PTO GENERATOR

15,000 RATED WATTS

Owner's Manual

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Description

The equipment is a revolving field, alternating current generator, designed for the purpose of supplying electrical power for compatible electrical loads. The generator is designed to be driven by the power takeoff mechanism of a suitable tractor, via power takeoff (PTO) drive shaft.

Use the generators to power 120 and/or 240 volts, single phase, 60 Hz, AC electrical loads requiring up to 15,000 watts. Refer to Specifications Chart for amperage capacity.

WARNING: Please read and save the Owner's Manual. Read carefully before attempting to install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

FEATURES

- **3600 RPM**
- **120V 20A GFCI Receptacles、120V 30A and 120/240V 50A Receptacles**
- **Voltage/Frequency/Time Digital Meter**
- **12V DC Output**
- **Automatic Voltage Regulator**
- **Circuit Breaker Protects Generator for Overload**
- **Compact Design**

Figure 1 - PTO Generator

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General Safety Information

Study these SAFETY RULES carefully before installing, operating or servicing this equipment. Become familiar with Operating Instructions and with the generator. The generator can operate safely, efficiently and reliably only if it is properly installed, operated and maintained. Many accidents are caused by failing to follow simple fundamental rules.

DANGER: Indicates an immediately hazardous situation which, if not avoided, will result in death or serious injury. Danger is limited to the most extreme situations.
WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Caution may also be used to alert against unsafe practices.
NOTE: Indicates a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property.

1. For permanent wiring or wiring into existing electrical service or system, the installation must comply with all national, state and local codes.
2. Never handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. DANGEROUS ELECTRICAL SHOCK WILL RESULT.
3. The alternator produces potentially lethal voltage. Observe all safety precautions. Never permit unqualified people -- especially children to operate the unit.
4. Electrical wiring used with this (and) related equipment must be in good condition, or approved insulative qualities, properly supported, and of the correct wire size to handle the maximum anticipated load current. Inspect extension cords frequently and maintain them in good condition.
5. Exposed PTO shaft is dangerous. Provide safety guards around it.
6. Never operate the alternator in any enclosed space where cooling air flow might be obstructed. Severe heat damage to the alternator will occur, as well as possible fire and property damage.
7. Excessively high drive speeds are dangerous. Operate only at the minimum drive speed required to provide the proper voltage.
8. Do not work on this generator (or other potentially hazardous equipment) when tired or fatigued.
9. Tractor engines used to drive the generator give off DEADLY carbon monoxide gas through their exhaust systems. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. Operate prime mover only in open areas where sufficient ventilation is available. NEVER operate the engine inside any room or enclosure where exhaust gases might accumulate and endanger people.
10. Read and make sure you understand all safety precautions and warnings in this manual and on tags and labels affixed to the generator.

11. Keep a fire extinguisher near the generator. Keep the extinguisher properly maintained, and be familiar with its proper use.
12. Segma cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual and on the generator are, therefore, not all inclusive. If a procedure, work method, operating method, or technique not specifically recommended by Segma is used, you must satisfy yourself that it is safe. for you and others and that the generator or property will not be damaged by the procedure or method you choose.

Unpacking
Before first using the unit, completely remove the generator from the shipping wood carton, and from the shipping pallet or skid to which it might be attached. In addition, completely remove all shipping material from the generator.

Inspection
The generator set was inspected and tested before it was shipped from the factory. When unpacking the generator, be sure to inspect it carefully for freight loss or damage. If loss or damage is noted at the time of delivery, require that the person making the delivery note the loss or damage on the freight bill, affix the carrier's signature under the consignor's memo of the loss or damage.

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Specifications

Generator	**Model TPTO--15000**
Rated Cont. Wattage	15,000 watts
Max. Wattage	16,000 watts
Power Factor	1
Rated AC Volts	120/240
Rated Load Current	125/62.5 amps
Phase	1-phase
Rated Frequency	60 Hz.
Power Needed	25 Hp or more
PTO Drive Speed	540 RPM
PTO Shaft	1-3/8" spline, 6-spline
Gearbox Reduction	single stage
Ratio PTO Shaft to Revolving Field Speed	1 to 6.67
Recommended Gear Box Oil	SAE 90 Gearlube Oil
PTO Shaft Lubricant	Lithium base grease
Length	26 inches (660mm)
Width	23.6 inches (600mm)
Height	31.5 inches (800mm)
Weight	285 lbs. (128kg)

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Installation

INSTALLING THE PTO SHAFT

The generator gearbox features a standard 1-3/8 inch diameter, 6-spline drive shaft. Supply a suitable power takeoff (PTO) shaft to fit the gearbox shaft and the tractor PTO drive shaft.

Connect power takeoff (PTO) shaft guard onto gearbox shaft. Keep generator and tractor shafts parallel as viewed from above and from the sides of the shafts. Maintain PTO shaft joint angles equal and as small as possible (Figure 2).
For Smoothest Operation Keep Tractor Shaft and Gearbox Shaft Parallel (Side and Top Views). Keep Joint Angles Equal & Small as Possible.

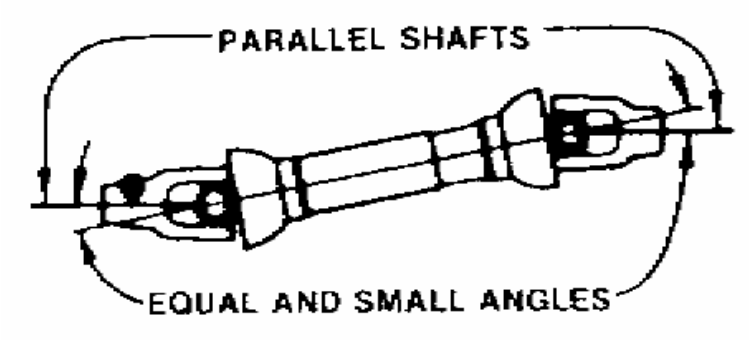

Figure 2 -- Checking PTO Shaft Connection

DANGER: Never operate the generator until the PTO shaft guard has been properly installed. Serious injury can result from operating the generator without the shaft guard in place.

INSTALLING THE CONNECTOR PANELS（OPTIONAL）

According to the types of tractor, the connector panels are optional. As shown in Figure 3.

Figure 3 – Installing The Connector Panels（optional）

GEARBOX LUBRICATION

Before operating the generator set, check gearbox oil level as outlined in "Maintenance" section on page 10.

CAUTION: Operating the generator with low gearbox oil level may cause gearbox failure.
See "Maintenance" section on page 10 for more information on periodic maintenance.

GROUNDING THE GENERATOR
The National Electrical Code requires that the frame and external electrically conductive parts of this generator be properly connected to an approved earth ground. Local electrical codes may also require proper grounding of the unit. For that purpose, the GROUNDING TERMINALS (Figure 4) are provided on the unit. Generally, connecting a No. 6 AWG (American Wire Gauge) stranded copper wire to the grounding terminal and to an earth driven copper or brass grounding rod (electrode) provides adequate protection against electrical shock. However, local codes may vary widely. Consult with a local electrician for grounding requirements in your area.

Grounding Terminals

Figure 4 -- Location of Grounding Terminals

DANGER: Do not connect the grounding wire to any pipe that carries flammable or explosive substances, fire or an explosion may result.
Proper grounding of the generator will help prevent electrical shock in the event of a ground fault condition in the generator or in connected electrical devices. Proper grounding also helps dissipate static electricity, which often builds up in ungrounded devices.

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Operation

This section outlines basic procedures for operating generator set. Read instructions carefully. Also read all information and instructions in Installation sections as well as General Safety Information.

DANGER: Comply with all safety rules, read all warning and caution decals and tags affixed to the generator. Failure to obey safety rules may result in personal injury or death.

BEFORE USING YOUR GENERATOR

WARNING: This generator requires a certain horsepower to drive revolving field when full capacity loads are being powered through unit. This horsepower is applied to generator as torsional or twisting force. Such a high twisting force can tip over generator with considerable force as soon as you apply electrical loads. This could cause personal injury or damage to equipment.

1. Use ONLY a 540 rpm power takeoff drive operating speed. Any attempt to operate the generator set with higher power takeoff speeds will result in damage to equipment or personal injury.
2. Make sure the generator has been properly prepared to use.

CHECK GEARBOX OIL LEVEL

Before using the generator, check gearbox oil level. See "Maintenance" section on page 10.

CONNECTING THE POWER TAKEOFF SHAFT

Connect the PTO shaft to the tractor PTO drive system and to the generator's gearbox shaft. The shaft must be fully engaged with both the tractor and the generator shaft. The generator and tractor shafts must be parallel as viewed from the top and sides of the shaft. Maintain PTO shaft joint angles (Figure 2) equal and as small as possible.
For Smoothest Operation Keep Tractor Shaft and Gearbox Shaft Parallel (Side and Top Views), Keep Joint Angles Equal & Small as Possible.

CAUTION: Make sure the generator's PTO shaft guard is properly attached to the gearbox before starting.

GENERATOR PANEL

The purpose of this section is to familiarize you with the components mounted on the generator's panel.
The outlet panel (Figure 5 on page 8) has the following components:
1. 20A Circuit Breakers: Each circuit breaker protects 120 volts AC outlet against overload. Breakers are 'push-to-reset' types.
2. 30A Circuit Breaker: Protect 120 volts AC outlet against overload.

3. 120 Volts GFCI Receptacles: Use these two outlets for operating 120 volts, single phase, 60 Hz AC electrical loads. Each receptacle is rated 125 AC volts at 20 amps. Use a same rated cord set.
4. 120 Volts Receptacle: Use the outlet for operating 120 volts, single phase, 60 Hz AC electrical loads. It is rated 125 AC volts at 30 amps. Use a same rated cord set.
5. 50 Amp, 120/240 Volt Receptacle and Circuit Breakers:
a. Use this 4-pin, grounded receptacle to operate 120/240 volts, single phase, 60 Hz AC electrical lighting, appliance, tool and motor loads requiring up to 50 AC amperes of current or up to 12,000 watts (12 kW) of power.
b. To use this receptacle, you must attach a connector plug rated 250 volts, 50 amps to a same rated 4 wire cord set.
c. The 50-amp circuit breaker protects each hot line of the receptacle.
6. DC 12V Receptacle: Use the outlet for operating DC 12V 8.3A electrical loads. Use a same rated cord set.
7. Volt/ freq/time digital meter: Use the digital meter as a visual aid to verify that the AC voltage, frequency and operating speed are all correct.
8. Grounding terminal: Provide adequate protection against electrical shock.

Figure 5 -- Generator Outlet Panel

WARNING: Never plug in (or unplug) modular connectors or the 120/240V, 50A connector with electrical loads connected and turned on. This can result in dangerous electrical arcing, possible injury and possible damage to equipment.

STARTING THE GENERATOR
Follow these steps to start the generator:
1. Start the tractor engine and engage the power takeoff (PTO) drive.
2. Slowly increase tractor engine speed while observing the frequency meter on the generator panel.

3. Increase the speed of the engine until the frequency meter indicates 60 Hz.
4. Plug in the desired electrical loads. This may be done by the following ways:
a. Connect cord set to the 120 volts, 20 amp GFCI receptacles.
b. Connect cord set to the 120 volts, 20 amp 3-pin receptacles.
c. Connect cord set to the 120/240 volts, 50 amp receptacles.
d. Connect cord set to the DC 12 volts, 8.3 amp receptacles.

WARNING: Connect electrical loads to generator output only after the panel volt/ freq/time meter indicates 240 volts and 60 Hz. This digital meter reading means that generator AC output frequency and voltage are correct. Some electrical loads may be damaged by incorrect voltage and/or frequency.

WARNING: Never plug in (or unplug) modular connectors or the 120/240 volts, 50 amp connector with electrical loads connected and turned on. This can result in dangerous electrical arcing, possible injury and possible damage to equipment.

5. Turn ON the electrical load you want to power (cord sets were connected in Step 4). Generator output is now powering electrical loads you connected to the generator.
6. Check frequency meter reading on generator panel. If reading has dropped below 60 Hz, increase tractor engine speed just enough to return the needle to 60 Hz.

STOPPING THE GENERATOR
Follow these steps:
1. Turn OFF electrical loads.
2. Let the generator and tractor engine run for a few minutes at no-load, to cool internal parts.
3. Shut OFF the tractor engine.
4. Unplug cord sets from the receptacles.
5. Remove the power takeoff (PTO) shaft from generator and tractor.

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Maintenance

Your generator set will perform reliably only if you properly maintain it. This section outlines the minimum recommended periodic maintenance to keep your unit in good condition and increase its life. If operating your generator under extremely adverse conditions (extreme dust, dirt, cold or heat), increase periodic maintenance frequencies accordingly.

VISUAL INSPECTION

Carefully inspect the generator set before you first use it and at least once each month thereafter. Look for the following discrepancies:

1. Loose or broken wires
2. Defective connections
3. Missing, corroded or damaged fasteners and other hardware
4. General appearance and cleanliness

CLEAN THE GENERATOR

Keep the generator set clean and free of foreign material. Clean generator at least once monthly. A soft brush may be used to loosen caked-on dirt. Use a soft, damp cloth to wipe away loosened dirt. To clean dirt from hidden or remote areas of the unit, use dry, filtered, low pressure air or vacuum system.

CAUTION: DO NOT use a forceful spray of water to clean the generator. Water can penetrate generator stator and rotor windings, which could reduce insulation resistance. Possible generator failure may result.

Moisture that is allowed to remain in contact with windings will be retained in voids and cracks of the windings. Dirt makes the problem worse, since it tends to hold the moisture into contact with the windings. Salt, as from sea air, worsens the problem since it tends to absorb moisture from the air. The combination of salt and moisture make a good electrical conductor.

1. Clean the interior of the generator control panel. The voltage regulator and electrical terminals especially must be kept clean. Carbon tracking on insulators may be caused by dirt or loose connections. Clean all carbon paths or else replace the insulators. If you do not correct carbon tracking, the generator eventually develops a shorted electrical circuit.
2. When cleaning, visually check for loose or broken wires and connections. Check voltage regulator wires. Make sure all circuit boards are fully plugged in to their sockets.

CHECK GEARBOX OIL LEVEL

Check gearbox oil level before you first use it. Thereafter, check gearbox oil level every 10 hours of operation or once weekly, whichever comes first. To check oil level, proceed as follows:

1. Make sure the generator is as level as possible.

2. Remove the OIL LEVEL CHECK PLUG from the generator gearbox (Figure 6).

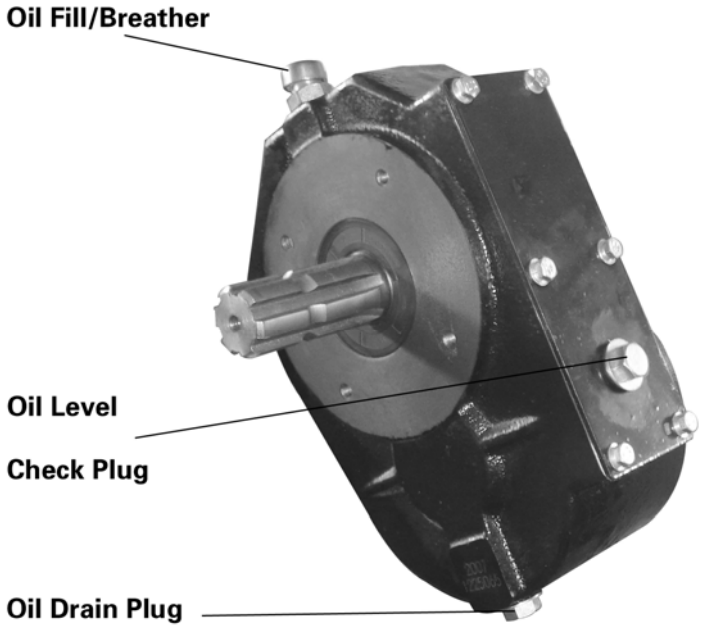

Figure 6 -- Gearbox Oil Servicing Points

3. Check oil level. Oil should be at point of overflowing the OIL LEVEL CHECK PLUG opening. If necessary, add SAE 90 GEARLUBE oil to the recommended level. See "CHANGE GEARBOX OIL."
4. When oil level is correct, install and tighten the OIL LEVEL CHECK PLUG.

CHANGE GEARBOX OIL
Change gearbox oil after the first 25 hours of operation. Thereafter change gearbox oil every 250 operating hours or every six months, whichever occurs first. To change gearbox oil, proceed as follows:
1. Operate the generator until gearbox oil is thoroughly warmed up (about 30 minutes), then shut down.
2. Immediately after shutting it down, remove gearbox oil drain plug (Figure 23). Drain oil completely into a suitable container. Remove oil fill/breather and oil level check plug to facilitate draining.
3. After all oil has drained, install and tighten oil drain plug.
4. Add SAE 90 gearlube oil through oil fill/breather opening, until oil just starts to overflow from oil level check plug opening. Pour slowly.
5. When oil level is correct, install and tighten oil fill/breather and oil level check plug.
6. Recheck all plugs. Make sure they are tight.
7. Start generator and check for leaks.

LUBRICATE POWER TAKEOFF (PTO) SHAFT

Grease the PTO shaft frequently. Use a low pressure, grease gun filled with general purpose, lithium base grease to apply to grease fittings (Figure 7) at shaft universal joints. Also apply general purpose, lithium base grease to PTO shaft splines and to telescoping sections of shaft.

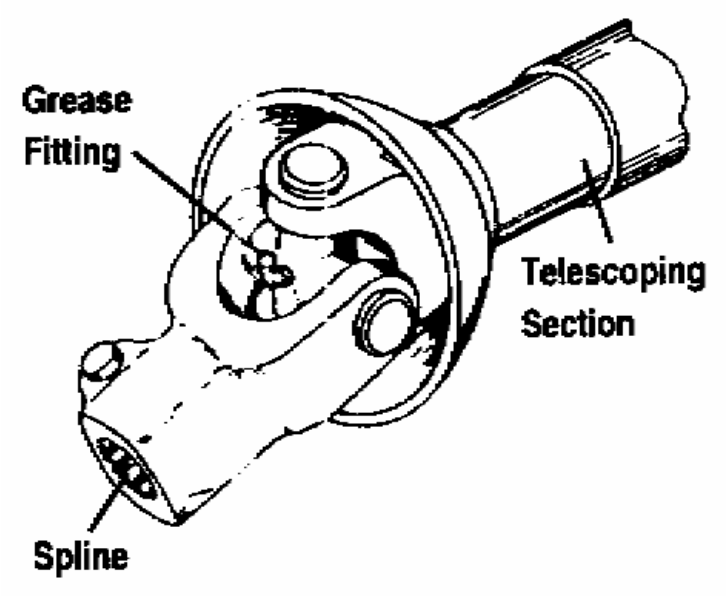

Figure 7-- Grease Points to Power Takeoff Shaft

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Troubleshooting

Symptom	Possible Causes	Corrective Action
No output or low output voltage	1. Open or shorted rotor	1. Replace rotor
	2. Open or shorted stator	2. Replace stator
	3. Generator operating below correct RPM speed	3. Operate generator at 3600 RPM for correct output voltage
	4. Generator overloaded	4. Reduce load to rated output
	5. Short circuit in load	5. Disconnect load. Check voltage at receptacle. Repair short
	6. Dirty slip rings	6. Clean and polish slip rings
Output voltage is too high	1. AVR setting incorrect	1. Readjust AVR setting
Generator is overheating	1. Generator is overloaded	1. Reduce load
	2. Rotor is rubbing stator	2. Check bearing condition
	3. Poor ventilation	3. Ensure alternator air vents are clear
	4. Short circuit in stator	4. Repair or replace stator
	5. Short turns in rotor	5. Replace rotor
Sparking at the brushes	1. Generator is overloaded	1. Reduce load
	2. Brushes not seated properly	2. Contour brushes (see "Maintenance")
	3. Brushes sticking in holder	3. Remove brushes and inspect and correct problem
	4. Brushes worn down shorter than 3/8-inch	4. Replace brush. NOTE: Always replace brushes one full set at a time

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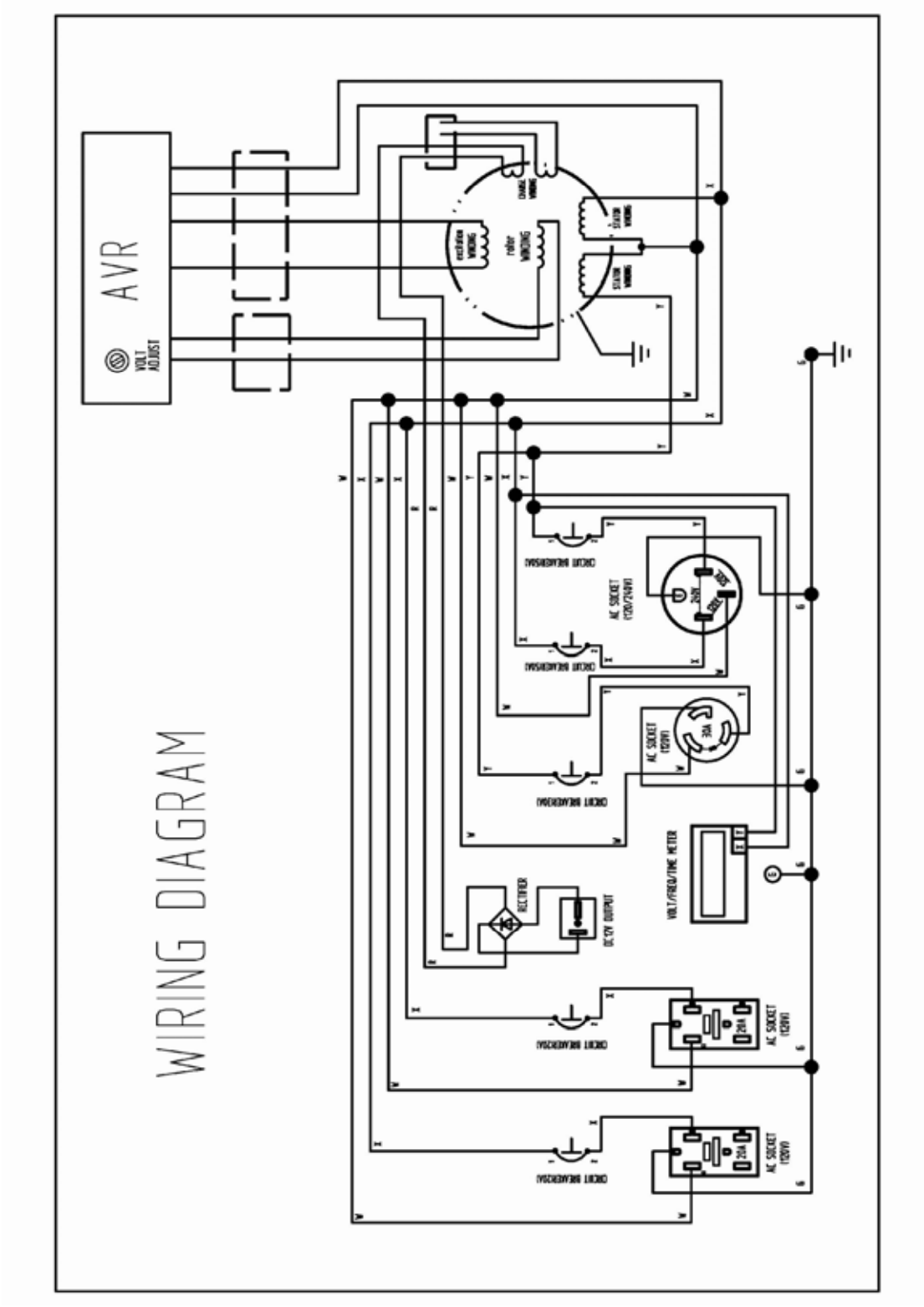
Wiring Diagram



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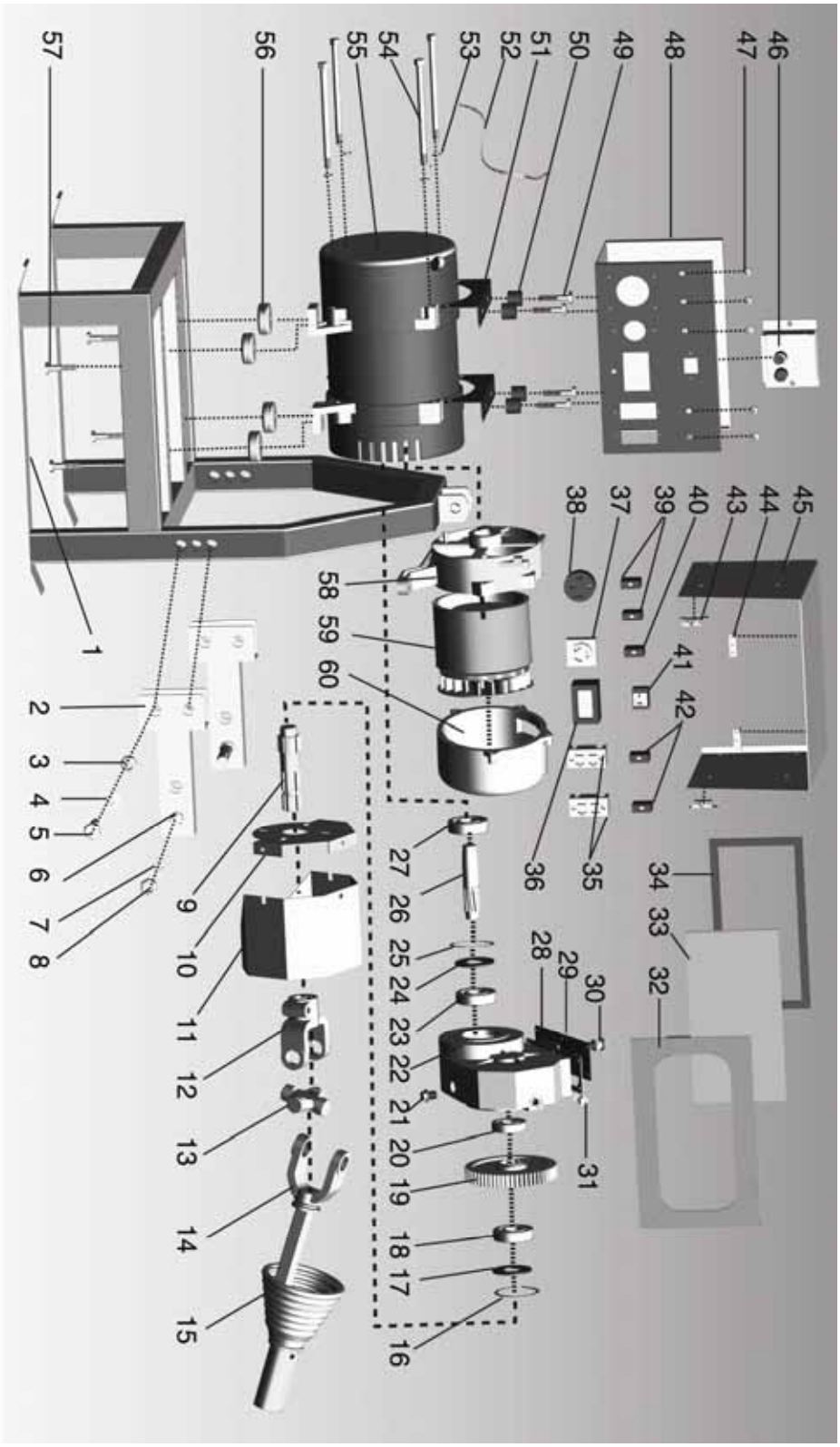
Exploded View And Parts List



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Parts List

NO.	description	QTY	Remark	NO.	description	QTY	Remark
1	frame	1	Rectangle steel 60X40X3.5	20	dustproof bearing6206-2Z	1	GB/T276-1994
2	Connecting plate	2	Rectangle steel 60X40X3.5	21	Outer hexagon plug M16X1.5	1	JB/ZQ4450-1997
3	Nut M12	4	GB/T41-2000	22	Gearbox body	1	
4	Washer 12	4	GB/T97.1-1985	23	dustproof bearing6305-2Z	1	GB/T276-1994
5	Bolt M12*75	4	GB/T5780-200	24	35X72X8 seal	1	GB/T13871-1992
6	Lengthen hanging pin 22	2	35	25	72Ahole washer	1	GB/T893.1-1986
7	Washer 22	2	GB/T97.1-1985	26	Output shaft	1	45
8	Locknut M22	2	GB/T6172.2	27	dustproof bearing6306-2Z	1	GB/T276-1994
9	Drive shaft	1	45	28	gasket	1	
10	Shield plate	1	steel plate2-Q235	29	Gearbox cover plate	1	
11	Shield plate cover	1	steel plate2-Q235	30	Transparent oil mark	1	
12	Spline cross section	1		31	Exhaust valve M16X1.5	4	GB/T2878-1993
13	Cross bearing	1		32	glass cover bracket	1	steel plate 2-Q235
14	Gimbal arm	1		33	Glass cover	1	
15	Gimbal pipe	1		34	sponge	1	
16	72Ahole washer	1	GB/T893.1-1986	35	GFCI receptacle	2	
17	30X72X10 seal	1	GB/T13871-1992	36	Three in One meter of Voltage, frequency and time	1	
18	dustproof bearing 6207-2Z	1	GB/T276-1994	37	3-hole lock socket	1	30A
19	Centre drive gear	1	45	38	4-hole lock socket	1	50A

NO.	description	QTY	Remark	NO.	description	QTY	Remark
39	overcurrent protection	2	50A	52	wire		
40	overcurrent protection	1	30A	53	Washer 12	4	GB/T97.1-1985
41	T receptacle	1		54	Bolt M12*180	4	GB/T5787-2000
42	overcurrent protection	2	20A	55	15KW alternator	1	
43	Gate pin	1		56	Φ60XΦ 40X25shock absorber	4	
44	Hinge	1		57	Bolt M12X60	4	GB/T5787-1986
45	Control box cover	1	steel plate2-Q235	58	alternator rear cover	1	
46	AVR	1		59	Stator& rotor	1	
47	Bolt M8X12	5	GB/T5787-1986	60	alternator front cover	1	
48	Control box body	1	steel plate2-Q235				
49	Bolt M10*60	4	GB/T5787-1986				
50	Cylindrical rubber shock absorber	4					
51	Control box bracket	2	steel plate2-Q235				