

GX 600 SERIES
(AUTOMATIC VOLTAGE REGULATOR)

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This AVR will replace the following Stamford Part Nos. And many more
Series 6 Stamford SX 460 – E000 24600
E000 26000
450 13900

Power Drive Systems

GX 600 AUTOMATIC VOLTAGE REGULATOR

1. INTRODUCTION

The GX600 is a solid state device, which is designed to give accurate and stable voltage regulation of brushless alternators regardless of prime mover type and will replace most Stamford series 6 regulators, Marathon SE350, Meccalte SR7, Braybon AVR's, and many others.

The GX600 is suitable for one and three phase machines both 50 and 60Hz sensing. It is a one or two phase sensing regulator with a voltage sensing range of 170 - 270 volts phase to phase and phase to neutral.

The GX600 regulator has several features:

- Voltage adjustment $\pm 10\%$ over each range
- Wide range of stability
- Underspeed adjustment which will provide voltage droop with large motor starting loads
- This feature will provide excellent starting characteristics and prevent unnecessary stalling of the prime mover
- Remote voltage adjustment available
- Fuse protection
- LED indication of underspeed operation

2. OPERATION

The regulator senses the alternator output voltage and derives excitation power from the centre tapped stator phase windings of the alternator.

Regulation and stability is maintained provided the prime mover speed is within governor class A1 to ISO 3046, at any machine load or power factor by comparing the sensed voltage with an internal reference.

The unit constantly adjusts the field excitation level to compensate for voltage difference between the sensed voltage and reference.

Output voltage of the machine will be held to $\pm 1.0\%$ for steady state conditions including cold to hot variations in ambient conditions of -10 deg. to +70 deg. and engine speed changes of $\pm 4\%$ from preset nominal.

3. CONSTRUCTION

The assembled PCB is designed to mount directly in the alternator terminal box using the same mounting centres or in a 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 fibreglass with double sided tracks and plated through holes.

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4. CONTROLS

There are for standard controls on each regulator.

a. STABILITY I – R7

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. STABILITY II – R12

This potentiometer widens range of stability and should always be normally fully anti-clockwise and only adjusted slightly clockwise to provide further stability should 'STABILITY I' run out of range, particularly on single phase machines.

Set STABILITY II fully anti-clockwise for 1 phase or fully clockwise for 3 phase.

c. VOLTAGE ADJUST – R10

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

An external 5K potentiometer may be added to terminals P.P. for remote panel voltage adjustment. When this is used the loop on P.P. is removed and the internal pot turned to maximum.

d. UNDERSPEED – R22

This potentiometer sets the frequency at which voltage drooping with speed will occur.

For example, if set at 48Hz and a large motor is started, this temporarily overloads the prime mover on starting. Once the speed falls to 48 Hz the alternator voltage will decrease and act as an automatic reduced voltage the sensing range is 170 - 270 V.

5. INITIAL SETTING UP

a. VOLTAGE

The GX600 sensing voltage can be adjusted for the required sensing voltage by adjusting potentiometer R10. For the required output voltage the sensing range is 170 - 270V.

Note:

If replacing other electric regulators for convenience use the same sensing connections if possible.

b. STABILITY I

Rotate clockwise to increase stability.

To check, if after sudden load change prolonged fluctuation occurs, turn stability slightly clockwise, or if voltage is very slow to recover from load changes, then counter clockwise.

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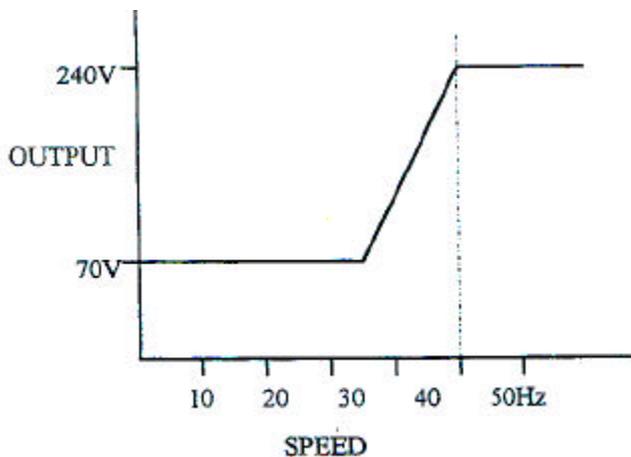
c. **UNDERSPEED**

To adjust the underspeed characteristic the alternator must be running at 50Hz \pm no load 240Hz.

Connect an AC voltmeter across the output of the alternator and slowly turn the underspeed potentiometer clockwise until the voltage just starts to fall, then turn slightly counterclockwise, approx. 30 deg.

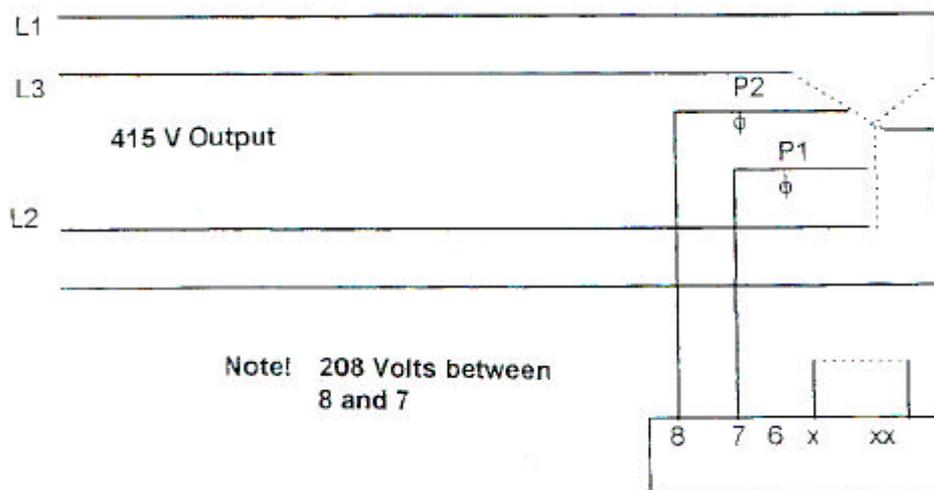
To check, apply full load if possible and voltage should not droop more than 1%, or alternatively lower speed to 48Hz and voltage should droop.

When setting is completed return no load prime mover speed back to 52Hz (where a mechanical governor is used).



6. **CONNECTIONS**

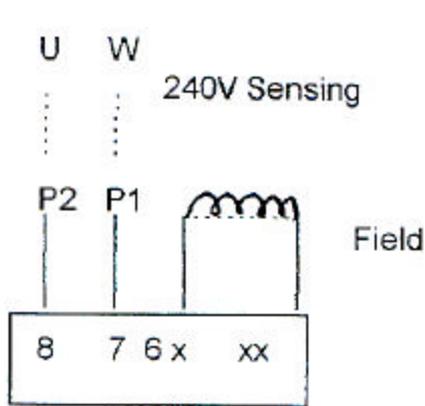
a. **STANDARD 3 PHAASE 4 WIRE**



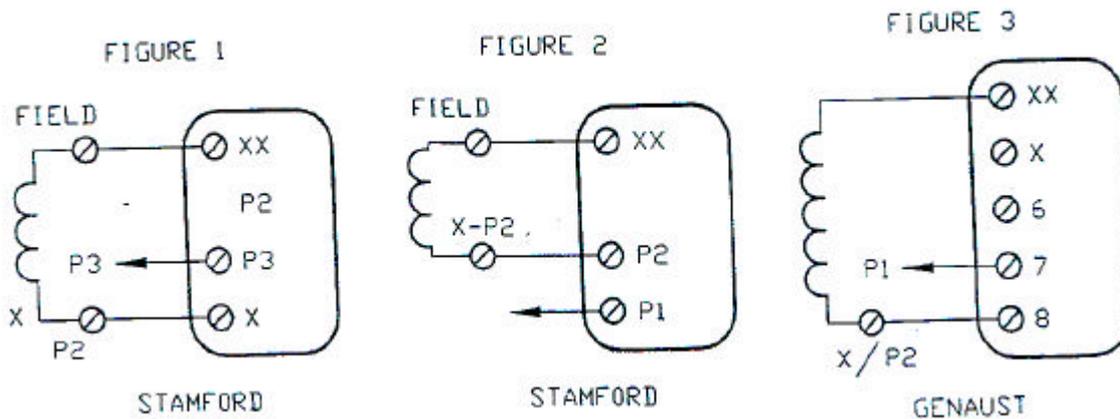
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GX 600 AUTOMATIC VOLTAGE REGULATOR

- b. **STANDARD 1 PHASE 2 WIRE**
For parallel zig zag or double delta connection.



- c. **CONNECTIONS**
Some series 6 AVR's from Stamford have only 3 connections.
Connect Genaust GX600 as per figure 3.



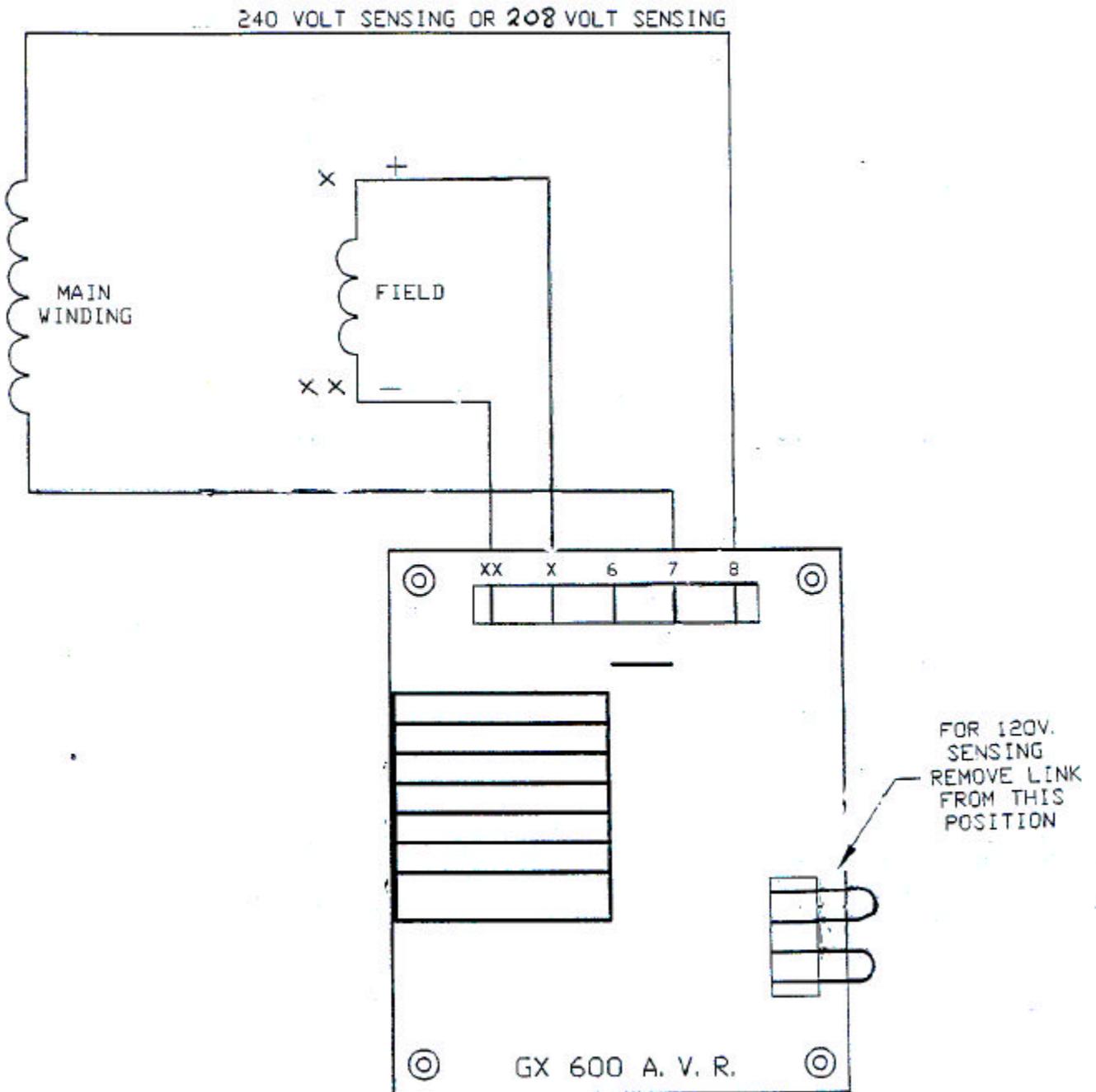
7. SPECIFICATIONS

- 1, 2 and 3 phase sensing
- Voltage range 170 – 270 volts
- Adjustment $\pm 10\%$ on each range
- Maximum field current 10 amps
- SCR rated at 25 amps 800 volts
- Suitable for single and three phase alternators
- Regulation $\pm 1\%$ (assuming class A1 governor ISO3046)
- Size 100mm X 135mm
- Mounting centres 115mm X 81mm
- Temperature -10 to 70°
- Reliable excitations 3 – 5 ohms
- Minimum field resistance 3-5 ohms
- Field voltage approx 50% of input sensing voltage
- Replaces Stamford part numbers E000 24600, E000 – 26000, E450 – 13900 plus many more

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STANDARD CONNECTION

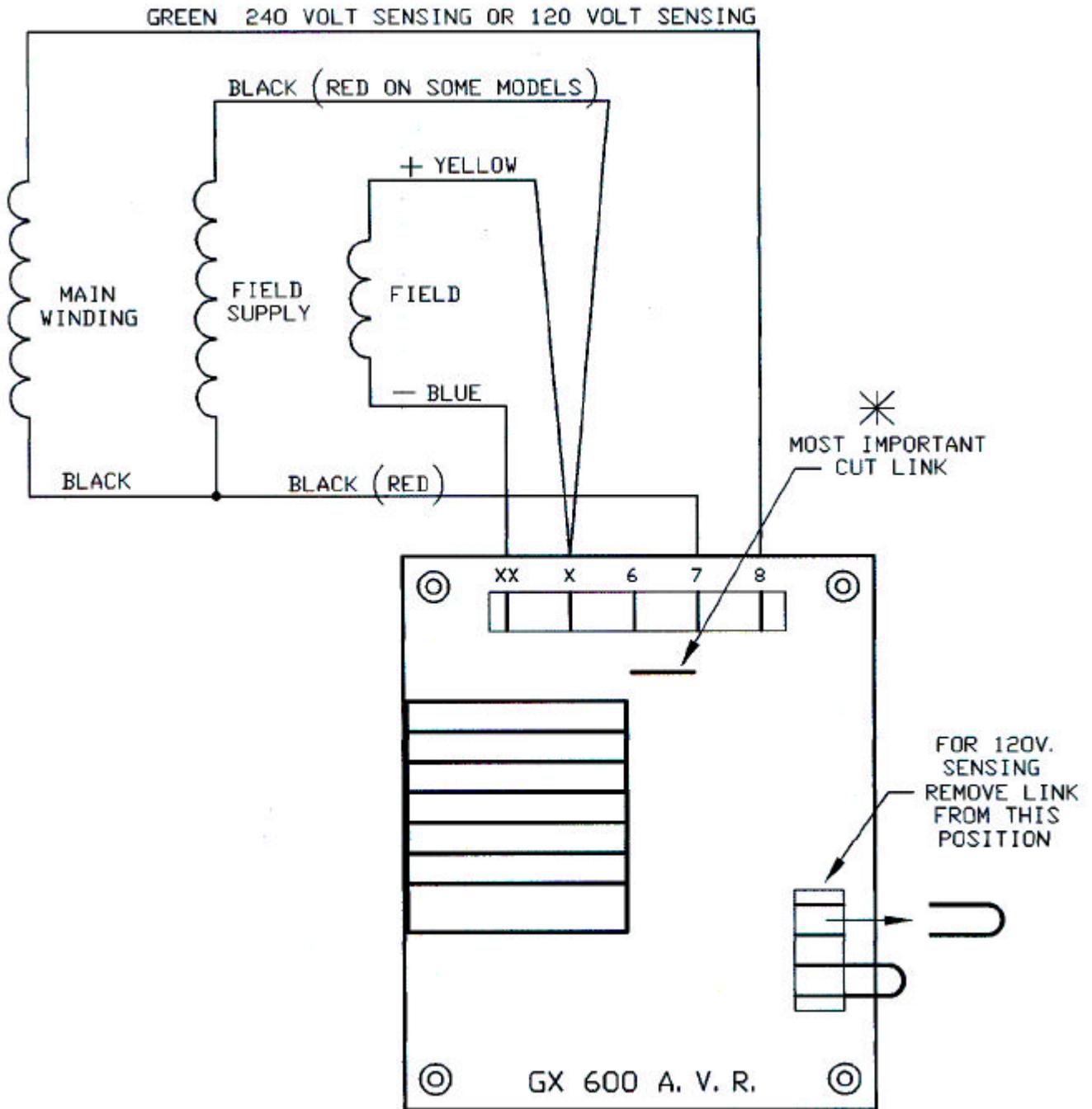


GX 600 A. V. R. CONNECTED TO

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GX 600 AUTOMATIC VOLTAGE REGULATOR

SPECIAL CONNECTION

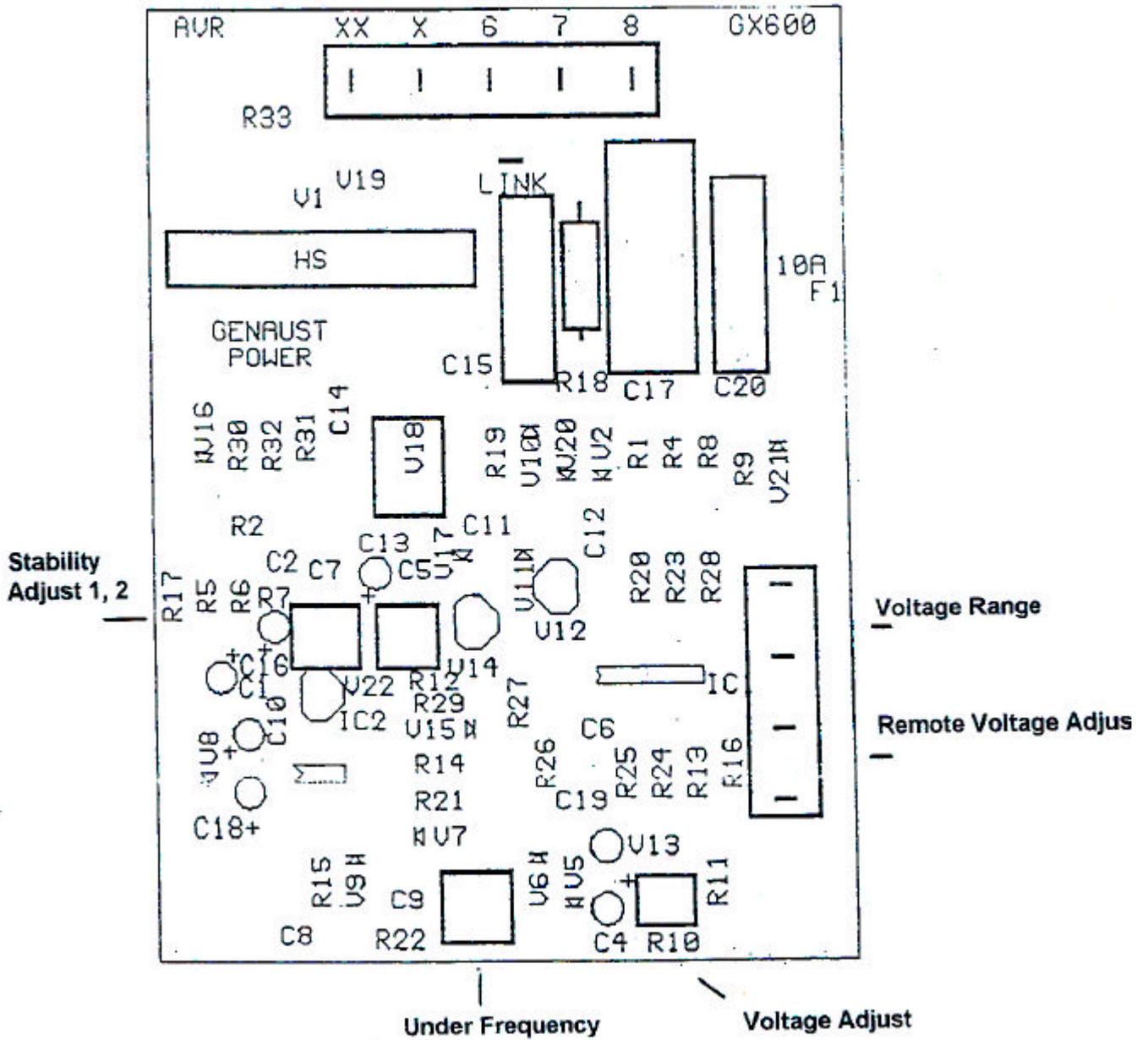


GX 600 A. V. R. CONNECTED TO
MECCALTE ALTERNATOR REPLACING
SR 7 REGULATOR & USING FIELD SUPPLY

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GX 600 AUTOMATIC VOLTAGE REGULATOR

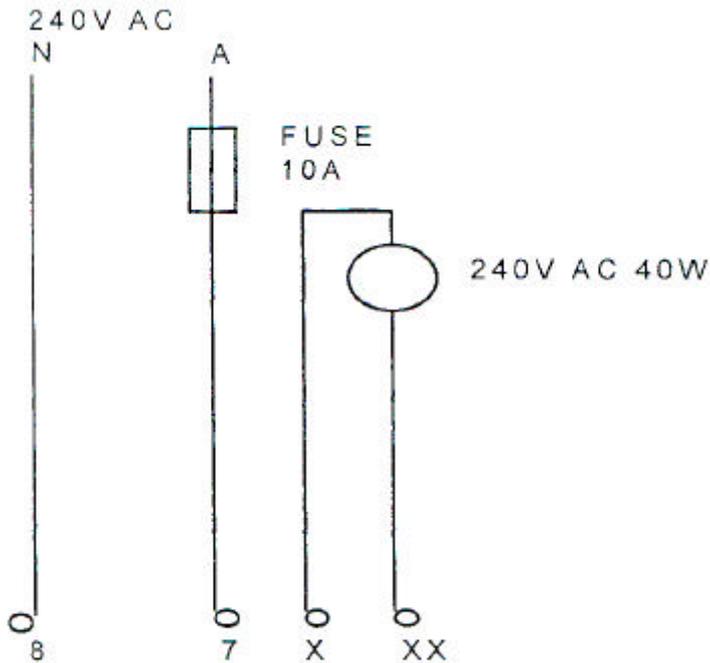
8. COMPONENT LAYOUT



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9. BENCH TEST



- a. The regulator can be bench tested as follows
- b. **REGULATOR TEST SET UP SELECTIONS**
240v Sense
- c. **TEST EQUIPMENT REQUIRED**
A 240 Volt 40 Watt globe, complete with holder and wire.
3 pin 240 Volts mains plugs and leads.
Mains supply
- d. **PROCEDURE**
 1. Remove the regulator from generator.
 2. Connect as above and select 240 Volt position. (Note the original sensing voltage position)
 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 240 Volt supply.
 6. 240 Volt globe should illuminate.
 7. Turn 240 Volt supply off.
 8. Turn the voltage potentiometer full ant-clockwise.
 9. Turn 240 Volt supply on.
 10. 240 Volts globe should just flash and then remain off immediately.

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GX 340 AUTOMATIC VOLTAGE REGULATOR

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: _____