Onan®

OPERATOR'S MANUAL
AND
PARTS CATALOG

FOR

YCB
SERIES

TWO-BEARING ALTERNATOR

FORM NUMBER
919-0304

ISSUE DATE
6-78
(SPEC A-F)

SAFETY PRECAUTIONS

The following safety precautions signal potentially harmful conditions to an operator or the equipment. Read them carefully and know when these conditions exist.

GUARD AGAINST ELECTRIC SHOCK

- Use extreme caution when working on electrical components. High voltage currents cause injury or death.
- Follow all state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician.
- When working around electrical equipment, move cautiously to avoid shocks.
- Do not lunge after falling tools.
- Stop all power, and ground all high voltage points before touching wires.
- Make certain that power cannot be accidentally restored.
- Be sure power is off if you must work on electrical equipment.
- Do not examine live equipment when mentally or physically fatigued.
- Do not touch live electrical equipment while standing on metal floors, damp concrete or other well grounded surfaces.
- Do not handle live electrical wiring.
- Use extra caution when working with generator during damp conditions (rain, etc.).
- Do not take risks.
- Do not work alone.

EXHAUST GASES ARE TOXIC

- Provide an adequate exhaust system to properly expel discharged gases. Check exhaust system regularly for leaks.
- Be sure the unit is well ventilated.

PROTECT AGAINST MOVING PARTS

- Avoid moving parts of the unit. Loose jackets, shirts or sleeves should not be permitted because of the danger of becoming caught in moving parts.
- Do not allow anyone to operate the generator without proper instructions.
- Make sure all nuts and bolts are secure. Keep power shields and guards in position.
- If adjustments *must* be made while the unit is running, use extreme caution around moving parts, etc.
- Before lubricating generator always:
  1. Disengage all power
  2. Shut off engine, and then
  3. Wait until rotor stops.

FIRE EXTINGUISHERS

- It is a good practice to have a fire extinguisher nearby. Be sure that the extinguisher is properly maintained and be familiar with its proper use.
- Extinguishers rated ABC by the NFPA are appropriate for all applications. Consult the local fire department for the correct type of extinguisher for various applications (note power must be turned off before electrical fire can be extinguished).

KEEP THE UNIT AND SURROUNDING AREA CLEAN

- Remove oil, grease, ice, snow or materials that create slippery conditions around unit.
- Remove oily rags and other materials that create potential fire hazards.

GENERAL INFORMATION

This operator's manual contains information for the proper installation, operation and maintenance of your new alternator. Keep this book handy so you can easily refer to it when necessary.

This top quality alternator provides durable and dependable service with very little maintenance or repair. With the alternator running at 3600 rpm, it produces the specified nameplate voltage.

The alternator is designed with a self-excited revolving field (rotor). The stationary armature (stator) contains two separate AC windings to supply AC power to the load. The stator contains a separate excitation winding: AC voltage of the winding is rectified to DC by two solid state silicon rectifiers. DC passes to the rotor through slip rings and low current brushes thus enabling the alternator to produce its own excitation currents.

WARNING **Onan uses this symbol throughout the text to warn of possible injury or death.**

CAUTION **This symbol is used to warn of possible equipment damage.**

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SPECIFICATIONS

SINGLE-PHASE, * 60-HERTZ MODEL SELECTION AND RATING TABLE

ALTERNATOR MODEL	CAPACITY WATTS	VOLTS	AMP	WIRE	RPM	NET WEIGHT LB (KG)
1.2YCB-1S	1250	120	10.4	2	3600	33.5 (15.2)
2.0YCB-1S	2000	120	16.6	2	3600	41.0 (18.6)
3.0YCB-3S	3000	120/240	25.0/12.5	3	3600	47.5 (21.5)
4.5YCB-3S	4500	120/240	37.4/18.4	3	3600	63.5 (28.8)
6.0YCB-3S	6000	120/240	50.0/25.0	3	3600	80.0 (36.3)

* Three-phase, 60-hz, 127/220-volt model is available by special order only.

SINGLE-PHASE, ** 50-HERTZ MODEL SELECTION AND RATING TABLE

1.0YCB-53AS	1000	100/200	10.0/5.0	3	3000	33.5 (15.2)
1.0YCB-53BS	1000	110/220	9.1/4.5	3	3000	33.5 (15.2)
1.0YCB-53CS	1000	120/240	8.3/4.2	3	3000	33.5 (15.2)
1.7YCB-53AS	1700	100/200	17.0/8.5	3	3000	41.0 (18.6)
1.7YCB-53BS	1700	110/220	15.5/7.7	3	3000	41.0 (18.6)
1.7YCB-53CS	1700	120/240	14.2/7.1	3	3000	41.0 (18.6)
2.5YCB-53AS	2500	100/200	25.0/12.5	3	3000	47.5 (21.5)
2.5YCB-53BS	2500	110/220	22.7/11.4	3	3000	47.5 (21.5)
2.5YCB-53CS	2500	120/240	20.8/10.4	3	3000	47.5 (21.5)
3.8YCB-53AS	3800	100/200	38.0/19.0	3	3000	63.5 (28.8)
3.8YCB-53BS	3800	110/220	34.5/17.3	3	3000	63.5 (28.8)
3.8YCB-53CS	3800	120/240	31.7/15.8	3	3000	63.5 (28.8)
5.0YCB-53AS	5000	100/200	50.0/25.0	3	3000	80.0 (36.3)
5.0YCB-53BS	5000	110/220	45.6/22.8	3	3000	80.0 (36.3)
5.0YCB-53CS	5000	120/240	41.6/20.8	3	3000	80.0 (36.3)

** Three-phase, 50-hz, 127/220 and 220/380-volt models are available by special order only.

TORQUES

Rotor-through Screw ..... 10-15 Ft. Lbs.
Alternator-through Screw ..... 5-8 Ft. Lbs.

INSTALLATION CONSIDERATIONS

Consider the following before installing the alternator.

Location
Mounting
Direction of rotation
Driving power
Wiring connections
Belt alignment and belt wrap

LOCATION

The proper location of the alternator includes good ventilation, convenience to driving power, good operating conditions and servicing convenience.

VENTILATION - The alternator creates considerable heat when operating under load conditions.

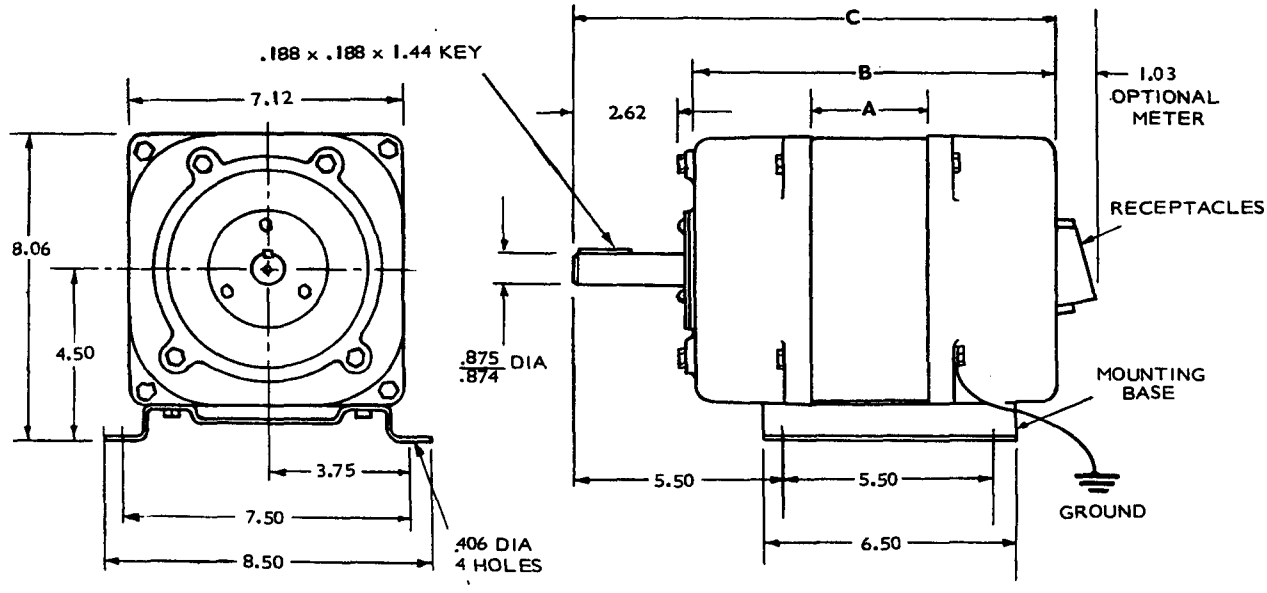
CAUTION **Overheating of the alternator can result in poor voltage regulation, alternator damage or failure.**

Through proper ventilation, the heat generated by the alternator is dissipated. If the alternator is installed inside a small room or compartment, provide a vent for exhausting heated air. Heated air is discharged through the drive shaft end of the alternator.

CONVENIENCE TO DRIVING POWER - (Driving power is defined as an engine or prime mover of the alternator.) Both the driving source (engine) and the driven counterpart (alternator) must be bolted securely to a heavy mounting base to maintain pulley and shaft alignment. The direction of rotation of the alternator is determined by the direction of rotation of the driving unit.

OPERATING CONDITIONS - Avoid extremely dusty or damp conditions. Protect the alternator against the weather by covering it or moving it to the inside of a building.

SERVICING CONVENIENCE - Allow at least 24 inches of space on all sides of the alternator for convenient servicing.



ALTERNATOR	DIM A	DIM B	DIM C
1.2 YCB	1.55	8.00	11.19
2.0 YCB	2.30	8.75	11.94
3.0 YCB	3.05	9.50	12.69
4.5 YCB	4.55	11.00	14.19
6.0 YCB	6.05	12.50	15.69

FIGURE 1. MOUNTING DIMENSIONS

MOUNTING

Provide a substantial mounting base of concrete, wood or steel and use large bolts. The mounting surface must be flat so that the mounting brackets are not damaged when tightened into place. It must be possible to easily turn the alternator shaft by hand after the alternator is bolted down. Refer to Figure 1 for mounting dimensions.

DIRECTION OF ROTATION

The alternator rotates in the same direction as does the driving unit. Shaft rotation in either direction is possible without modification.

DRIVING POWER

When using a gasoline engine as the driving source, consider the following:

ENGINE POWER - The engine must provide a minimum of 2HP for each 1000 watts of alternator output. For example, if operating at 2500 watt alternator, the engine must deliver at least 5HP at the drive shaft. If the engine has a considerable reserve of power, speed regulation and voltage regulation will be more consistant.

ENGINE PULLEY SPEED

Some engines have no governor or a variable speed governor that regulates engine speed at approximately 8-1/2 to 12%. When the engine is so equipped, governor operation is best at the maximum rated speed of the engine. When the alternator is operating at or near its capacity and the load is suddenly removed, the engine tends to increase speed.

CAUTION **The governor does not react fast enough at low speeds to prevent momentary acceleration and high voltage. This can result in serious damage to any electrical equipment left connected to the unit.**

The engine must not increase speed too much when a portion of the load is removed. If the engine has a constant speed governor, the speed regulation is 5% or less and the effects described above are not present.

Low alternator speed causes low voltage and frequency. For example, if a 3600 rpm alternator is slowed to 3000 rpm, the frequency of the current produced will be 50 cycles instead of 60 cycles.

CAUTION **The combination of low voltage and frequency could result in burned out windings of any compressor motor connected to the alternator such as refrigerators and air conditioners. Under voltage will not damage fans, blowers or pumps, but will cause a T.V. set picture to roll or to have a small picture.**

PULLEY SELECTION

The rated speed of the engine determines the size of pulley to use on the alternator. To determine the correct alternator pulley size to use, proceed as follows:

1. Multiply the diameter of the driving unit pulley by its speed in rpm (revolutions per minute).
2. Divide the above result by the nameplate speed of the alternator (3600 rpm).

   EXAMPLE: A pulley 6 inches in diameter is used on a engine operating at 2400 rpm.

   Multiply 6 x 2400 getting a result of 14,400. Divide the 14,400 by 3600 rpm (alternator pulley speed desired) and the final result is 4. This is the size of the pulley required on the alternator (4 inches).

BELT ALIGNMENT

The pulleys must rotate in the same plane for longest belt life and lower bearing loads. On units larger than 3 kW in size, a double pulley is recommended for increased belt life and better speed and voltage regulation, along with reserve engine power. See Figure 2.

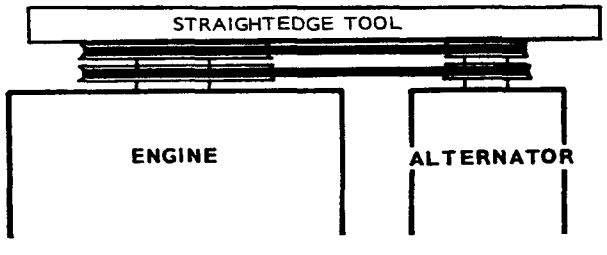


FIGURE 2. BELT ALIGNMENT

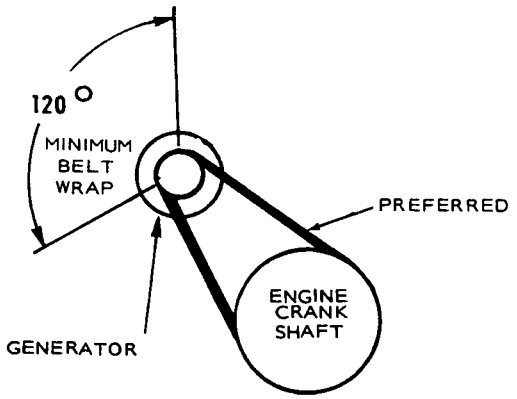


FIGURE 3. BELT WRAP

BELT WRAP

The greater the degree of belt wrap the less slippage that occurs. The amount of belt wrap should not be less than 120 degrees for satisfactory operation. See Figure 3.

WIRING CONNECTION

Follow specifications of local and national electrical codes for installing load connection wiring and grounding. Be sure to use wire large enough to avoid excessive drop in voltage between the alternator and the load, depending upon the distance and the amount of the load.

OPERATION

STARTING

Start the unit. While running with no load connected to the alternator, check the voltage. A 120-volt alternator should produce 126 volts; a 240-volt alternator produces 252 volts.

Be sure the alternator is being driven at its nameplate rpm. Make any necessary adjustments to the driving power source to correct the alternator speed.

OPERATING

Connect the electrical load after the alternator operates satisfactorily at no load. When electric motors are connected, connect one at a time. Allow each motor to reach running speed before connecting another. Electric motors require much more current for starting then when running at normal speed. Connecting several motors at the same time can result in an alternator overload condition. Should this occur none of the motors will start.

If the driving engine governor does not provide proper speed regulation, it may be necessary to manually adjust the engine throttle control as the load is substantially changed.

BELT ADJUSTMENT, BELT DRIVE UNITS

Maintain proper belt tension at all times. Too much belt tension causes rapid wear of the belts and places an extra load on the alternator bearings. Belts that are too loose will slip, wear out rapidly and cause the alternator to run at a low speed. Reduced alternator speed causes lower output voltage.

To test the V-belt tension, press down on the belt at a point midway between the driving unit and the alternator while not in operation. It should be possible to press the belt down a slight amount depending on the distance between the pulleys. When more than one belt is used, each belt should show the same tension. When it becomes necessary to replace a worn belt, replace all belts at the same time.

A new belt will stretch slightly when first put into operation. Tension should be checked frequently during the first week or two of operation. After this period, further belt tension adjustment should be minimal.

The driving unit and alternator pulleys must be in alignment. To test alignment place a straight edge tool against the side of the outer driving pulley. See Figure 3. As the straight edge contacts both sides of the driving unit pulley, it should contact both sides of the alternator pulley. Complete contact of both pulleys should be made at the same time.

ALIGNING COUPLING DRIVE UNITS

Coupling direct drive units have the driving unit and alternator shafts in line with each other. If either the driving unit or the alternator is loosened from the base, the loosened unit must be properly realigned when reinstalled.

CAUTION **Misalignment will cause vibration and excessive strain on the coupling and bearings.**

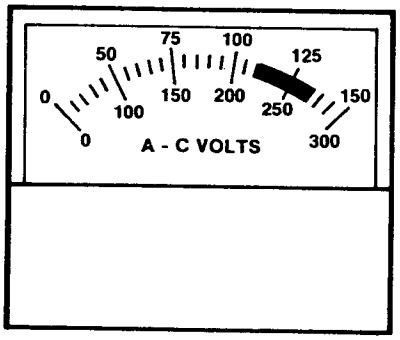


FIGURE 4. VOLTMETER

MAINTENANCE

ALTERNATOR

Once every year, inspect the alternator brushes for cracks or chips. Measure the brushes and replace them when they wear to 5/16 inch. If collector rings are rough, smooth the ring surfaces with #240 sandpaper. Do not use emery paper.

To inspect the brushes, refer to Figure 5 and perform the following.

1. Remove cover plate on the end bell.
2. Unfasten brush mounting screws.
3. Slide brushes out of holder.
4. Replace when worn to 5/16 inch.

Use only the replacement brushes specified in the parts list. Other brushes might appear identical but have entirely different electric characteristics.

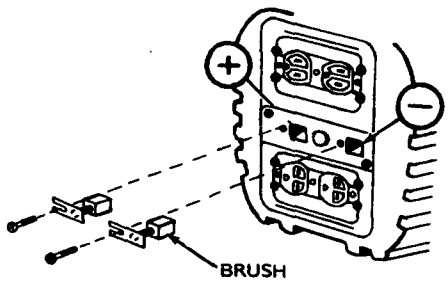


FIGURE 5. BRUSH REMOVAL

ALTERNATOR TROUBLESHOOTING

If the generator does not build up to rated voltage, check the following four items:

1. Worn brushes (as mentioned above).
2. Diodes that are shorted out.
3. Loss of residual (see *Flashing The Field*).
4. Bad capacitor.

Diodes (All Models Prior to Spec C)

Diodes can be tested without removing from end bell or disconnecting wires, provided connector plug is disconnected from stator.

Using an accurate ohmmeter, connect one lead to each end of diode and observe resistance readings. See Figure 6 for location of diodes.

A good diode should have a higher reading in one direction than the other. If both readings are high, or low, diode is defective and must be replaced with a new, identical part.

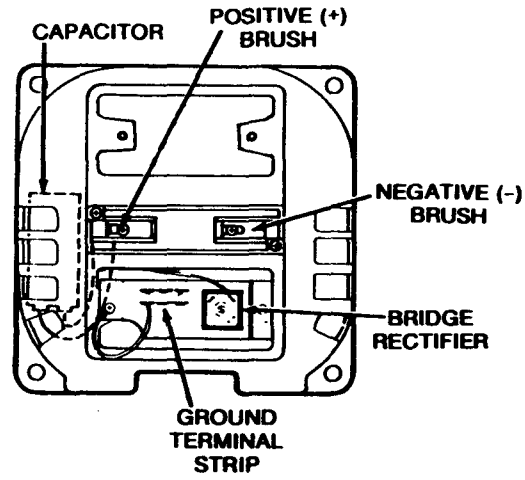


FIGURE 6. END BELL (INSIDE VIEW) BEGIN SPEC C

CHECKING BRIDGE RECTIFIER (Begin Spec C)

1. Remove the two AC leads, X2 and X3 from the bridge rectifier. Also remove the black lead from the "+" terminal of the rectifier.
2. Touch one lead of an accurate ohmmeter to one of the AC terminals on the bridge rectifier and touch the other ohmmeter lead to the "+" terminal of the rectifier. Observe the ohmmeter reading.
3. Now reverse the two ohmmeter leads and again observe the ohmmeter reading. (Check both AC terminals separately in this manner.)
4. A good rectifier will have a high reading in one test and a low reading when the leads are reversed in steps 2 and 3.

If both readings (on either separate AC terminal) are high or low, the rectifier is defective and must be replaced with a new identical part as listed in Parts Catalog. A typical bridge rectifier is shown in the illustration below.

Later models have two light blue leads connected to bridge rectifier rather than yellow leads.

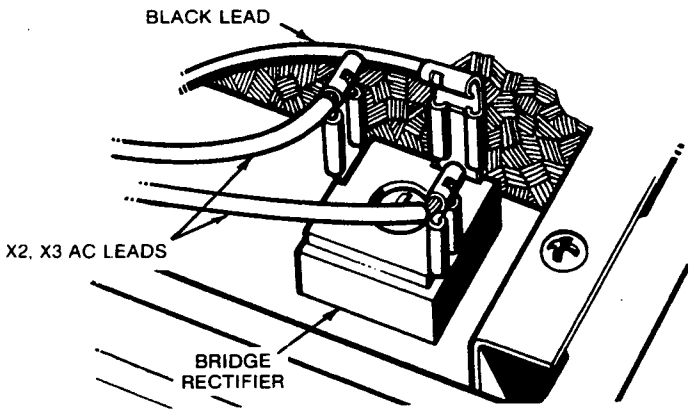


FIGURE 7. CHECKING BRIDGE RECTIFIER

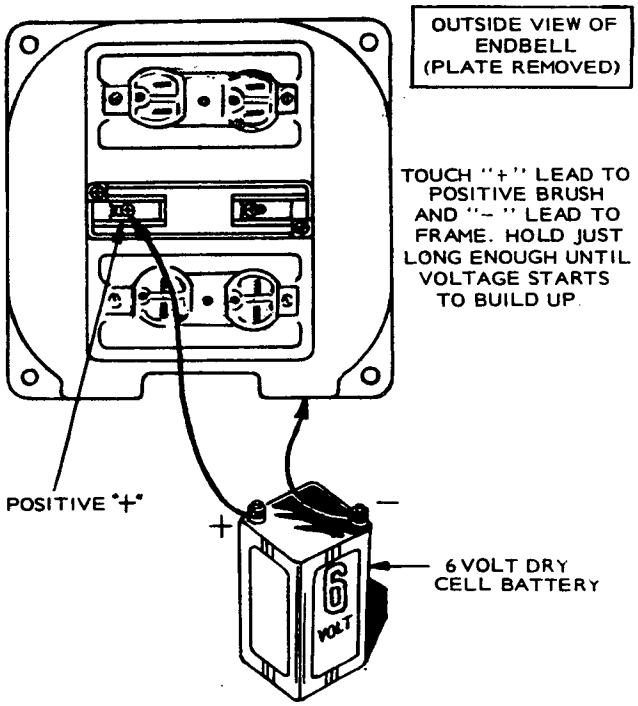


FIGURE 8. FLASHING THE FIELD

Flashing the Field

If there is a loss of residual magnetism (voltage will not build up), it may be necessary to flash the field.

1. Remove receptacle plate (or blank cover) from end bell.
2. Connect a 6 volt lantern battery with leads as shown in Figure 8.
3. Start unit with *no* load connected to generator.
4. Momentarily touch positive brush with "+" lead of lantern battery while grounding the "–" lead to generator frame. Remove as soon as voltage starts to build up. (Use a plug-in voltmeter in one of the receptacles if unit is not equipped with a voltmeter.)

If it is necessary to flash the field daily or each time the generator is used, the problem is most likely a defective capacitor (Figure 4).

Receptacles (Prior to Spec C)

Receptacles mounted on the end bell can be removed and replaced without removing the end bell from the generator. Remove receptacle plate (or blank cover), then remove screws on receptacles. Pull straight out to remove wires.

RECEPTACLES AND RECEPTACLE BOXES (Begin Spec C)

Receptacles mounted on the end bell can be removed and replaced without removing the end bell from the generator. Remove receptacle box by removing the four screws as shown in Figure 9 and then disconnect the interconnecting wires from the end bell. Each receptacle can now be removed by disconnecting wires and removing one screw in the center of receptacle. Mark all wires for easier replacement before disconnecting.

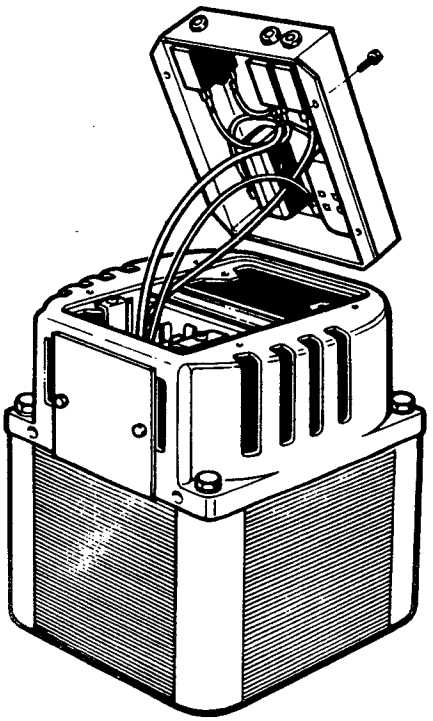


FIGURE 9. TYPICAL RECEPTACLE BOX WIRING

Replacing the Capacitor

If it is necessary to flash the field daily or each time the alternator is used, the problem is probably a defective capacitor. See Figures 6 and 9.

To replace the capacitor:

1. Remove the screw that secures the capacitor mounting bracket to the end bell. Remove the bracket.
2. Free the capacitor from its position.
3. Slide the two terminal wires off the terminal posts at the bottom of the capacitor.
4. Connect terminal wires onto the terminal posts of the new capacitor. Be sure to attach the grounding wire (white) to the unpainted terminal post. The black wire attaches to the terminal post with the red marking.
5. Install the capacitor into position with the mounting bracket.
6. Fasten the screw through the mounting bracket to the end bell. Be sure the grounding wire is in position.

REPLACING FUSES (Prior to Spec C)

Some models have a separate receptacle box that is equipped with fuses. Too much load on the receptacle, or an external short circuit can cause a fuse to blow. If the fuse is open or blown, turn the fuse cover on top of the box counterclockwise. Replace with an identical fuse as described in the parts portion of this manual.

CAUTION **Do not exceed the current rating stamped below the receptacles on the box. Be sure to replace with the correct rated fuse to avoid damage to power tools.**

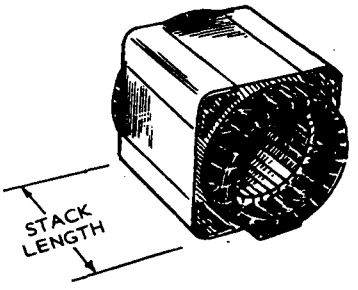
TROUBLESHOOTING CHART

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
No Output	1. Open fuses(s) or circuit breaker in receptacle box (if used).	1. Replace
	2. Faulty receptacle.	2. Replace
	3. Brushes worn excessively.	3. Replace
	4. Brushes sticking or broken spring.	4. Replace
	5. Loss of residual.	5. See Troubleshooting Procedures
	6. Dirty collector rings.	6. Clean or replace
	7. Loose or broken wire.	7. Repair
	8. One or both diodes shorted or defective bridge rectifier (if used).	8. Replace
	9. Faulty capacitor.	9. Replace
	10. Faulty rotor.	10. Replace
	11. Faulty stator.	11. Replace
Low Output	1. Alternator speed too low.	1. Speed should be 3600 rpm.
	2. Engine low on power.	2. See Engine Manual.
	3. Worn brushes.	3. Replace
	4. One open diode.	4. Replace
	5. Open Capacitor.	5. Replace
	6. Rotor windings shorted.	6. Replace
	7. Stator windings shorted.	7. Replace
Alternator Overheats	1. Overloaded.	1. Remove part of load.
	2. Alternator air intake plugged with dirt, leaves, etc.	2. Clean
	3. Windings covered with dirt or oil.	3. Clean

NOTES

PARTS CATALOG

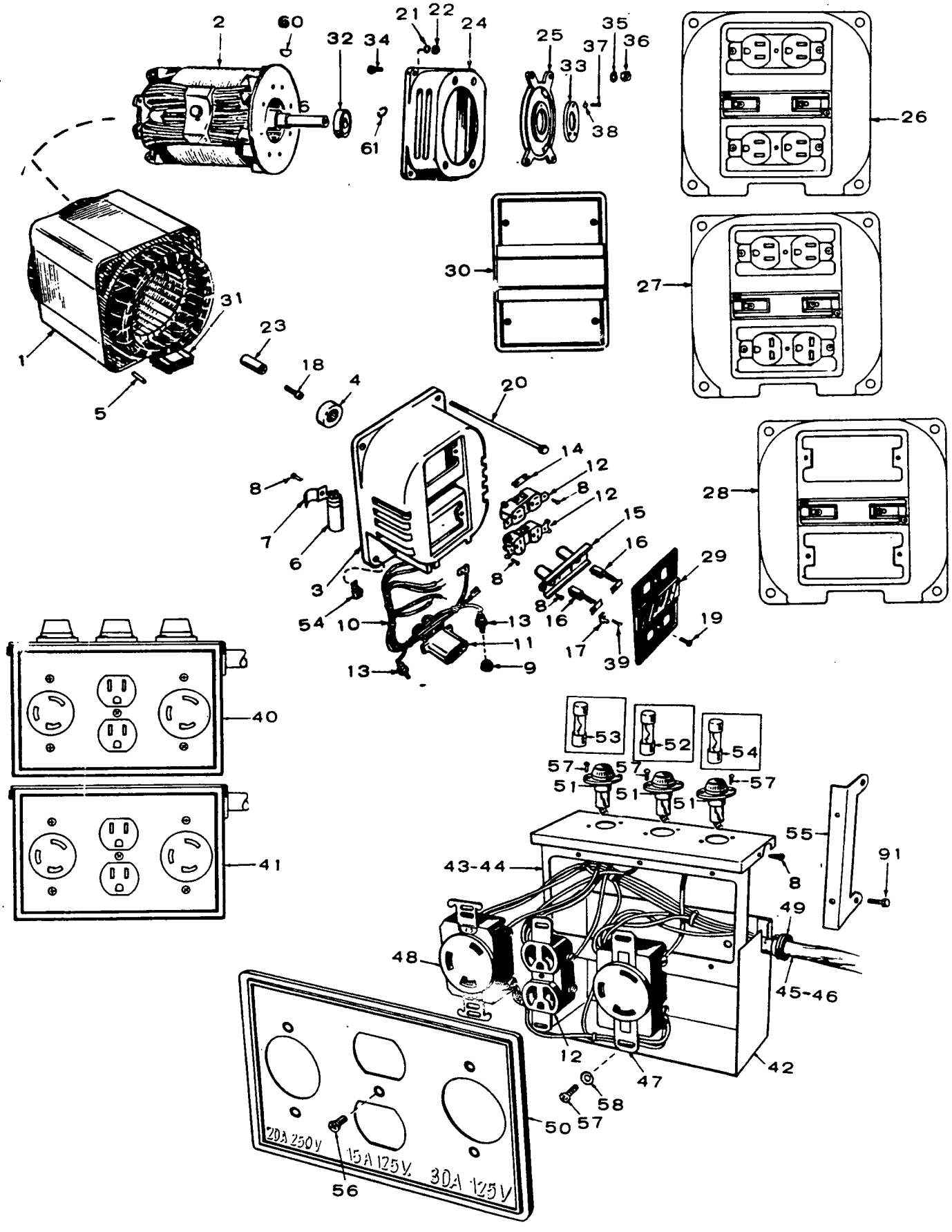
To determine correct column in this parts list, check alternator nameplate for output voltage. Also determine receptacle location and generator stack length.



ALTERNATOR DATA TABLE

OUTPUT (WATTS)	RECEPTACLE LOCATION		GENERATOR STACK LENGTH	VOLTS	HERTZ	PHASE	USE PARTS COLUMN
	END BELL	SEPARATE BOX					
Up to 1000		X	1-1/2"	220	50	1	A
Up to 1000		X	1-1/2"	110/220	50	1	A
Up to 1000		X	1-1/2"	220/380	50	3	A
Up to 1200		X	1-1/2"	127/220	60	3	A
Up to 1200	X		1-1/2"	120	60	1	B
1001 thru 1700		X	2-1/4"	220	50	1	C
1001 thru 1700		X	2-1/4"	110/220	50	1	C
1001 thru 1700		X	2-1/4"	220/380	50	3	C
1201 thru 2000		X	2-1/4"	127/220	60	3	C
1201 thru 2000	X		2-1/4"	120	60	1	D
1701 thru 2500		X	3"	220	50	1	E
1701 thru 2500		X	3"	110/220	50	1	E
1701 thru 2500		X	3"	220/380	50	3	E
2001 thru 3000		X	3"	120/240	60	1	E
2001 thru 3000		X	3"	127/220	60	3	E
2001 thru 3000	X		3"	120	60	1	F
2001 thru 3000	X		3"	120/240	60	1	F
2501 thru 4200		X	4-1/2"	220	50	1	G
2501 thru 4200		X	4-1/2"	110/220	50	1	G
2501 thru 4200		X	4-1/2"	220/380	50	3	G
3001 thru 4500		X	4-1/2"	120/240	60	1	G
3001 thru 4500		X	4-1/2"	127/220	60	3	G
3001 thru 4500	X		4-1/2"	120	60	1	H
3001 thru 4500	X		4-1/2"	120/240	60	1	H
4201 thru 5000		X	6"	220	50	1	J
4201 thru 5000		X	6"	110/220	50	1	J
4201 thru 5000		X	6"	220/380	50	3	J
4501 thru 6000		X	6"	120/240	60	1	J
4501 thru 6000		X	6"	127/220	60	3	J
4501 thru 6000	X		6"	120	60	1	K
4501 thru 6000	X		6"	120/240	60	1	K

GENERATOR AND RECEPTACLES - SPEC A AND B



GENERATOR AND RECEPTACLES - SPEC A AND B

REF NO.	PART NUMBER	PART DESCRIPTION	QUANTITY USED									
			A	B	C	D	E	F	G	H	J	K
1		STATOR ASSEMBLY, WOUND										
	220-2093	220 Volt, 50 Hertz, 1 Phase	1									
	220-2323	110/220 Volt, 50 Hertz, 1 Phase	1									
	220-2112	220/380 Volt, 50 Hertz, 3 Phase	1									
	220-2104	127/220 Volt, 60 Hertz, 3 Phase	1									
	220-1949	120 Volt, 60 Hertz, 1 Phase		1								
	220-2094	220 Volt, 50 Hertz, 1 Phase			1							
	220-2324	110/220 Volt, 50 Hertz, 1 Phase			1							
	220-2113	220/380 Volt, 50 Hertz, 3 Phase			1							
	220-2105	127/220 Volt, 60 Hertz, 3 Phase			1							
	220-1950	120 Volt, 60 Hertz, 1 Phase				1						
	220-2095	220 Volt, 50 Hertz, 1 Phase					1					
	220-2325	110/220 Volt, 50 Hertz, 1 Phase					1					
	220-2114	220/380 Volt, 50 Hertz, 3 Phase					1					
	220-1951	120 Volt and 120/240 Volt,60 Hertz, 1 Phs					1	1				
	220-2106	127/220 Volt, 60 Hertz,3 Phase					1					
	220-2096	220 Volts, 50 Hertz, 1 Phase							1			
	220-2326	110/220 Volt, 50 Hertz, 1 Phase							1			
	220-2115	220/380 Volt, 50 Hertz, 3 Phase							1			
	220-1952	120 Volt and 120/240 Volt,60 Hertz, 1 Phs							1	1		
	220-2107	127/220 Volt, 60 Hertz, 3 Phase							1			
	220-2097	220 Volt, 50 Hertz, 1 Phase									1	
	220-2327	110/220 Volt, 50 Hertz 1 Phase									1	
	220-2116	220/380 Volt, 50 Hertz, 3 Phase									1	
	220-1953	120 Volt and 120/240 Volt,60 Hertz,1 Phs									1	1
	220-2108	127/220 Volt, 60 Hertz, 3 Phase									1	
2	201-2036	Rotor Assembly, Wound-Spec A Only	1	1								
2	201-2037	Rotor Assembly, Wound-Spec A Only			1	1						
2	201-2038	Rotor Assembly, Wound-Spec A Only					1	1				
2	201-2039	Rotor Assembly, Wound-Spec A Only							1	1		
2	201-2046	Rotor Assembly, Wound-Spec A Only									1	1
2	201-2392	Rotor Assembly, Wound-Begin Spec B	1	1								
2	201-2393	Rotor Assembly, Wound-Begin Spec B			1	1						
2	201-2394	Rotor Assembly, Wound-Begin Spec B					1	1				
2	201-2395	Rotor Assembly, Wound-Begin Spec B							1	1		
2	201-2396	Rotor Assembly, Wound-Begin Spec B									1	1
3	211-0238	Bell, End-Brush End + o #	1	1	1	1	1	1	1	1	1	1
4	510-0107	Bearing, Roller-Brush End + o #	1	1	1	1	1	1	1	1	1	1
5	516-0182	Pin, Locating-End Bell + o #	4	4	4	4	4	4	4	4	4	4
6	356-0056	Capacitor + o #	1	1	1	1	1	1	1	1	1	1
7	312-0194	Bracket, Capacitor Mounting + o #	1	1	1	1	1	1	1	1	1	1
8	815-0395	Screw, Pan Head (#6 x 3/8) + o #	6	7	6	7	6	7	6	7	6	7
9	870-0131	Nut, Hex With External Washer(#10-32)+ o #	2	2	2	2	2	2	2	2	2	2
10	338-0716	Harness,Wiring-End Bell(Inc.Parts Marked*)+#		1		1		1		1		1
10	338-0727	Harness,Wiring-End Bell(Inc.Parts Marked¢)o	1		1		1		1		1	
11	323-0848	Connector, Wiring Harness* ¢ + o #	1	1	1	1	1	1	1	1	1	1
12		RECEPTACLE, DUPLEX 120 Volt										
	323-0383	Parallel Blades (120Volt)* @ o # v '	1	2	1	2	1	2	1	2	1	2
		(NOTE: One only used on 120/240 Volt Units										
	323-0213	Tandem Blades (240Volt)* @ o # v '						1		1		1
13	358-0015	Rectifier, Diode* ¢ + o #	2	2	2	2	2	2	2	2	2	2
14	323-0869	Strap, Ground* @ v '		1		1		1		1		1
15	212-1249	Guide, Brush + o #	1	1	1	1	1	1	1	1	1	1

GENERATOR AND RECEPTACLES - SPEC A AND B

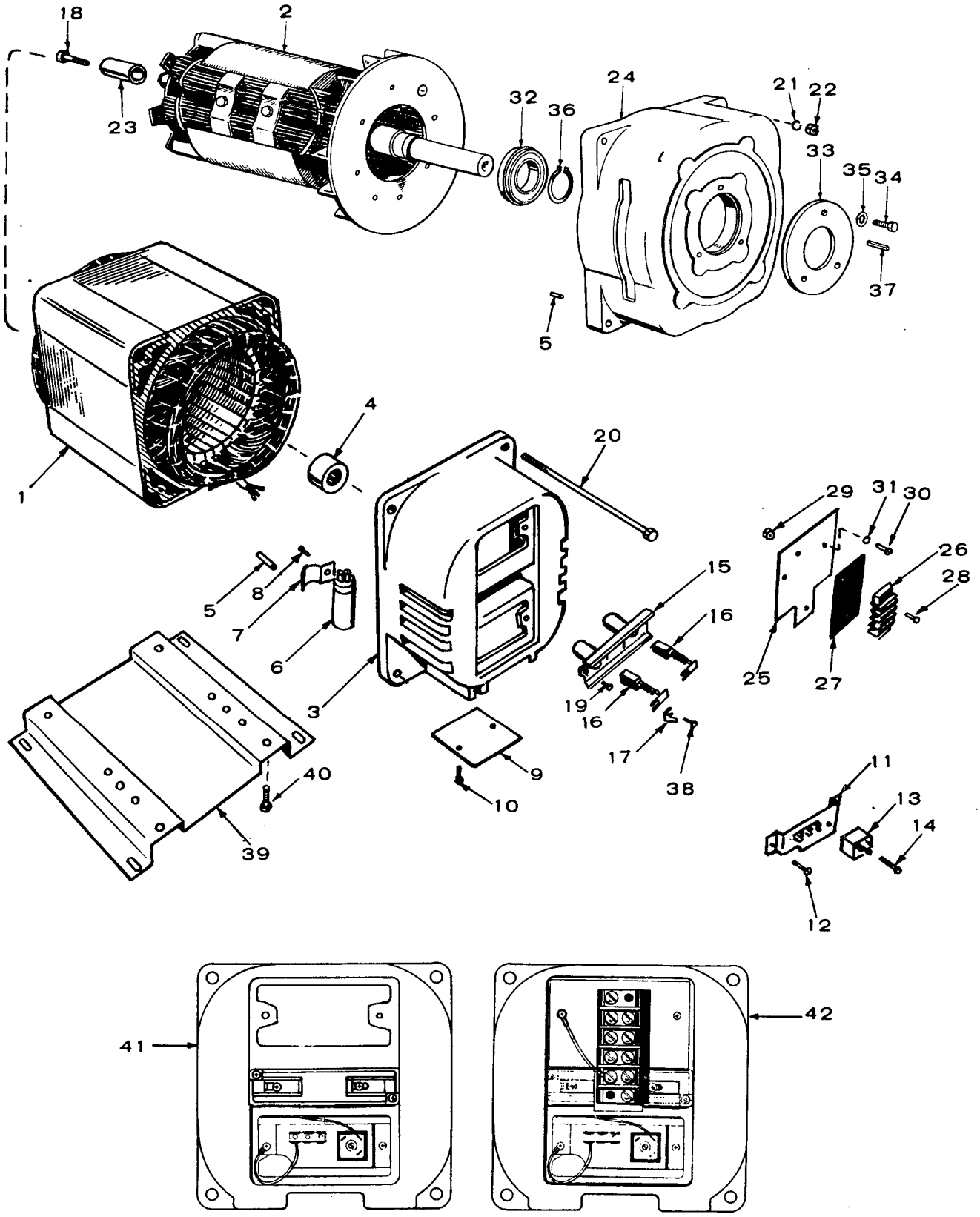
REF NO.	PART NUMBER	PART DESCRIPTION	QUANTITY USED									
			A	B	C	D	E	F	G	H	J	K
16	214-0099	Brush, Alternator + o #	2	2	2	2	2	2	2	2	2	2
17	332-1564	Terminal Tab + o #	1	1	1	1	1	1	1	1	1	1
18	802-0056	Screw, Allen Head Cap-Rotor Through	1	1	1	1	1	1	1	1	1	1
19	815-0396	Screw, Pan Head Phillips - End Bell Receptacle Cover	2	2	2	2	2	2	2	2	2	2
20	800-0017	Screw, Hex Cap-Alternator Through (1/4-20 x 3 1/2")	4	4								
20	800-0021	Screw, Hex Cap-Alternator Through (1/4-20 x 4-1/2")			4	4						
20	800-0187	Screw, Hex Cap-Alternator Through (1/4-20 x 5")					4	4				
20	800-0188	Screw, Hex Cap-Alternator Through (1/4-20 x 6-1/2")							4	4		
20	800-0189	Screw, Hex Cap-Alternator Through (1/4-20 x 8")									4	4
21	850-0040	Washer, Lock-Alternator Through Screw(1/4")	4	4	4	4	4	4	4	4	4	4
22	862-0001	Nut, Hex-Alternator Through Screw(1/4-20)	4	4	4	4	4	4	4	4	4	4
23	202-0674	Sleeve, Alternator Shaft	1	1	1	1	1	1	1	1	1	1
24	231-0165	Bell, End-Alternator(Shaft End)-Spec A Only	1	1	1	1	1	1	1	1	1	1
24	231-0194	Bell, End-Alternator(Shaft End)Begin Spec B	1	1	1	1	1	1	1	1	1	1
25	231-0175	Adapter, Alternator Bearing-Spec A Only	1	1	1	1	1	1	1	1	1	1
26	211-0243	Bell Assembly, End(Includes Parts Marked+) 120 Volt Units Only		1		1		1		1		1
27	211-0247	Bell Assembly, End (Includes Parts Marked#) 110/240 Volt Units Only		1		1		1		1		1
28	211-0245	Bell Assembly, End (Includes Parts Markedo)	1		1		1		1		1	
29	232-2434	Cover, End Bell Receptacles		1		1		1		1		1
30	232-2433	Cover, End Bell-Blan	1		1		1		1		1	
31	323-0849	Housing, Tab Connector	1	1	1	1	1	1	1	1	1	1
32	510-0108	Bearing, Roller-Shaft end	1	1	1	1	1	1	1	1	1	1
33	232-2432	Plate, Bearing Retainer-Spec A Only	1	1	1	1	1	1	1	1	1	1
33	232-2588	Plate, Bearing Retainer-Begin Spec B	1	1	1	1	1	1	1	1	1	1
34	800-0050	Screw, Hex Cap-Spec A Only (3/8-16x1")	4	4	4	4	4	4	4	4	4	4
35	850-0050	Washer, Lock-Spec A Only (3/8")	4	4	4	4	4	4	4	4	4	4
36	862-0003	Nut, Hex-Spec A Only (3/8-16)	4	4	4	4	4	4	4	4	4	4
37	813-0100	Screw, Round Head-Bearing Plate Retainer (#10-32 x 1/2")	3	3	3	3	3	3	3	3	3	3
38	850-0030	Washer, Lock-Bearing Plate Retainer (#10)	3	3	3	3	3	3	3	3	3	3
39	815-0388	Screw, Pan Head Brush Mounting(#6 x1/2")+o#	2	2	2	2	2	2	2	2	2	2
40	323-0874	Box Assy.,Receptacle-External-With Receptacles and Fuses(Includes Parts Markedv) 120/240 volt Only	1		1		1		1		1	
41	323-0875	Box Assembly Receptacle-External-With Receptacles (Includes Parts Marked ') 120/240 Volt Only	1		1		1		1		1	
42	301-3649	Box Outlet (External) v '	1		1		1		1		1	
43	301-3648	Bracket, Receptacle Box (With Fuses) v	1		1		1		1		1	
44	301-3672	Bracket, Receptacle Box (Without Fuses) '	1		1		1		1		1	
45	338-0734	Harness, Wiring-External Outlet Box (With Fuses) (Includes Parts Marked @) v	1		1		1		1		1	
46	338-0733	Harness, Wiring-External Outlet Box (Without Fuses) Includes Parts Marked @	1		1		1		1		1	

GENERATOR AND RECEPTACLES - SPEC A AND B

REF NO.	PART NUMBER	PART DESCRIPTION	QUANTITY USED									
			A	B	C	D	E	F	G	H	J	K
47	323-0872	Receptacle, Locking (30 Amp,120 Volt)@v'	1		1		1		1		1	
48	323-0873	Receptacle, Twistlock(20 Amp,240 Volt)@v'	1		1		1		1		1	
49	508-0071	Grommet, Rubber-Harness Through Receptacle Box @ v '	1		1		1		1		1	
50	301-3676	Cover, Receptacle Box v '	1		1		1		1		1	
51	321-0198	Holder, Fuse v	3		3		3		3		3	
52	321-0199	Fuse, Cartridge(15 Amp)120/240 Volt Units v	1		1		1		1		1	
53	321-0200	Fuse, Cartridge(20 Amp)120/240 Volt Units v	1		1		1		1		1	
54	321-0201	Fuse, Cartridge(30 Amp)120/240 Volt Units v	1		1		1		1		1	
55	323-0876	Bracket, Receptacle Box Mounting	2		2		2		2		2	
56	815-0396	Screw, Fillister Head-Receptacle Cover (6-32 x 1/2") v '	5		5		5		5		5	
57	808-0022	Screw, Round Head-Receptacle and Fuse (Holder Mounting (#8 x 3/8") v '	12		12		12		12		12	
58	526-0048	Washer, Flat-Receptacle Mounting (#8 Brass) v '	6		6		6		6		6	
59	821-0009	Screw, Hex Head Flange Receptacle (Box Bracket Mounting (1/4-20 x 3/8")	4		4		4		4		4	
60	515-0026	Key, Drive Shaft	1	1	1	1	1	1	1	1	1	1
61	518-0010	Ring, Retaining-Bearing	1	1	1	1	1	1	1	1	1	1

* Parts included in 338-0716 Wiring Harness
¢ Parts included in 338-0727 Wiring Harness
\+ Parts included in 211-0243 End Bell Assy
\# Parts included in 211-0247 End Bell Assy
o Parts included in 211-0245 End Bell Assy
v Parts included in 323-0874 Receptacle Box Assembly
' Parts included in 323-0875 Receptacle Box Assembly
@ Parts included in 338-0733 and 338-0734 Wiring Harness

GENERATOR - BEGIN SPEC C



NOTE: See separate group for receptacle box and associated parts.

GENERATOR - BEGIN SPEC C

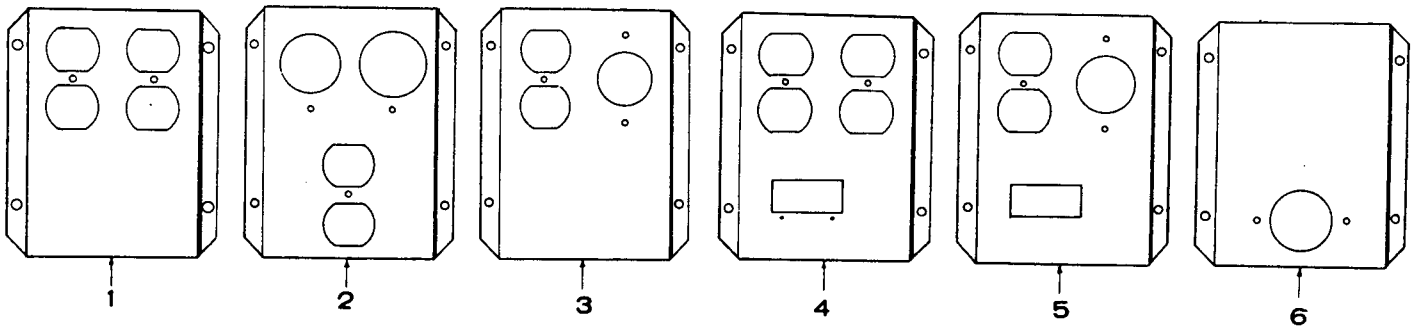
QTY.	PART NO.	DESCRIPTION	QUANTITY USED									
			A	B	C	D	E	F	G	H	J	K
1		STATOR ASSEMBLY, WOUND										
	220-2554	100/200 Volt, 50 Hertz, 1 Phase	1	1								
	220-2562	110/220 Volt, 50 Hertz, 1 Phase	1	1								
	220-2570	120/240 Volt, 50 Hertz, 1 Phase	1	1								
	220-2586	127/220 Volt, 50 Hertz, 3 Phase	1	1								
	220-2578	220/380 Volt, 50 Hertz, 3 Phase	1	1								
	220-2472	120/240 Volt, 60 Hertz, 1 Phase	1	1								
	220-2525	127/220 Volt, 60 Hertz, 3 Phase	1	1								
	220-2555	100/200 Volt, 50 Hertz, 1 Phase			1	1						
	220-2563	110/220 Volt, 50 Hertz, 1 Phase			1	1						
	220-2571	120/240 Volt, 50 Hertz, 1 Phase			1	1						
	220-2587	127/220 Volt, 50 Hertz, 3 Phase			1	1						
	220-2579	220/380 Volt, 50 Hertz, 3 Phase			1	1						
	220-2473	120/240 Volt, 60 Hertz, 1 Phase			1	1						
	220-2526	127/220 Volt, 60 Hertz, 3 Phase			1	1						
	220-2556	100/200 Volt, 50 Hertz, 1 Phase					1	1				
	220-2564	110/220 Volt, 50 Hertz, 1 Phase					1	1				
	220-2572	120/240 Volt, 50 Hertz, 1 Phase					1	1				
	220-2588	127/220 Volt, 50 Hertz, 3 Phase										
	220-2580	220/380 Volt, 50 Hertz, 3 Phase					1	1				
	220-2474	120/240 Volt, 60 Hertz, 1 Phase					1	1				
	220-2527	127/220 Volt, 60 Hertz, 3 Phase					1	1				
	220-2557	100/200 Volt, 50 Hertz, 1 Phase							1	1		
	220-2565	110/220 Volt, 50 Hertz, 1 Phase							1	1		
	220-2573	120/240 Volt, 50 Hertz, 1 Phase							1	1		
	220-2589	127/220 Volt, 50 Hertz, 3 Phase							1	1		
	220-2581	220/380 Volt, 50 Hertz, 3 Phase							1	1		
	220-2475	120/240 Volt, 60 Hertz, 1 Phase							1	1		
	220-2528	127/220 Volt, 60 Hertz, 3 Phase							1	1		
	220-2558	100/200 Volt, 50 Hertz, 1 Phase									1	1
	220-2566	110/220 Volt, 50 Hertz, 1 Phase									1	1
	220-2574	120/240 Volt, 50 Hertz, 1 Phase									1	1
	220-2590	127/220 Volt, 50 Hertz, 3 Phase									1	1
	220-2582	220/380 Volt, 50 Hertz, 3 Phase									1	1
	220-2476	120/240 Volt, 60 Hertz, 1 Phase									1	1
	220-2529	127/220 Volt, 60 Hertz, 3 Phase									1	1
2		ROTOR ASSEMBLY, WOUND										
	201-2392	1 Phase	1	1								
	201-2425	3 Phase	1	1								
	201-2393	1 Phase			1	1						
	201-2426	3 Phase			1	1						
	201-2394	1 Phase					1	1				
	201-2427	3 Phase					1	1				
	201-2395	1 Phase							1	1		
	201-2428	3 Phase							1	1		
	201-2396	1 Phase									1	1
	201-2429	3 Phase									1	1
3	211-0238	Bell, End (Brush End)	1	1	1	1	1	1	1	1	1	1
4	510-0107	Bearing, Roller (Brush End)	1	1	1	1	1	1	1	1	1	1
5	516-0182	Pin, Locating - End Bell	8	8	8	8	8	8	8	8	8	8
6	356-0056	Capacitor	1	1	1	1	1	1	1	1	1	1
7	312-0194	Bracket, Capacitor Mounting	1	1	1	1	1	1	1	1	1	1
8	815-0395	Screw, Tapping - Pan Head (#6 x 3/8)	1	1	1	1	1	1	1	1	1	1
9	234-0526	Cover, Protection	1	1	1	1	1	1	1	1	1	1
10	815-0340	Screw, Cap Hex Head - Tapping (#10 x 3/8")	2	2	2	2	2	2	2	2	2	2

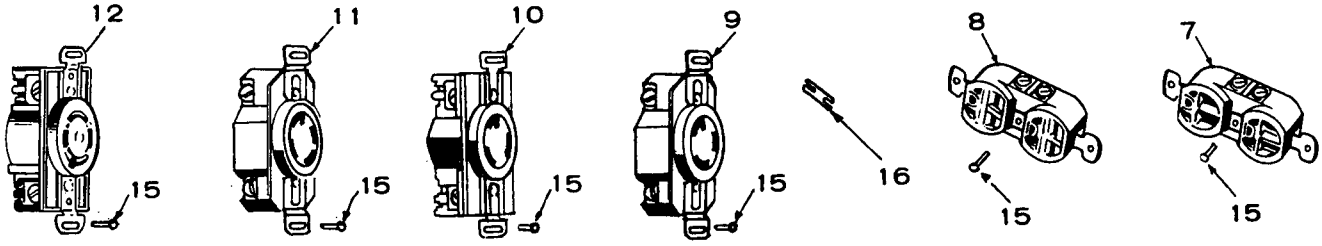
GENERATOR - BEGIN SPEC C

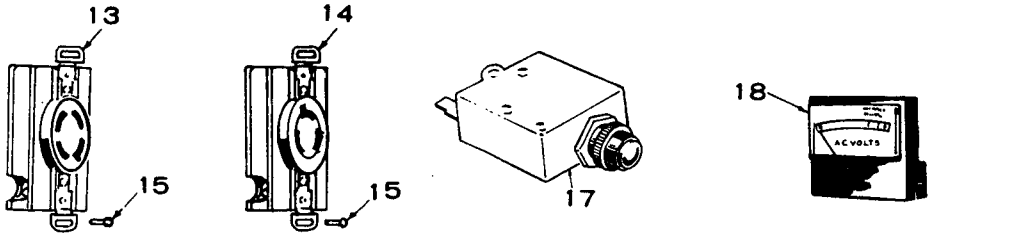
QTY	PART NO.	DESCRIPTION	QUANTITY USED									
			A	B	C	D	E	F	G	H	J	K
11	232-2697	Bracket and Terminal Assembly *#	1	1	1	1	1	1	1	1	1	1
12	815-0395	Screw, Tapping - Pan Head (#6 x 3/8") *#	2	2	2	2	2	2	2	2	2	2
13	305-0548	Rectifier, Bridge *	1	1	1	1	1	1	1	1	1	1
14	815-0198	Screw, Machine - Round Head (#8-32 x 5/8") *#	1	1	1	1	1	1	1	1	1	1
15	212-1249	Guide, Brush *#	1	1	1	1	1	1	1	1	1	1
16	214-0099	Brush, Alternator *#	2	2	2	2	2	2	2	2	2	2
17	332-1564	Terminal, Tab *#	1	1	1	1	1	1	1	1	1	1
18	802-0056	Screw, Allen Head Cap - Rotor (5/16-18 x 1-1/4")	1	1	1	1	1	1	1	1	1	1
19	815-0395	Screw, Tapping - Pan Head (#6 x 3/8") *#	2	2	2	2	2	2	2	2	2	2
20		SCREW, CAP - HEX HEAD										
	800-0017	1/4-20 x 3-1/2"	4	4								
	800-0021	1/4-20 x 4-1/2"			4	4						
	800-0187	1/4-20 x 5"					4	4				
	800-0188	14/-20 x 6-1/2"							4	4		
	800-0189	1/4-20 x 8"									4	4
21	850-0040	Washer, Lock - Spring (1/4")	4	4	4	4	4	4	4	4	4	4
22	862-0001	Nut, Hex (1/4-20)	4	4	4	4	4	4	4	4	4	4
23	202-0674	Sleeve, Alternator Shaft	1	1	1	1	1	1	1	1	1	1
24	231-0194	Bell, End (Shaft End)	1	1	1	1	1	1	1	1	1	1
25	232-2620	Bracket, Terminal Mounting - 3 Phase Sets #	1	1	1	1	1	1	1	1	1	1
26	332-1862	Block, Terminal - 3 Phase Sets #	1	1	1	1	1	1	1	1	1	1
27	332-1863	Strip, Terminal Block Marker - 3 Phase Sets #	1	1	1	1	1	1	1	1	1	1
28	812-0082	Screw, Machine - Round Head (#8-32 x 3/4") - 3 Phase Sets #	2	2	2	2	2	2	2	2	2	2
29	870-0221	Nut, Hex W/ET (#8-32) 3 Phase Sets #	2	2	2	2	2	2	2	2	2	2
30	815-0395	Screw, Tapping - Pan Head (#6 x 3/8")	2	2	2	2	2	2	2	2	2	2
31	526-0047	Washer, Flat (.147 ID x 5/16 OD X 1/32 Thk) - 3 Phase Set #	1	1	1	1	1	1	1	1	1	1
32	510-0108	Bearing, Roller (Shaft End)	1	1	1	1	1	1	1	1	1	1
33	232-2588	Plate, Bearing Retainer (Shaft End)	1	1	1	1	1	1	1	1	1	1
34	813-0100	Screw, Machine - Round Head (#10-32 x 1/2")	3	3	3	3	3	3	3	3	3	3
35	850-0030	Washer, Lock - Spring (#10)	3	3	3	3	3	3	3	3	3	3
36	518-0010	Ring, Retaining - Bearing	1	1	1	1	1	1	1	1	1	1
37	515-0026	Key, Drive Shaft	1	1	1	1	1	1	1	1	1	1
38	815-0388	Screw, Tapping - Pan Head (#6 x 1/2") *#	2	2	2	2	2	2	2	2	2	2
39	232-2431	Base, Alternator Mounting (Optional)	1	1	1	1	1	1	1	1		
39	232-2430	Base, Alternator Mounting (Optional)									1	1
40	815-0384	Screw, Cap - Hex Head (3/8-16 x 3/4") Optional	4	4	4	4	4	4	4	4	4	4
41	211-0266	Bell Assembly, End - 1 Phase Sets (Includes Parts Marked *)	1	1	1	1	1	1	1	1	1	1
42	211-0272	Bell Assembly, End - 3 Phase Sets (Includes Parts Marked #)	1	1	1	1	1	1	1	1	1	1

* - Included in 211-0266 End Bell Assembly
\# - Included in 211-0272 End Bell Assembly

BOX, RECEPTACLE - BEGIN SPEC C



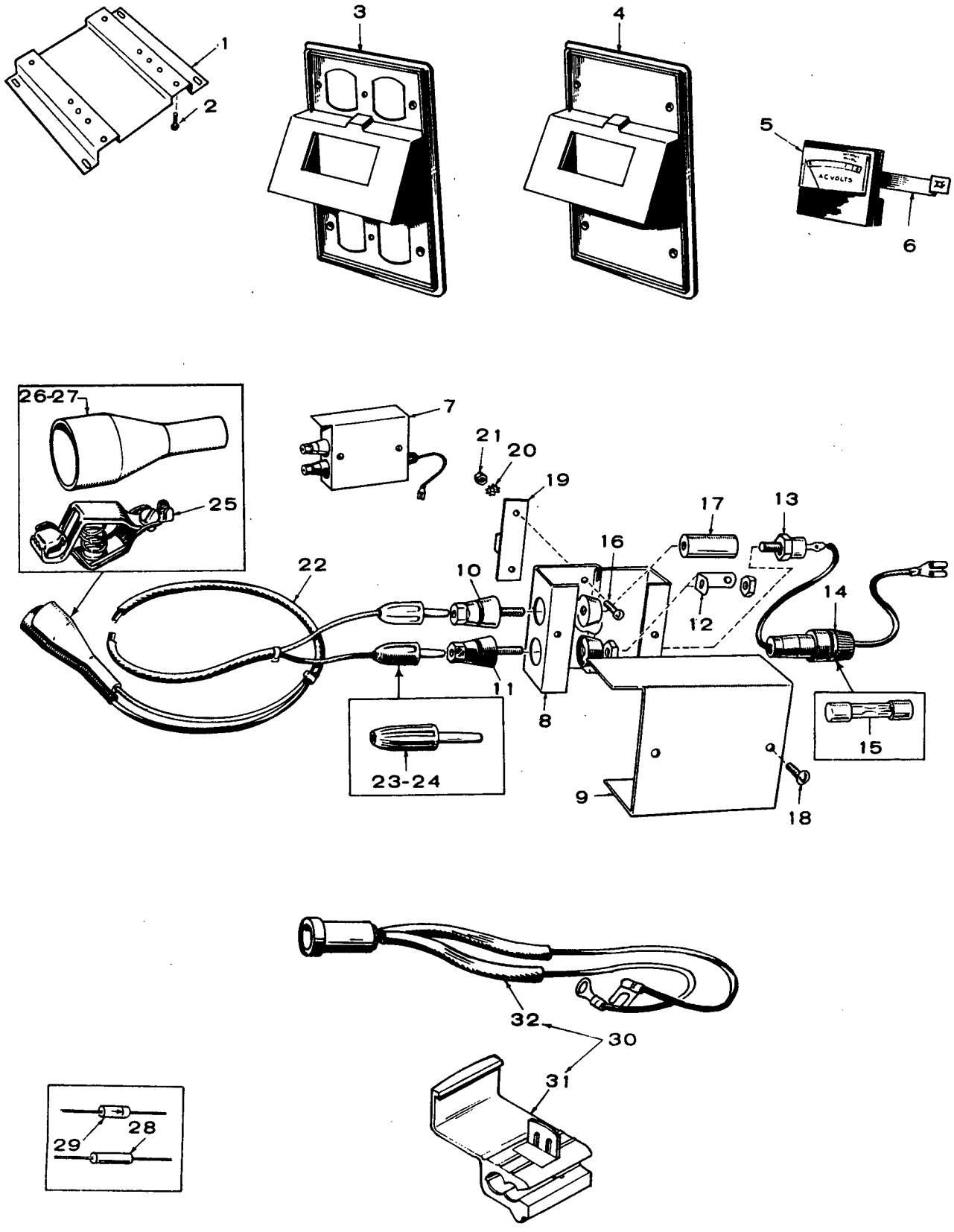




BOX, RECEPTACLE - BEGIN SPEC C

QTY	PART NO.	DESCRIPTION	QUANTITY USED
1	301-3916	Box, Receptacle - Holes for two Duplex Receptacles and Two fuses	As Required
2	301-3915	Box, Receptacle - Holes for One Duplex Receptacle, Two Single Receptacles (1.62" Diameter and 1.75" Diameter) and Four Fuses	As Required
3	301-3824	Box, Receptacle - Holes for One Duplex Receptacle, One Single Receptacle (1.75" Diameter) and Three Fuses	As Required
3	301-3987	Box, Receptacle - Holes for One Duplex Receptacle, One Single Receptacle (1.437" Diameter) and Three Fuses	As Required
4	301-3872	Box, Receptacle - Holes for two Duplex Receptacles, two fuses and Voltmeter	As Required
5	301-3873	Box, Receptacle - Holes for One Duplex Receptacle, One Single Receptacle (1.75" Diameter), Three Fuses and Voltmeter	As Required
5	301-3988	Box, Receptacle - Holes for One Duplex Receptacle, One Single Receptacle (1.437 Diameter), Three Fuses and Voltmeter	As Required
6	301-3875	Box, Receptacle - Hole for Single Receptacle (1.625" Diameter)	As Required
7	323-0383	Receptacle, Duplex (125 Volt) Parallel Blades	As Required
8	323-0213	Receptacle, Duplex (250 Volt) Tandem Blades	As Required
9	323-0854	Receptacle, Twistlock (3 Wire, 30 Amp, 125 Volt)	As Required
10	323-0855	Receptacle, Twistlock (3 Wire, 20 Amp, 250 Volt)	As Required
11	323-0943	Receptacle, Twistlock (4 Wire, 30 Amp, 125/250 Volt)	As Required
12	323-0856	Receptacle, Twistlock (4 Wire, 20 Amp, 125/250 Volt)	As Required
13	323-0091	Receptacle, Twistlock (4 Wire, 20 Amp, 250 Volt)	As Required
14	323-0971	Receptacle, Twistlock (3 Wire, 20 Amp, 125/250 Volt)	As Required
15	812-0061	Screw, Machine - Round Head (#6-32 x 3/8")	As Required
16	323-0869	Strap, Ground	As Required
17		BREAKER, CIRCUIT	
	320-0540	15 Ampere	As Required
	320-0541	20 Ampere	As Required
	320-0542	25 Ampere	As Required
	320-0543	30 Ampere	As Required
18	302-1031	Voltmeter, AC	As Required
19	332-0556	Connector, Faston	As Required

OPTIONAL EQUIPMENT



OPTIONAL EQUIPMENT

REF NO.	PART NUMBER	PART DESCRIPTION	QUANTITY USED									
			A	B	C	D	E	F	G	H	J	K
1	232-2431	Base, Alternator Mounting-Optional-Spec A and B Only	1	1	1	1	1	1	1	1		
1	232-2430	Base, Alternator Mounting-Optional-Spec A and B Only									1	1
2	815-0384	Screw, Hex Cap-Base Mounting (3/8-16x3/4") Optional-Spec A and B Only	4	4	4	4	4	4	4	4	4	4
3	232-2439	Cover, End Bell(Units With Receptacles and Voltmeter in End Bell) Optional-Spec A and B Only		1		1		1		1		1
4	232-2440	Cover, End Bell (Units With Voltmeter Only in the End Bell) Optional-Spec A and B	1		1		1		1		1	
5	302-0917	Meter, Volt (AC) Optional-Spec A and B	1	1	1	1	1	1	1	1	1	1
6	870-0293	Pushnut, Twin-Voltmeter Mounting-Optional Spec A and B Only	1	1	1	1	1	1	1	1	1	1
7	305-0527	Charger Assy., Battery Opt.(inc. Parts Marked**)	1	1	1	1	1	1	1	1	1	1
8	232-2437	Bracket, Battery Charger Terminal Optional**	1	1	1	1	1	1	1	1	1	1
9	232-2436	Cover, Battery Charger Bracket-Optional**	1	1	1	1	1	1	1	1	1	1
10	332-0785	Post, Binding(Red) Battery Charger-Optional**	1	1	1	1	1	1	1	1	1	1
11	332-0784	Post, Binding (Black) Battery Charger-Optional**	1	1	1	1	1	1	1	1	1	1
12	332-1575	Strip, Terminal-Battery Charger-Optional**	1	1	1	1	1	1	1	1	1	1
13	358-0016	Rectifier,Diode-Battery Charger-Optional**	1	1	1	1	1	1	1	1	1	1
14	321-0203	Holder, Fuse-Battery Charger (Includes Fuse and Spring Nut)-Optional**	1	1	1	1	1	1	1	1	1	1
15	321-0127	Fuse, 15 Amp-Battery Charger-Optional**	1	1	1	1	1	1	1	1	1	1
16	815-0333	Screw, Round Head (#10 x 1/2") Battery Charger-Optional**	2	2	2	2	2	2	2	2	2	2
17	232-2438	Spacer, Threaded-Battery Charger-Opt.**	1	1	1	1	1	1	1	1	1	1
18	815-0048	Screw, Round Head-Battery Charger Cover-Optional**	2	2	2	2	2	2	2	2	2	2
19	191-1074	Bracket, Battery Charger Mounting-Optional	1	1	1	1	1	1	1	1	1	1
20	853-0008	Washer, Shakeproof-Charger to Bracket(#10) Optional	2	2	2	2	2	2	2	2	2	2
21	870-0053	Nut, Hex-Charger to Bracket(#10-32) Optional	2	2	2	2	2	2	2	2	2	2
22	305-0537	Cable Assembly, Battery Charger-Optional (Includes Parts Marked +)	1	1	1	1	1	1	1	1	1	1
23	323-0888	Plug, Banana(Red)-Optional +	1	1	1	1	1	1	1	1	1	1
24	323-0889	Plug, Banana(Black)-Optional +	1	1	1	1	1	1	1	1	1	1
25	332-1446	Clip, Battery-Optional +	2	2	2	2	2	2	2	2	2	2
26	332-1447	Insulator, Battery Clip(Red)-Optional +	1	1	1	1	1	1	1	1	1	1
27	332-1448	Insulator, Battery Clip(Black)-Optional +	1	1	1	1	1	1	1	1	1	1
28	350-0131	Resistor, Fixed(Part of Voltmeter) Opt.	1	1	1	1	1	1	1	1	1	1
29	357-0004	Diode, Rectifier(Part of Voltmeter) Opt.	2	2	2	2	2	2	2	2	2	2
30	322-0159	Package, Lamp-Running Lamp-Optional (Includes Parts Marked #)	1	1	1	1	1	1	1	1	1	1
31	323-0883	Connector, Electrical-Running Lamp-Opt.#	1	1	1	1	1	1	1	1	1	1
32	322-0156	Lamp, Assembly-Running-Optional #	1	1	1	1	1	1	1	1	1	1

** Parts included in 305-0527 Battery Charger Assembly.

\+ Parts included in 305-0537 Cable Assy.

\# Parts included in 322-0159 Running Lamp Package.