

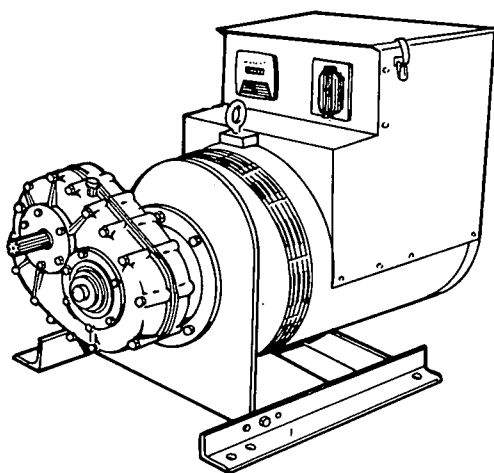
OPERATORS MANUAL AND PARTS CATALOG

FOR

Onan[®]

TRACTOR- DRIVE ALTERNATOR

**UR
SERIES**



ONAN

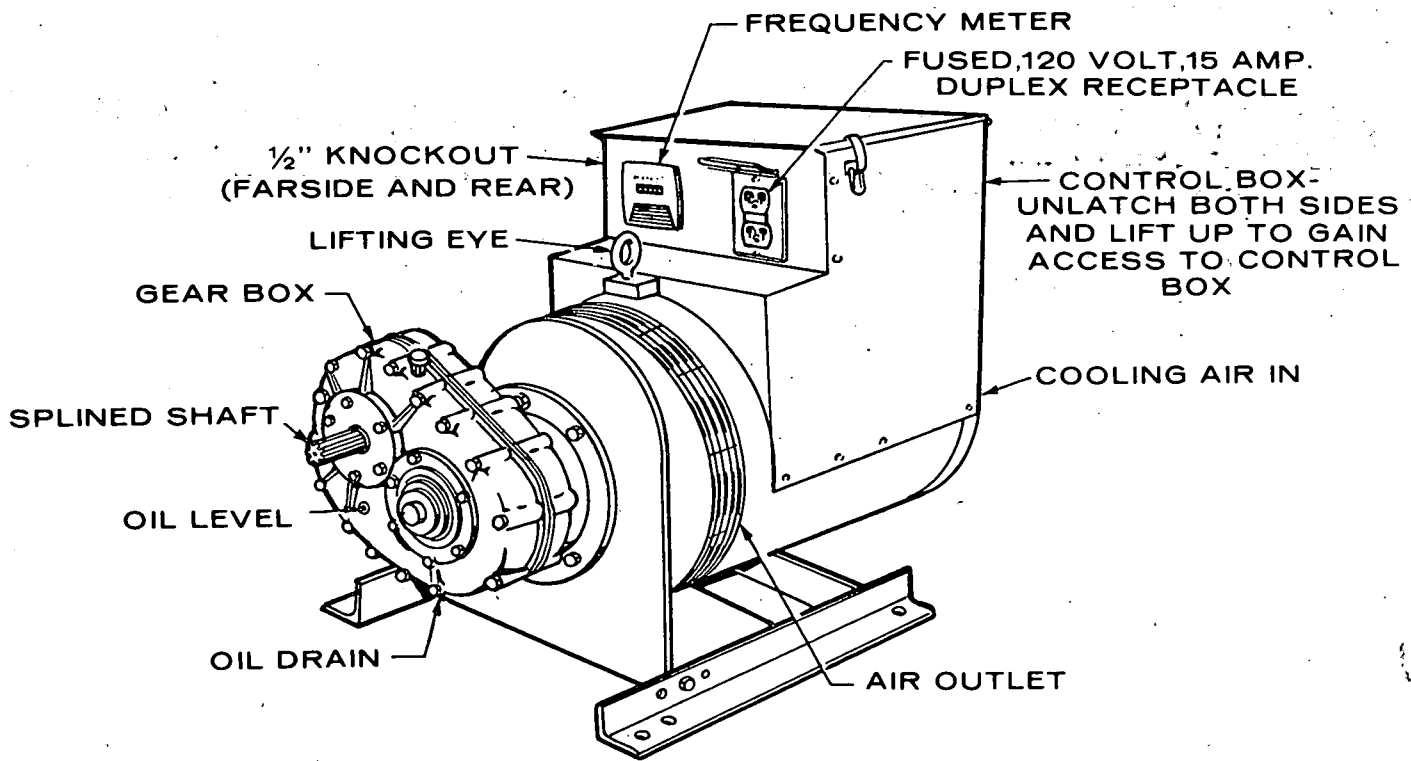
1400 73RD AVENUE N. E. • MINNEAPOLIS, MINNESOTA 55432

A DIVISION OF ONAN CORPORATION

N. Y. INTERNATIONAL OFFICE: Empire State Bldg.

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GENERAL INFORMATION

INTRODUCTION

This manual contains information for the proper installation, operation and maintenance of your alternator. We suggest you keep this book handy so it can be referred to when necessary.

If you wish to contact your dealer regarding this equipment, be sure to supply the complete MODEL NUMBER and the full SERIAL NUMBER of your equipment. This information is necessary to identify your equipment among the many units manufactured.

DESCRIPTION

Onan 40KW and 55KW models are revolving field, two bearing alternators. AC output voltage is generated in the stator and controlled by an exciter-regulator system. The exciter-regulator produces DC for field excitation and regulates the AC output.

The rotor consists of four inter-connected coils spaced symmetrically on a steel shaft. Slip rings on the shaft transmit excitation voltage to the field coils. The shaft is supported at both ends by prelubricated ball bearings. A centrifugal blower on the drive end of the alternator draws air through the alternator for cooling.

The complete alternator includes an exciter-regulator system, mounting feet, lifting eye, mounted gear box with splined shaft and control box.

Exciter-Regulator System: The exciter and voltage regulator work together to control the AC output voltage over a wide range of load conditions. This system is factory-set to provide the proper voltage.

Control Box: The control box includes a frequency meter, a fused, 120 volt, duplex receptacle, an exciter circuit breaker (alternator protection) and a load (line) circuit breaker and convenient load connection terminals.

The load circuit breaker can be used as a disconnect switch, however a transfer switch is recommended.

Gear Box: The gear box is secured to the alternator's rear adapter. The gear box oil capacity is 1-1/2 pints; the gear ratio is 3.33 to 1.

CAUTION

This alternator cannot be belt driven.

OPTIONAL ACCESSORIES

Power Take-Off Shaft: Telescoping, shielded, heavy duty power take-off shafts, recommended for use with PTO powered, Onan gear drive alternators provide maximum safety for the operator. The splined universal joint with snap ring type shield and quick disconnect feature, fits a 1-3/8 inch tractor PTO drive. PTO shaft operating lengths are: minimum 41 inch, maximum 57 inch; weight 65 pounds. Six spline universal for 540 rpm PTO.

IMPORTANT!
RETURN WARRANTY CARD
ATTACHED TO UNIT

SPECIFICATIONS

	<u>40.0UR-3S</u>	<u>40.0UR-15S</u>	<u>55.0UR-3S</u>	<u>55.0UR-15S</u>
Watts	40,000	40,000	55,000	55,000
Volts	120/240	120/240	120/240	120/240
Phase	1	3	1	3
Hertz	60	60	60	60
Running Current (Amperes)	208	120	287	166
Alternator Speed (rpm)	1800	1800	1800	1800
Tractor Speed (rpm)	540	540	540	540
Minimum Horsepower Required, Driving Source	73	73	100	100
Gear Ratio	3.33-1	3.33-1	3.33-1	3.33-1
Gear Box Oil Capacity, Pints	1-1/2	1-1/2	1-1/2	1-1/2
Recommended Gear Lubricant	SAE 90	SAE 90	SAE 90	SAE 90
Weight (Approximate)	1075	940	1300	1100
Power Factor	0.8	0.8	0.8	0.8

INSTALLATION

LOCATION

Figure 1 shows dimensions of the alternator and bolt-hole centers for installation. Select a site for the alternator with the following points in mind.

- Ventilation:** The alternator creates considerable heat when operating under load. It is important that this heat be dissipated by proper ventilation. If the alternator is installed inside a small room or compartment, provide a vent for exhausting the air heated by the alternator. Locate the exhaust vent above the inlet vent. Heated air is discharged from the drive-shaft end of the alternator.
- Convenience to Driving Power:** Locate the alternator for easy connection to the tractor. Align the power take-off to the alternator. Stay within the limits of the power take-off shaft.
- Dusty or Damp Conditions:** Avoid dusty or damp conditions as much as possible. Alternator should be mounted under cover or inside a building to protect it against the weather.
- Servicing Convenience:** Allow at least 24 inches of space on all sides of the alternator.
- Wiring Convenience:** Do not locate the alternator in a location difficult to service or which would have poor ventilation, to save a few feet of wiring. Install the alternator as close to the load transfer switch as possible. Do not move the load transfer switch to the alternator. Refer to *INSTALLING THE LOAD TRANSFER SWITCH*.

WARNING

Be sure to ground the alternator as shown in Figure 3.

MOUNTING THE ALTERNATOR

Figure 2 shows the recommended mounting base and bolt-hole centers to use for the alternator. The top surface must be level and flat so the mounting brackets will not be sprung when tightened down. After securing alternator with lockwashers and nuts, the shaft should turn freely.

Be sure that the alternator is properly aligned with the driving mechanism and that it will stay in alignment.

CAUTION To develop 40 and 55KW requires 73 and 100 horsepower respectively at the power take-off. The torque will flip the alternator over unless secured to a strong substructure. **DO NOT MOUNT THIS ALTERNATOR ON A TRAILER.**

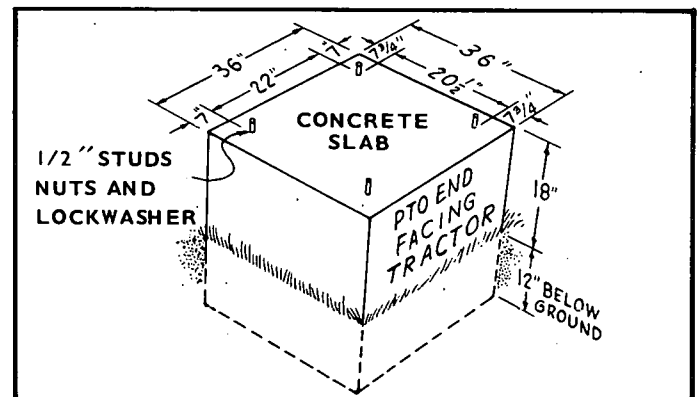


FIGURE 2. RECOMMENDED MOUNTING BASE

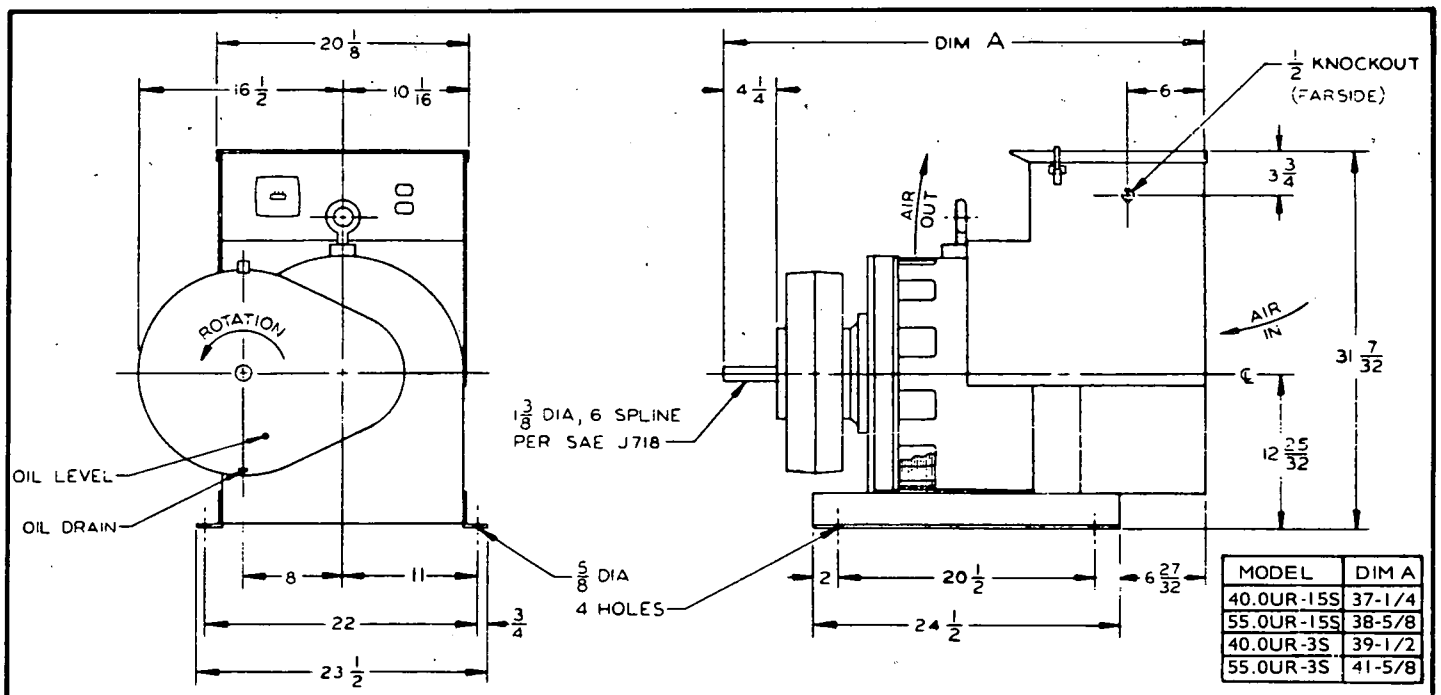
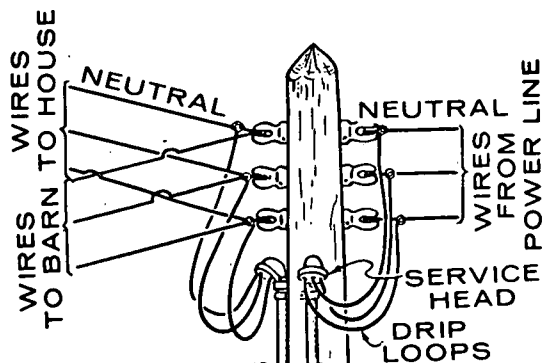
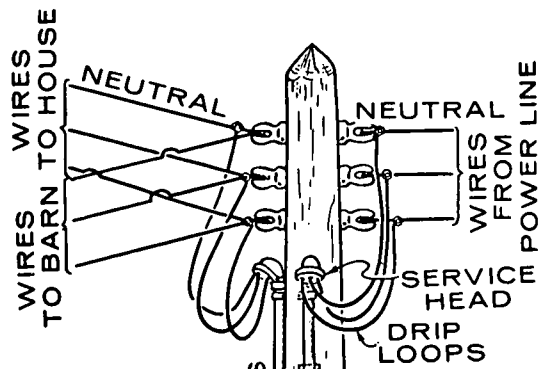


FIGURE 1. INSTALLATION OUTLINE

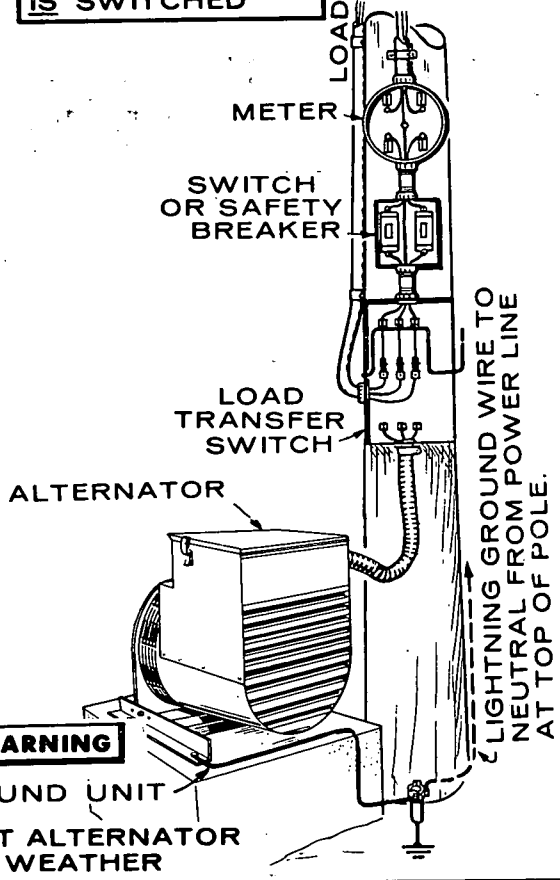
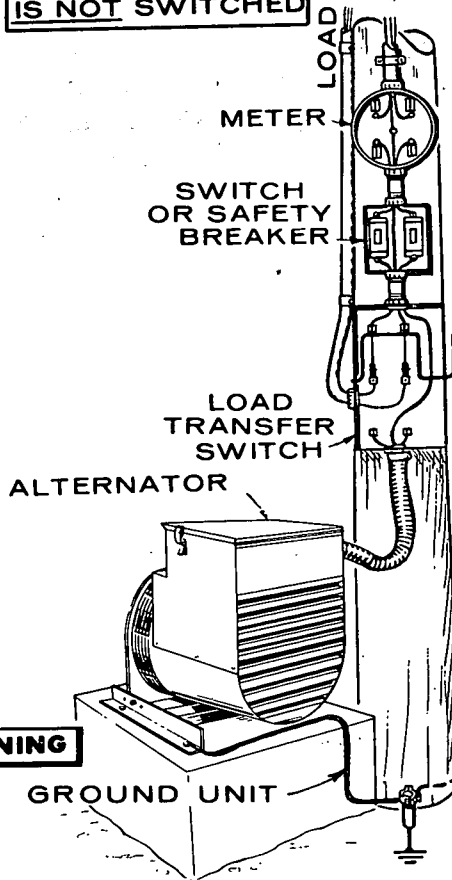
SINGLE PHASE ONLY



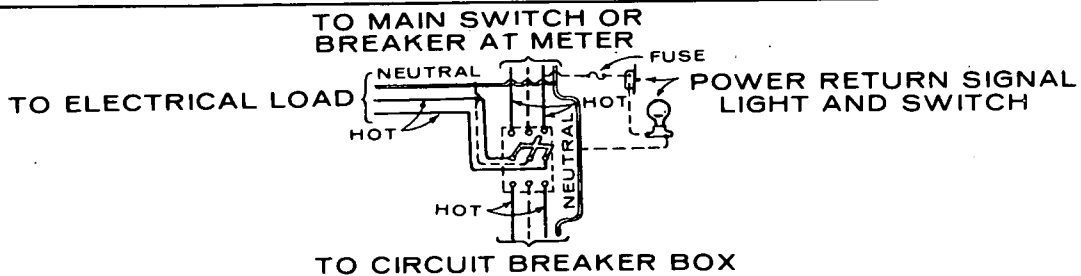
USE THIS DIA-
GRAM IF NEUTRAL
IS NOT SWITCHED



USE THIS DIA-
GRAM IF NEUTRAL
IS SWITCHED



PROTECT ALTERNATOR FROM WEATHER



LOAD TRANSFER SWITCH CONNECTIONS

FIGURE 3. TYPICAL FARM STANDBY, SINGLE PHASE

CONNECTING THE ALTERNATOR WIRES

Connect the load wires to the large circuit breaker inside of the control box before operating the alternator. Fasten with large allen screws as shown in Figures 4 and 5. Connect the grounded wire to the neutral bar located near the circuit breaker.

Connect the circuit breaker leads to the load transfer switch using flexible conduit.

WARNING Personnel connecting the alternator and any such auxiliary equipment must be fully qualified and understand wiring diagrams, circuits, etc.

120/240 Volt, 1 Phase, 3 Wire Alternator: Terminal post L0 is the grounded (neutral) terminal. For 120 volt current, connect the "hot" load wire to either the L1 or L2 terminal. Connect the neutral load wire to the L0 terminal. Two 120 volt circuits are thus available, with not more than 1/2 the alternator's rated capacity available on each circuit. Balance the load as closely as possible.

For 240 volt current, connect one load wire to terminal L1 and the second load wire to terminal L2. Terminal L0 is not used for 240 volt service.

If using both 120 and 240 volt current at the same time, use care not to overload either circuit.

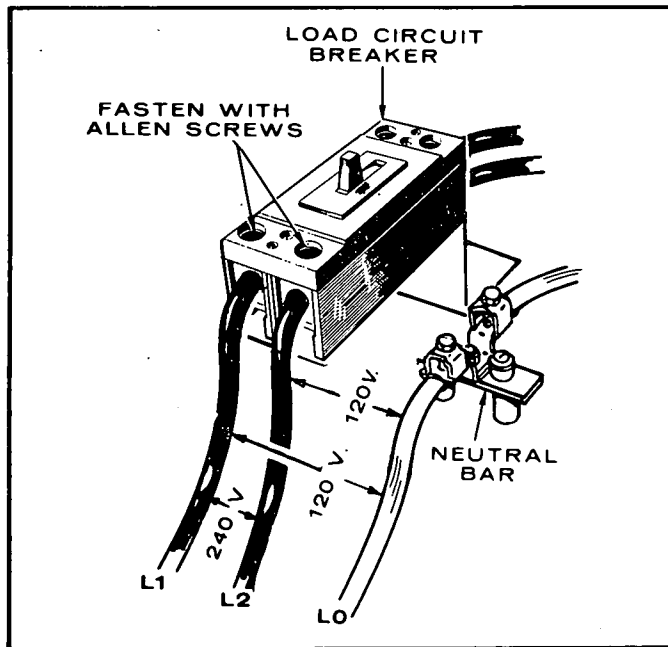


FIGURE 4. 120/240 VOLT, SINGLE PHASE

120/240 Volt, 3 Phase, 4 Wire Delta Connected Alternator: The 3 phase Delta connected unit is designed to supply 120 and 240 volt, 1 phase current and 240 volt, 3 phase current.

For 3 phase operation, connect the three load wires to the three terminals L1, L2, and L3 - one wire to each terminal. For 3 phase operation the L0 terminal is not used.

For 120/240 volt, 1 phase, 3 wire operation, terminals L1 and L2 are the "hot" terminals. The L0 terminal is the neutral, which can be grounded if required. For 120 volt service, connect the "hot" (black) load wire to either the L1 or L2 terminal. Connect the neutral (white) wire to the L0 terminal. Two 120 volt circuits are available. For 240 volt, 1 phase connect between any two, three phase terminals.

Any combination of 1 phase and 3 phase loading can be used at the same time as long as no terminal current exceeds the NAMEPLATE rating of the alternator. If no 3 phase output is used, usable 1 phase output is 2/3 of 3 phase KVA.

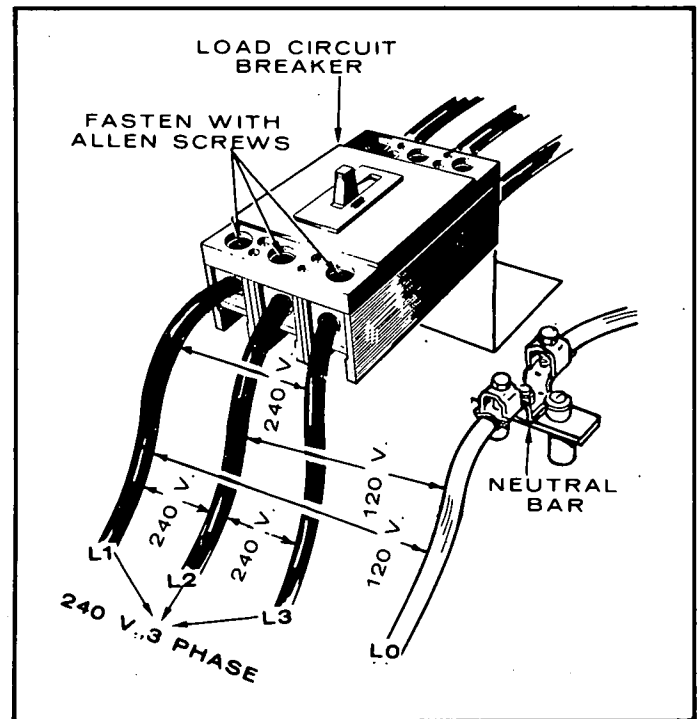


FIGURE 5. 120/240 VOLT, THREE PHASE

INSTALLING THE LOAD TRANSFER SWITCH

Before using the alternator for emergency purposes, install a DOUBLE THROW LOAD TRANSFER SWITCH. The switch must have an ampere rating large enough to carry the total load when the main source of power is in use. Follow the local electrical code. The load transfer switch should always be installed close to the main line switch, and between the main line switch and the load. When properly installed, the load transfer switch in one position will connect the electrical load to the highline. When the load transfer switch is thrown to the other position, the load is first disconnected from the main source of power, and then connected to the standby alternator. Using the load transfer switch makes it impossible to connect the alternator to the main source

of power. The load lines must connect to the center terminals of the transfer switch. The alternator leads and the main power source leads must be connected at OPPOSITE ends of the switch.

POWER RETURN SIGNAL

When using the alternator for emergency applications, install a pilot light or alarm signal to indicate when the power is restored and the alternator can be disconnected. Connect a signal light across the regular power line, just ahead of the load transfer switch. Install an on-off switch and a fuse for the signal light. When a power failure occurs, snap the signal switch to the ON position before putting the alternator into operation. When the normal power returns, the signal will operate and the alternator can then be disconnected.

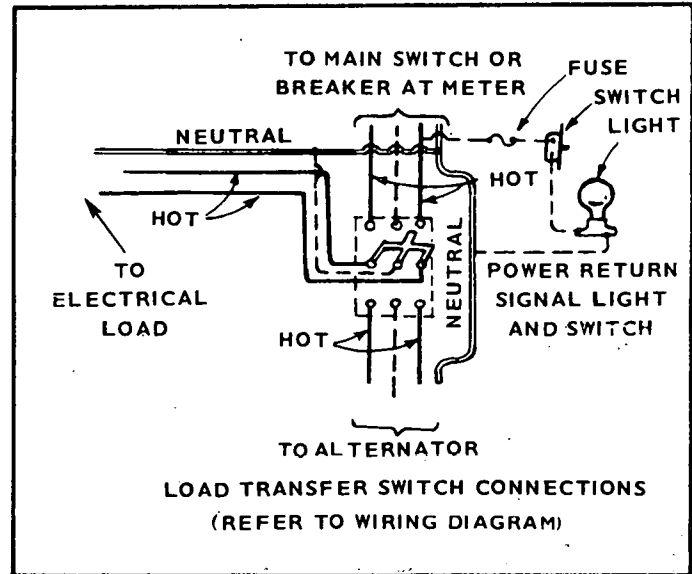


FIGURE 6. LOAD TRANSFER SWITCH

OPERATION

STARTING

When a power failure occurs, the alternator should be ready to run and to take over the load. Set up the tractor and properly install the power take-off shaft. Before engaging power take-off, proceed as follows in the order shown.

1. Alternator line circuit breaker must be in the OFF position.
2. Throw transfer switch to connect load to alternator.
3. Turn power return signal ON if one has been installed.
4. Engage power take-off and bring PTO shaft speed to 540 rpm. The alternator speed at this time will be 1800 rpm. The frequency meter on the alternator control box should read approximately 59-61 cycles.
5. Turn exciter breaker on.

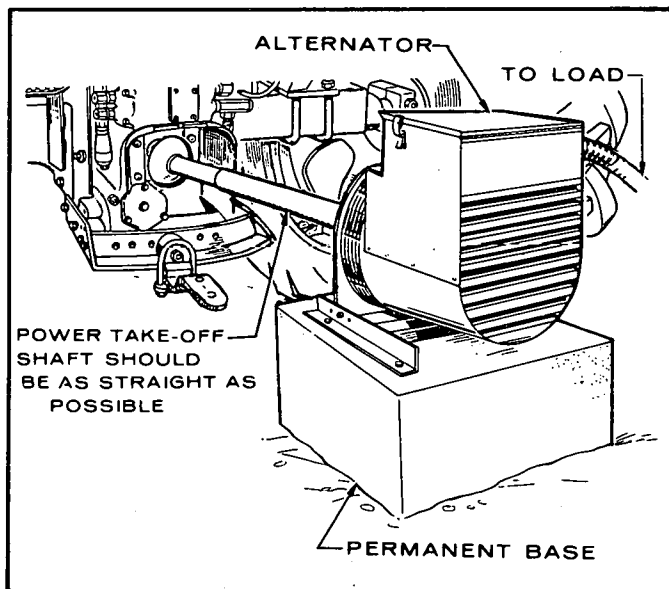


FIGURE 7. TRACTOR CONNECTION

OPERATING

With alternator running, throw the alternator line disconnect switch to the ON position. The various

electrical loads can then be connected. When motor loads are connected, connect one at a time, allowing each to reach running speed before connecting the next one. Motors require four to five times more current for starting than for running at normal speed. If several motors are started at the same instant, the total electrical load may overload the alternator, causing the circuit breaker to operate.

If the alternator frequency is not at the proper value, it may be necessary to advance or retard the engine throttle control. In some cases, it may be necessary to change the engine throttle setting when large changes in the electrical load are made.

CAUTION *Keep the alternator load within its nameplate rating. If the alternator is seriously overloaded the circuit breaker will automatically trip, disconnecting the entire electrical load. Reduce the load before throwing the circuit breaker back to the ON position.*

If the tractor engine has very little reserve power, use care when operating the alternator. For example, if a 100 horsepower (at the power take-off) engine is used to drive a 55,000 watt alternator, the engine throttle will be wide open at full alternator load. If most of the electrical load is suddenly removed, the governor cannot act quickly and smoothly enough to prevent a surge of speed and high voltage. Any electrical equipment left connected may be damaged by the resulting high voltage.

When disconnecting large portions of the load, disconnect one piece of equipment at a time, or first disconnect that part of the load which will be left on. Then remove the rest of the load. Wait until the alternator speed has stabilized and then reconnect that part of the load which will be left on. The alternator speed will remain relatively stable, and the tractor engine speed will not change or surge enough to cause any damage if this procedure is followed.

SERVICE AND MAINTENANCE

PERIODIC SERVICE AND INSPECTION

Follow a definite schedule of inspection and servicing. Make a good visual check before, during, and after alternator operation; look for loose or broken leads and bad connections.

GEAR BOX LUBRICATION

Drain the gear box after the first 100 hours of operation and refill with fresh lubricant of the recommended grade. Use only SAE 90 multi-purpose gear lubricant. Repeat this procedure every six months thereafter, or every 100 hours.

Maintain the proper oil level between changes. Overfilling will cause foaming, which can lead to an oil leak due to overheating. Remove the filler plug on top of the case and the oil level plug from the face of the gear case. Fill the case until the oil just begins to flow from the oil level plug hole. Gear box holds 1-1/2 pints U. S. Measure. Replace both plugs. See Figure 8.

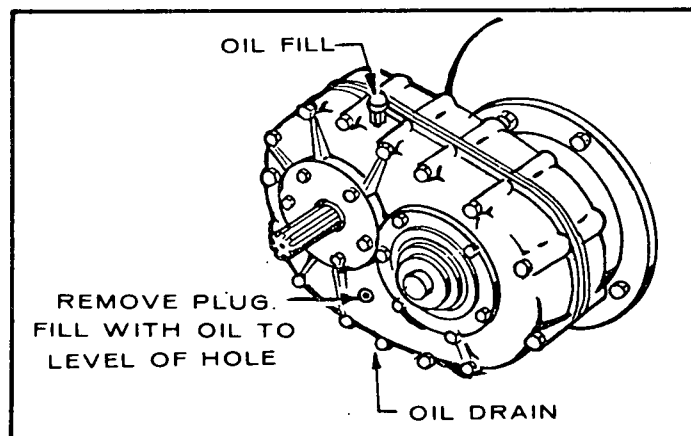


FIGURE 8. GEAR BOX LUBRICATION

IMPORTANT: Exercise alternator every three months to ensure reliable electricity in case of a power outage.

POWER TAKE-OFF SHAFT

Grease the universal joints at least every 25 operating hours. Under adverse conditions, grease the joints as required, possibly every 4 to 8 hours. Never operate the alternator with the shield removed from the power take-off shaft.

WARNING Be extremely careful when working near a running unit. Avoid wearing loose clothing which could get caught in the revolving PTO.

SLIP RINGS

Slip rings must be clean and free of scratches and burrs (do not remove the dark brown film). If necessary to use an abrasive on the slip rings, use No. 00 sandpaper, never emery cloth or other conducting abrasives.

If rings are grooved, out of round, pitted, or rough so brushes seat poorly, remove rotor and refinish rings in a lathe. Remove or shield the bearing during refinishing.

BRUSHES

To examine the brushes, brush springs, and collector rings, remove the grille section below the control box. There is a direct access to the brushes through the large openings in the endbell.

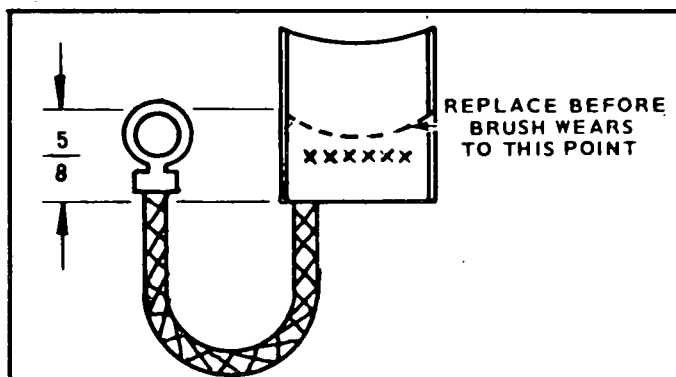


FIGURE 9. BRUSH REPLACEMENT

Replace brushes when worn to approximately 5/8" long, or when the brush is wearing into the stamped name (Figure 9). Do not attempt to remove the brush without first removing its spring and brackets as shown. Never bend a spring back over its bracket - doing so will put a kink in it and require its replacement. Do not use a substitute brush that may look identical but may have entirely different electrical characteristics. Be sure the brush is installed so that the short side of its taper is toward the spring and its bracket (Figure 10).

ALTERNATOR BEARING

The alternator bearing is double-sealed and prelubricated. Inspect the bearing for rotation every 1000 hours while the alternator is running.

If alternator is used for "prime power", replace the bearing every 10,000 hours or two years. If the alternator is used as "standby", replace the bearing every five years. Deterioration of the bearing grease, due to oxidation, makes this replacement necessary.

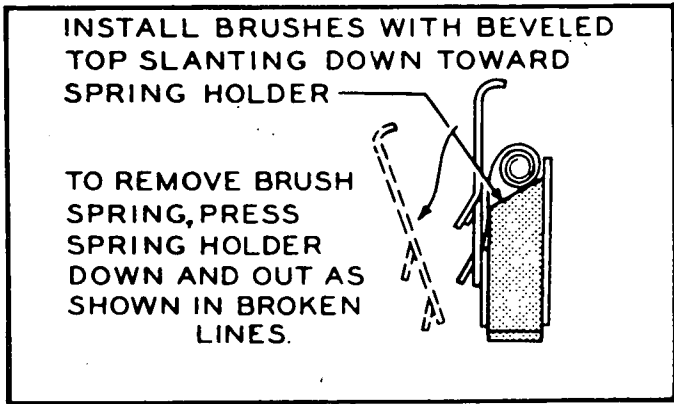


FIGURE 10. BRUSH REMOVAL

EXCITER VOLTAGE REGULATOR

This system contains no moving parts. Occasionally blow out dust, etc. with clean, filtered air. Check thoroughly to assure that all components are mechanically secure and that all electrical connections are tight.

FUSE REPLACEMENT

A fused, 120 volt duplex receptacle provides for convenient load connections up to 15 amps. If exceeding this load, fuse will blow and will require replacement. To change fuse, unlatch top panel of control box and lift open. Twist fuse holder as shown in Figure 11 and replace with Buss ABC 15 or equivalent.

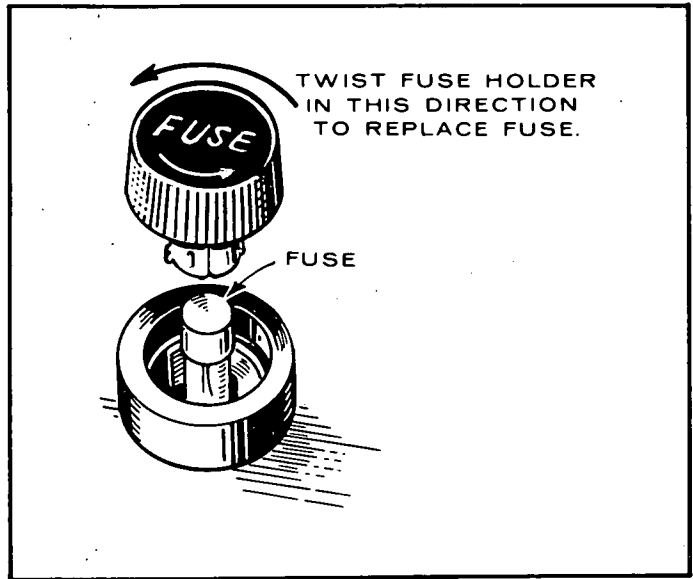


FIGURE 11. FUSE REPLACEMENT

OUTPUT VOLTAGE

A voltage adjusting potentiometer located on the printed circuit board inside the control box, provides for a $\pm 3\%$ adjustment of the output voltage. This potentiometer is preset at the factory and should not require readjustment unless replacing printed circuit board.

ALTERNATOR TROUBLESHOOTING GUIDE

NATURE OF TROUBLE	PROBABLE CAUSE
No Output Voltage	<ol style="list-style-type: none"> 1. Check load circuit breaker for a tripped position; an external short or overload may have caused this condition. Remove part of the load before resetting breaker. 2. Check exciter circuit breaker for a tripped position. Correct problem before resetting. 3. Check tractor PTO speed - should be 540 rpm.
No Output Voltage From 120 Volt Duplex Receptacle	<ol style="list-style-type: none"> 1. Blown fuse - Open control box cover and replace fuse with Buss ABC 15 or equivalent.
Low Frequency - Alternator Will Not Maintain 60Hertz.	<ol style="list-style-type: none"> 1. Check engine PTO speed - Should be 540 rpm.
Alternator Overheats	<ol style="list-style-type: none"> 1. Overloaded - Remove part of load. 2. Poor ventilation - Check alternator's air intake and outlet for restrictions.

NOTE: If alternator does not produce current after making these checks, contact your nearest Onan dealer or service center.

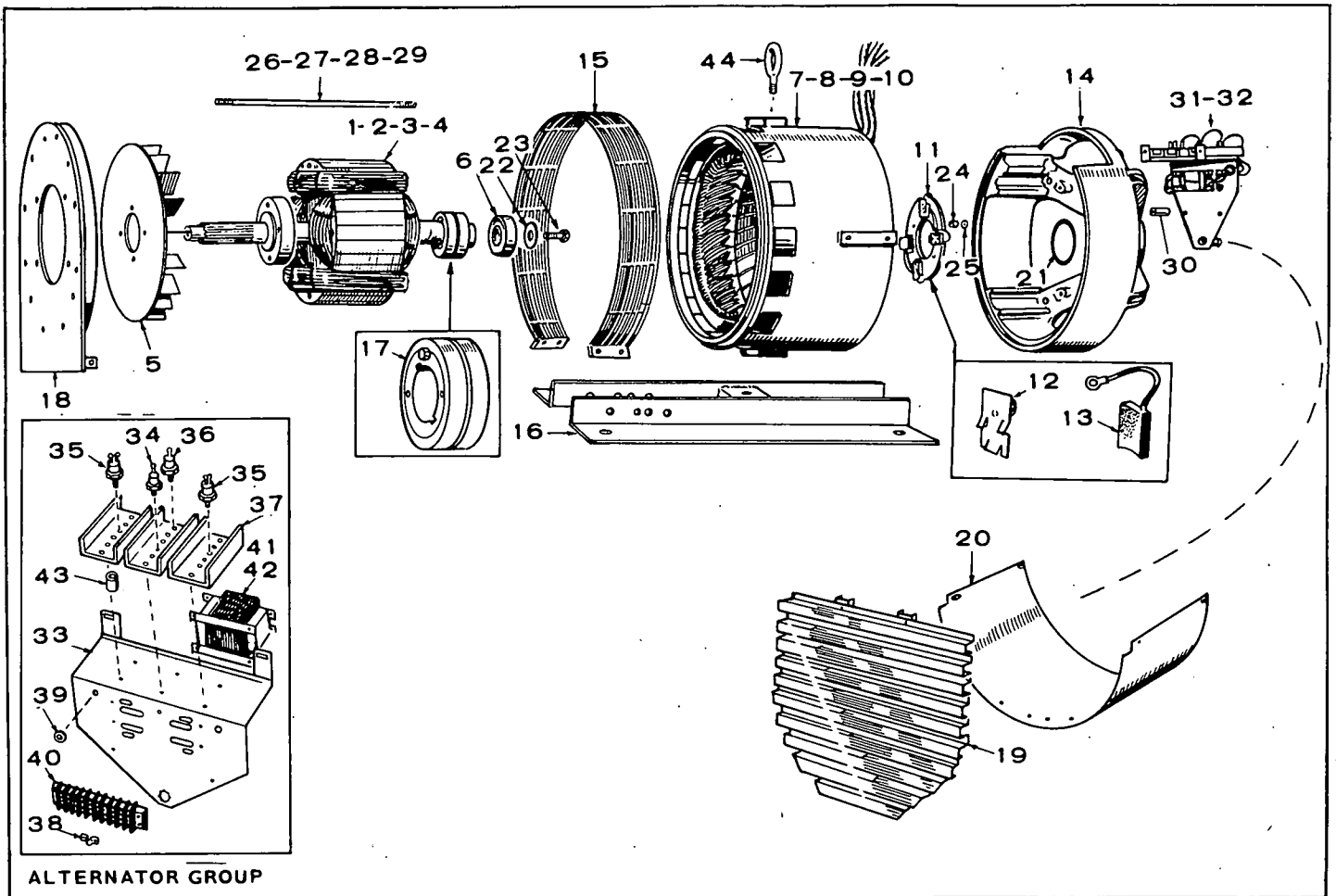
PARTS CATALOG

For parts or service, contact the dealer from whom you purchased this equipment or refer to your Nearest Authorized Parts & Service Center.

To avoid errors or delay in filling your parts order, please furnish all information requested.

Always give the MODEL & SPEC. NO. and SERIAL NO.

MODEL [REDACTED]
SERIAL [REDACTED]
ALWAYS MENTION MODEL & SERIAL No.
AC VOLTS [REDACTED] KVA [REDACTED] KW [REDACTED]
AMPS [REDACTED] PF [REDACTED] CYCLES [REDACTED]
PH [REDACTED] RPM [REDACTED]
EXCITER DC VOLTS [REDACTED] AMPS [REDACTED]
GENERATOR ONLY OF THIS
GENERATING PLANT MANUFACTURED BY
ONAN
MINNEAPOLIS, MINNESOTA, U.S.A.
99A413 FOR ELECTRICAL EQUIPMENT ONLY

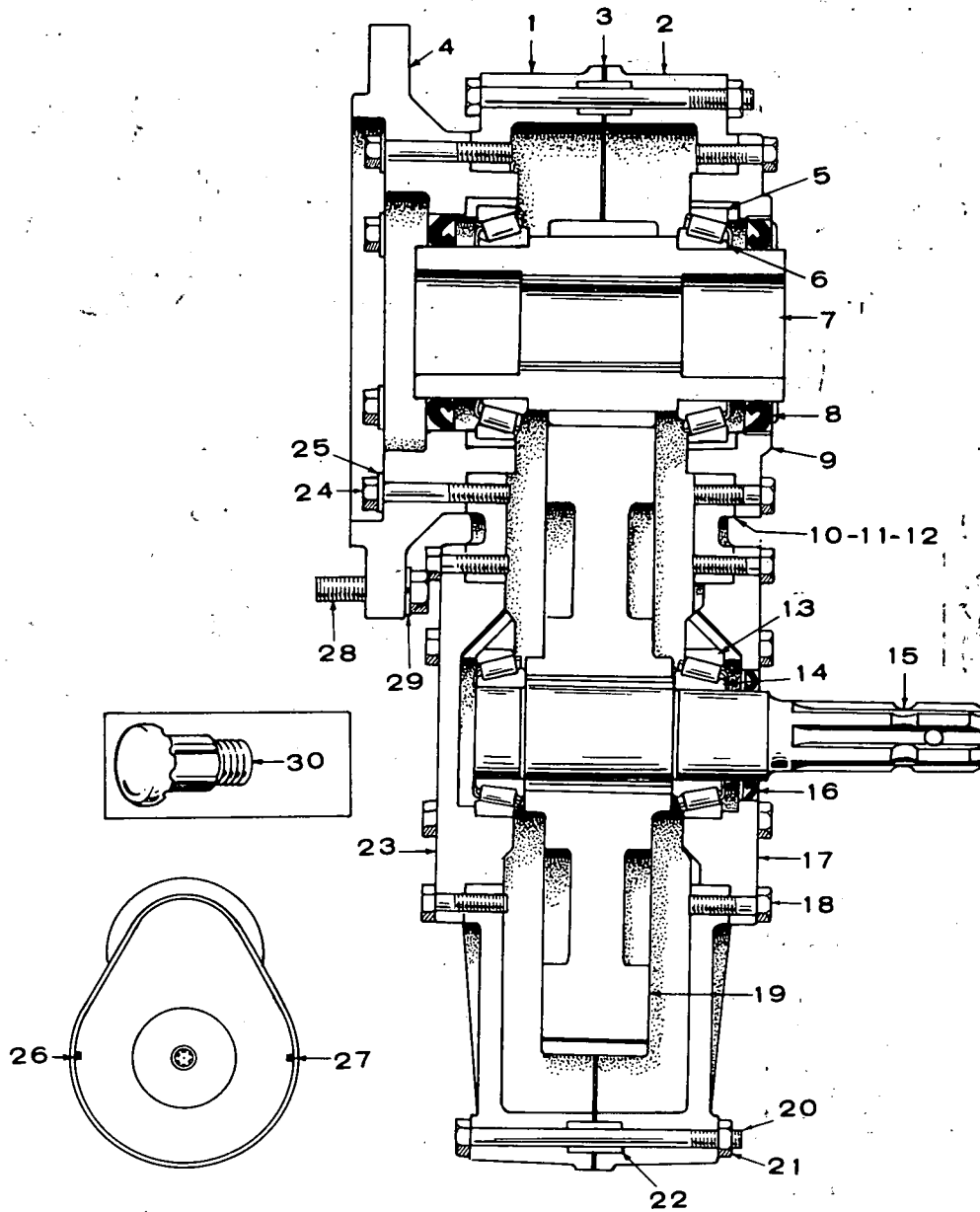


ALTERNATOR GROUP

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	201DI766	1	Rotor Assembly, Wound - 40 KW, 1 Phase
2	201DI763	1	Rotor Assembly, Wound - 40 KW, 3 Phase
3	201DI768	1	Rotor Assembly, Wound - 55 KW, 1 Phase
4	201DI765	1	Rotor Assembly, Wound - 55 KW, 3 Phase
5	205C98	1	Blower
6	510B101	1	Bearing
7	220DI591	1	Stator Assembly, Wound - 40 KW, 1 Phase
8	220DI578	1	Stator Assembly, Wound - 40 KW, 3 Phase
9	220DI593	1	Stator Assembly, Wound - 55 KW, 1 Phase
10	220DI580	1	Stator Assembly, Wound - 55 KW, 3 Phase
11	212C342	1	Rig Assembly, Brush (Includes Brushes and Springs)
12	212B1105	4	Spring, Brush
13	214A46	4	Brush
14	211E185	1	Bell, End
15	234B368	1	Screen, Alternator
16	403C929	1	Base, Alternator Mounting
17	204A83	1	Ring, Collector
18	231C154	1	Adapter, Alternator
19	234D370	1	Grille, Alternator Air Inlet
20	234B361	1	Wrapper, Alternator End Bell
21	509P125	1	Seal, "O" Ring - Bearing
22	526A238	1	Washer, Bearing Retainer
23	800A513	1	Screw, Bearing Retainer
24	212A1225	4	Spacer, Brush Rig Mounting
25	526-18	4	Washer, Brush Rig Mounting

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
26	520A723	4	Stud, Alternator Through - 40 KW, 1 Phase
27	520A720	4	Stud, Alternator Through - 40 KW, 3 Phase
28	520A726	4	Stud, Alternator Through - 55 KW, 1 Phase
29	520A722	4	Stud, Alternator Through - 55 KW, 3 Phase
30	305A481	2	Spacer, Voltage Regulator Chassis Mounting
31	305D489	1	Chassis Assembly, Voltage Regulator (Includes Parts Marked *) - 3 Phase
32	305D483	1	Chassis Assembly, Voltage Regulator (Includes Parts Marked +) - 1 Phase
33	305D482	1	*+Chassis, Voltage Regulator
34	358B29	1	*+Rectifier, Silicon (Avalanche) - Negative
35	364B12	2	*+Rectifier, Gate Control (SCR) Negative
36	358B31	2	*+Rectifier, Silicon (Avalanche) - Negative
37	363-48	3	*+Heat Sink, Rectifier
38	332C1043	2	*+Jumper, Terminal Board
39	508A2	2	*+Grommet, Reactor Leads
40	332A1266	1	*+Block, Terminal
41	315A341	1	*+Reactor Assembly
42	315D339	1	+Reactor Assembly
43	332P1265	6	*+Insulator, Heat Sink Mounting
44	403P931	1	Eyebolt, Lifting

* - Included in 305D489 Chassis Assembly.
 +- Included in 305D483 Chassis Assembly.

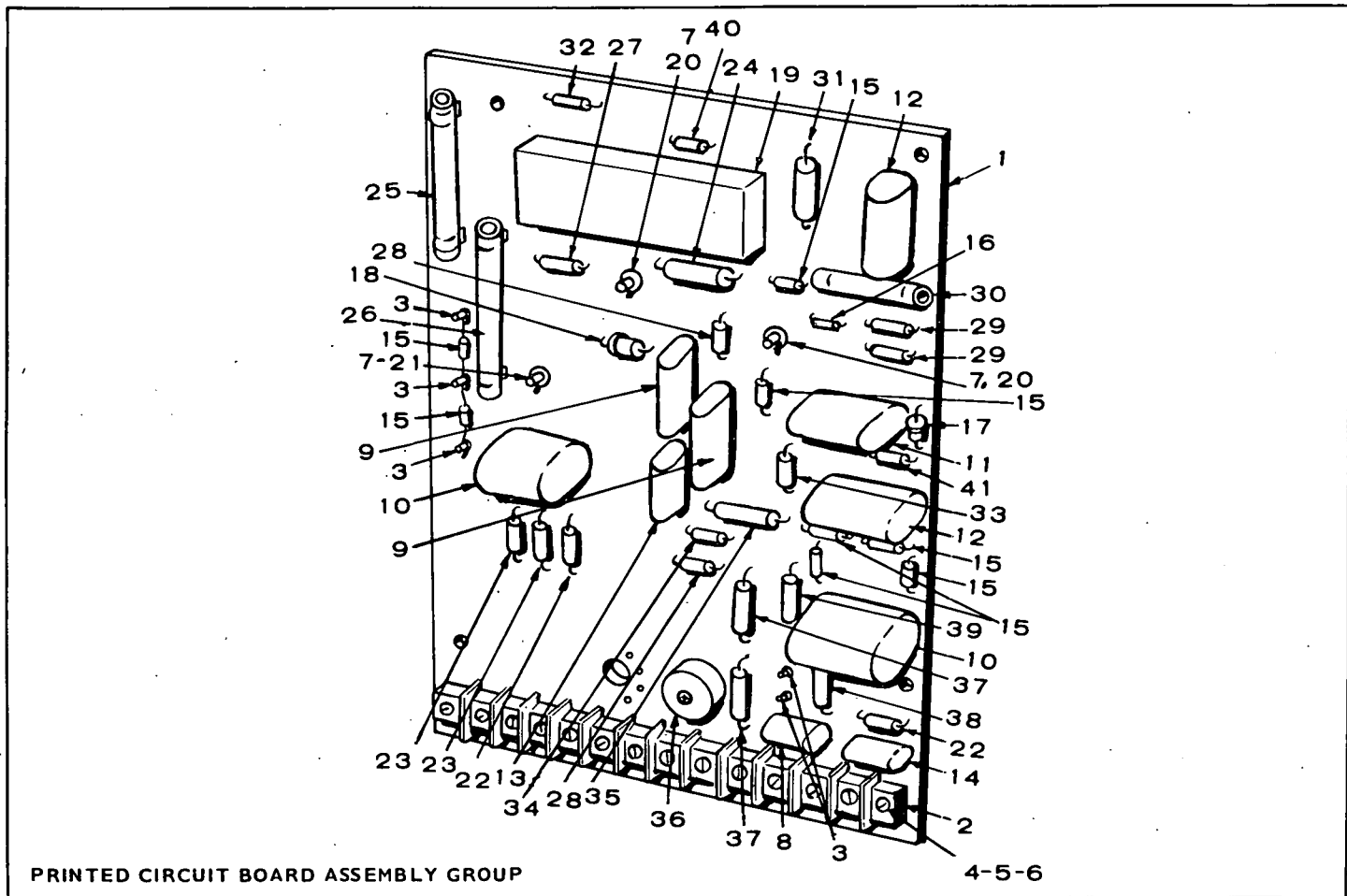


GEAR DRIVE BOX

REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
	*190D303	1	Gear Box - Complete
1	50977	1	Case (Less Pipe Plugs)
2	50978	1	Case (Includes Pipe Plugs)
3	40669	1	Gasket
4	40661	1	Flange
5	10601	2	Bearing, Cup
6	10602	2	Bearing, Cone
7	40664	1	Shaft & Gear
8	10605	2	Seal
9	40663	1	Plate, Open End
10	10596	As Req.	Shim, .001" Thick (Clear)
11	10597	As Req.	Shim, .003" Thick (Green)
12	10598	As Req.	Shim, .005" Thick (Blue)
13	10603	2	Bearing, Cup
14	10604	2	Bearing, Cone
15	40668	1	Shaft, Splined

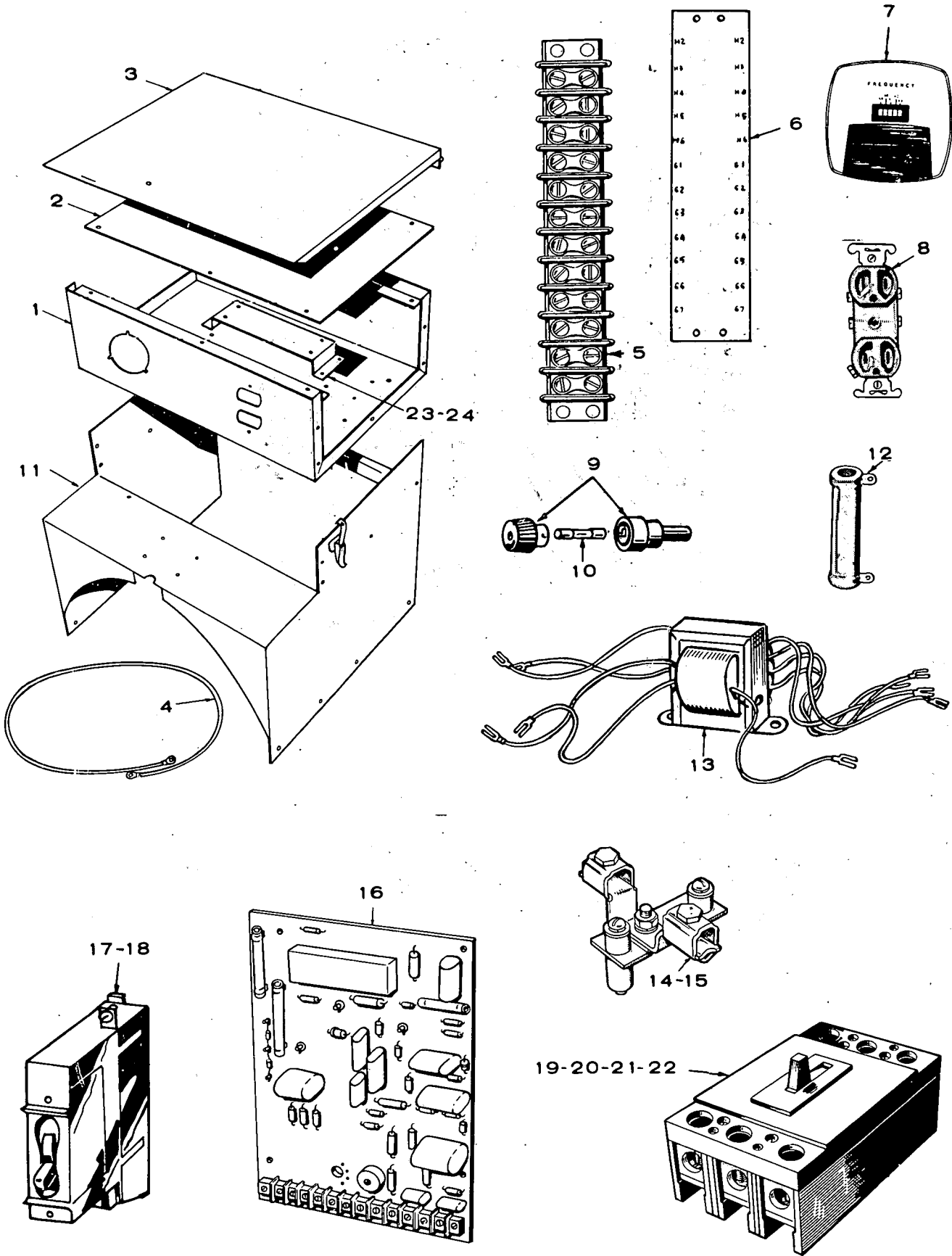
REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
16	10263	1	Seal
17	40666	1	Plate, Open End
18	10032	18	Screw, Cap
19	40667	1	Gear
20	10599	16	Screw, Cap
21	10006	16	Nut
22	20415	2	Bushing, Lineup
23	40665	1	Plate, Closed End
24	10600	6	Screw, Cap
25	10446	6	Washer, Lock
26	10439	1	Plug
27	10179	2	Plug, Drain
28	10606	2	Screw, Cap
29	10514	2	Washer, Lock
30	*518A275	1	Cap, Vent

NOTE: Order parts that do not have * before part number from Von Ruden Mfg. Co., Claremont, Minnesota 55924.



REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION	REF. NO.	PART NO.	QTY. USED	PART DESCRIPTION
1	332D1264	1	Board Assembly, Printed Circuit - Complete	24	350-1075	1	Resistor (2 Watt, 4.7 Megohm)
2	332B1252	1	Block, Terminal (12 Place)	25	353P40	1	Resistor, Fixed (10 Watt, 270-Ohm)
3	332B833	5	Terminal, Standoff	26	353P39	1	Resistor, Fixed (15 Watt, 5,000-Ohm)
4	812-81	2	Screw, Rd. Head Machine (#8-32 x 5/8)	27	350P398	1	Resistor (1/2 Watt, 3,000-Ohm)
5	853-5	2	Washer, E.T. Lock (#8)	28	350-447	2	Resistor (1/2 Watt, 300,000-Ohm)
6	860-8	2	Nut, Hex (#8-32)	29	350-423	2	Resistor (1/2 Watt, 33,000-Ohm)
7	362C12	3	Pad, Transistor Mounting	30	352P151	1	Resistor, Fixed (5 Watt, 15,000-Ohm)
8	355P18	1	Capacitor (.47 Mfd., 100 Volt)	31	350-1014	1	Resistor (2 Watt, 13,000-Ohm)
9	355P5	2	Capacitor (.22 Mfd., 200 Volt)	32	350-1007	1	Resistor (2 Watt, 6,800-Ohm)
10	355P17	2	Capacitor (.47 Mfd., 400 Volt)	33	350-443	1	Resistor (1/2 Watt, 220,000-Ohm)
11	355P6	1	Capacitor (.47 Mfd., 200 Volt)	34	350-435	1	Resistor (1/2 Watt, 100,000-Ohm)
12	355P16	2	Capacitor (1 Mfd., 100 Volt)	35	351P421	1	Resistor, Metal Film (1/4 Watt, 12,100-Ohm)
13	355P15	1	Capacitor (.1 Mfd., 200 Volt)	36	303A168	1	Potentiometer
14	355P14	1	Capacitor (.047 Mfd., 200 Volt)	37	351P520	2	Resistor, Metal Film (1/4 Watt, 28,000-Ohm)
15	357B14	8	Rectifier, Silicon	38	351P522	1	Resistor, Metal Film (1/4 Watt, 5,110-Ohm)
16	359A16	1	Diode, Zener	39	351P523	1	Resistor, Metal Film (1/4 Watt, 8,870-Ohm)
17	359A25	1	Diode, Zener	40	359A15	1	Diode, Zener
18	359A26	1	Diode, Zener	41	356A39	1	Capacitor (100Mfd., 10 Volt)
19	307C1063	1	Relay, Magnetic Reed				
20	362-17	2	Transistor, Silicon NPN				
21	361B4	1	Transistor, Unijunction				
22	350-355	2	Resistor (1/2 Watt, 47-Ohm)				
23	350-351	2	Resistor (1/2 Watt, 33-Ohm)				

CONTROL GROUP



<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
1	301D3300	1	Chassis, Control
2	301B3299	1	Panel, Control Chassis
3	301B3298	1	Cover, Control Chassis
4	406C341	1	Holder, Cover
5	332A607	1	Block, Terminal - 12 Place
6	332A1248	1	Strip, Marker - 12 Place
7	302B765	1	Meter, Frequency
8	323P184	1	Receptacle, Duplex
9	321P104	1	Holder, Fuse
10	321P138	1	Fuse, 15 Amp
11	301D3296	1	Saddle, Control Chassis Mounting
12	351-216	1	Resistor, Fixed - 1740-Ohms, 1/4 Watt
13	315D342	1	Transformer, Voltage
14	332B1351	1	Bar Assembly, Neutral - 55 KW, 1 Phase
15	332B1352	1	Bar Assembly, Neutral - 40 KW, 1 & 3 Phase and 55 KW, 3 Phase

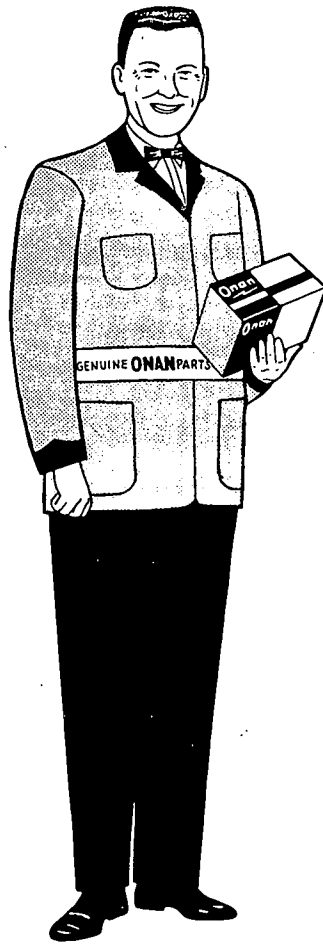
<u>REF. NO.</u>	<u>PART NO.</u>	<u>QTY. USED</u>	<u>PART DESCRIPTION</u>
16	332D1264	1	Board Assembly, Printed Circuit (See Separate Group For Components)
17	320B2	1	Breaker, Circuit (15 Amp) - 40 KW, 1 & 3 Phase
18	320B18	1	Breaker, Circuit (20 Amp) - 55 KW, 1 & 3 Phase
19	320P442	1	Breaker, Circuit (125 Amp) - 40 KW, 3 Phase
20	320P443	1	Breaker, Circuit (175 Amp) - 55 KW, 3 Phase
21	320P444	1	Breaker, Circuit (225 Amp) - 40 KW, 1 Phase
22	320P420	1	Breaker, Circuit (300 Amp) - 55 KW, 1 Phase
23	301B3385	1	Bracket, Circuit Breaker Mtg. - 40 KW, 1 Phase and 40 KW & 55 KW, 3 Phase
24	301B3303	1	Bracket, Circuit Breaker Mtg. - 55 KW, 1 Phase

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