VOLT master America®







MODEL: PTO 30/25

PTO SERIES OWNERS MANUAL

PTO 15/12, PTO 30/25
PTO 40-1, PTO 50-1, PTO 65-1, PTO 75-1
PTO 55-3, PTO 70-3, PTO 90-3, PTO 110-3

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Safety First

While safety is built into every generator, imprudent operation, negligent maintenance or carelessness can contribute to present serious hazards to life and injury.

Keep a fire extinguisher nearby. Know its proper use. Consult your local fire department for the correct extinguisher type. Extinguishers rated ABC by the NFPA are appropriate for most applications. Annually service the extinguishers and perform service as required.

Be sure the generator is well ventilated. Do not operate this generator in an enclosed compartment. All warranties are voided if operated in an enclosed compartment.

Provide adequate ventilation for the prime mover engine on the tractor.

The output power voltage present in this equipment can cause a fatal electric shock. This equipment must only be operated by a responsible adult.

Do not allow anyone to operate the generator without proper instructions.

Guard against electric shock.

Avoid direct contact with live terminals or receptacles.

Do not operate this unit in rain or snow.

Use only 120 volt 3-wire grounded plugs and 240 volt 4-wire grounded plugs, connectors and extension cords.

This unit must be properly grounded by the operator according to the National Electric Code and the Occupational Safety and Health Administration (OSHA). All pulleys, shafts, belts must be protected with safety guards properly installed before operating the equipment.

When working on or around this generator, do not wear neckties or loose clothing, jackets or sleeves that may become caught in moving parts.

Only a qualified technician should perform repairs on this equipment.

Do not work on this equipment while fatigued or under the influence of alcohol or drugs. Use extreme caution when working on electrical components. High output voltages from this equipment can cause injury or death.

When working around engines use noise suppression equipment and wear protective devices as necessary. Excessive noise is not only tiring, but continual exposure can lead to loss of hearing.

Installing and wiring a home or building to a PTO generator is not a do-it-yourself project. Consult a qualified licensed electrician or contractor. This installation must comply with all national and local electrical codes.

Do not connect this generator to a home or building except through an isolation transfer switch (double pole double throw).

When wiring an electrically driven pump, follow all electrical and safety codes, as well as the most recent United States National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

Safety Symbols

These symbols alert you to potential personal injury situations. Follow the Information to avoid possible injury or death.

A DANGER

This symbol indicates imminent

hazardous situations, which, if not avoided, WILL result in death or serious personal injury.

AWARNING

This symbol indicates a

potentially hazardous situation, which, if not avoided, COULD result in death or serious personal injury.

▲ CAUTION

This symbol indicates a

potentially hazardous situation, which, if not avoided, MAY result in personal injury.

Visual Inspection

Visually inspect the unit before the initial start. Check for loose or missing parts and any damage that may have occurred in shipment. You must remove the generator from the wooden mounting base.

Ground Mounting

A DANGER

See figures 1 and 2 for installation

on a concrete slab with mounting dimensions. Failure to mount securely will result in damage to the generator and possible personal injury or death.

Trailer Mounting (Optional Accessory) 3403

▲ DANGER

See figure 3 for a typical example of

a trailer. Mount the generator on a trailer if you plan to use the generator as a portable source of power. The trailer should first be connected to the tractor. Next the generator should be placed on the trailer and connected with the shaft to the tractor and generator. IMPORTANT The generator MUST be mounted forward of the trailer axle to prevent the trailer from tipping backwards which can cause personal injury or death. Once the positioning of the generator, shaft and relationship to the axles has been determined, secure the generator using 4 hex bolts of at least 3/8 inch diameter with washers and nuts. Drilling four holes will be required. It is strongly recommended that the axle length be at least 41 inches before the wheel hubs. This width is recommended to prevent the torque required to turn the generator from causing the generator and trailer from tipping over. The trailer height should enable aligning the drive shaft in a straight or nearly straight line between the tractor PTO and the generator PTO. Misalignment must be less than 10 degrees during operation even though the mechanical design of the shaft would allow greater misalignment. This optional trailer can be ordered from your local dealer.

Three Point Hitch (Optional Accessory)3418

A DANGER See figure 4 for a typical example of a three point hitch. Mount the three point hitch to the tractor. Place the generator on the three point hitch. Attach the shaft to the generator and the tractor PTO's. Once the positioning of the generator, shaft and relationship on the three point hitch has been determined, secure the generator using 4 hex bolts of at least 3/8 inch diameter with washers and nuts. The height of the generator should enable aligning the drive shaft in a straight or nearly straight line between the tractor PTO and the generator PTO. Misalignment must be less than 10 degrees during operation even though the mechanical design of the shaft would allow greater misalignment. This optional hitch can be ordered from your local dealer. Drilling four holes will be required.

Operating The Generator

A DANGER

Keep the area around the

generator clear of all debris, rags etc. Do not smoke around the generator or tractor. Be certain the generator is properly grounded. Turn the main 2 pole circuit breaker on the generator to the off position. Be certain all of the safety guards are in place. Check the gear box inspection plate to verify that gear oil is up to the level of the inspection point. Do not overfill the oil in the gear box. Remove any weather protective covers that may have been put over the generator before operating the unit. Make certain that the generator is properly mounted on a secure location (concrete slab, trailer or three point hitch), no people or children are around the generator and plug in the electrical load into the receptacle or full power connector. Make certain that the tractor wheels are blocked to prevent the tractor from moving and the parking brake is applied. Start the tractor and at low idling speed engage the PTO to the generator. Slowly bring up the speed in the generator until the volt meter reads at least 240 volts on the PTO 15/12 and PTO 30/25 (which is 60 hertz) or 60 hertz on the other PTOs (which is 240 volts) and lock the tractor speed. Lower voltage, below 240 volts or below 60 hertz is worse than slightly higher voltage or slightly higher frequency. When the tractor and generator are operating properly, turn the isolation switch from the utility position to the off position and then to the generator position. Next, switch the main 2 pole circuit breaker on the generator

to the on position and you are now being powered by the PTO generator. Do not open any protective covers, control panels, etc. while the generator is operating.

When it is time to stop operating the generator, you must first remove either the electrical load from the generator

circuit breaker to the off position.

Do not slow the generator speed down with an electrical load on the generator or damage to the generator and load will occur. Bring the tractor PTO speed down to idle and shut the tractor PTO off. You would then switch the isolation switch back to normal utility power.

Isolation Switch and Isolation Circuits

See figure 5 for the proper installation of a customer supplied isolation switch.

AWARNING

Installation of an isolation switch

must be done by a licensed electrician. Back feeding of electrical power from a generator without a proper isolation switch installed can kill service personnel working on power lines and/or damage equipment when the utility returns normal power. See figure 5 for a sample wiring of an isolation switch. Do not operate this generator in parallel with another generator. The isolation switch has three positions, utility position, off and generator position. The National Electrical Code and local codes require an isolation switch be installed between a standby generator (such as a PTO generator) and the utility lines. See figures 6 and 7 for Isolation Circuits.

Full Power Connector Installation

A DANGER

See figures 15 and 17. The connector

has been assembled at the factory. Only a licensed electrician should install the wire cables to the connector. Failure to properly connect the wires will result in damage to the equipment and/or personal injury. Consult a wire ampacity chart for the proper wire gauge size for a given generator. You must use stranded copper welding cable with a 600 volt rating and a minimum of 3AWG hypalon insulation. The wires must be stripped about 0.75 inch from the end of the cable. Insert the end of the wire into the open

or turn the generator main 2 pole contact. Use a heavy crimping tool to secure the wire into the contact. Insert the four contacts into the full power connector making certain that they are securely in place.

Grounding

A DANGER

Proper grounding will prevent an

electric shock in the event loss of internal ground or loss of a ground in the load. The National Electric Code requires at least a number 12AWG stranded copper wire to the grounding lug on the generator. Connect the lug to a copper or brass grounding rod driven into the earth. DO NOT attach ground connections to gas or water pipes.

Wiring Diagrams

See figure 8 for PTO 15/12 See figure 9 for PTO 30/25 See figures 10 and 10A for all other **PTOs**

Typical Installation

See figures 5, 6 and 7 for all models.

Shaft Installation

AWARNING

See figure 11 for all models. It is

strongly recommended to keep the angle of the shaft within 10 degrees from the tractor PTO and generator gear box. Do not operate over 540 RPM. A three point hitch requires a short shaft and a two-wheel trailer and ground mounting requires a long shaft. These optional shafts can be ordered from your local dealer. Keep guards in place at all times.

Gear Box

AWARNING

The gear box is a self contained

helical gear unit. It has a glass inspection plate. Be sure to check before using the generator that the gear oil is at the fill line. Use SAE 90 gear oil. DO NOT overfill the oil or leaks may occur. The fill location is at the top of the gear box, inspection plate is on the side of the gear box and the drain plug is located on the bottom of the gear box. This gear box is not to be serviced in the field. All gear boxes have been filled with gear oil at the factory. The cone guards must be in place at all times.

Parts Explosions

See figure 12 and 13 for PTO 15/12 See figure 14 and 15 for PTO 30/25 See figure 16 and 17 for PTO 40-1, PTO 50-1, PTO 65-1, PTO 75-1, PTO 55-3, PTO 70-3, PTO 90-3

Maintenance

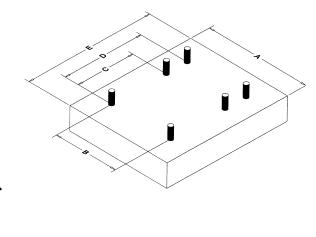
It is recommended to lubricate the shaft with a lithium base grease. In the winter with freezing conditions, the PTO shaft should be greased with a brush to avoid sticking and freezing. Before using the generator, be sure to clean the generator and remove dirt etc. Barns may contain a lot of moisture, dirt and ammonia-type gases that can lead to corrosion of copper wire. Store this unit in a clean area. Let the generator cool down completely before placing any protective cover over the generator.

▲ CAUTION | your generator

To maintain

under warranty, you must use original factory parts. Use of non factory original parts will void the warranty and the manufacturer does not accept any claims for property damage, injury, death or any other damages caused by the non factory authorized parts.

The gear box oil should be changed every 250 hours of operation, the shaft should be lubricated with each use, and the generator should be tested at least every 3 months.



TRACI

Figure 2 - Concrete Mounting Dimensions

MODEL	Α	В	C	D	Е
PTO 15/12	18.0 (457)	9.92 (252)	13.625 (346)		21.0 (533)
PTO 30/25	22.0 (559)	13.8125 (351)	19.0 (483)		27.0 (686)
PTO 40-1	22.0 (559)	13.38 (340)	12.2 (310)	16.9 (429)	27.0 (686)
PTO 50-1	22.0 (559)	13.38 (340)	12.2 (310)	16.9 (429)	27.0 (686)
PTO 65-1	22.0 (559)	13.38 (340)	12.2 (310)	16.9 (429)	27.0 (686)
PTO 55-3	22.0 (559)	13.38 (340)	12.2 (310)	16.9 (429)	27.0 (686)
PTO 70-3	22.0 (559)	13.38 (340)	12.2 (310)	16.9 (429)	27.0 (686)
PTO 75-1	26.0 (660)	15.9 (406)		13.7 (347)	24.0 (610)
PTO 90-3	26.0 (660)	15.9 (406)		13.7 (347)	24.0 (610)
PTO 100-3	26.0 (660)	15.9 (406)		13.7 (347)	24.0 (610)

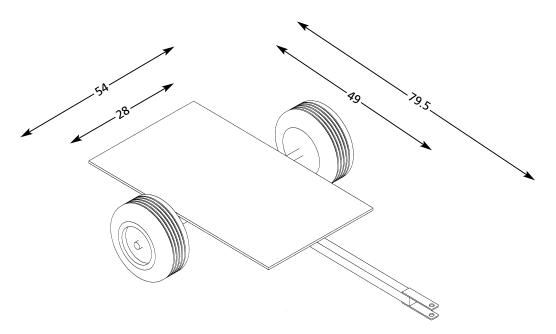


Figure 3 – Two Wheel Trailer 3403 (Optional), Weight 175lbs., Tires P175/80R13 M+S(14" Hub)

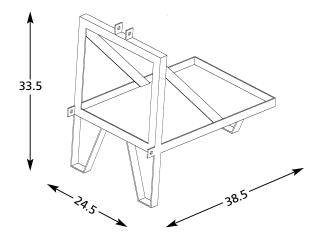


Figure 4 – Three Point Hitch 3418 (Optional), Weights 92lbs.

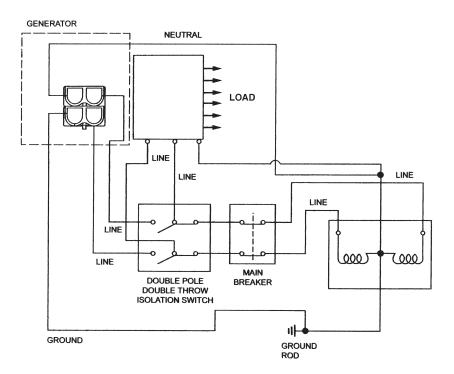


Figure 5 - Isolation Switch

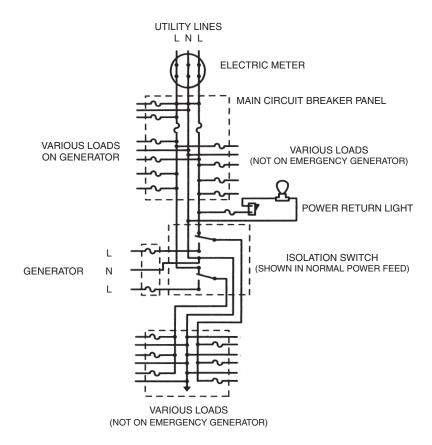


Figure 6 - Selected Isolation

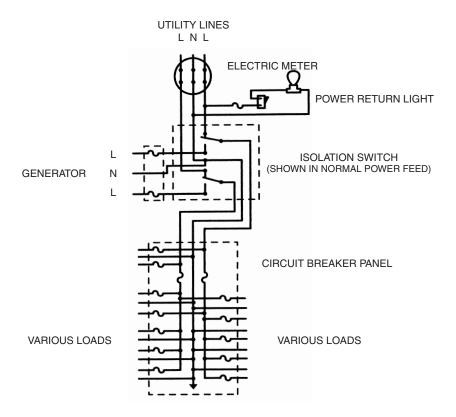


Figure 7 - Total Isolation

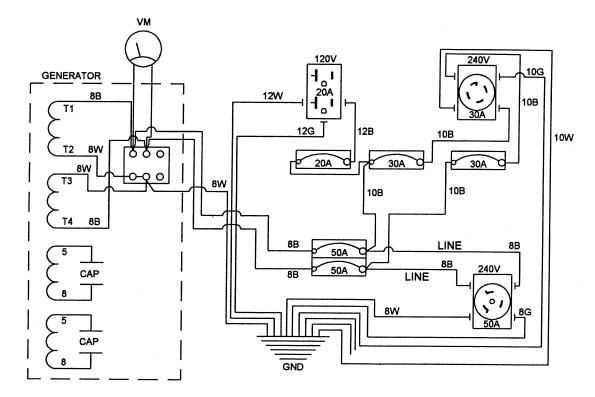


Figure 8 - Wiring Diagram for Model PTO 15/12

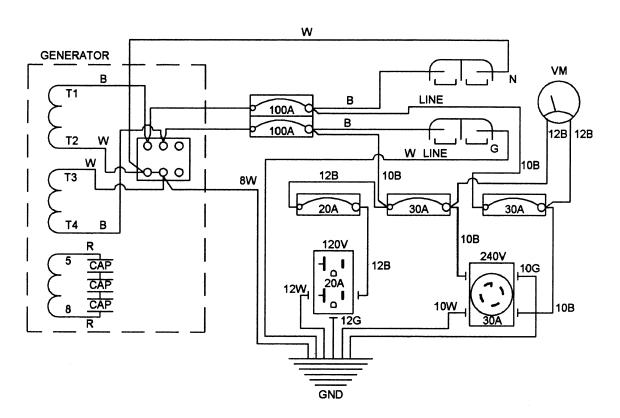
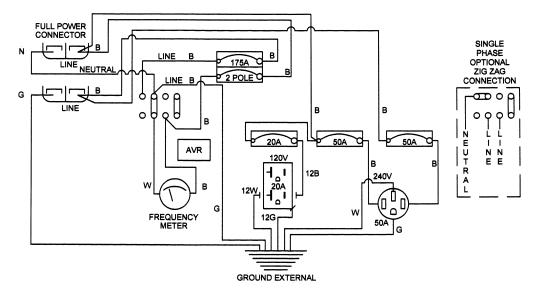
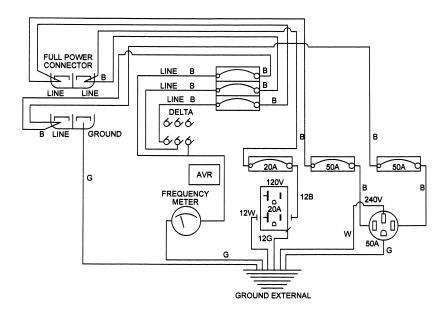


Figure 9 - Wiring Diagram for Model PTO 30/25



WIRE: 105°C UL/CSA

Figure 10 – Wiring Diagram for Single Phase Models PTO 40-1, PTO 50-1, PTO 65-1 (PTO 75-1 not shown and does not have a circuit breaker)



WIRE: 105°C UL/CSA

Figure 10A – Wiring Diagram for Three Phase 240V, Delta Models PTO 55-3, PTO 70-3, (PTO 90-3 and PTO 110-3 not shown do not have a circuit breaker)

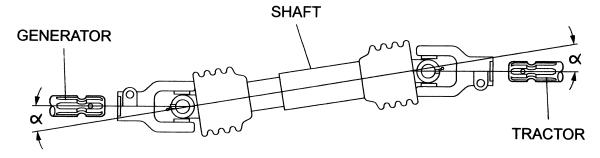


Figure 11 - Shafts 3397 (long) 57"-67" and 3421 (short) 37"-50" (Length Dimensions are end of hub to end of hub. 1 3/8" 6 spline both hubs)

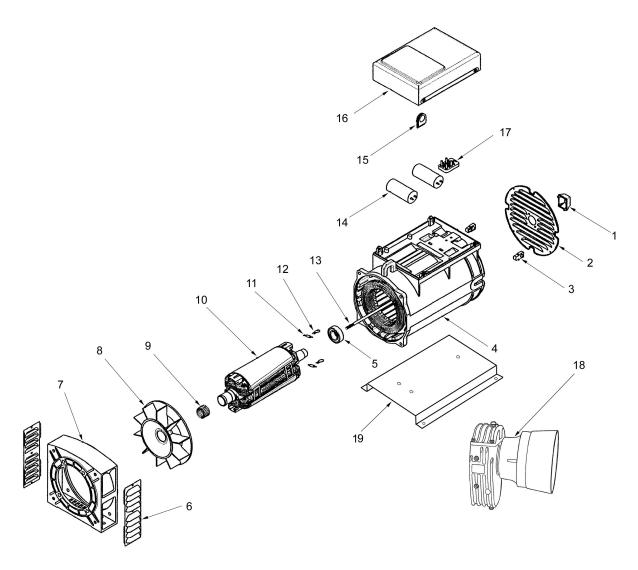


Figure 12 - Parts Explosion for PTO 15/12

Repair Parts List for Model PTO 15/12

Item	Part No.	Description	Quantity	Item	Part No.	Description	Quantity
1	3344	Rotor Screw Cover	1	11	3190	Diode	2
2	3342	End Cover	1	12	2603	Varister	2
3	3282	Grommet	2	13	3341	Rotor Screw	1
4	3346	Stator	1	14	1135	Capacitor 35 mf	1
5	2615	Ball Bearing 52 mm	1	15	3670	Bushing	1
6	3330	Fan Guard	2	16	3281	Top Cover	1
7	3328	Fan Bracket	1	17	3184	Terminal Strip	1
8	3332	Fan	1	18	3382	Gear Box Transmission Car 3P	1
9	3349	Fixing Ring	1	18	3383	Safety Cone	1
10	3336	Rotor	1	19	3168-B	Base Plate	1

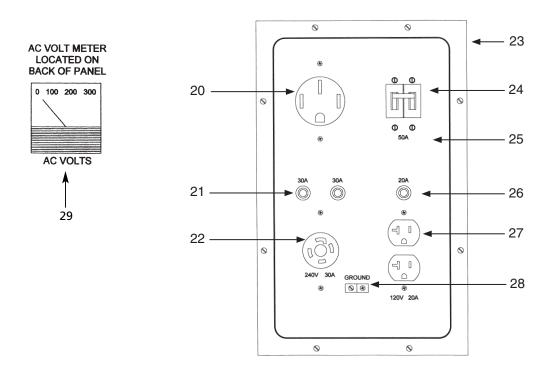


Figure 13 - Parts Explosion for PTO 15/12

Item	Part No.	Description	Quantity
20	3506	Receptacle 50 A, 240 V	1
21	1112	Circuit Breaker 30 A	2
22	1101	Receptacle T/L 30 A,240 V	1
23	3378	Control Box Back	1
24	3015	Circuit Breaker 50 A, 2 Pole	1
25	3377	Front Panel	1
26	1069	Circuit Breaker 20 A	1
27	1011	Receptacle Duplex 20 A, 120 V	1
28	1024	Ground Lug	1
29	2024	Volt Meter	1

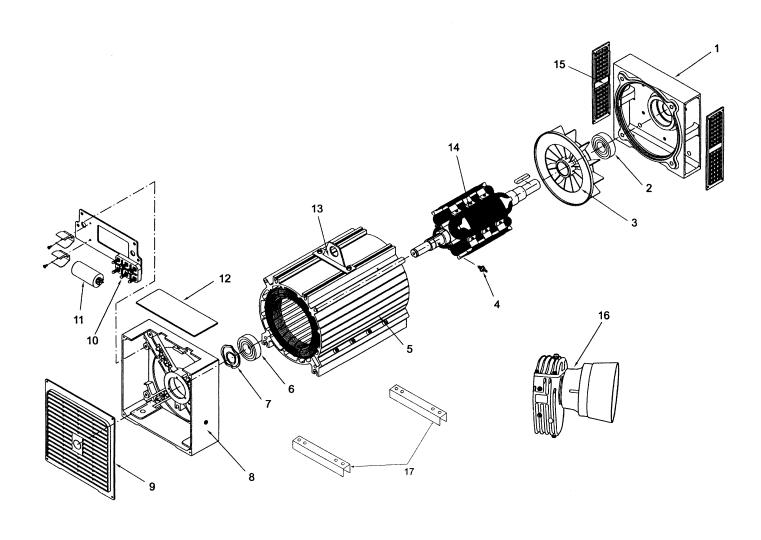


Figure 14 – Parts Explosion for PTO 30/25

Item	Part No.	Description	Quantity	Item	Part No.	Description	Quantity
1	3359	Bracket PTO Side	1	11	1134	Capacitor 30 mf	2
2	3361	Ball Bearing 90 mm	1	11	3217	Capacitor 40 mf	1
3	3362	Fan	1	12	3355-T	Top Cover	1
4	3363	Diode	1	13	3318-LH	Lifting Hook	1
5	3356	Stator	1	14	3357	Rotor	1
6	3364	Ball Bearing 80 mm	1	15	3358	Fan Guard	2
7	3365	Spring Washer	1	16	3383	Safety Cone	1
8	3368	Bracket (Control Box Side)	1	16	3381	Gear Box M5	1
9	3355	Cover	1	17	3360	Channel	2
10	3184	Terminal Strip	1				

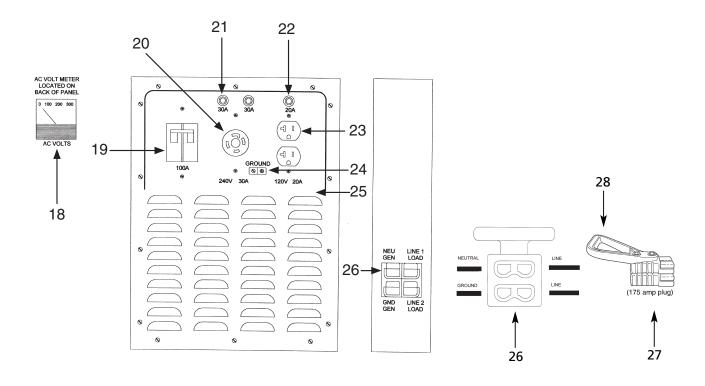


Figure 15 – Parts Explosion for PTO 30/25

Item	Part No.	Description	Quantity
18	2024	Volt Meter	1
19	3369	Circuit Breaker 100 A, 2 Pole	1
20	1101	Receptacle T/L 30 A, 240 V	1
21	1112	Circuit Breaker 30 A	2
22	1069	Circuit Breaker 20 A	1
23	1011	Receptacle Duplex 20 A, 120 V	1
24	1024	Ground Lug	1
25	3375-F	Front Panel	1
26	3379	Connector (Assembly of 2)	1
27	3379	Connector Male loose (2)	1
28	3380	Connector Handle	1

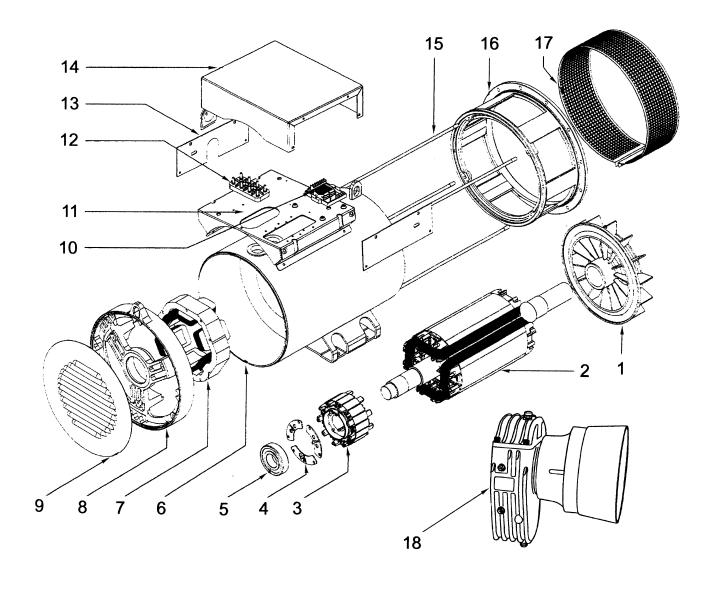


Figure 16 - Parts Explosion for PTO 40-1, PTO 50-1, PTO 65-1, PTO 75-1, PTO 55-3, PTO 70-3, PTO 90-3, PTO 110-3

Item	Part No.	Description	Quantity	Item	Part No.	Description	Quantity
1	3655	Fan	1	10	3656	Automatic Voltage Regulator	1
2	3654	Rotor	1	11	3660	Mounting Plate Control Box	1
3	3653	Exciter Armature	1	12	3648	Terminal Strip	1
4	3652	Diode Bridge with Diodes	1	13	3659	Side Panels	2
5	3671	Ball Bearing 6312.2RS	1	14	3646	Top Cover	1
5A	3672	Ball Bearing 6309.2RS	1	15	3657	Stator Thru Bolts	4
6	3649	Stator	1	16	3650	Fan Bracket	1
7	3651	Exciter Stator	1	17	3658	Fan Guard	1
8	3647	Bracket (Non PTO Side)	1	18	3662	Gear Box transmission M7, M9	1
9	3673	End Cover	1	18	3383	Safety Cone	1

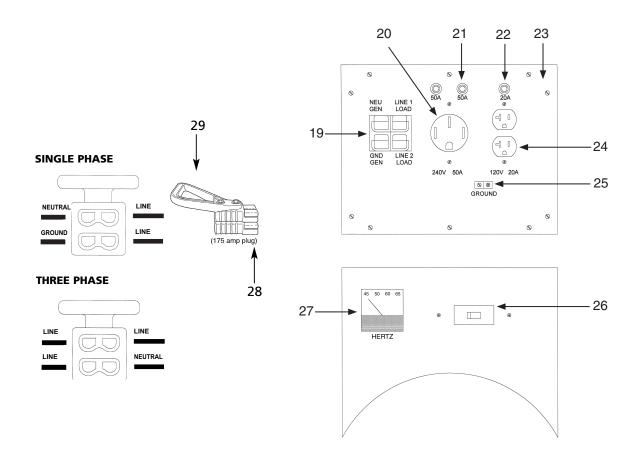


Figure 17 - Parts Explosion for PTO 40-1, PTO 50-1, PTO 65-1, PTO 75-1, PTO 55-3, PTO 70-3, PTO 90-3, PTO 110-3

Item	Part No.	Description	Quantity	Item	Part No.	Description	Quantity
19	3661	Connector Cover	1	*	3569	PTO 40-1 125A, 2 Pole	1
20	3506	Receptacle 50 A, 240 V	1		3570	PTO 50-1 175A, 2 Pole	1
21	2883	Circuit Breaker 50 A, 1 pole	2		3571	PTO 65-1 225A, 2 Pole	1
22	1069	Circuit Breaker 20 A	1		3572	PTO 55-3 150A, 3 Pole	1
23	3673	Front Cover	1	**	3379 and	3380 Used on PTO 40-1,	
24	1011	Receptacle Duplex 20 A, 120 V	/ 1		PTO 50-1	and PTO 55-3	1
25	1024	Ground Lug	1	**	350A	Used on PTO 65-1,PTO 75-1,	
26*	3512	Circuit Breaker 175 A. 2 Pole	1		PTO 70-3	, PTO 90-3 and PTO 110-3	1
27	3479	Frequency (Hertz) Meter	1				
28**	3379	Connector Male Loose (2)	1				
29**	3380	Connector Handle	1				

^{*} Model PTO 50-1 shown

(Models PTO 75-1, PTO 90-3 and PTO 110-3, do not come with a main line circuit breaker. customer supplied)

Adjusting Voltage for PTO's

A DANGER
All PTO's with 12 wire units feature an automatic voltage regulator that will

automatic voltage regulator that will maintain +/- 1 1/2% voltage regulation. The voltage regulator is preset at the factory for the required voltage. If a change in voltage is required, the frequency meter MUST be connected to one line (hot) wire and to the neutral connection for the meter to function. On a three phase 240 volt series delta connection, there is no neutral. For neutral conncection you must use the center tap(CT) adjacent to the line connection you choose. With the frequency meter operating at 60 hertz (50 hertz for 50 hertz operation and the jumper installed) you can increase or decrease the voltage by simply adjusting the Phillips screw marked VOLTS on the automatic voltage regulator.

See connections/reconnections page

A DANGER The generator must be operating at the proper speed (RPM) before and while adjusting the voltage regulator. Turn the VOLTS adjusting screw very slowly stop and wait 2 or 3 seconds and read the voltage from one of the lines and neutral connection (note that on the three phase 240 volt series delta connection there is no neutral so you must go to the center tap as a neutral. Adjust the voltage up or down by turning the VOLTS clock wise or counter clock wise. Once the voltage is adjusted, do not adjust any of the other Phillips screws on the automatic voltage regulator. Refer to the re connection chart if you are changing voltages. Near the automatic voltage regulator are the main power terminals of the generator. If you make contact with the main terminals, serious injury and death will occur. These adjustments MUST be done by a licensed electrician or technician familiar with high voltage equipment. This is NOT a do it yourself activity.

From the automatic voltage regulator terminal 4 a green wire always goes to stator lead wire 3. From the automatic voltage regulator terminal 5 a black wire always goes to stator lead wire 4. This applies to single and three phase units both 50 and 60 hertz and any voltage combination. On 60 hertz versions, single and three phase and any voltage combination,

there is a small brass jumper connected on the automatic voltage regulator between terminal 5 and terminal 6. For 50 hertz operation, this jumper is removed.

Adjacent to the automatic voltage regulator is the radio suppressor on some models. The lead wires from the radio suppressor are always red and must go to the stator leads wires 5, 7, 9 and 12 on any version in single or three phase., 50 or 60 hertz and any voltage combination. Some leads may be on the same terminals as other depending on the various phase and voltage combinations.

Changing voltage will change the amperage output of the generator. The circuit breaker should be changed accordingly.

OPERATING GENERATOR SHAFT SPEED

AWARNING For 60 hertz operation the

generator shaft speed of 1800 RPM must be continuously maintained. The operating speed range is 1700 RPM to 1900 RPM for 60 hertz. Shaft speed of the gear box connected to the generator is either 540 RPM or 1000 RPM depending on the model. Slightly lower gear box speed(about 520 RPM for the 540 RPM on/or 970 RPM for the 1000 RPM unit is acceptable, the frequency meter at 60 hertz is how to determine proper speed. These are NOT variable speed generators.

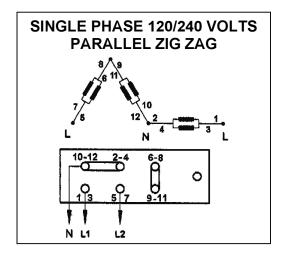
GUARD FOR PULLEYS, BELTS AND COUPLINGS

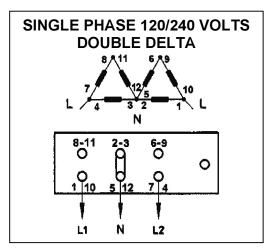
▲ DANGER

All rotating equipment MUST

be equipped with guards to prevent contact with rotating shafts, pulleys, belts and couplings. The customer is responsible for installing the appropriate guards. Serious personal injury or death could result without proper guards in place while the generator is in operation.

PTO Series Connections/RE Connections 60 Hertz 12 Wire Generators





L1 = LINE

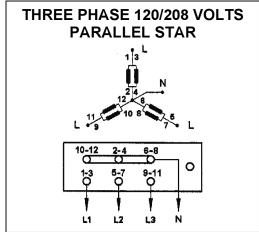
L2 = LINE

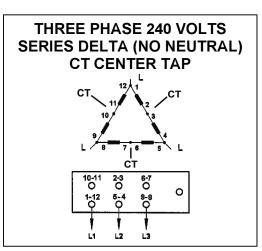
L3 = LINE

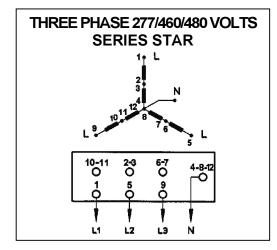
N = NEUTRAL

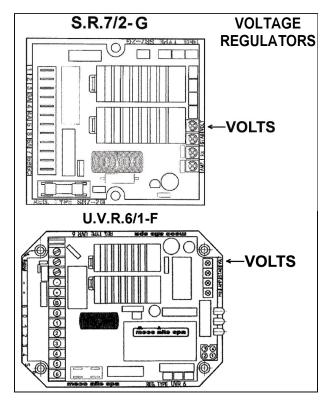
CT = CENTER TAP

DO NOT USE OTHER CONNECTION TERMINALS









FOR 50 HERTZ CONNECTIONS, CONSULT THE FACTORY.

ORDERING PARTS

Instructions For Ordering Repair Parts

For parts or service, contact either the factory or the dealer or distributor from whom you purchased this equipment for the name of the nearest authorized service station.

- 1. To avoid errors or delay in filling your parts order, please furnish all information requested and always refer to the nameplate on your unit by giving the model and serial number.
- 2. Do not order by reference number or group number. Always use part number and description.
- 3. Give the part number, description and quantity needed for each item.
- 4. State definite shipping instructions. Any claim for loss or damage to your unit in transit should be filed promptly against the transportation company making the delivery. Shipments are complete unless the packing list indicated items are back ordered.
- 5. FOR SERVICE OR PARTS CONTACT THE FACTORY AT:

Wanco/Voltmaster 5870 Tennyson Street, Arvada, Colorado 80003. Phone 800-730-3927 Fax 303-427-5725

FIVE/ONE YEAR LIMITED WARRANTY- PTO SERIES

Five year limited warranty on parts and a 1year limited warranty on labor.

This warranty extends to the original purchaser only. The generator sold is warranted to the original purchaser for a period of five (5) years for parts only and one (1) year for labor only from the original purchase date. The manufacturer warrants the generator sold to be free from defects in material and workmanship if properly installed, serviced and operated within nameplate rating under normal conditions according to the manufacturer's instructions.

Disclaimers

This warranty does not apply to any items which must be repaired or replaced due to normal wear, which have been subject to misuse, negligence, accident or which have been repaired, altered by others outside of the manufacturer's factory unless authorized in writing by the manufacturer. Under no circumstances will the manufacturer be liable for any or consequential damage or expense of any kind, including loss of profits nor the fitness of the product for any specific application or particular purpose. Any implied warranties are limited in duration to the above one (1) year period. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Performance

The manufacturer's obligation under this warranty is limited to correcting without further charge at its factory or authorized service station any part or parts which shall be returned transportation charges prepaid, and which upon examination shall disclose to the manufacturer's satisfaction to have been originally defective. Other than transportation charges, no charge will be made for such repair adjustment and /or replacement. This remedy is expressly in lieu of all other remedies, and is the purchaser's sole and exclusive remedy hereunder.