Part No. 45670

Sears

owners manual

MODEL NO.
580.320580

CAUTION: READ ALL RULES OF SAFETY AND INSTRUCTIONS CAREFULLY TO PREVENT ACCIDENTS.

INSTALLATION
OPERATING INSTRUCTIONS
SERVICING
REPAIR PARTS

PORTABLE ALTERNATOR

4000 WATT Pulley Driven

Sears, Roebuck and Co., Chicago, Ill. 60684 U.S.A.

SB-65480-101

FULL ONE YEAR WARRANTY

For one year from date of purchase Sears will repair any defect in material or workmanship in the Alternator at no charge.

If the Alternator is used for commercial or rental purposes this warranty applies for only thirty days from date of purchase.

Service under this warranty is available by contacting the nearest Sears store or service center throughout the United States or Canada.

Sears, Roebuck And Co.
BSC 41-3
Sears Tower
Chicago, IL 60684

IMPORTANT

As you read your manual, watch for the words WARNING or CAUTION. These words mean PAY ATTENTION – BE ALERT. Failure to comply with instructions following these words can result in personal injury or damage to equipment.

RULES OF SAFETY

- Keep clear of moving parts, such as V-belts and sheaves.
- Never work on the alternator while it is running.
- The unit must be securely mounted. Install it properly and then inspect frequently for loose, missing or damaged fasteners.
- Maintain proper tension and alignment on V-belts.
- Never plug in electrical loads until the unit's voltmeter indicates that the proper operating speed has been reached.
- Never exceed the wattage capacity of the alternator unit. Total the wattage requirements of all equipment powered by the unit.
- Maintain power cords in good condition. The alternator produces lethal voltages. TREAT IT WITH RESPECT.
- Read all instructions carefully before installing or operating the alternator.

SPECIFICATIONS

MODEL NO.	580.320580
WATTAGE CAPACITY	4000 Watts
VOLTAGE	120/240
AMPERAGE	33.3 at 120 Volts 16.7 at 240 Volts
FREQUENCY	60 Hz
PHASES	Single Phase
RPM	3600
HORSEPOWER REQUIRED TO DRIVE ALTERNATOR	Minimum of 10 H.P.
VOLTAGE REGULATION	± 2% at 3600 rpm
DIMENSIONS (IN INCHES)	Length - 19 Width - 8 Height - 11

TABLE OF CONTENTS

SECTION 1
GENERAL INFORMATION

INTRODUCTION

The compact 4000 watt pulley driven alternator is dseigned to be truly universal. It can be mounted anyplace a driving force is available, and taken anywhere there's a job to be done.

The unit is designed to be operated in either direction at 3600 rpm. All that is necessary is to mount the unit to a hefty board or metal platform and then use your own engine to drive it.

NOTE
The alternator requires at least a 10 horsepower engine.

Study this manual carefully before attempting to install or operate your alternator. Comply with all instructions and rules of safety.

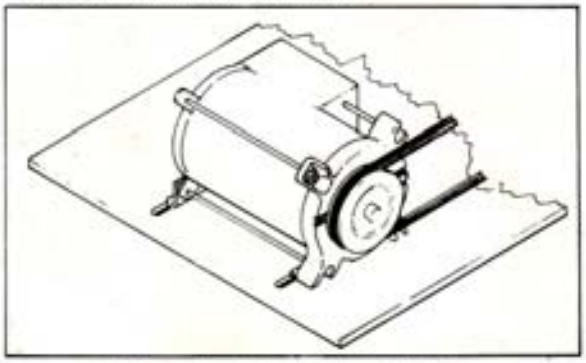
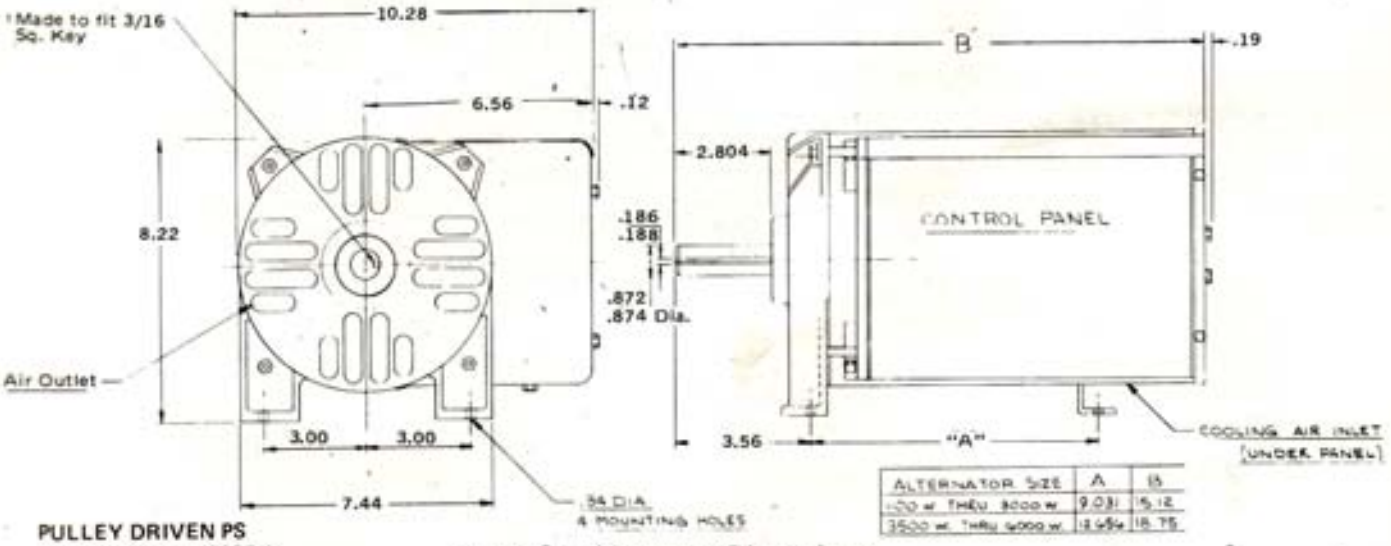


Figure 1 – Typical Installation



PULLEY DRIVEN PS
ALTERNATOR 45935-A

Figure 2 – Alternator Dimensions

ALTERNATOR DIMENSIONS

To help you plan your installation, major alternator unit dimensions are given in Figure 2.

Notice that the cooling air inlet is located under the control panel, while the air outlet is on the pulley end of the alternator. Make sure the air inlet and outlet are not blocked. An adequate cooling air flow is essential for operation.

CAUTION

Any installation that blocks the flow of cooling air can cause serious heat damage to the alternator.

TRACTOR MOUNTING KIT

A kit can be purchased for mounting your pulley driven alternator to the Sears 12, 14 or 16 horsepower suburban tractor. Figure 3 shows a "typical" tractor mounted unit. Complete installation instructions are included with the mounting kit.

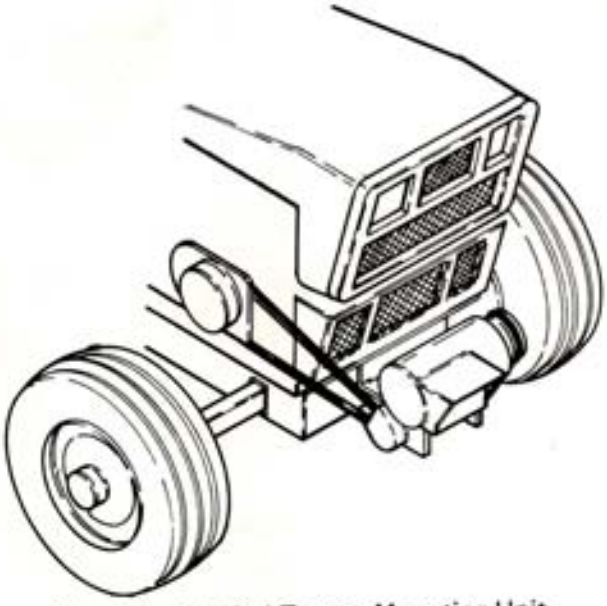


Figure 3 – Typical Tractor Mounting Unit

PULLEYS

A single groove gripbelt pulley (or sheave) with a split taper bushing is recommended for driving the unit. Nominal bore diameter of the split taper bushing is 7/8 inch.

The alternator will produce 120 volts of alternating current (AC), at a frequency of 60 Hz, when driven at 3600 rpm. If you know the diameter of the engine pulley and its rpm, the required diameter of the alternator pulley can be found as follows:

$$\frac{\text{ENGINE PULLEY DIAMETER} \times \text{RPM}}{3600} = \text{Alternator Pulley Diameter}$$

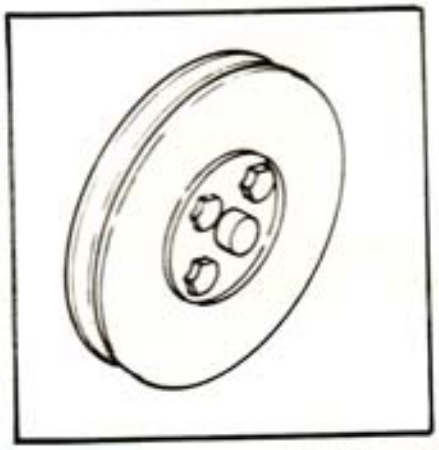


Figure 4 – Typical Pulley with Split Taper Bushing

For example, if the engine pulley diameter is 5 inches and the engine will produce 10 horsepower at 3000 rpm, find the required alternator pulley diameter as follows:

$$\frac{\text{ENGINE PULLEY DIAMETER} \times \text{RPM}}{3600} = \text{Alternator Pulley Diameter}$$

$$5 \times 3000 = \frac{15{,}000}{3600} = 4.17 \text{ inches}$$

In this case the diameter of the alternator pulley should be 4.17 inches (or approximately 4-1/4 inches, since engine speed can be varied).

If the diameter of the alternator pulley and the speed of the engine pulley are known, the required diameter of the engine pulley can be found by its rpm and then dividing the product by engine pulley speed. For example, if the alternator pulley diameter is 3.375 (3-3/8) inches, its required speed is 3600 rpm, and engine pulley speed is 3000 rpm to produce the required 10 horsepower:

$$\frac{\text{Alternator Pulley Diameter} \times \text{RPM}}{\text{Engine Pulley Speed}} = \text{Engine Pulley Diameter}$$

$$3.375 \times 3600 = \frac{12150}{3000} = 4.05 \text{ inches}$$

An alternator pulley diameter of approximately 4 inches would provide satisfactory alternator speeds, in this case.

CAUTION

Be sure that pulleys and V-belts are matched.

V-BELTS

A standard "A" type V-belt having a 1/2 inch width is recommended. The V-belt and pulley must be matched, to prevent slippage, excessive wear, and breakage. Belt length will depend on the individual installation.

NOTE

Belts are normally ordered by giving the belt type (which denotes cross-section) followed by the belt's standard length. For example, a 42 inch belt with a type "A" cross-section is an A-42 belt.

A cross-section of a typical "A" type belt is shown in Figure 5. The width and thickness of V-belts belts may vary between manufactures. For this reason, it is recommended that different makes of belts not be used on the same belt drive system.

To drive your 4000 watt unit, 2 V-Belts on a multi-groove sheave is required.

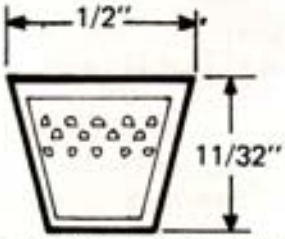


Figure 5 – Typical "A" type V-Belt Cross Section

The following suggestions are offered for proper V-belt installation

Figure 6

PROVIDE TAKE-UP

Install the alternator on an adjustable base. This will allow ample room for installation and for taking up slack to compensate for belt stretch and wear.

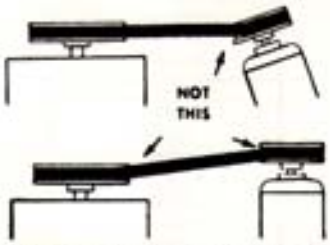


Figure 7

MOUNT BELTS STRAIGHT

Shafts must be parallel and sheaves aligned to prevent unnecessary wear.

Figure 8

DON'T OVERLOAD

Don't overload the driving sheave. Provide a drive adequate for the maximum load.

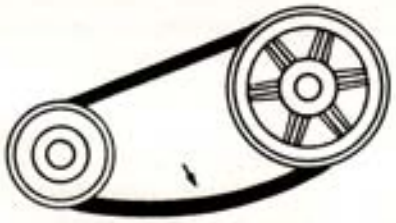


Figure 9

ELIMINATE SLACK

Slack belts wear out, cause slippage and deliver less power. Provide proper tension. See Section 3, **MAINTENANCE.**

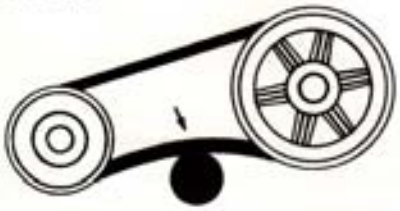


Figure 10

AVOID BELT IDLERS

Do not use belt idlers unless it is absolutely necessary.

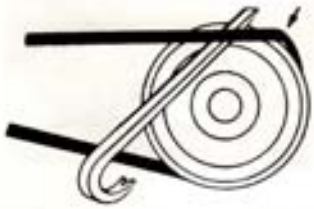


Figure 11

DON'T FORCE BELT

Loosen the alternator mounts so the belt slips over the sheave easily. Forcing the belt will break the cords and cause early belt failure.

Figure 12

USE LARGER SHEAVES FOR LONGER DRIVE LIFE

WATTAGE AND POWER

Electrical power is usually measured in **WATTS.** The power capacity of the alternator covered by this manual is 4000 watts. This wattage capacity should never be exceeded.

Add up the wattages of all equipment to be powered at one time by your alternator. This total should not exceed 4000 watts. Obtain wattages directly from equipment nameplates whenever possible. If wattage is not given, wattage requirements can be found by multiplying volts times amps. For example, if an appliance requires 120 volts at 10 amps for its operation:

WATTS = Volts x Amps
WATTS = 120 x 10
WATTS = 1200

Some motors require more power for starting than for on-speed operation. To find the watts of power needed to start a motor, first locate the type of motor and its horsepower rating on the motor nameplate. Then locate the required starting and running watts in the following **MOTOR STARTING REQUIREMENTS** chart. (shown below)

USING THE VOLTMETER

The voltmeter on your alternator unit is a valuable indication that proper voltage and frequency are being delivered to equipment being operated by the unit.

Figure 13

Never attempt to run equipment when the voltmeter needle is above or below the green band. If voltage is incorrect, frequency will also be wrong, and damage to equipment can result.

ELECTRICAL OUTLETS

Figure 14

The 120 volt parallel blade outlets on the control panel are each rated at 125 volts at 15 amps. The volts times amps method (previously discussed) can be used to determine wattage capacity of these outlets, as follows:

WATTS = Volts x Amps
WATTS = 125 x 15
WATTS = 1875

Wattage capacity of each 120 volt outlet is 1875 watts. Never plug equipment into either outlet requiring more than 1875 watts of power.

Figure 15

The 240 volt, 4-prong, twistlock outlet is rated at 20 amps, giving it a wattage capacity of 4800 watts. The full 4000 watt capacity of the unit can be taken from this outlet, providing no other outlets are being used.

RULE 1 Do not exceed the 4000 watt capacity of the alternator.

RULE 2 Do not exceed voltage, amperage or wattage ratings of individual outlets.

MOTOR STARTING REQUIREMENTS

MOTOR STARTING REQUIREMENTS		APPROXIMATE STARTING WATTS			
Motor H.P. Rating	Approx. Running Watts	Universal Motors	Repulsion Induction Motors	Capacitor Motors	Split Phase Motors
⅛	275	400	600	850	1200
¼	400	500	850	1050	1700
⅓	450	600	975	1350	1950
½	600	750	1300	1800	2600
¾	850	1000	1900	2600	*
1	1000	1250	2300	3000	*
1½	1600	*	3200	4200	*
2	2000	*	3900	5100	*
3	3000	*	5200	6800	*
5	4800	*	7500	9800	*

*Motors of higher horsepower shown in this classification are not generally used.

ACCESSORIES

Several accessory items can be purchased which will permit your unit to be used as a source of emergency power for your home, or other building. These accessories, when used with your alternator unit, make up what is called a **HOME STAND-BY ELECTRICAL SYSTEM. A TYPICAL** Home Stand-By system is shown in Figure 16.

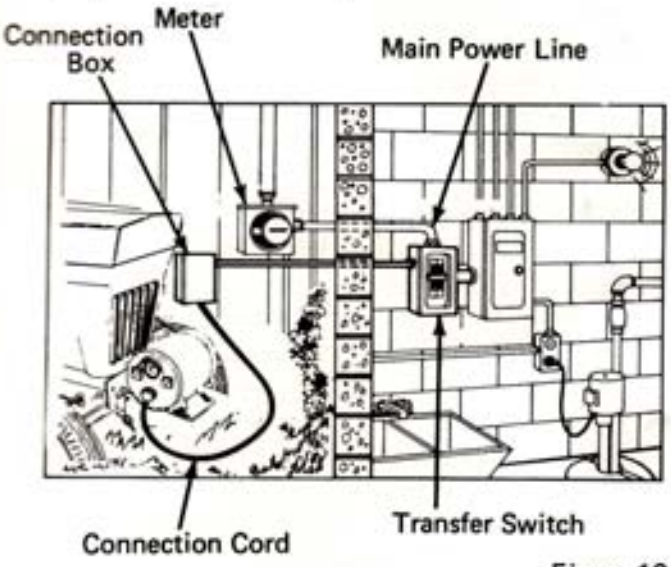


Figure 16

A connection kit is available which consists of an **INLET BOX** and a **CONNECTION CORD**. The connection kit is a 4-wire hook - up for a 240 volt outlet. Order Model No. 322260.

The transfer switch is required to prevent electrical "Feed-Back" into the commercial power lines. Select the proper switch based on commercial amperage input to the home. If commercial amperage service is less than 100 amps, order a 100 amp transfer switch, Model No. 580.322240. If commercial amperage input is less than 200 amps order a 200 amp transfer switch, Model No. 580.322250.

The inlet box and transfer switch must be permanently installed.

WARNING

Installation of the inlet box and transfer switch should be done by a competent electrician in accordance with applicable electrical codes. Improper or unauthorized installation is not only extremely dangerous, but may void your warranty.

Before you have your Home Stand-By system installed, make sure the wattage capacity of your alternator is sufficient to handle the job. Add up the wattages of all tools, equipment and appliances. The total wattage should not exceed the power rating of your unit.

SECTION 2

OPERATING INSTRUCTIONS

BEFORE STARTING THE UNIT

Unplug all electrical loads. Never start the unit under load. Do not plug in power cords until the volt-meter needle remains steadily in the green area on the dial face. (See **USING THE VOLTMETER** in Section 1.)

STARTING THE UNIT

Start the driving engine. Slowly bring the unit up to speed until the voltmeter needle is in the green band. Plug in the desired electrical loads. **DO NOT EXCEED THE UNIT'S WATTAGE CAPACITY.**

STOPPING THE UNIT

Before shutting down, unplug all electircal loads. Let the unit run for several minutes without load.

CAUTION

Provide adequate air flow for the alternator unit. Insufficient cooling air can seriously damage the alternator.

BRUSHES AND SLIP RINGS

Slip rings are made of a "sintered" brass material, which is extremely resistant to wear. Under normal use, no maintenance problems should ever be experienced. However, it is possible that a dull oxide coating may form on slip rings after an extended period of storage. If no electrical output occurs after storage, brushes should be inspected and slip rings cleaned by a Sears Service Technician.

PULLEYS

The following rules should be followed in the care and maintenance of pulleys:

1. Check the engine pulley and alternator pulley for proper alignment about every 8 hours of operation. Shafts must be parallel and pulley grooves aligned.
2. Never drive alternator pulleys on or off the shaft. The shaft should be kept smooth and clean. Remove burrs by dressing lightly with a finishing file. Wipe shaft and bores clean with oil.
3. Check split taper bushing bolts for tightness every 8 operating hours. Re-tighten if necessary.
4. Never install new V-belts into pulleys with worn grooves. Pulleys with worn grooves should be replaced.

To remove pulleys with a split taper bushing proceed as follows:

Figure 14

Remove capscrews. (see figure 14)

Figure 15

Install 2 capscrews into "Push-Off" holes in flange. Tighten capscrews until pulley is loose. (Figure 15)

Figure 16

Remove the pulley. (Figure 16)

REINSTALL PULLEYS AS FOLLOWS:

Figure 17

Install the bushing loosely into the pulley and tighten the capscrews.

Place the pulley on the alternator. Align the engine pulley and the alternator pulley along the edges of both sheaves.

Figure 18

Tighten the capscrews by following the instructions furnished with the split taper bushing.

V-BELTS

Comply with the following rules in the care and maintenance of V-Belts:

1. Maintain proper belt tension. Tighten belts just enough to take out the slack. To check for proper tension, strike the belt with the fist. Properly adjusted belts will vibrate and feel "alive." Belts that are too loose will feel "dead."
2. Keep belts clean and free of oil. Clean by wiping with a dry cloth. Remove dirt by washing in soap and water and rinsing well. Clean off grease and oil with carbon tetrachloride.
3. Never use belt dressing on a V-Belt.
4. The V-Belt should ride in the sheave groove so that the top surface of the belt is just above the highest point of the sheave.
5. Never leave V-Belts exposed to sunlight.

STORAGE

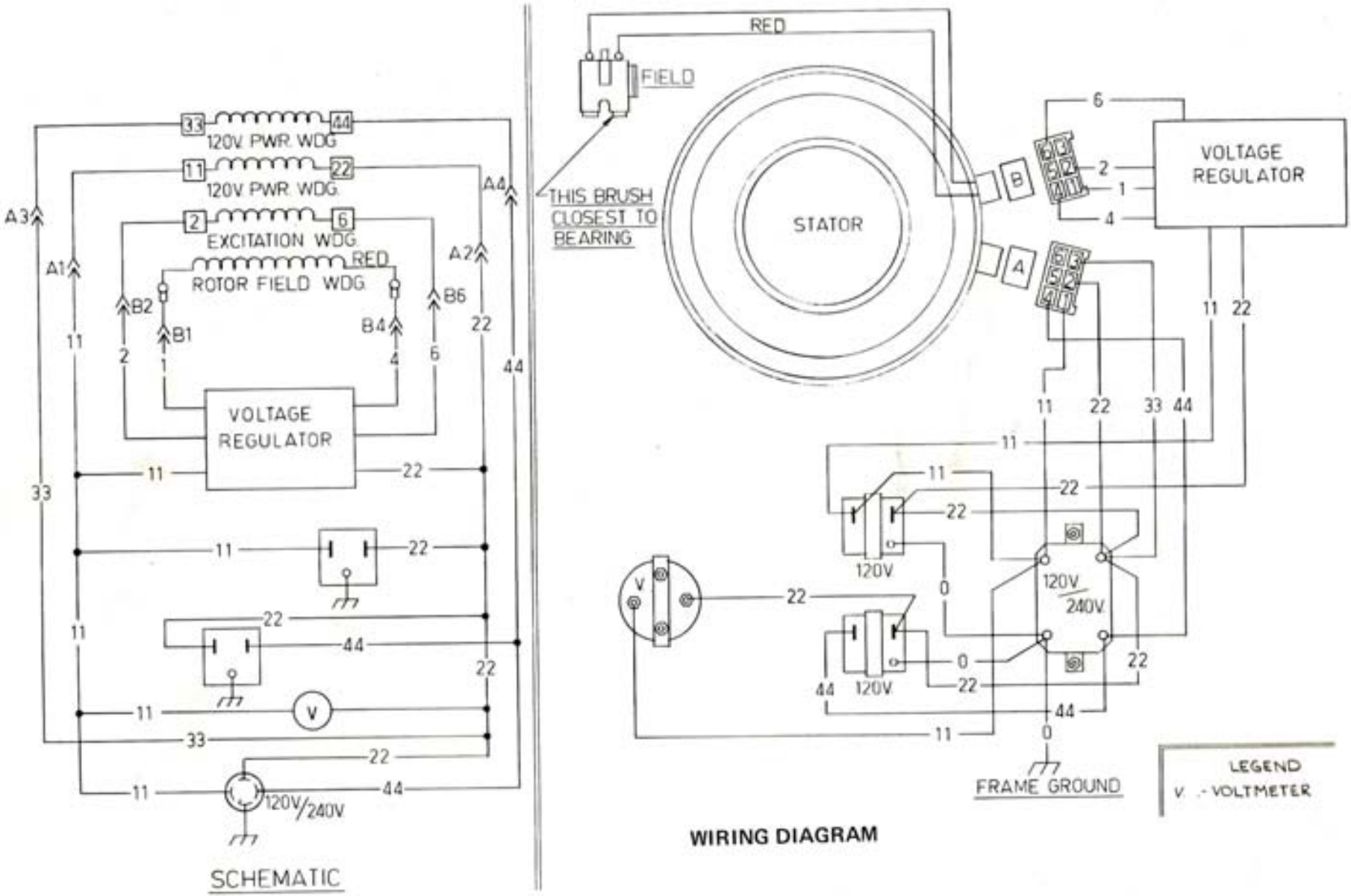
Keep extra V-Belts stored in a cool, dry, dark place.

Cover and store the alternator in a dry place. Units that have been stored over a period of time may develop a dull, tarnished, oxide coating on slip rings. If a unit that has been stored will not develop full A-C power, inspect slip rings. They should have a shiney appearance. If they appear dull or tarnished they should be cleaned.

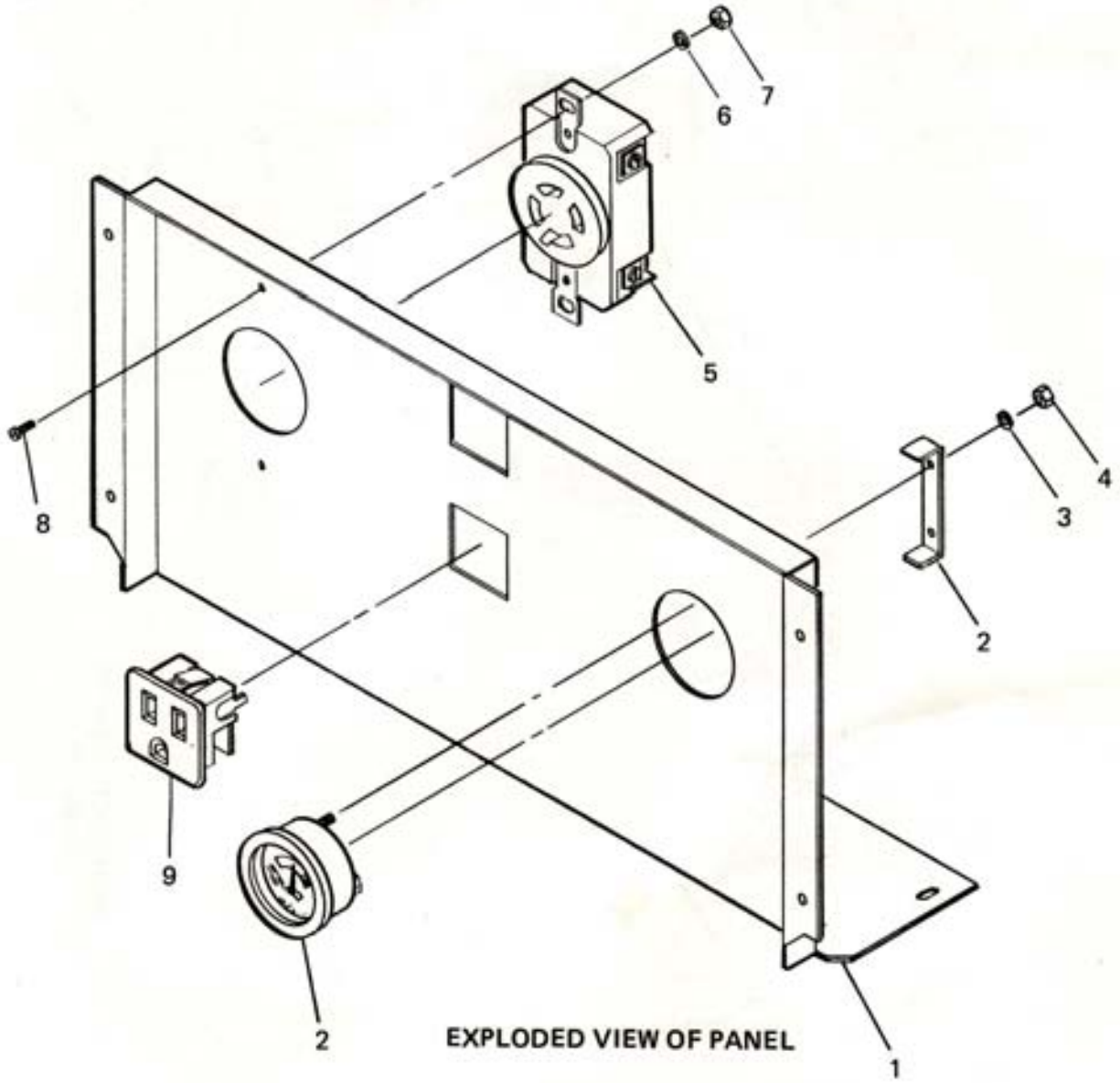
MAINTENANCE RECORD

After using and servicing the machine, enter the data on this log for future reference.

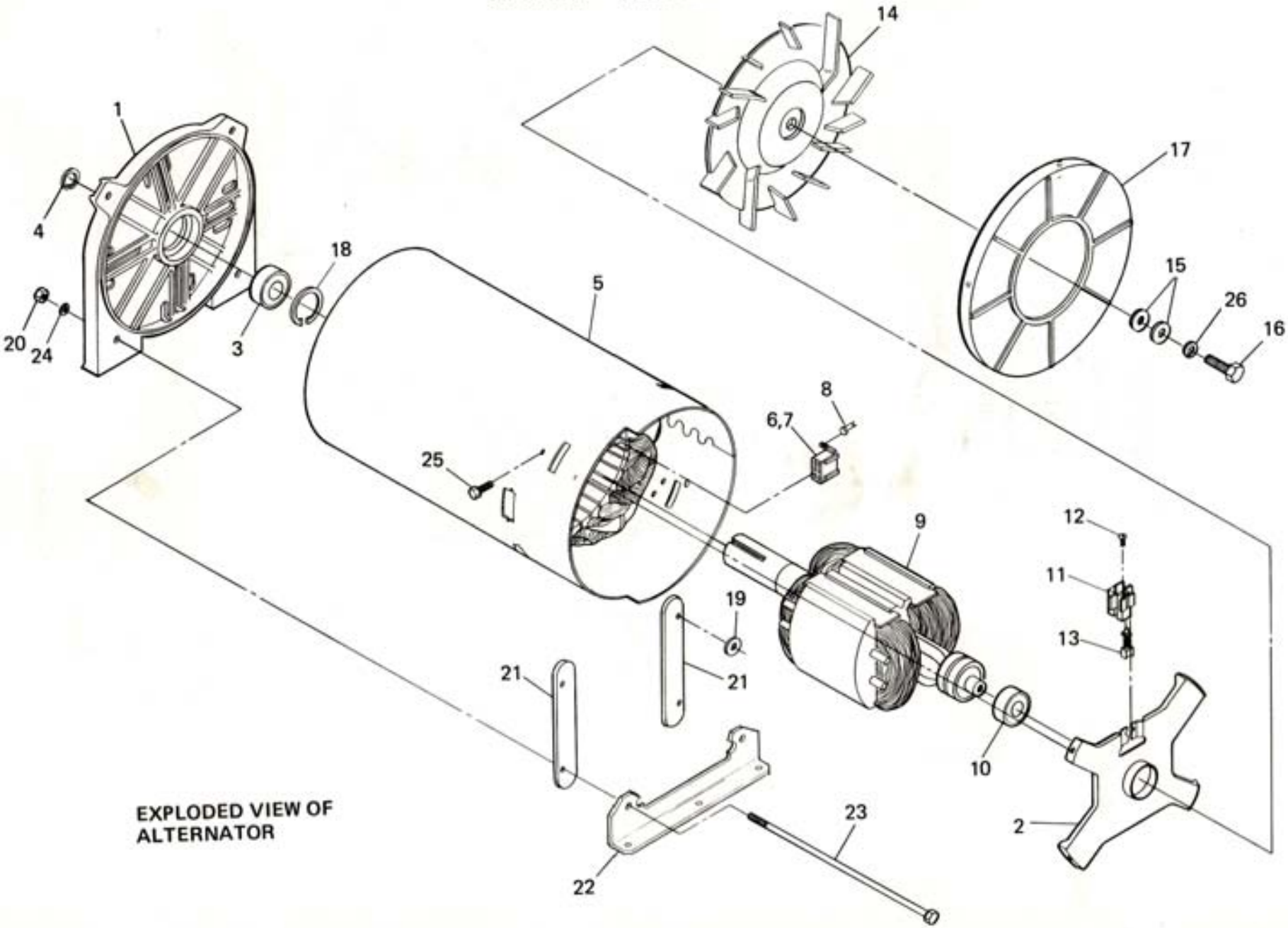
STARTING TIME	FINISHING TIME	OPERATING TIME	ACCUMULATED TIME	SHEAVES	V-BELTS	BRUSHES & SLIP RINGS	COMMENTS



Item	Part No.	Req'd	Description
1	45669	1	Control Panel
2	45049	1	Voltmeter 120V.
3	22155	2	No. 6 Lockwasher
4	22188	2	No. 6 Hex. Nut
5	43482	1	Outlet 240V. 20A.
6	22152	2	No. 10 Lockwasher
7	22158	2	No. 10-32 Hex. Nut
8	36933	2	No. 10-32 x 3/8 Phillips Pan Hd.Mch.Sc.
9	22693	1	Outlet 125V. 15A.



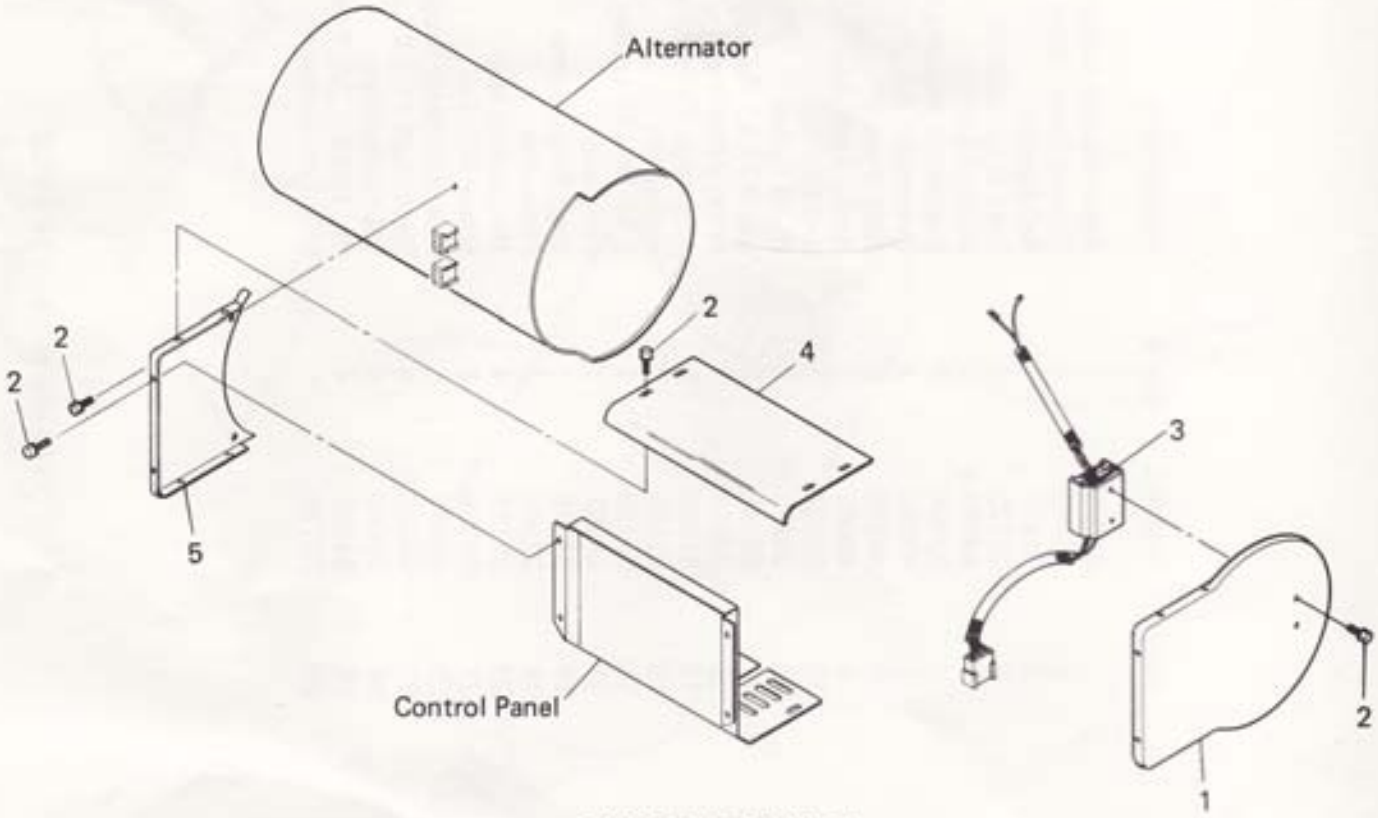
EXPLODED VIEW OF PANEL



EXPLODED VIEW OF ALTERNATOR

Item	Part No.	Req'd	Description
1	45088	1	Front Bearing Carrier
2	44943	1	Bearing Carrier Plate
3	31971	1	Ball Bearing
4	22122	1	Snap Ring-External
5	44961-V	1	Stator Assembly
6	22694	1	Receptacle Housing-White
7	43994	1	Receptacle Housing-Red
8	44959	4	Split Rivet
9	45667	1	Rotor Assembly
10	24049	1	Ball Bearing
11	23877-D	1	Brush Holder
12	25105	2	No. 6-32 x 1/4 Lg.Sc. and Lockwasher
13	A-24044-A	2	Brush Assembly
14	45660	1	Alternator Fan-Alum.
15	22131	2	Flatwasher
16	22125	1	5/16-18 x 1" Lg.Hex.Hd.Cpsc.
17	44357	1	Fan Cover
18	22816	1	Snap Ring-Internal
19	22145	2	Flatwasher
20	22127	4	1/4-20 Hex. Nut
21	44338	2	Stator Bolt Bar
22	45040	1	Rear Alternator Support
23	44395-B	4	Stator Bolt 11-7/8 Lg.
24	22097	4	1/4 Lockwasher
25	24489	4	No. 10-32 x .3/8 Taptite
26	22129	1	5/16 Lockwasher

Item	Part No.	Req'd	Description
1	44328-Y	1	End Panel
2	24489	14	No. 10-32 x 3/8 Lg. Taptite Sc.
3	P-44352	1	Voltage Regulator
4	45254-A	1	Panel Cover-2500W Alt.
5	45270	1	Panel Shroud Back



EXPLODED VIEW OF
SHEET METAL & REGULATOR

– NOTES –

Roper 815- 937-6000

– NOTES –

Sears

owners manual

SEARS . . . at your service anywhere in the U.S.A.

The Model Number of the unit will be found on the nameplate. Always mention this Model Number when requesting service or repair parts for your alternator.

All parts listed herein may be ordered from any SEARS, ROEBUCK and CO. retail or catalog store. If the parts you need are not stocked locally, your order will be electronically transmitted to a Sears Repair Parts Distribution Center for expedited handling.

WHEN ORDERING REPAIR PARTS, ALWAYS GIVE THE FOLLOWING INFORMATION –

1. The PART NUMBER:
2. The PART DESCRIPTION:
3. The MODEL NUMBER:
4. The NAME: ALTERNATOR

Sears, Roebuck and Co., Chicago, Ill. 60684 U.S.A.

Printed in U.S.A.