

INSTRUCTION MANUAL

AND PARTS CATALOG

FOR

Onan[®]

DC GENERATOR

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SECTION

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"UF"

SERIES

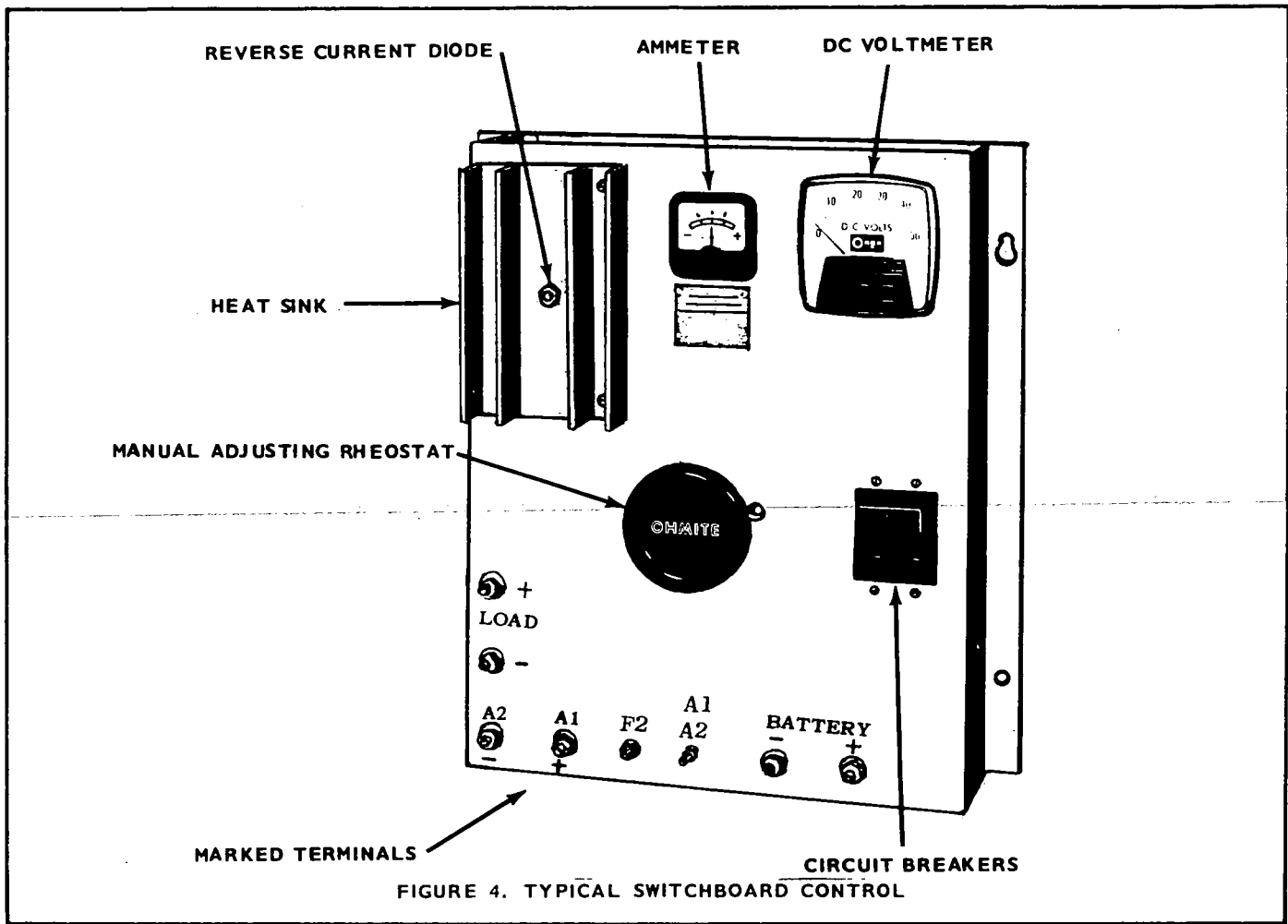
**32-VOLT, 110-VOLT
BATTERY CHARGING
1750-3500 RPM**

ONAN

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

A DIVISION OF ONAN CORPORATION

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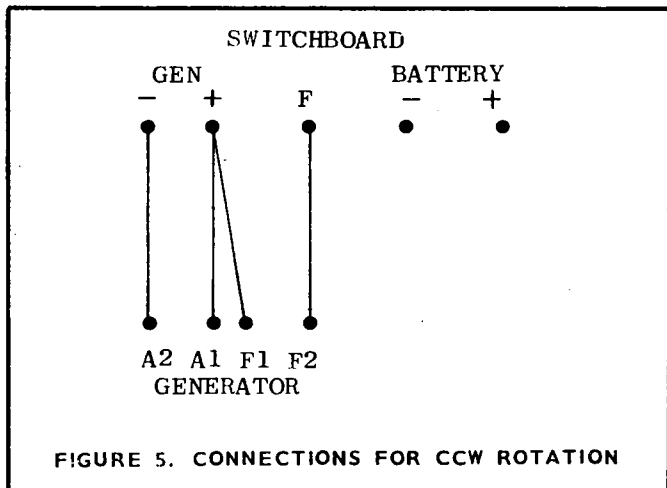


WIRING CONNECTIONS FOR SPEC 19 CONTROLS

The following diagrams show correct connections for generator to Spec 19 controls. After connecting generator to control, connect battery cables to Battery "+" and "-" terminals on the control.

CAUTION All warranties void if this equipment is operated with reverse polarity.

COUNTERCLOCKWISE



CLOCKWISE

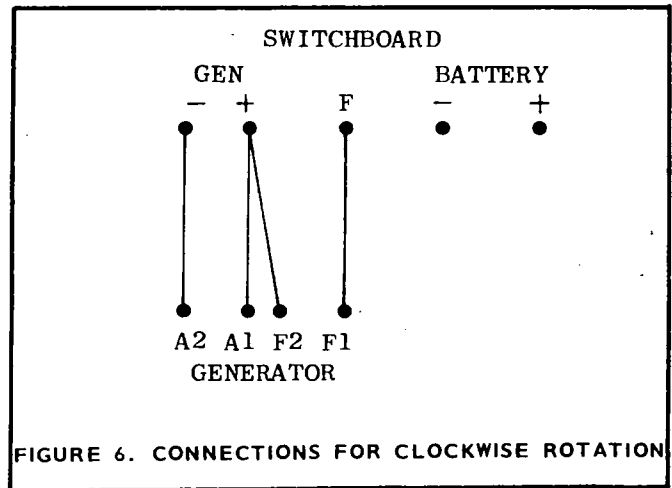


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MODEL AND RATING TABLE

GENERATOR MODEL NO.	GENERATOR PARTS KEY ‡	CAPACITY WATTS	VOLTS DC	CONSTANT OR VARIABLE SPEED 1750-3500 RPM ★		CONSTANT SPEED 1750 RPM ★	
				SWITCHBOARD	WIRING DIAGRAM	SWITCHBOARD	WIRING DIAGRAM
1.5UF-232S*	1	1500	32	1.5S-232/19C 1.5S-232/51C	615B312 615B305	1.5S-232/1A	615A3
2.0UF-232S*	2	2000	32	2.0S-232/19A	615A96	2.0S-232/1A	615A2
3.0UF-232S*	3	3000	32	3.0S-232/19A 3.0S-232/51C	615A80 615B303	3.0S-232/1A	615A4
3.0UF-210S*	4	3000	110	3.0S-210/19A	615A145	3.0S-210/1B	615A166
5.0UF-210S*	5	5000	110	5.0S-210/19A 5.0S-210/51C	615B143 615B306	5.0S-210/1B	615A159

‡ Use this parts key number for ordering parts for your generator.

★ When ordering parts for your switchboard, see wiring diagram furnished with switchboard.

* New model designation beginning with Spec B. Example: 1.5UF-232S was 105UF-232N.

GENERAL INFORMATION

INTRODUCTION

This instruction book contains information for the proper installation, operation, and maintenance of your generator. We suggest that this book be kept handy so that it can be referred to when necessary.

This generator is the result of proven engineering design, highest quality materials, and expert workmanship. Thorough inspection and testing assures you that the generator will perform as expected.

If you wish to contact your dealer or the factory regarding this equipment, be sure to supply the complete MODEL and SPEC.NO., and the full serial number of the equipment as shown on the nameplate. This information is necessary to identify your equipment among the many basic and special optional units manufactured.

GENERATOR DESCRIPTION

These generators are designed for charging 32-volt or 110-volt lead-acid or cadmium-cell batteries. They can be operated at constant or variable speeds ranging from 1750 to 3500-rpm when the correct switchboard is used. Generator output depends upon the speed which it is driven and the rheostat setting.


The generator is a shunt wound, revolving armature, 4-pole type with two double-sealed ball bearings. Standard equipment includes connection box, mounting feet, removeable lifting eye and keyed shaft.

Rotation of the generator shaft can be either clockwise or counterclockwise. The wiring diagram shows proper connections for both directions. See page 3 for instructions.

SWITCHBOARD CONTROL DESCRIPTION

These wall-mounting switchboard controls are designed for constant or variable speed operation of Onan battery charging generators. The charge rate is manually controlled by the operator whenever the generator speed varies.

Controls include a manual field rheostat, reverse current diode, voltmeter, ammeter, circuit breakers and marked terminals for connection to generator and batteries.



MANUFACTURER'S WARRANTY

Onan warrants, to the original user, that each product of its manufacture is free from defects in material and factory workmanship if properly installed, serviced and operated under normal conditions according to Onan's instructions.

Onan will, under this warranty, repair or replace, as Onan may elect, any part which on examination shall disclose to Onan's satisfaction to have been defective in material and workmanship; provided that such part shall be returned to Onan's factory or one of its Authorized Service Stations, transportation charges prepaid, not later than one (1) year after the product is first placed in service. Such defective part will be repaired or replaced free of charge, including labor (in accordance with rates approved by Onan) during the stated one (1) year coverage under this warranty.

THIS WARRANTY AND ONAN'S OBLIGATION THEREUNDER IS IN LIEU OF ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER OBLIGATIONS OR LIABILITIES, INCLUDING LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGE.

No person is authorized to give any other warranty or to assume any other liability on Onan's behalf unless made or assumed in writing by an Officer of Onan, and no person is authorized to give any warranty or to assume any liabilities on the Seller's behalf unless made or assumed in writing by such Seller.

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NOTE

GENERATOR SHAFT ROTATION IS DETERMINED WHILE LOOKING AT END OPPOSITE DRIVE SHAFT. ALL GENERATORS ARE POLARIZED FOR COUNTERCLOCKWISE ROTATION WHEN SHIPPED FROM FACTORY UNLESS OTHERWISE SPECIFIED.

INSTALLATION

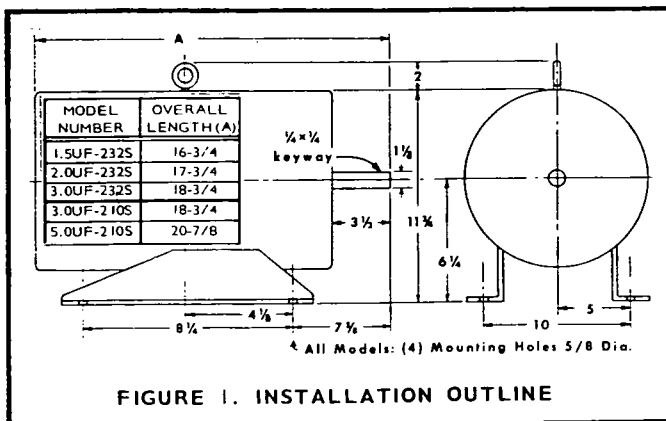
LOCATION

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

1. Ventilation - The generator creates a considerable amount of heat when operating under load conditions. It is of vital importance that this heat be dissipated by proper ventilation. If the generator is installed inside a small room or compartment, provide a vent for exhausting the air heated by the generator. Locate the heated air exhaust vent above the inlet vent. Heated air is discharged from the drive-shaft end of the generator.
2. Convenience to Driving Power- (Driving power is described as an engine or prime mover of the generator). Both driving source (engine) and driven counterpart (generator) must be bolted securely to a heavy mounting base to maintain pulley and shaft alignment. The direction of rotation of the generator will be determined by the direction of rotation of the driving unit.

The shaft of the generator and driving unit must be parallel and the pulleys must be lined up. Correct belt tension must be maintained. After the pulleys are in proper alignment both generator and driving source must be bolted down to a heavy rigid mounting base.

NOTE: If a flexible coupling is used, shaft alignment of the generator and driving unit must be accurately made and permanently maintained. Incorrect shaft alignment will cause excessive wear on both units and unnecessary loss of power from the driving unit.



3. Dusty or Damp Conditions - Avoid dusty or damp conditions as much as possible. Generator should be mounted under cover or inside a building to protect it against the weather.

MOUNTING THE GENERATOR

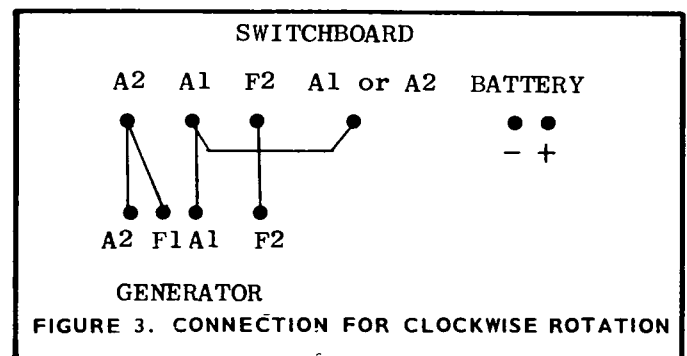
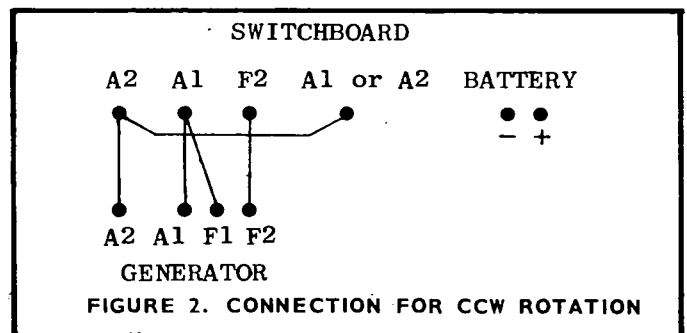
Provide a substantial mounting base of concrete, wood or steel and use large cap screws. The surface of the mounting base should be flat so that the generator mounting brackets will not be sprung when tightening into place. It should be possible to turn the generator shaft by hand after the generator is bolted down.

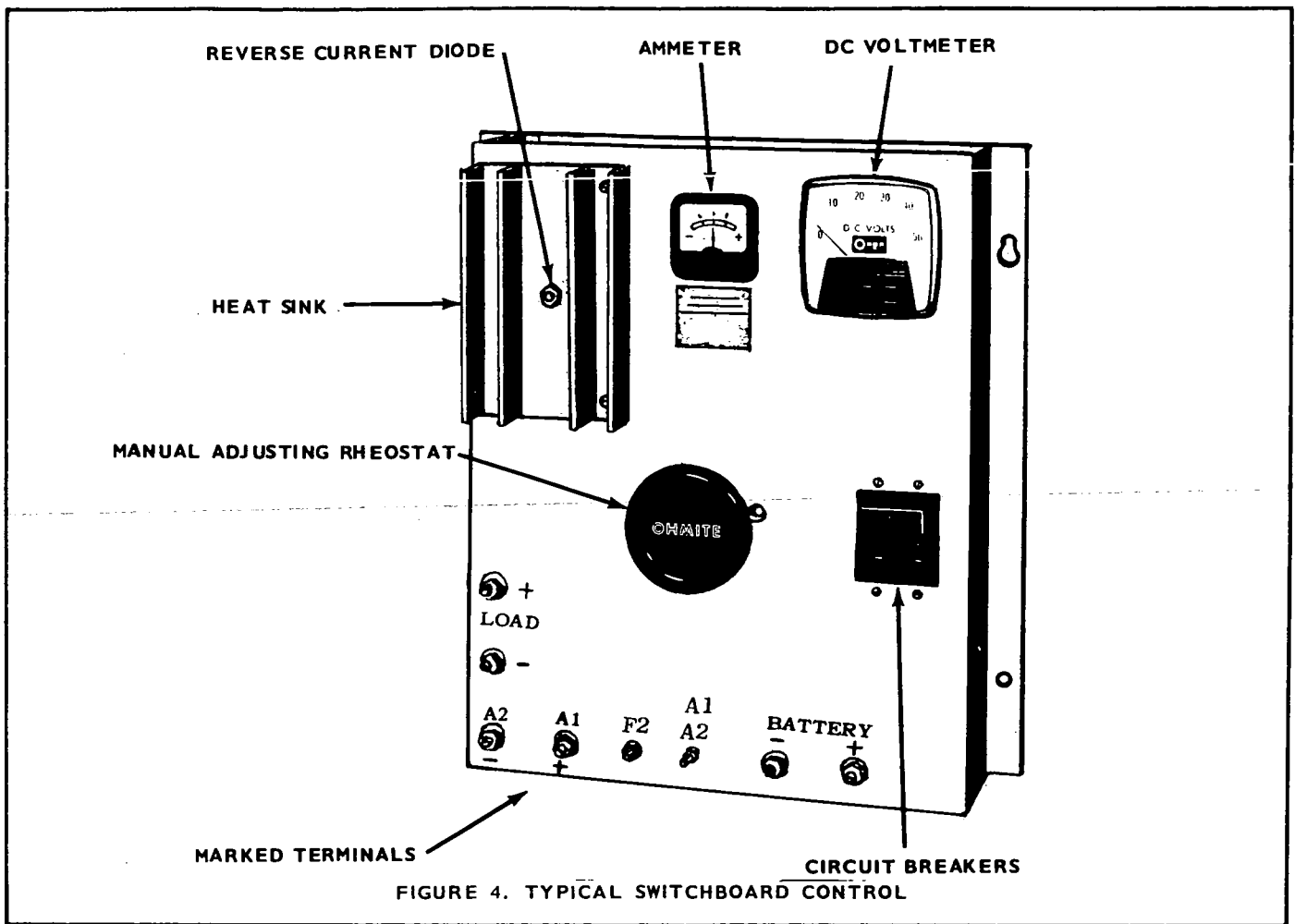
MOUNTING THE SWITCHBOARD

Switchboards are designed for wall mounting. Avoid excessive heat and vibration. They should be located for easy access and as near to generator and batteries as possible.

WIRING CONNECTIONS FOR SPEC. "51C" CONTROLS

The following diagrams show correct connections for generator to Spec 51C controls. Always remember that direction of rotation is determined looking at end opposite shaft. Be sure blower scroll is installed correctly for shaft rotation.



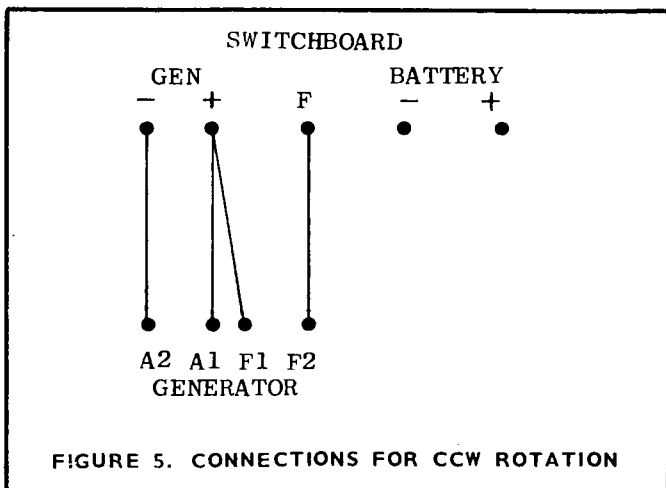


WIRING CONNECTIONS FOR SPEC 19 CONTROLS

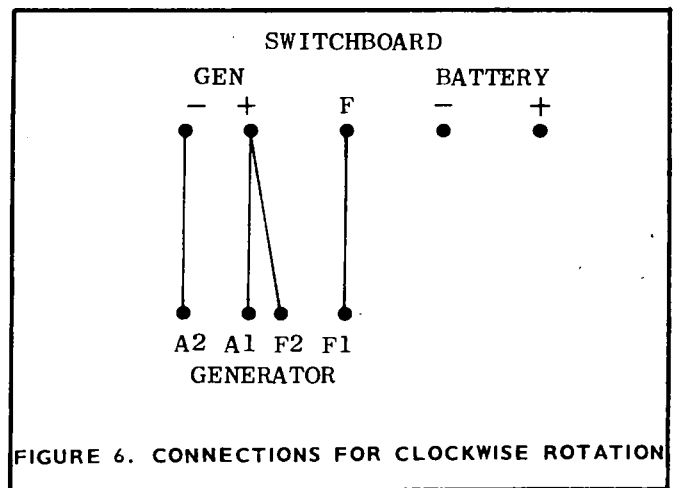
The following diagrams show correct connections for generator to Spec 19 controls. After connecting generator to control, connect battery cables to Battery "+ " and "- " terminals on the control.

CAUTION All warranties void if this equipment is operated with reverse polarity.

COUNTERCLOCKWISE



CLOCKWISE



OPERATION

BATTERY CHARGE RATE THEORY

Regulation is the control of voltage and amperes in the charging system. The battery, generator and rheostat must work together for proper operation. The battery's ability to resist a charge increases as the battery nears full charge and decreases when the battery becomes discharged.

Figure 7 is divided into a white area and a shaded area. The dividing line is 38.5 volts which represents a typical voltage regulator setting or limit for a 32 volt system. Thus the shaded area covers conditions which are prevented by the limiting action of the regulator, while the white zone is the working area of the battery. Battery terminal voltage is shown on the left side of the chart, and the charging current (amperes) from the DC generator is shown on the bottom. The heavy black lines or CHARGE VOLTAGE CURVES show what charge rate a healthy battery at 80°F can be expected to take at different voltages and various states of charge.

To use the chart, select a voltage and move straight across to the right until we intersect the charge voltage for the particular state of charge we are interested in. Moving straight down from the intersection we can read the charge rate in amperes. If we like, we can reverse this procedure, starting with a charge rate and reading off the corresponding voltage. The curves show that a battery in the more discharged condition will accept higher charge rates at fairly low voltages. For instance, the 1/2 charge curve shows that a battery in this condition will accept approximately 30 amperes at 38.5 volts for a 32 volt system and will take more at higher voltages. We can assume here, however, that even at higher voltages the current would be limited to the generator capacity. In the case of the DC generator this would be limited by the circuit breakers. We have assumed the limit to be 35 amperes in Figure 7.

As the battery becomes nearly charged, higher and higher voltages are required to maintain the same charge rate. The circuit breakers step in to limit the voltage, so the charge rate is reduced. Thus we see that a 3/4 charged battery at 38.5 volts can be charged at 15 amperes; at full charge a voltage of 38.5 gives only about 2 amperes.

We can state this principle of regulation in simple terms by saying - IF THE CHARGING VOLTAGE IS LIMITED; THE CHARGING RATE WILL BE REDUCED BY THE BATTERY AS IT COMES UP TO CHARGE.

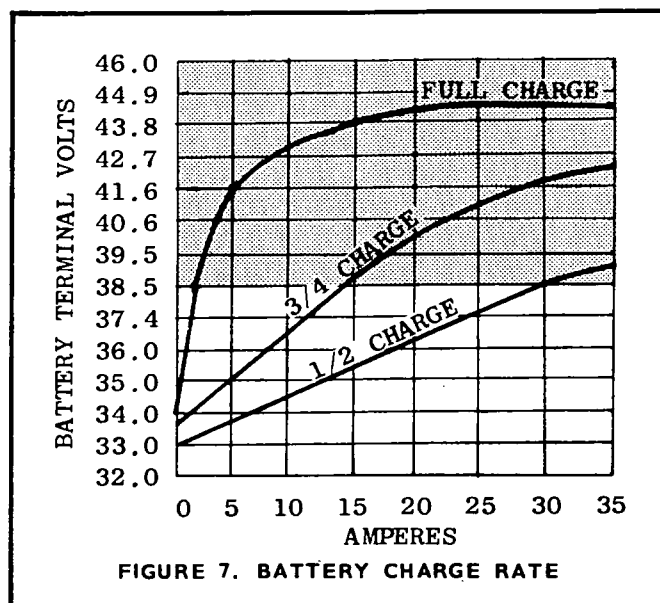


FIGURE 7. BATTERY CHARGE RATE

CONTROLLING THE CHARGE RATE

These controls are not automatic and therefore require adjustment whenever the generator speed varies or when battery condition changes. Adjust by turning the rheostat either clockwise or counterclockwise. Turning clockwise will give the maximum output. Always observe the ammeter and voltmeter on the control to obtain the desired setting.

CAUTION Do not operate generator and control when the driving unit speed is rapidly changing (increasing or decreasing in speed). Although the control is designed to operate over a wide speed range (1750-3500 rpm), the operator cannot adjust the manual field rheostat fast enough to follow rapid speed variations.

If driving unit speed is varying, turn the rheostat fully counterclockwise (no charge current) or open the circuit breakers until the speed stabilizes.

SAFETY DEVICES

The reverse current diode (relay on older models) in the control automatically disconnects the battery from the generator whenever the generator voltage falls below the battery voltage. If the operator forgets to adjust the manual rheostat as the generator speed in-

creases, the generator and rheostat are protected by circuit breakers (Fuses are used on older models). The circuit breaker in series with the load circuit of the generator prevents the load current from exceeding the maximum current rating of the generator. The circuit breaker in series with the manual field rheostat prevents the maximum current rating of the rheostat from being exceeded.

If the generator speed increases, with the control unattended, the generator voltage rises to a high value. When this occurs, the load circuit breaker opens first, disconnecting the battery from the generator. If the generator remains unattended after the load circuit breaker opens, the generator voltage rises to a high value causing the manual field rheostat circuit breaker to open. The generator voltage then falls to zero.

GENERATOR COOLING (Fig. 8)

The generator blower scroll is mounted at the factory for a counterclockwise rotation. If clockwise rotation is desired, scroll position must be reversed. The arrow printed on the scroll must be pointing in the direction of rotation of the shaft.

To reverse scroll, remove only the scroll with screen attached. Turn it end for end and reinstall so scroll will be at opposite end of air outlet hole.

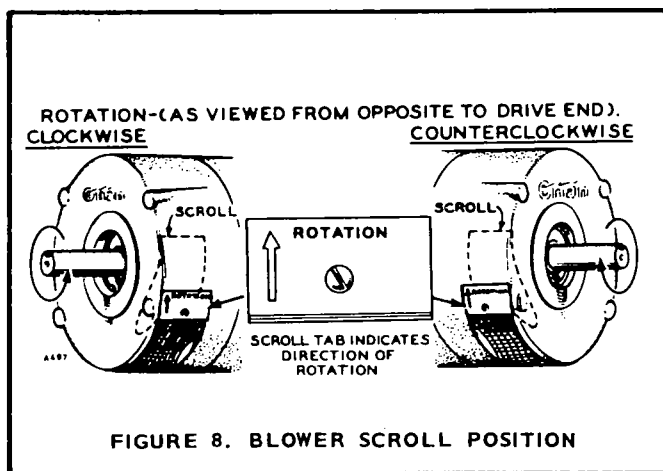


FIGURE 8. BLOWER SCROLL POSITION

CHANGING GENERATOR SHAFT ROTATION (counterclockwise to clockwise)

To reverse polarity for clockwise rotation as viewed from the end opposite shaft, proceed as follows:

1. Be sure the control is not connected to the generator.
2. Separate all leads coming out of the generator.
3. Reverse the scroll for clockwise operation. See Fig 8, Reversing the Scroll.
4. Get a good battery (or bank of batteries) in fully charged condition.
5. Connect the generator F2 lead to the battery positive (B+) terminal.
6. Touch the F1 lead of the generator to the battery negative (B-) terminal. Be sure a good contact is made. A definite spark (arc) should be observed between the F1 generator lead (terminal) and the negative (B-) battery terminal. If no spark (arc) is observed, check for a bad battery or open circuit between the F1 and F2 leads of the generator.
7. Disconnect the generator F2 lead from the battery positive (B+) terminal.

The generator should now be polarized for clockwise rotation. Now connect the generator to the control according to wiring diagram for clockwise rotation.

CAUTION

Extreme care must be taken when changing generator speed not to exceed rated current on the generator.

SERVICE AND MAINTENANCE

PERIODIC SERVICE AND INSPECTION

Follow a definite schedule of inspection and servicing. Make a good visual check before, while, and after generator is operating; look for loose or broken leads and bad connections.

Internal generator parts should be examined periodically. Remove end bell cover and inspect brushes, springs, bearings, etc.

BRUSHES

Replace the brushes when they wear to about 5/8 inch in length. Order replacement brushes by part number, never by description: similar brushes may have different electrical characteristics.

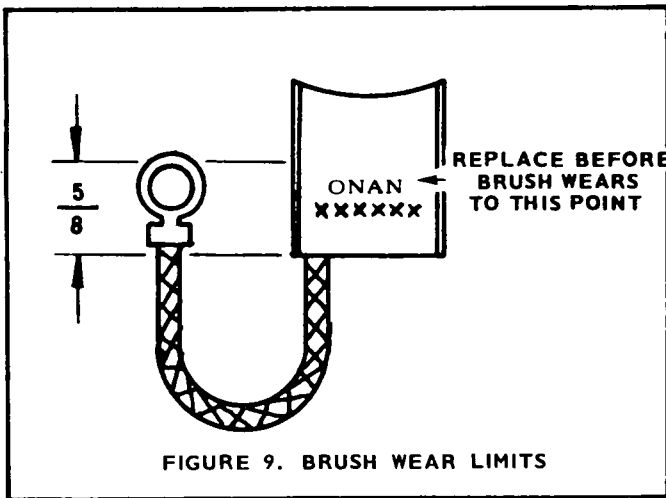


FIGURE 9. BRUSH WEAR LIMITS

CAUTION If brushes are not replaced by the time they wear to the stamped Onan name and number, severe damage to the commutator will take place (see Figure 9).

BRUSH RIG SETTING

These generators are properly adjusted when shipped from the factory. If you have replaced the brush rig follow these instructions:

1. Remove the end cover and band to allow access to brush rig.
2. Loosen the four cap screws holding the brush rig to the end bell.
3. Mark the new brush rig in the same location as the old one with a reference mark.
4. After you have made sure the brush rig is free to

rotate, rotate the rig back to the original location, start the unit and run at rated rpm. (Original location is shown in Fig. 10 with reference mark.)

5. Stop unit and inspect brush faces. They must be seated across the thickness of the brush for an accurate setting.
6. With a DC voltmeter (0-30 range) attached across the positive (+) and negative (-) brushes, start unit and run at rated rpm and no load.
7. Rotate brush rig in one direction until voltage starts to drop (or sparking occurs). Mark this point. Rotate in opposite direction until voltage starts to drop (sparking occurs) Mark this point also.
8. Approximately halfway between these two marks peak voltage should be reached.
9. Stop unit and tighten all four brush rig cap screws. Start unit again to make sure DC voltage is the same as Step 8 and that no sparking (or arcing) of the brushes occurs.
10. Mark the ring of the brush rig and end bell with a notch or paint.

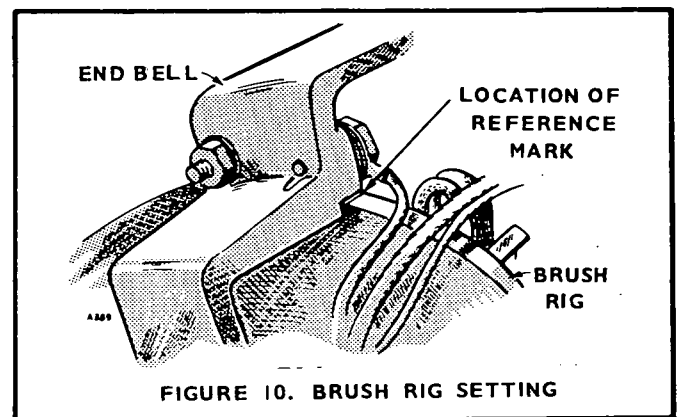


FIGURE 10. BRUSH RIG SETTING

BEARINGS

The ball bearings are double-sealed and lubricated for life.

MAJOR GENERATOR REPAIR

Several tests for open or grounded circuits can be made without disassembling the generator. However, if it becomes necessary to disassemble, proceed as follows:

- a. Remove the sheet metal end cover. Tag or otherwise mark each lead as it is disconnected, to assure correct reconnection.
- b. Remove all brushes and springs.

- c. Remove the hex screws holding the end plate at the drive end of the frame. With a soft faced mallet, tap the armature shaft at the brush rig end until the ball bearing is free of the end support. On reassembly, align the bearing notch with its support notch.
- d. Carefully withdraw the armature from the frame to prevent damage to the windings.

Armature Grounded (Figure 11): Use a continuity type test lamp set. Place one test prod on the commutator and the other prod on a bare clean part of the generator frame or armature shaft. The prods must make good electrical contact. The test set lamp should not light. If it does light up, the armature is grounded. If the armature tests grounded, replace with a new one.

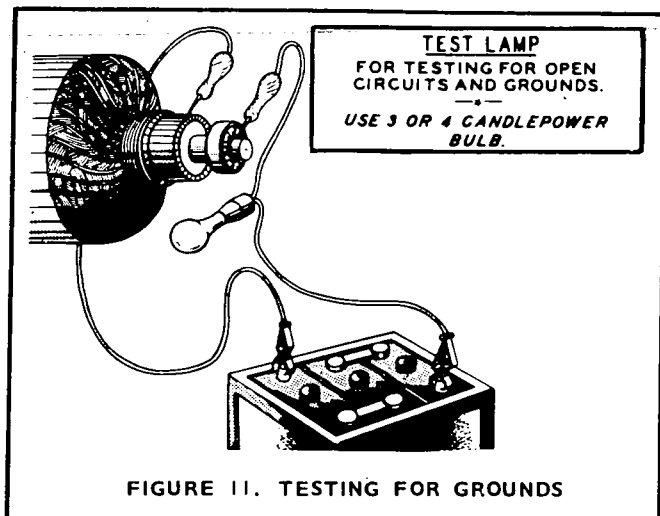


FIGURE 11. TESTING FOR GROUNDS

Testing The Armature For An Open Circuit (Figure 12): To test the DC winding of an armature for an open circuit, use an armature growler. Most electrical repair shops have such equipment. Remove the armature for testing. Proceed as follows:

1. Place the armature in the growler which is connected to alternating current. Rub a smooth steel blade (back edge of a hacksaw blade) across the segments of the commutator.
2. At some point around the commutator a spark should occur as the blade contacts the two adjacent segments. If a spark occurs, the circuit is complete (not open) between those two segments. Then rotate the armature just enough to test the next two segments.

Continue the rotating and testing until the commutator segments have been tested completely around. A good spark should occur between all adjacent segments when those segments and windings attached to them are in the correct position in the growler magnetic field. If no spark occurs, the winding between those two segments is open circuited. (There is a possibility that a short circuit of a winding might prevent the sparking, but then the armature would also be magnetized as described in the following paragraph).

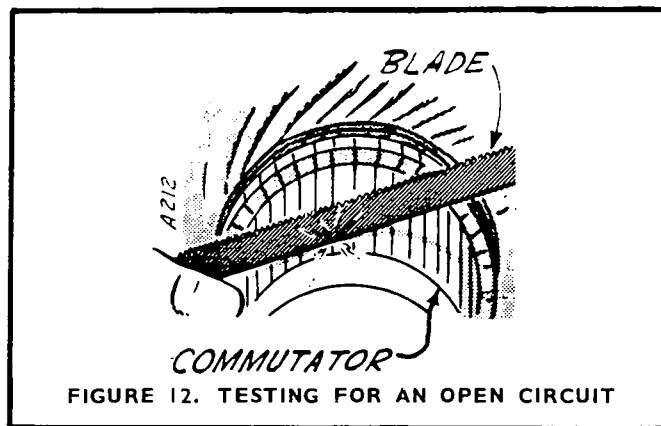


FIGURE 12. TESTING FOR AN OPEN CIRCUIT

Testing The Armature For Short Circuits (Figure 13): Place the armature in the growler which is connected to alternating current. Hold a steel knife blade (or hacksaw blade) 1/4 inch from the armature laminations. If the steel blade is attracted to any magnetized armature laminations, either the armature windings or commutator is short circuited. Do not test for magnetism at just one point of the armature laminations, but test all of the armature laminations, from one side over to the other side (along the dotted line of Figure 13). After testing the armature in one position, revolve the armature about 1/8 revolution and test for magnetism again. Continue the revolving and testing until the armature has been tested completely around.

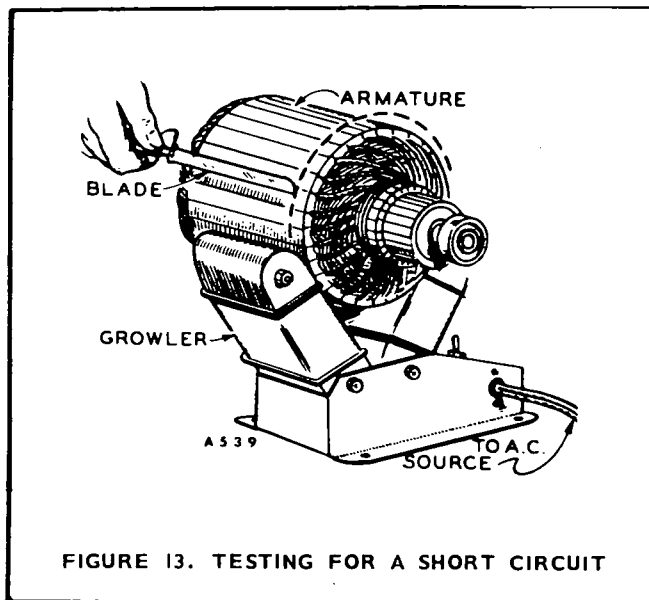


FIGURE 13. TESTING FOR A SHORT CIRCUIT

Field Windings, Open Circuit: A test lamp set can be used to test field windings for an open circuit. Place one test prod on one of the terminal ends of the field windings, and the other test prod on the other terminal end of the winding. The test lamp should light. If it does not, an open circuit is indicated. Check carefully to see that the open circuit is not at the terminal leads or a loose terminal. An open circuit due to a broken lead or loose terminal is easily repaired. An open circuit within a coil requires replacement of the set of coils

GENERATOR TROUBLE SHOOTING CHART

WE SUGGEST THAT ONLY A QUALIFIED ELECTRICIAN OR MECHANIC PERFORM THESE TESTS.

NATURE OF TROUBLE	POSSIBLE CAUSE	REMEDY
<p>Poor Commutation or Arcing at the Generator Brushes</p>	<p>Brushes out of neutral position.</p> <p>Brushes not seating properly.</p> <p>Generator heavily overloaded.</p> <p>Brushes binding in holder.</p> <p>Brush tension insufficient.</p> <p>Brushes worn too short.</p> <p>Brush tension unequal.</p> <p>Wrong type brush</p> <p>Loose commutator bars.</p> <p>High mica.</p> <p>Commutator out of round.</p> <p>Commutator surface dirty or oily.</p>	<p>Turn brush ring until the identifying marks are aligned.</p> <p>Sand the brush to the proper contour.</p> <p>If the DC amperage is more than stated on the generator nameplate, remove part of the load.</p> <p>Clean each brush and holder.</p> <p>Replace brush springs.</p> <p>Replace brushes.</p> <p>Replace weak brush springs.</p> <p>Replace with correct type and make of brush and spring.</p> <p>Replace with new armature.</p> <p>Undercut the mica.</p> <p>True the commutator in a lathe.</p> <p>Clean the commutator.</p>
<p>Generator Overheats.</p>	<p>Windings and parts covered with dirt and oil.</p> <p>Overloaded.</p> <p>Short circuit or grounded circuit in the field winding or armature winding.</p> <p>Excessive arcing at the brushes.</p> <p>Generator blower scroll installed in wrong position.</p>	<p>Clean generator.</p> <p>Check load or output of generator.</p> <p>Replace defective parts.</p> <p>See "Poor Commutation" above.</p> <p>Reverse blower scroll position.</p>
<p>Noisy Generator</p>	<p>Generator loose on base.</p> <p>Worn or defective bearing.</p> <p>Field pole rubbing armature.</p>	<p>Tighten mounting bolts.</p> <p>Replace worn parts. Check alignment.</p> <p>Tighten field poles to frame.</p>

NATURE OF TROUBLE	POSSIBLE CAUSE	REMEDY
<p>Generator Runs but does not Produce Current.</p>	<p>Brushes not contacting commutator.</p> <p>Open, short or grounded circuit in generator.</p> <p>Generator line leads broken or loose.</p> <p>Generator armature rotating in the wrong direction.</p>	<p>Free brushes in holders. Assemble brushes and springs correctly.</p> <p>Test windings and repair or replace defective parts.</p> <p>Tighten connections and replace broken leads.</p> <p>Correct direction of rotation. Or, connect wires, polarize field and re-install scroll to agree with direction of rotation.</p>
<p>Generator Produces Low Voltage</p>	<p>Speed low because of loose, slipping belts.</p> <p>Generator brushes not in neutral position.</p> <p>External short circuit on line.</p> <p>Open circuit of shunt field winding.</p> <p>Short circuit of windings in the field or armature.</p>	<p>Adjust belt tension.</p> <p>Turn brush ring until the identifying marks are aligned correctly.</p> <p>Test generator with line wires disconnected.</p> <p>Make proper connections according to wiring diagram.</p> <p>Replace defective part.</p>

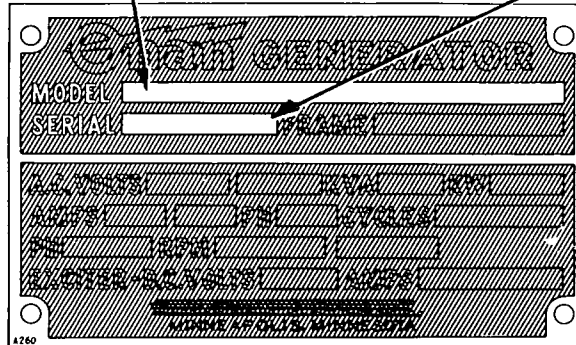
INSTRUCTIONS FOR ORDERING REPAIR PARTS

FOR PARTS OR SERVICE, CONTACT THE DEALER FROM WHOM YOU PURCHASED THE EQUIPMENT OR REFER TO YOUR NEAREST AUTHORIZED SERVICE STATION.

TO AVOID ERRORS OR DELAY IN FILLING YOUR ORDER, PLEASE FURNISH ALL INFORMATION REQUESTED.

REFER TO THE NAMEPLATE

1. Always give the Model No. ----- and Serial No. -----



2. Refer to the "Table of Ratings" near the front of this book to determine the "Parts Key No.", which agrees with your model, for selecting the correct part from the list. If your Model and Spec. No. is not shown use the list only as a guide and order by description.
3. Give the part number, description and quantity needed of each item. If an old part cannot be identified return the part prepaid to your dealer or nearest AUTHORIZED SERVICE STATION. Print your name and address plainly on the package. Write a letter to the same address stating the reason for returning the part.
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 indicates items are back ordered.

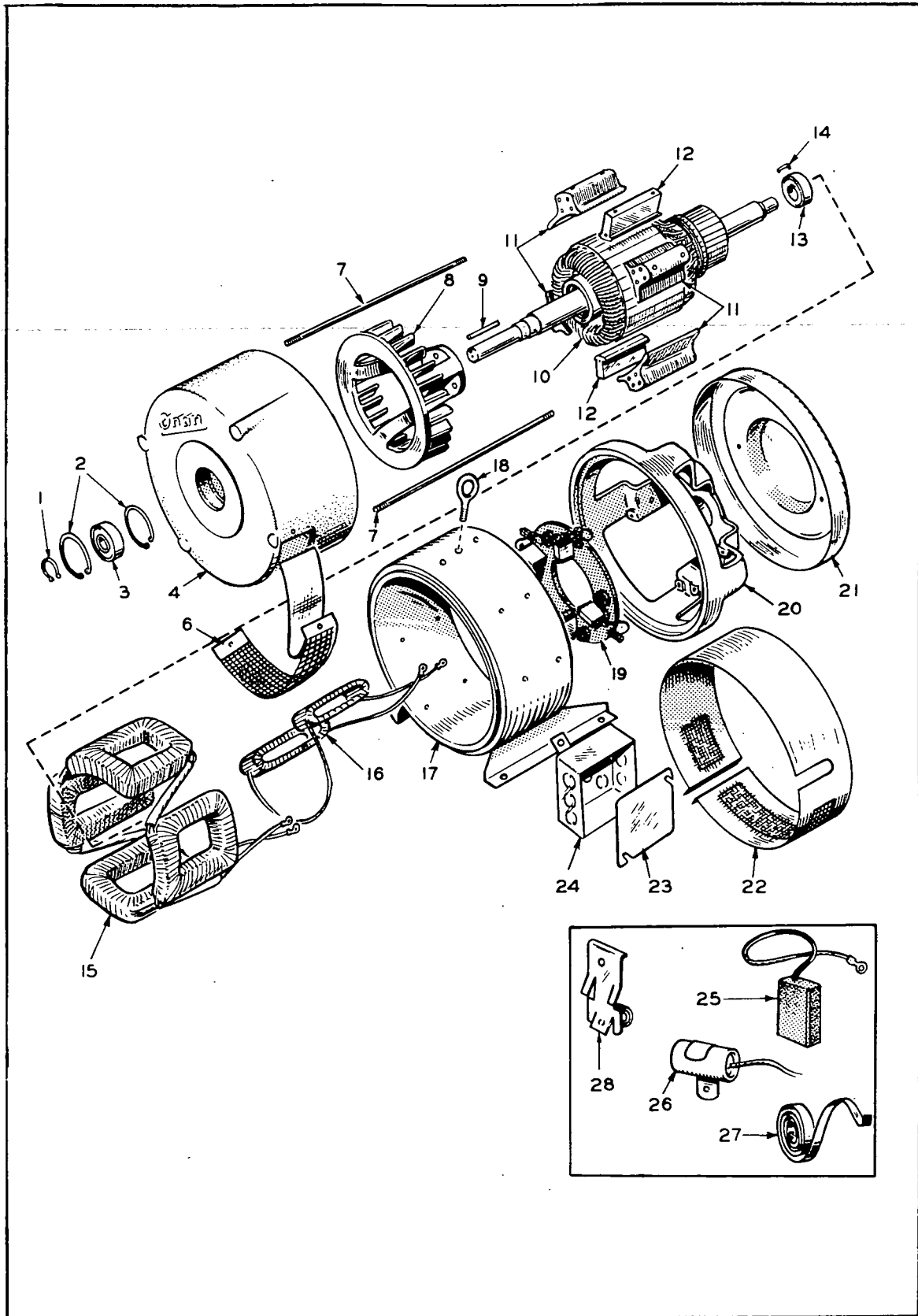
"Prices are purposely omitted from this Parts Catalog due to the confusion resulting from fluctuating costs, import duties, sales taxes, exchange rates, etc.

For Current parts prices, consult your Onan Dealer, Distributor or Parts and Service Center."

"En esta lista de partes los precios se omiten de proposito, ya que bastante confusion resultado de fluctuaciones de los precios, derechos aduanales, impuestos de venta, cambios extranjeros etc.

Consiga los precios vigentes de su distribuidor de productos ONAN".

PARTS LIST



GENERATOR PARTS ILLUSTRATION

PARTS LIST

REF. NO.	PART NO.	QTY.	DESCRIPTION
----------	----------	------	-------------

GENERATOR PARTS

NOTE: For explanation of "Parts Key No." refer to "Table of Ratings" near the front of this book.

1	518-12	1	Ring, Retaining - External - Drive End Bearing to Shaft.
2	518-166	2	Ring, Retaining - Internal - Drive End Bearing to End Bell.
3	510A52	1	Bearing, Armature - Drive End.
4	211E127	1	Bell, End - Drive End.
6	234A77	1	Scroll and Screen, Blower.
7			Stud, Generator Through.
	520A490	2	For models with Parts Key No. 1.
	520A145	2	For models with Parts Key No. 2.
	520A340	2	For models with Parts Key Nos. 3 and 4.
	520A486	2	For models with Parts Key No. 5.
8	205C60	1	Blower, Air.
9	515A45	1	Key, Armature Shaft Drive (Was 515-91).
10			Armature Wound Assembly.
	201A967	1	For models with Parts Key No. 1.
	201A969	1	For models with Parts Key No. 2.
	201A962	1	For models with Parts Key No. 3.
	201A963	1	For models with Parts Key No. 4.
	201A984	1	For models with Parts Key No. 5.
11			Shoe, Pole - Field.
	221A54	4	For models with Parts Key No. 1.
	221B55	4	For models with Parts Key No. 2.
	221B126	4	For models with Parts Key Nos. 3 and 4.
	221B131	4	For models with Parts Key No. 5.
12			Interpole, Commutating.
	221A108	2	For models with Parts Key No. 1.
	221A102	2	For models with Parts Key No. 2.
	221A129	2	For models with Parts Key No. 3.
	221A133	2	For models with Parts Key Nos. 4 and 5.
13	510A47	1	Bearing, Armature - Brush Rig End.
14	232A596	1	Clip, Bearing.
15			Coil Set, Field.
	222A1195	1	For models with Parts Key No. 1.
	222A1197	1	For models with Parts Key No. 2.
	222A1541	1	For Models with Parts Key No. 3.
	222A1543	1	For models with Parts Key No. 4.
	222A1547	1	For models with Parts Key No. 5.

PARTS LIST

REF. NO.	PART NO.	QTY.	DESCRIPTION
GENERATOR PARTS (Cont.)			
16			Coil Set, Commutating.
	222A1380	1	For models with Parts Key No. 1.
	222A1198	1	For models with Parts Key No. 2.
	222A1542	1	For models with Parts Key No. 3.
	222A1544	1	For models with Parts Key No. 4.
	222A1548	1	For models with Parts Key No. 5.
17			Frame, Generator.
	210C1678	1	For models with Parts Key No. 1.
	210C1677	1	For models with Parts Key No. 2.
	210C1648	1	For models with Parts Key Nos. 3 and 4.
	210C1682	1	For models with Parts Key No. 5.
18			Bolt, Eye - Lifting.
	403A95	1	For models with Parts Key Nos. 1, 2, 3 & 4.
	410P228	1	For models with Parts Key No. 5.
19			Rig Assembly, Brush - Includes Brushes and Springs.
	212C205	1	For models with Parts Key No. 1.
	212C125	1	For models with Parts Key No. 2 - Replaces 212B79.
	212C244	1	For models with Parts Key No. 3.
	212C237	1	For models with Parts Key Nos. 4 and 5.
20			Bell, End - Brush Rig End.
	211D111	1	For models with Parts Key No. 1.
	211D97	1	For models with Parts Key Nos. 2, 3, 4, & 5
21	234C47	1	Cover, End Bell.
22	234B65	1	Band, End Bell.
23	330-6	1	Cover, Junction Box.
24	330B47	1	Box, Junction.
25			Brush, Commutator.
	214A9	4	For models with Parts Key No. 1.
	214A30	8	For models with Parts Key No. 2.
	214A68	4	For models with Parts Key No. 3.
	214A65	4	For models with Parts Key Nos. 4 and 5.
26	312A17	2	Condenser - .5 Mfd.
27			Spring, Commutator Brush.
	212A1003	4	For models with Parts Key No. 1.
	212A1003	8	For models with Parts Key No. 2.
28			Spring, Commutator Brush.
	212B1106	4	For models with Parts Key No. 3.
	212B1105	4	For models with Parts Key Nos. 4 and 5.

NOTE: If your generator nameplate carries a different model or Spec. No. than listed in this manual, order replacement parts by description only, not by the part numbers given in the Parts List. Always be sure to furnish the Model, Spec. and Serial No. of the generator as given on its nameplate.

PARTS LIST

NOTE: For explanation of ordering control parts, refer to the Table Of Controls near the front of this book.

PARTS!

LOOK FOR THEM ASK FOR THEM BE SURE YOU GET GENUINE ONAN REPLACEMENT PARTS. NEVER ACCEPT SUBSTITUTES! IF YOU WANT TO MAKE YOUR ONAN ELECTRIC PLANT OR ENGINE AS GOOD AS NEW, WATCH FOR THE GREEN AND WHITE LABEL WITH THE IDENTIFYING WORDS: GENUINE ONAN PARTS.

SERVICE!

REMEMBER TOO, THAT ONAN AUTHORIZED SERVICE STATIONS, WITH THEIR FACTORY TRAINED PERSONNEL, HAVE THE BEST OF FACILITIES FOR COMPLETE OVERHAULING AND REBUILDING YOUR ONAN ELECTRIC PLANT OR ENGINE. SEE YOUR PARTS AND SERVICE CENTER FOLDER FORM F-115.