



**PTSG-12**

**Operators  
Manual**

**Power Technology Southeast, Inc.**

634 State Road #44 Leesburg, FL 34748-8103

◆ (352) 365-2777 ◆ Fax (352) 787-5545 ◆



## Limited Warranty on Power Tech Generators

Power Technology Southeast, Inc. warrants to you, the original purchaser, that each product of our manufacture is free from defects in materials, and workmanship. That each generator will deliver its rated output as indicated on The Power Technology Nameplate, if properly installed, serviced, and operated under normal conditions in accordance with Power Technology's instructions.

### THE WARRANTY COVERAGE TERMS:

2 years from date of purchase, or 3000 hours whichever comes first, or 36 months from the date of manufacture. Parts, and labor, including diagnostic labor, removal, and reinstallation are covered for the first 12 months from date in service or 1000 hours whichever comes first.

Parts and labor are covered only on the following generator and engine parts for 2 years or 3000 hours whichever comes first. Generator Parts: Main Rotor and Main Stator. Engine Parts: Cylinder Block, cylinder head, crankshaft, camshaft, cylinder head gears, connecting rods, flywheel and flywheel housing, intake and exhaust manifold (only if flexible connection is used).

- 3) Stand-by Units are covered for a period of 1 year from date of installation, or 1000 hours, or 24 months from the date of manufacture whichever comes first.
- 4) Replacement Parts are warranted: 30 days. (Excluding the following: voltage regulators, fuses, controllers, capacitors, brushes, and switches)

### WHAT POWER TECHNOLOGY WILL DO:

*Power Tech will at our option, repair or replace any part covered by this warranty which becomes defective, malfunctions or otherwise fails to conform to this warranty under normal use and service during the term of this warranty.*

### WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE:

In order to obtain warranty repairs you must deliver the product, together with proof of purchase to an authorized Power Tech service facility. In the case of repairs pertaining to the engine only, you must use an authorized dealer or distributor of that make of engine, to be covered under their warranty. Engines used in the manufacture of Power Tech products are warranted solely by the engine manufacturer.

### PRIOR APPROVAL IS REQUIRED FOR ANY WARRANTY SERVICE

Failure to obtain authorization prior to the repair being performed will result in the claim being denied.

All claims must be submitted within 30 days of the repair. Along with the following: a copy of the original repair order, Power Tech authorization number, Power Tech serial number, and operation hours shown on the genset mounted hour meter.

### THIS WARRANTY DOES NOT COVER THE FOLLOWING:

A. Normal wear items, including but not limited to: turbo-chargers, fuel injector (s), starter, alternator, and electronic components, as well as normal engine and/or generator wear. **A1.** Travel time and fuel charges to and from the repair facility or travel time and fuel charges for mobile service. (Except stationary units with a maximum of 2-hours travel time.) **B.** Defects, malfunctions or failure resulting from accidents, abuse, misuse, improper servicing, improper installation, improper storage, and lack of performance of required maintenance service. **C.** Products which have been subjected to alteration, modification, neglect or unauthorized repairs. **D.** Troubleshooting, routine service, tune-ups, replacement of filters, belts, coolant, lubricants, hoses, clamps, exhaust system components, fuel system components, gaskets and/or seals. **E.** Electrical items damaged by welding or jump-starting. **F.** Damage caused by water ingestion or electrolysis. **G.** Damage caused by ingestion of substances other than clean filtered air, fuel, or intake water. **H.** Damage caused by faulty repairs performed by a repair facility not authorized in writing by Power Tech. **I.** Damage caused by operation with improper fuel or at speeds, loads, conditions, modifications, or installation contrary to published specifications or recommendations. **J.** Original installation charges and startup costs. **K.** Removal and re-installation charges of more than 1-hour labor for outside units, 2-hours for compartment mounted units, and 3-hours for below deck marine units. Customer is responsible for additional labor/charges due to difficult access, removal or installation. **L.** Starting batteries and labor or charges related to battery service. **M.** Loss of revenue or the rental of equipment due to down time. **N.** Generator repairs made within the warranty period other than by an authorized Power Tech service dealer without prior written approval from Power Tech warranty department. **O.** Damage caused by negligent maintenance such as but not limited to: Failure to provide the specified type and quantity of lubricating oil, cooling air flow, and proper coolant mixture and level. Failure to provide adequate air intake/or maintenance of the air intake system. Failure to provide scheduled maintenance as prescribed in supplied manuals. **P.** Engine fluids such as fuel, oil or coolant/antifreeze. **Q.** Shop supplies such as adhesives, cleaning agents, rags, paint, or other miscellaneous supplies. **R.** Use of other than factory supplied or approved repair parts or procedures. Replacement of a failed Power Tech component with a non-Power Tech component voids the Power Tech warranty on that component and any and all failures related to that component. **S.** Fuel injection pumps repaired by anyone other than the factory authorized dealer or distributor of that engine. **T.** Expenses incurred investigating performance complaints unless defective Power Tech materials or workmanship are discovered. **U.** Generator sets used in rental applications. **V.** Cleaning, service, or repair of generator sets that have not been kept free of dirt, debris, or other items that prevent the unit from being able to operate properly. **W.** Any generator set not application approved. **X.** Loss of excitation due to prolonged storage. **Y.** Any damage attributed to low battery monitoring or automatic generator starting systems. **Z.** Optional accessories are warranted solely by the manufacturer of that item including but not limited to the following item: Block heaters, oil pan heaters, electric cooling fans, air-bag isolators, compartment heaters, fuel tanks, trailers, battery chargers, battery monitors.

**To obtain warranty service:** For your nearest Power Tech authorized service center, on the World Wide Web at: [http://www.powertech-gen.com/parts\\_service.php](http://www.powertech-gen.com/parts_service.php)

Call 1-352-365-2777 or write to Power Tech Warranty Department, P.O. Box 490133 Leesburg, FL 34749 USA.

Power Tech must be notified in writing within five (5) business days of any product failure.

### General Conditions:

This Warranty is the sole property of the original owner /user.

A transfer of ownership shall terminate this Warranty.

This Warranty is only valid within the contiguous United States and Canada.

Warranty coverage is available outside the U.S. and Canada; please speak to a factory representative for those details.

This Warranty does not cover any products or parts not purchased from Power Technology.

Power Technology reserves the right to make design improvements and model changes without any obligation to change units or parts previously manufactured.

Warranty registration card must be completed and mailed to Power Tech at the above address to validate the Warranty.

### This is the only express warranty on Power Tech products

No person, agent, or dealer is authorized to give any Warranties on behalf of Power Technology Southeast, Inc., and not to assume for Power Technology Southeast, Inc. any other liability in connection with any of its products unless made in writing and signed by an officer of Power Technology Southeast, Inc.

**LIMITATIONS ON OUR RESPONSIBILITY WITH RESPECT TO PRODUCTS PURCHASED AND USED FOR PERSONAL, FAMILY OR HOUSEHOLD USE:**

Our responsibility is to repair or replace defective parts as stated above. We will not be responsible for any other expenses, losses or inconvenience which you may Sustain as a result of the purchase, use, malfunction or defective condition of our products. **ANY IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED IN DURATION TO THE PERIOD SET FORTH ABOVE.**

Some states do not allow limitations on how long an implied Warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above

Limitations or exclusions may not apply to you. This Warranty gives you specific legal rights and you may have other rights which vary from state to state.

This Warranty is in lieu of all other Warranties, expressed or implied and of any other obligations or liability on our part.

Our responsibility for any and all losses and **IN NO EVENT WILL WE BE LIABLE FOR LOSS OF USE, LOSS OF PROFITS, INCONVIENCE, COMMERCIAL LOSS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER.**

## Engine Maintenance Service Schedule

Maintenance Service Item	*See Note	Daily	Every 150 Hours	Every 500 Hours	Every 1000 Hours	Remarks
Engine Oil Level Deterioration & Leakage		X				
Engine Oil Change	*		X			Or Once a Year
Oil Filter Change	*		X			Or Once a Year
Coolant Level		X				
Coolant Leakage		X				
Coolant Change					X	Or Once a Year
Fuel Level		X				As Necessary
Fuel Leakage		X				
Fuel Filter Replacement				X		Or Once a Year
Air Filter Replacement	**			X		Or Once a Year
Damaged Worn Or Loose Belts		X				Or Every Two Years
Replace Fuel Hoses					X	Or Every Two Years
Check Radiator Hoses & Clamps				X		Once a Year
Abnormal Engine Noise		X				
Abnormal Generator Noise		X				
Muffler Condition		X				
Exhaust Gas Condition		X				

\* Engine oil and filter must be changed after the first 50 hours of operation. Then every 150 hours or once a year whichever comes first.

\*\* Air filter replacement interval will vary depending on operating conditions. Adverse conditions may require frequent service.

**NOTE:** Under normal operation items such as Belts, Hoses and Filters are not covered by Power Technology Southeast, Inc. Limited Warranty.

# GENERATOR ASSEMBLY INFORMATION

## EXCITER TYPE GENERATOR

The exciter pole pieces contain residual magnetism, which sets up lines of force across the air gap to the exciter armature. When the exciter begins to rotate a voltage is induced and current flow is initiated in the exciter armature AC windings. This voltage is fed to the rotating rectifier assembly, rectified and fed to the alternator field, which sets up lines of force across the air gap to the alternator stator windings and to the output circuit.

A static voltage regulator is connected to the generator output. The regulator will rectify part of the output voltage to provide a DC voltage to the exciter field coils. This will increase the density of the lines of force in the exciter, increasing the voltage induced into the exciter armature windings, and therefore, to the rotating rectifiers. The rotating rectifier output will be increased which will increase the alternator field strength and generator output will build up its rated voltage. Adjustment of the generator output to the rated voltage level is accomplished by controlling the current fed to the exciter field coils. Regulation is automatic with the static type voltage regulator. An additional voltage adjustment range is provided if desired by turning the Voltage Adjust Rheostat.

## ELECTRONIC VOLTAGE REGULATION

Electronic Voltage Regulator (EVR) also referred to, as an Automatic Voltage Regulator (AVR) is a very reliable device, which uses solid-state electronics to maintain voltage accuracy at  $\pm 2\%$  of the regulated voltage. The Voltage Regulator is designed to automatically regulate and maintain the generated AC voltage through out the load range that is from no load to full load.

## VOLTAGE CONNECTION

The generator may be connected at the terminal board to deliver 120/240 volts to a 3 wire grounded neutral system, or 120-volts only to a 2 wire distribution system. If any equipment requires 240-volts, then the 120/240-volt connection must be used. If all equipment requires 120-volts then the 120-volt connection is preferred, even if two lines leave the same switch box. The two lines at the inputs to the switch box are both connected to the un-grounded 120-volt lines from the generator. The 120-volt connection enables the Electronic Voltage Regulator (EVR) to hold the voltage very close to the 115 or 120 volts, as initially adjusted, regardless of the power distribution amount the different distribution lines. The 120-volt connection is recommended if the entire electrical load requires only 115 or 120 volts.

Although the 120/240-volt connection may also be used when all loads requires only 110 volts, it should be pointed out that this connection, the 240-volts, is regulated and the lightly loaded phase, or line, will deliver a high line to neutral voltage and the heavily loaded phase will deliver a low line to neutral voltage. The heavily loaded line may have such a low voltage that air conditioning will have more difficulty in starting, and long starting lines may overload generator and trip circuit breakers

## EXCITER FIELD COIL VOLTAGE SOURCE

Field coil DC voltage is obtained by rectifying the voltage from the phase to neutral line of the generator output, or either appropriate terminal to provide the needed voltage reference.

The rectifier bridge is an internal part of the static regulator. The static regulator senses a change in the generator output and automatically regulates current flow in the exciter field coil circuit to increase or decrease the exciter field strength. An adjustable rheostat sized to be compatible with the regulator is used to provide adjustment of the regulator sensing circuit.

## ROTATING FIELD ASSEMBLY (ROTOR)

The rotating field assembly consists basically of four members: 1) the shaft assembly, 2) the core assembly, 3) the field coil damper windings, and 4) balance lugs to provide a high degree of static and dynamic balance.

### CORE ASSEMBLY

The core assembly consists of a quantity of thin steel plates compressed and fastened together to form a single laminated assembly. The field windings are wound around this assembly.

### FIELD COIL

Field coils of heavily insulated wire are “wet” wound directly onto the poles. Field coil leads are brought out to the rectifier assembly for connection to the source of DC excitation voltage.

### BALANCE

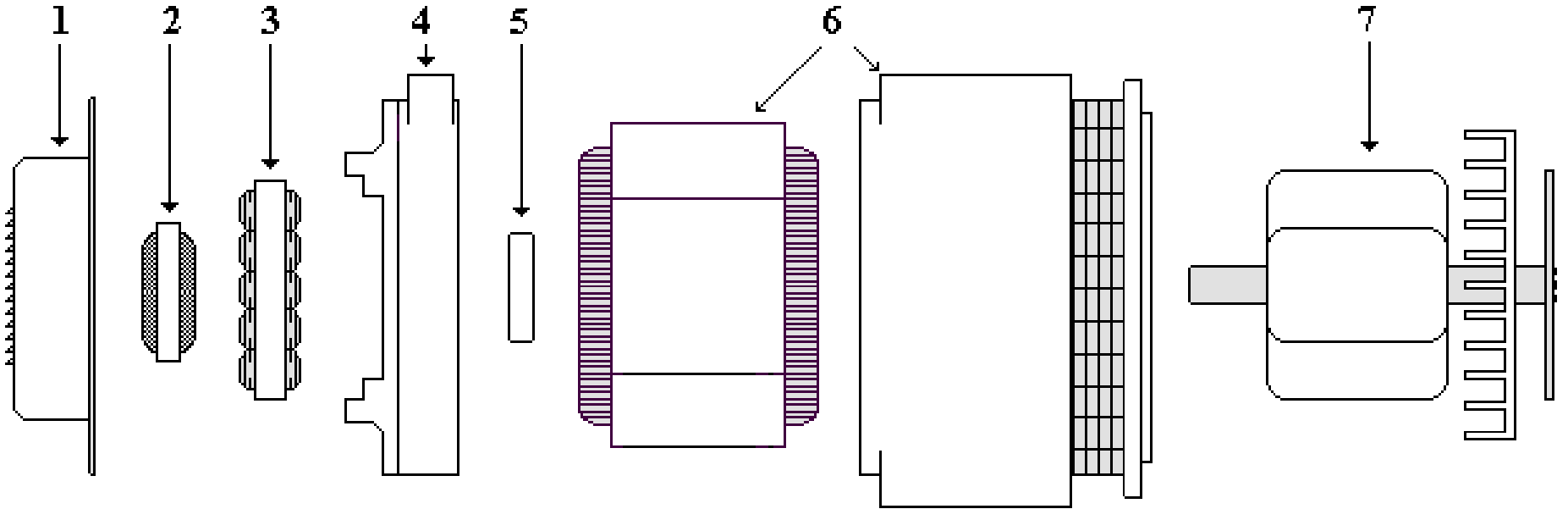
The rotor assembly is precision balanced to a high degree of static and dynamic balance. Although the balance will remain dynamically stable at speeds in excess of the design frequencies, the prime mover should be adequately governed to prevent excessive over speed. High centrifugal forces created by excessive over speed may damage the rotor windings and field coils.

### BEARING

The generator rotor assembly is suspended on a shielded factory lubricated ball bearing. A visual inspection of the bearing is recommended at typical service intervals. If signs of abnormal wear or leakage are observed, the bearing should be replaced. Never use liquids of any kind to clean the generator end and bearing.

### STATOR ASSEMBLY

The stator assembly consists of laminations of steel mounted in a rolled steel frame. Random wound stator coils are fitted into the insulated slots.

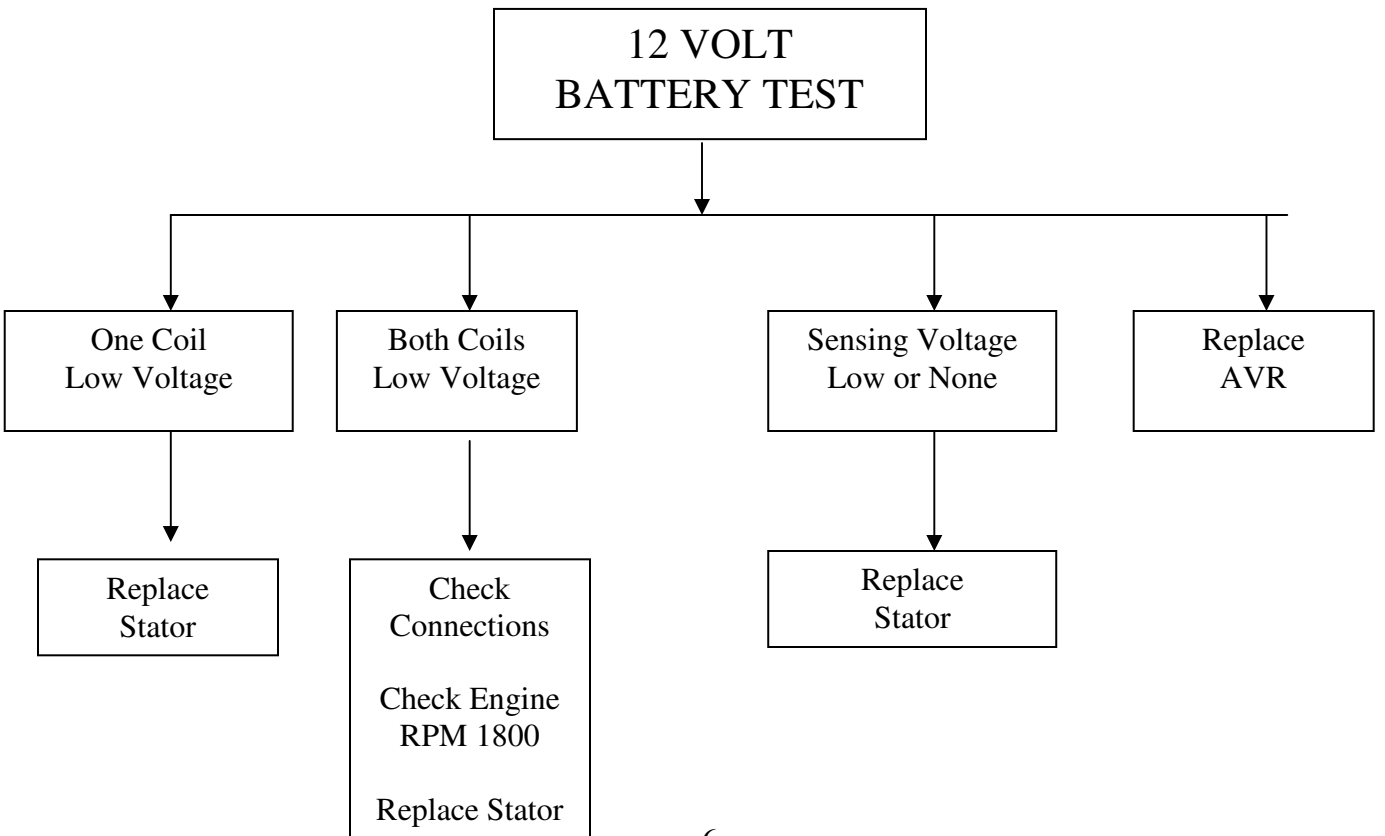
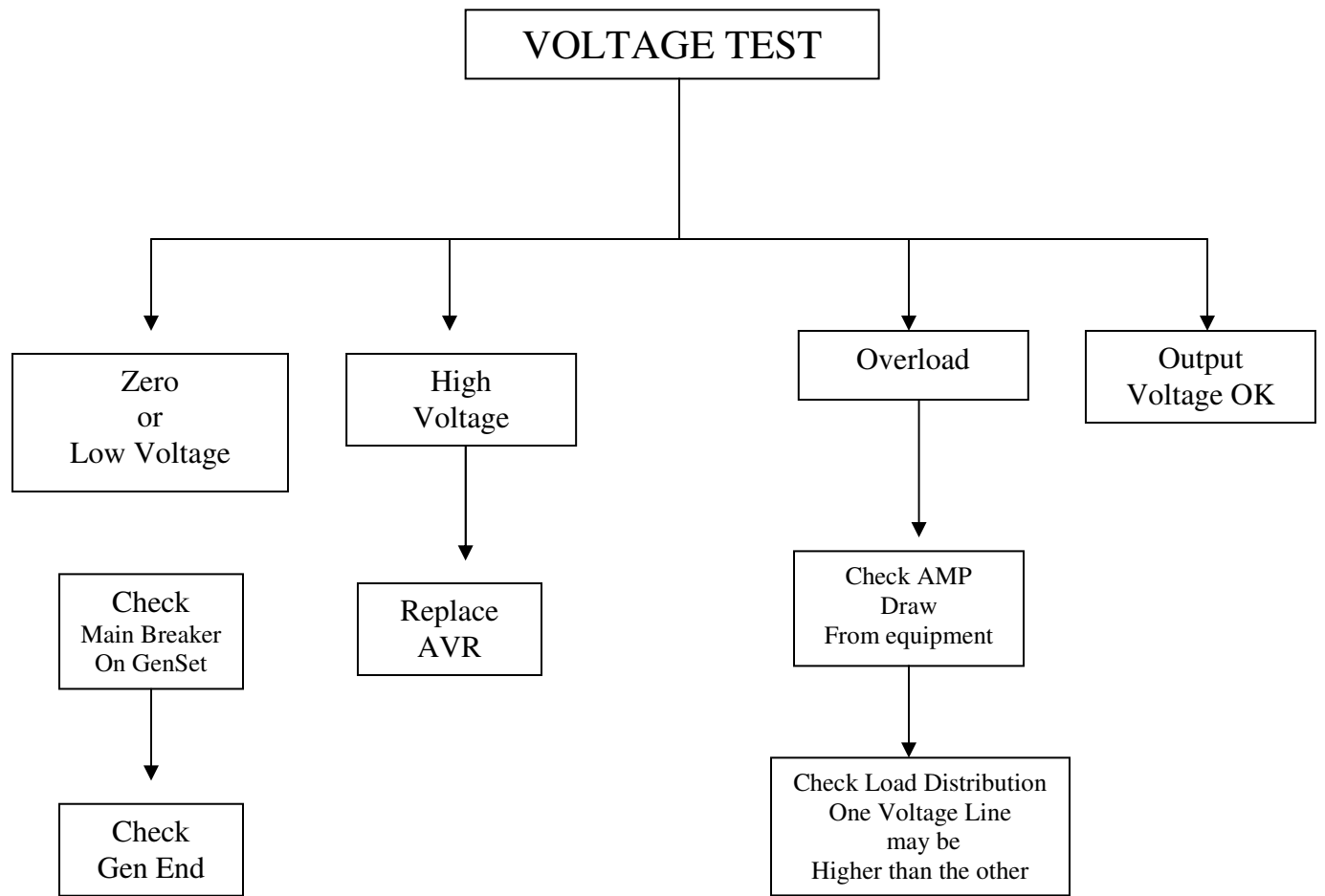


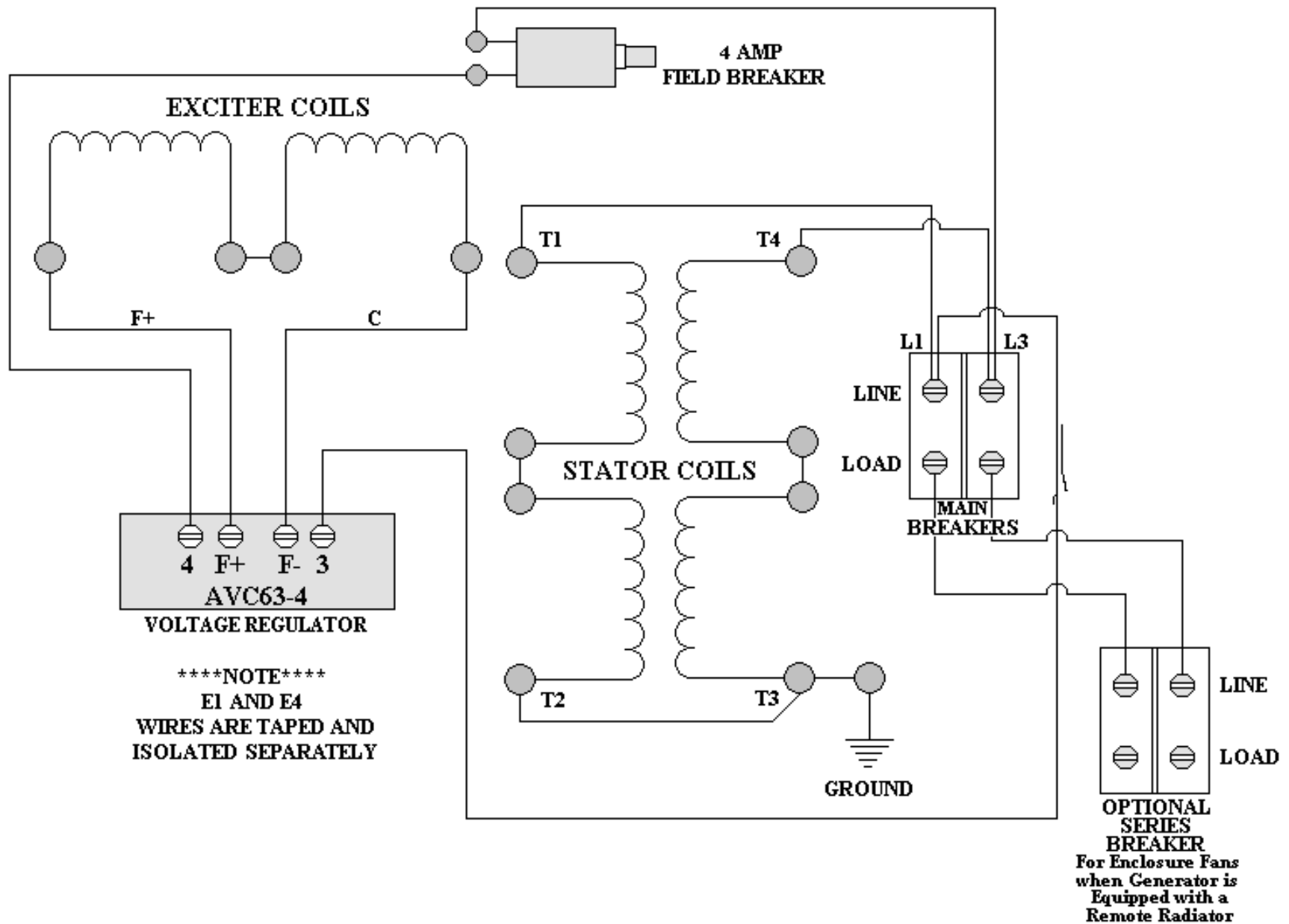
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DESCRIPTION	PART NUMBER		
	15KW	17.5KW	20KW
1. END COVER	NS-GENCAN	NS-GENCAN	NS-GENCAN
2. EXCITER ROTOR	02RTR1520EXC	02RTR1520EXC	02RTR1520EXC
3. EXCITER STATOR	02STA1520EXCG	02STA1520EXCG	02STA1520EXCG
4. REAR HOUSING BRACKET	02HB15TCGE	02HB175	02HB15TCGE
5. ROTOR BEARING	02BRG207	02BRG207	02BRG207
6. MAIN STATOR ASSEMBLY**	02STMN15	02STMN175	02STMN20
7. MAIN ROTOR ASSEMBLY	02RTRMN15	02RTRMN175	02RTRMN20
GENERATOR ASSEMBLY	02GEN15TCGE	02GEN175TCGE	02GEN20TCGE
VOLTAGE REGULATOR	06REG634AVC	06REG634AVC	06REG634AVC

**\*\*NOTE:** Item #6 MAIN STATOR ASSEMBLY is a one-piece unit. The Stator cannot be separated from the Generator's outer housing.

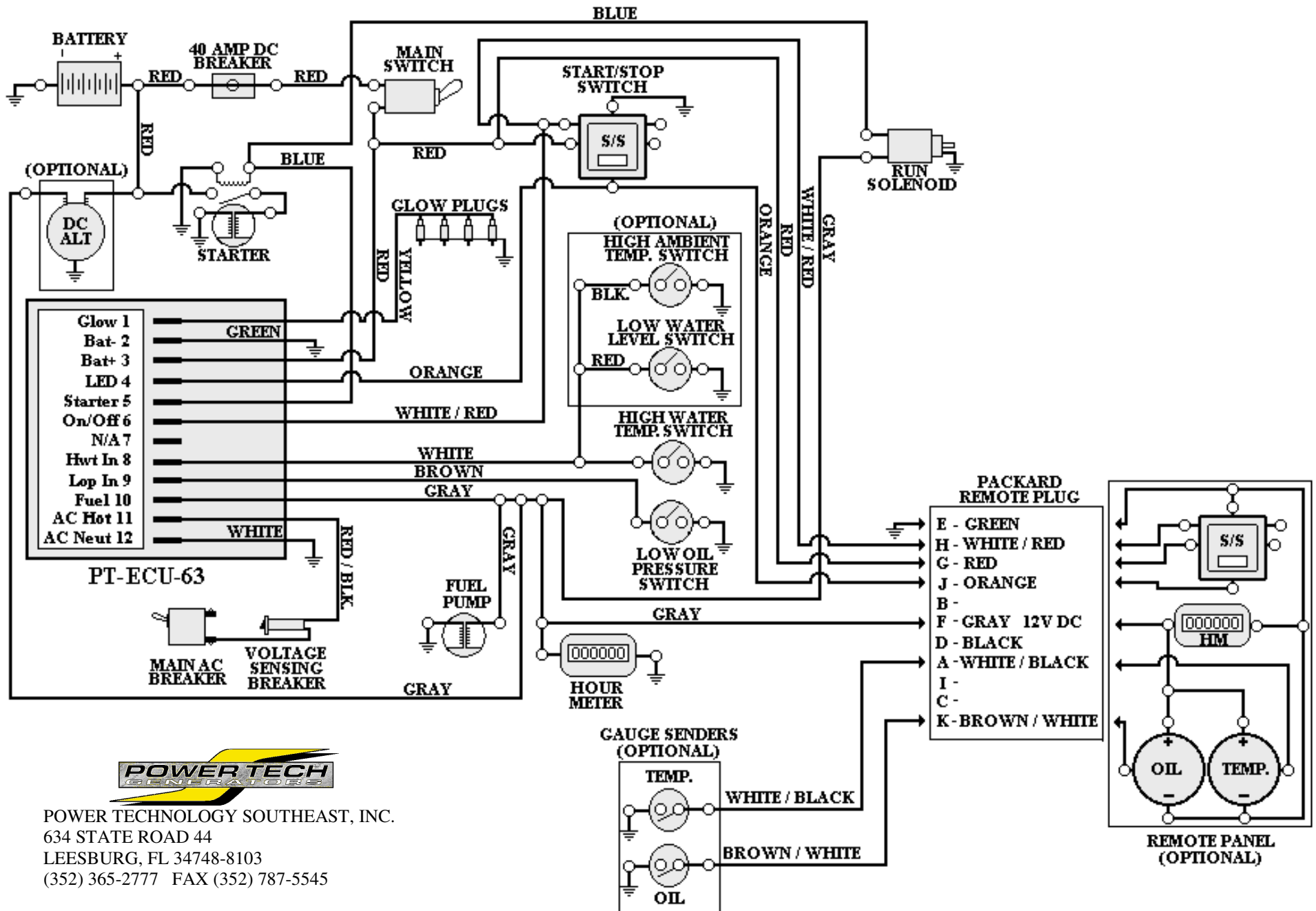
### “M” SERIES EXCITER TYPE GENERATOR ASSEMBLY





120 / 240 VOLT CONNECTION "M" SERIES EXCITER TYPE





12V DC ENGINE CONTROL  
PT-ECU-63