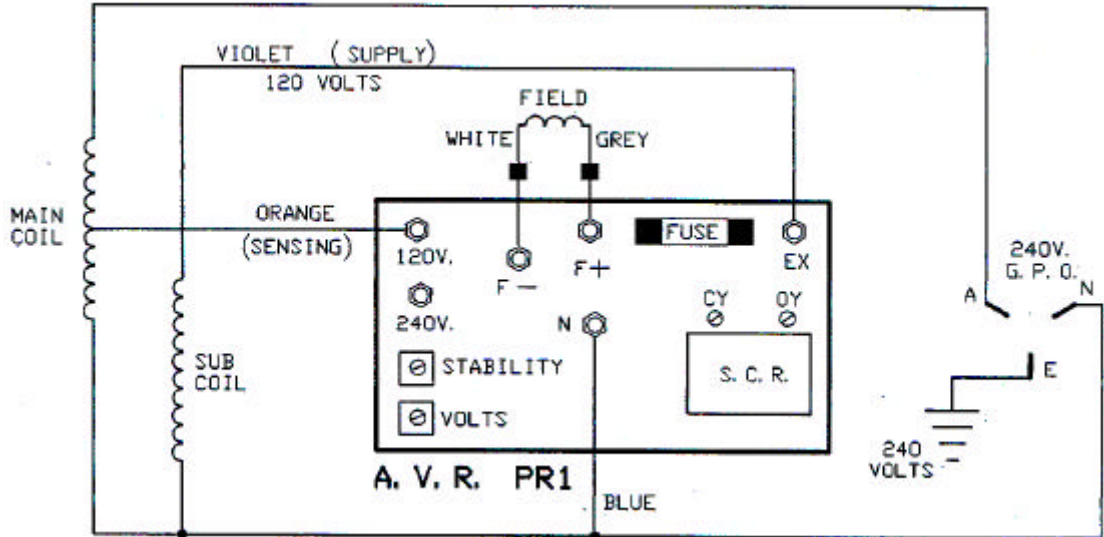
a. PR1 CONNECTIONS FOR DUNLITE GENERATOR

Replacement for PR102A and PR102B regulators

Dunlite 120V sense 240V output

Figure 1

Brown 240 Volts



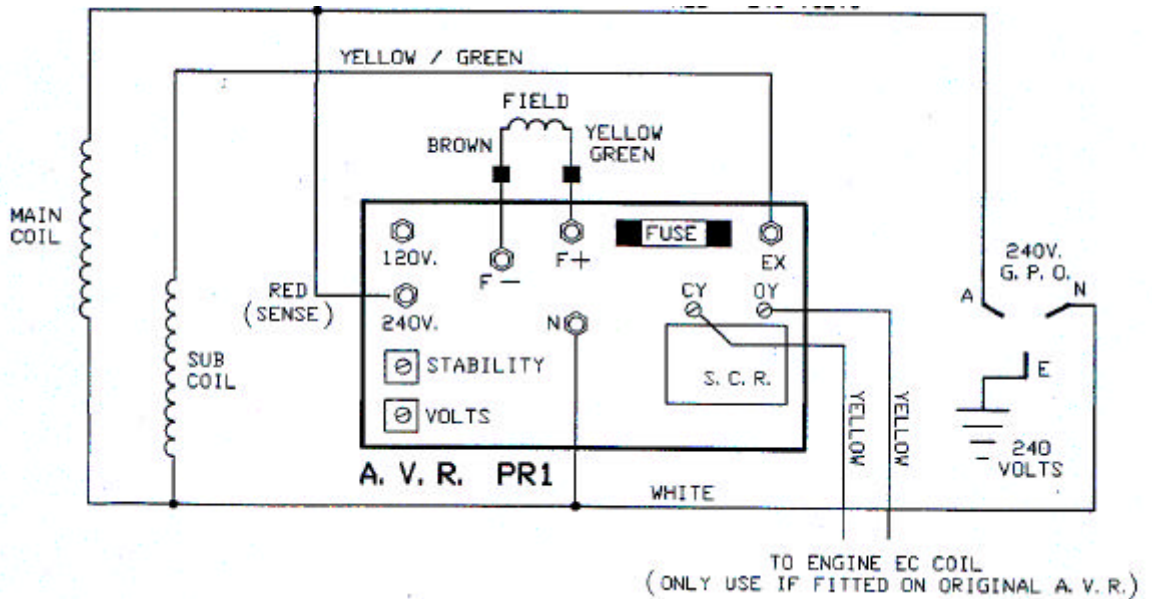
b. PR1 CONNECTIONS FOR ROBIN SERIES OF GENERATORS

Replacement for RGX305, RGD500, RG100, RGD551, RGD1101 and RGX405 regulators

Robin 240V sense 240V output

Figure 2

Red 240 Volts



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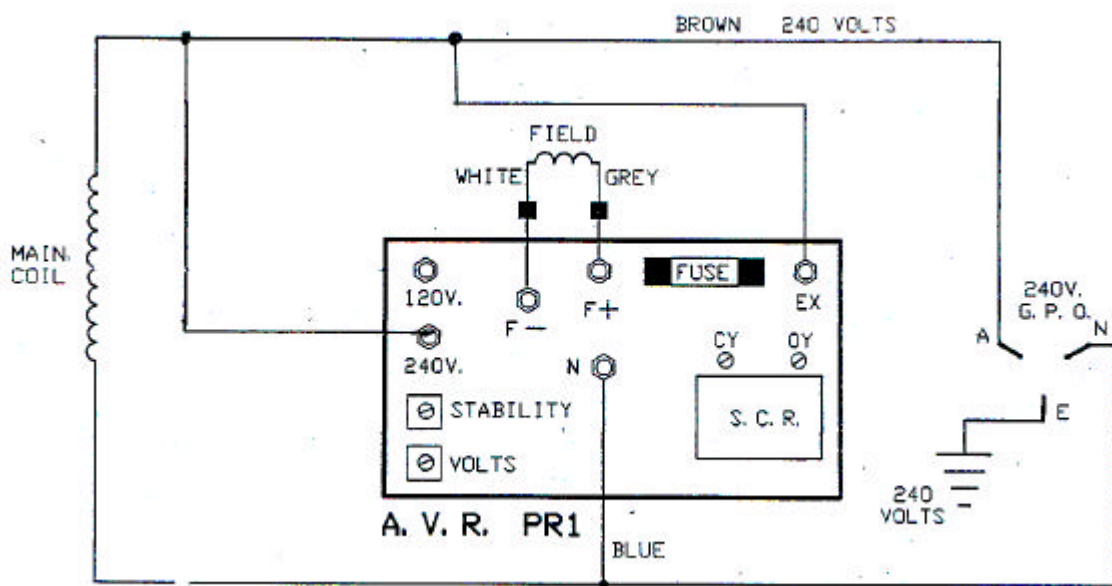
AVR PR1 & PR2 AUTOMATIC VOLTAGE REGULATOR

c. PR1 CONNECTIONS FOR SENSING AND POWER TO FIELD FROM OUTPUT

No sub coil (excitation supply) available

240V sense excitation from 240V output

Figure 3



7. SPECIFICATIONS

Voltage range 120 and 240V
Selectable taps $\pm 10\%$ adjustment on each range
Maximum field current 10 amps
SCR rated 10 amps 800V
Suitable for single and three phase alternators
Regulation $\pm 1.5\%$ (1% can be attained on some machines)
Temperature -10 deg to 60 deg
Residual voltage required for reliable excitation 1.5 volts
Minimum field resistance 3-5 ohms
Field voltage 50% of input sensing voltage

PRI Physical size H 20mm W130 D60 – 4 fixing holes Centres 122 x 4
52 x 4

PR2 Physical size H 32mm W84 D72 Base 105 x 71 2 fixing holes 95 x 5 Dia

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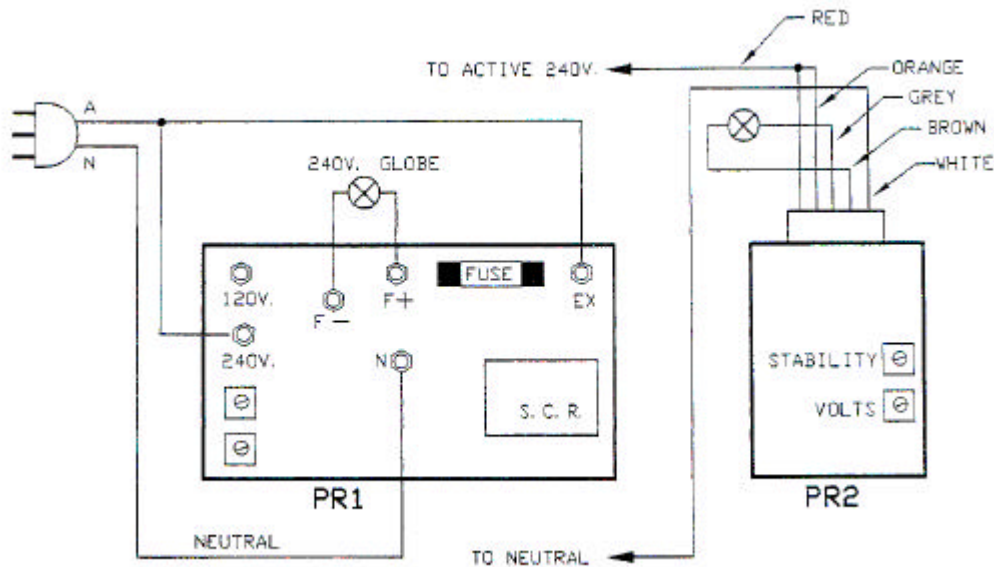
AVR PR1 & PR2 AUTOMATIC VOLTAGE REGULATOR

8. BENCH TEST

The PR1 regulator can be tested on the bench which will give a good indication whether the PR1 is working or not.

a. PR & PR2 BENCH TEST CONNECTIONS

Using 240V sense Figure 4



b. TEST EQUIPMENT REQUIRED

240V 40 watt globe, complete with holder and wire
3 pin 240V mains plug and lead
Mains supply

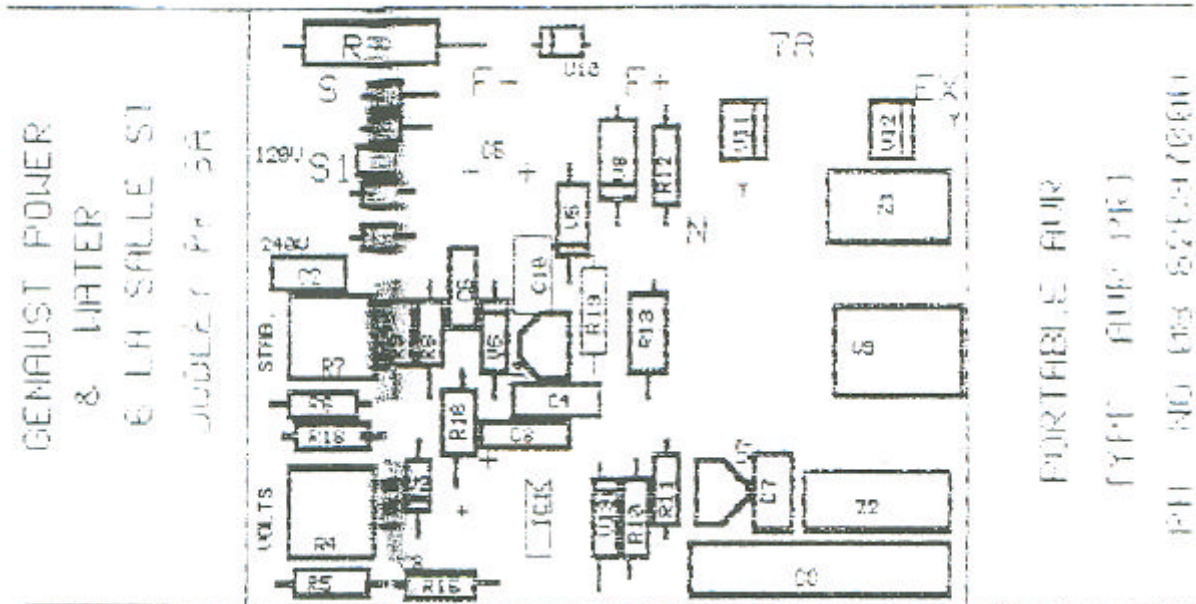
c. PROCEDURE

1. Remove AVR from generator
2. Connect as figure 4, use 240V terminal sense
3. Mark position of voltage adjusting potentiometer with biro or pencil (this enables the potentiometer to be returned to its original position)
4. Turn voltage adjusting potentiometer fully clockwise
5. Turn on the 240V supply
6. Globe's should be illuminated
7. Turn the voltage adjusting potentiometer anti-clockwise
The globe should go off
8. If the AVR operates as the test procedure then the fault may be in the alternator
9. Reconnect to alternator making sure the potentiometer is in its correct position and try again correcting the volt sensing used.

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9. PR1 COMPONENT LAYOUT



10. CONNECTIONS

As per following diagrams

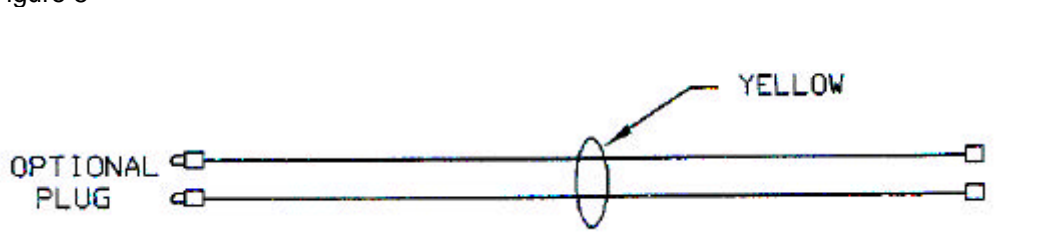
a. PR2 CONNECTIONS FOR ROBIN GENERATOR

Optional Robin plug available

Note:

Colour change on AVR - Grey on PR2 AVR to green or yellow green on generator wiring.

Figure 5



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b. PR2 OPTIONAL PLUG

Figure 6



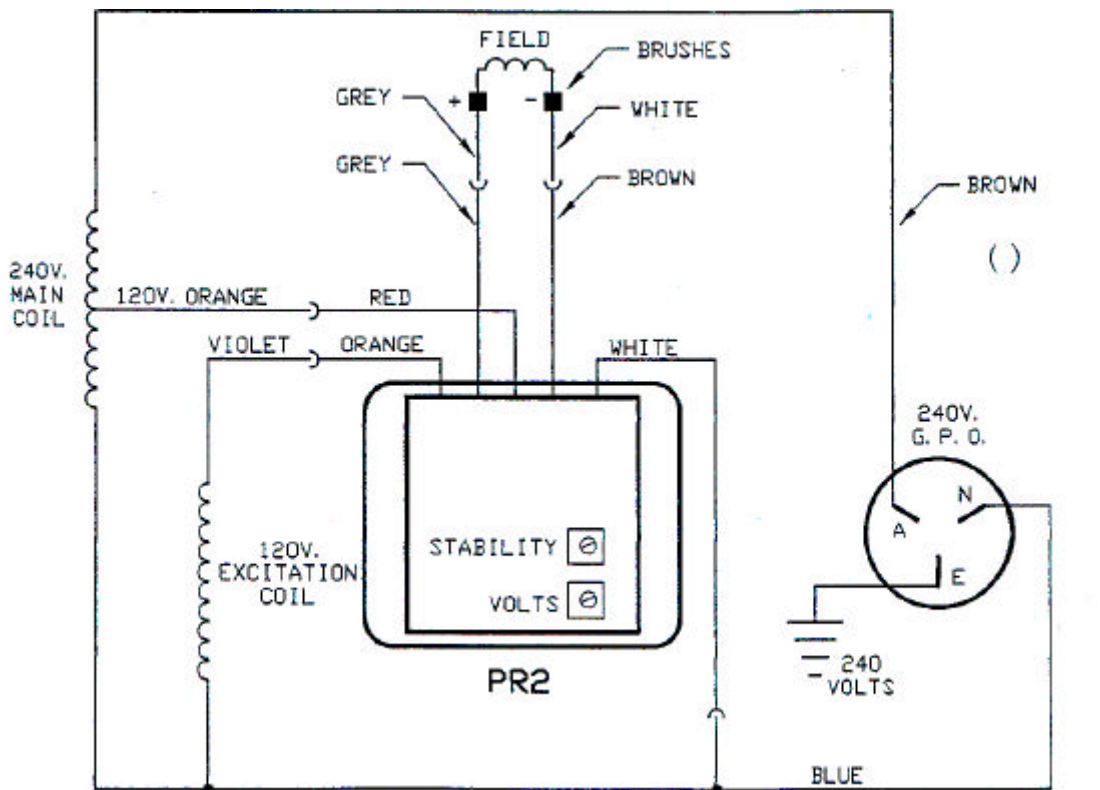
c. PR2 CONNECTIONS FOR DUNLITE GENERATOR

Replacement for PR102A and PR102B regulators

Use 120V sense red wire curled up in enclosure

PR2 basic colours	White	Neutral
	Red	Active sense 240V or 120V
	Orange	Excitation supply
	Brown	Field -ve
	Grey	Field +ve

Figure 7

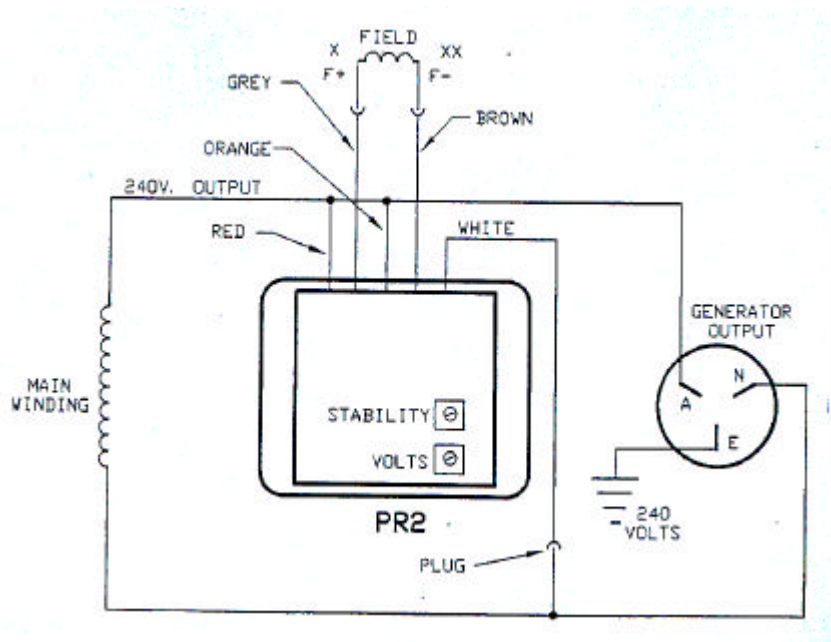


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d. **PR2 CONNECTIONS FOR GENERATOR WITH NO FIELD SUPPLY WINDING**

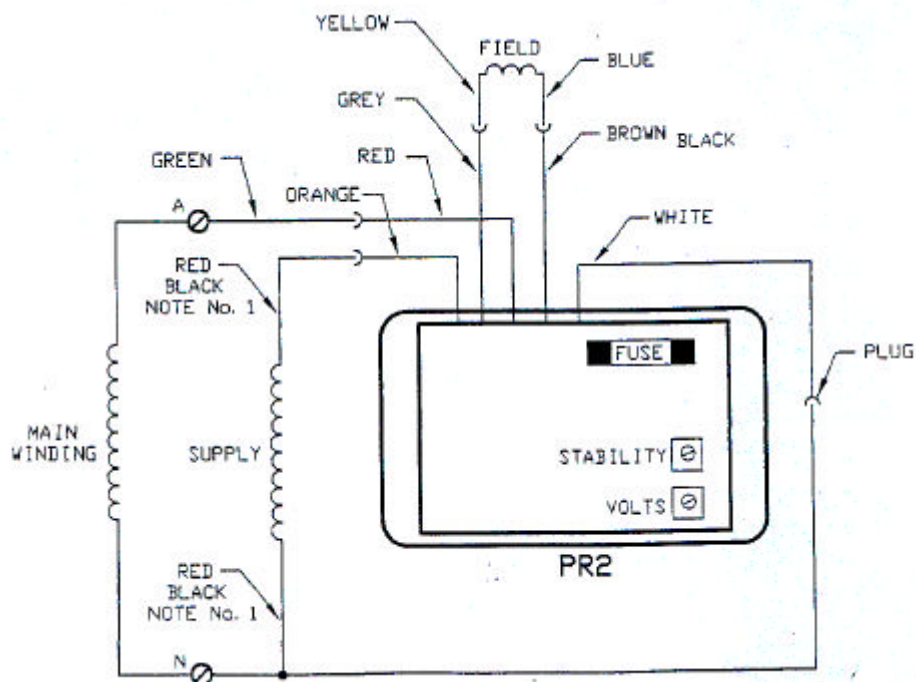
Power to field supplied from output eg. brushless Stamford alternator
Figure 8



e. **PR2 CONNECTIONS FOR MECCALTE ALTERNATOR REPLACING SR7 AVR**

Note: Some Meccalte alternators field supply may have black wires

Figure 9



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WARRANTY CLAIM PROCEDURE

- (a) On identifying a possible component fault advise the company in writing the model and serial number of the component and major assembly it is part of as well as fault details
- (b) Remove and return the faulty component to the company following any tests or checks requested by the company

BASIC WARRANTY CONDITIONS

- (a) The warranty is a 12 month back to base warranty where the customer is liable for the re delivery costs
- (b) Items modified without the companies knowledge or approval may not be warrantable
- (c) If the company is required to inspect / remove or reinstall any part of the goods, the customer will be liable for any out of pocket expenses
- (d) Major third party items such as engines and alternators are subject to the original manufacturers warranty only
- (e) The warranty does not cover inter alias, loss of damage due to accident misuse or fair wear and tear

WARRANTY REGISTRATION

CUSTOMER NAME: _____

ADDRESS: _____

TELEPHONE No: _____ **FAX No:** _____

ITEM MODEL No: _____ **SERIAL No:** _____

SUPPLIER NAME: _____

DATE PURCHASED: _____