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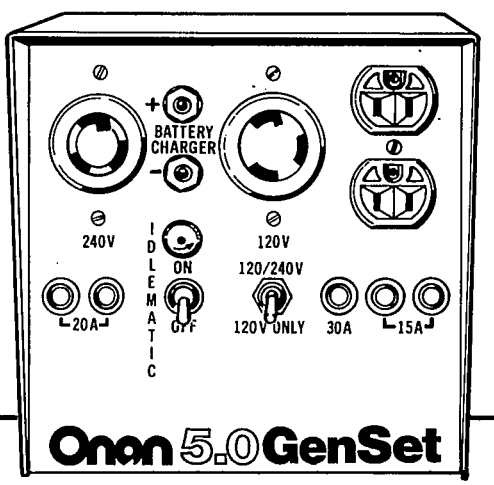
Onan

Major Service Manual

YCB Alternator

1200 - 6500 Watts
50 and 60 Hertz

- Alternator Description
- Troubleshooting Chart
- Testing Procedures
- Repairs
- Wiring Diagrams



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6-82
Printed in U.S.A.

Safety Precautions

Before operating the generator set, read the Operator's Manual and become familiar with it and the equipment. **Safe and efficient operation can be achieved only if the unit is properly operated and maintained.** Many accidents are caused by failure to follow fundamental rules and precautions.

The following symbols, found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel, or the equipment.

⚠ DANGER ***This symbol warns of immediate hazards which will result in severe personal injury or death.***

⚠ WARNING ***This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.***

⚠ CAUTION ***This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.***

FUEL AND FUMES ARE FLAMMABLE. Fire, explosion, and personal injury can result from improper practices.

- DO NOT fill fuel tanks with the engine running unless tanks are outside the engine compartment. Fuel contact with hot engine or exhaust is a potential fire hazard.
- DO NOT SMOKE OR ALLOW AN OPEN FLAME near the generator set or fuel tank. Internal combustion engine fuels are highly flammable.
- Fuel lines must be adequately secured and free of leaks. Fuel connections at the engine should be made with an approved flexible line. Do not use copper piping on flexible lines as copper will work harden and become brittle.
- Be sure that all fuel supplies have a positive shutoff valve.
- DO NOT SMOKE while servicing batteries. Lead acid batteries emit a highly explosive hydrogen gas that can be ignited by electrical arcing or by smoking.

EXHAUST GASES ARE DEADLY

- Provide an adequate exhaust system to properly expel discharged gases. Inspect the exhaust system daily for leaks per the maintenance schedule. See that exhaust manifolds are secure and are not warped. Do not use exhaust gases to heat a compartment.
- Be sure the unit is well ventilated.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Keep your hands away from moving parts.
- Before performing any maintenance on the generator set, disconnect the starting battery negative (–) ground lead lead first. This will prevent accidental starting.
- Make sure that fasteners on the generator set are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- Do not wear loose clothing or jewelry while servicing any part of the generator set. Loose clothing and jewelry can become caught in moving parts. Jewelry can short out electrical contacts and cause shock or burning.
- If adjustment *must* be made while the unit is running, use extreme caution around hot manifolds, moving parts, etc.

ELECTRICAL SHOCK WILL CAUSE SEVERE PERSONAL INJURY OR DEATH

- Remove electric power before removing protective shields or touching electrical equipment. Use rubber insulative mats placed on dry wood platforms over floors that are metal or concrete when around electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin surfaces to be damp when handling electrical equipment.
- Use extreme caution when working on electrical components. High voltages can cause injury or death. DO NOT tamper with interlocks.
- Follow all state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag open switches to avoid accidental closure.
- DO NOT CONNECT THE GENERATOR SET DIRECTLY TO ANY BUILDING ELECTRICAL POWER SYSTEM. Hazardous voltages can flow from the generator set into the utility line. This creates a potential for electrocution or property damage. Connect only through an approved device and after building main switch is open. Consult an electrician in regard to emergency power use.

GENERAL SAFETY PRECAUTIONS

- Provide appropriate fire extinguishers and install them in convenient locations. Consult your local fire department for the correct type of extinguisher to use. Do not use foam on electrical fires. Use extinguisher rated ABC by NFPA.
- Used engine oils have been identified by some state or federal agencies as causing cancer or reproductive toxicity. When checking or changing engine oil, take care not to ingest, breathe the fumes, or contact used oil.
- Benzene and lead, found in some gasoline, have been identified by some state and federal agencies as causing cancer or reproductive toxicity. When checking, draining or adding gasoline, take care not to ingest, breathe the fumes, or contact gasoline.
- Make sure that rags are not left on or near the engine.
- Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause over heating and engine damage, and present a potential fire hazard.
- Keep the generator set and the surrounding area clean and free from obstructions. Remove any debris from the set and keep the floor clean and dry.
- Do not work on this equipment when mentally or physically fatigued, or after consuming any alcohol or drug that makes the operation of equipment unsafe.

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WARNING

ONAN RECOMMENDS THAT ALL SERVICE INCLUDING INSTALLATION OF REPLACEMENT PARTS ONLY BE DONE BY PERSONS QUALIFIED TO PERFORM ELECTRICAL AND/OR MECHANICAL SERVICE. TO PREVENT PERSONAL INJURY AND/OR EQUIPMENT DAMAGE IT IS IMPERATIVE THAT THE SERVICE PERSON BE QUALIFIED.

Electrical Data - Portable Alternators

Spec A Through F - 60 Hz Models Only

GENERATOR SET SERIES**	WATTS	AMPERES	VOLTAGE*	RPM	PHASE
PD TM	1200	10	120	3600	1
PC TN	1750	14.6	120	3600	1
PE TP	2000	16.7	120	3600	1
PF TR	3000	25/12.5	120/240	3600	1
PG TS	4500	38/19	120/240	3600	1
PH TT	5500	45.8/22.9	120/240	3600	1
PK TS	4500	39/19	120/240	3600	1
PM	5500	45.8/22.9	120/240	3600	1

Spec H - 60 Hz Models Only

	WATTS	VOLTS	AMPS	WIRE	RPM	PHASE
1.7 PC/1P	1750	120	14.6	2	3600	1
2.2 PE/1P	2250	120	18.7	2	3600	1
3.0 PL/1P	3000	120	25.0	2	3600	1
3.0 PL/3P	3000	120/240	*25/12.5	3	3600	1
3.2 PF/3P	3250	120/240	*27/13.5	3	3600	1
3.7 PF/3P	3750	120/240	*31/15.5	3	3600	1
5.0 PK/3P	5000	120/240	*41/20.5	3	3600	1
5.0 PK/3E•	5000	120/240	*41/20.5	3	3600	1
6.5 PM/3P	6500	120/240	*54/27	3	3600	1
6.5 PM/3E•	6500	120/240	*54/27	3	3600	1
**5.0 PM/3P•	5000	120/240	*41/20.5	3	3600	1
**6.5 PM/3P•	6500	120/240	*54/27	3	3600	1

* 120 Volt Current Rating.
** Extended Run Models.
• Electric Start Models.

Spec J - 60 Hz Models Only

Models	Watts	Volts	Amps	Wire	Phase	RPM
RESIDENTIAL MODELS						
1.7PE-1P	1750	120	14.6	2	1	3600
2.2PE-1P	2250	120	18.8	2	1	3600
3.0PL-1P	3000	120	25.0	2	1	3600
3.0PL-3P	3000	120/240	25.0/12.5	3	1	3600
3.7PP-3P	3750	120/240	31.2/15.6	3	1	3600
5.0PN-3P	5000	120/240	41.7/20.8	3	1	3600
5.0PN-3E	5000	120/240	41.7/20.8	3	1	3600
6.5BFAB-3E	6500	120/240	54.2/27.1	3	1	3600
CONTRACTOR MODELS						
2.2PEI-1P	2250	120	18.8	2	1	3600
3.2PFI-3P	3250	120/240	27.1/13.5	3	1	3600
3.7PFI-3P	3750	120/240	31.2/15.6	3	1	3600
5.0PKI-3P	5000	120/240	41.7/20.8	3	1	3600
6.5BFAB-3P	6500	120/240	54.2/27.1	3	1	3600

Electrical Data - Portable Alternators

Spec A Through F - 50 Hz Models Only

GENERATOR SET SERIES**	WATTS	AMPERES	VOLTAGE	RPM	PHASE
PD TM	1000	10/5	100/200	3000	1
	1000	9/4.5	110/220	3000	1
	1000	8.4/4.2	120/240	3000	1
PC TN	1400	14/7	100/200	3000	1
	1400	12.6/6.3	110/220	3000	1
	1400	11.6/5.8	120/240	3000	1
PE TP	1600	16/8	100/200	3000	1
	1600	14.4/7.2	110/220	3000	1
	1600	13.2/6.6	120/240	3000	1
PF TR	2500	25/12.5	100/200	3000	1
	2500	22.8/11.4	110/220	3000	1
	2500	20.8/10.4	120/240	3000	1
PG TS	3700	37/18.5	100/200	3000	1
	3700	33.6/16.8	110/220	3000	1
PK -	3700	30.8/15.4	120/240	3000	1
PH TT	4500	45/22.5	100/200	3000	1
PM -	4500	41/20.5	110/220	3000	1
	4500	37.5/18.7	120/240	3000	1

* - Some nameplates are stamped 125/250.

** - First letter "P" designates alternator is driven by a Briggs and Stratton engine. "T" designates driven by Tecumseh engine.

Spec H - 50 Hz Models Only

GENERATOR SET MODEL NO.		1.4PC-53AP 1.4PC-53BP 1.4PC-53CP	1.8PE-53AP 1.8PE-53BP 1.8PE-53CP	2.7PL-53AP 2.7PL-53BP 2.7PL-53CP	3.1PF-53AP 3.1PF-53BP 3.1PF-53CP	4.1PK-53AP 4.1PK-53BP 4.1PK-53CP	4.1PK-53AE 4.1PK-53BE 4.1PK-53CE	5.4PM-53AP 5.4PM-53BP 5.4PM-53CP	5.4PM-53AE 5.4PM-53BE 5.4PM-53CE
WATTS		1400	1800	2700	3100	4100	4100	5400	5400
Amperes (Code)	53A	14/7.0	18/9.0	27/13.5	31/15.5	41/20.5	41/20.5	54/27	54/27
	53B	12.7/6.3	16.4/8.2	24.5/12.3	28.2/14.1	37.3/18.6	37.3/18.6	49/24.5	49/24.5
	53C	11.6/5.8	15/7.5	22.5/11.3	25.8/12.9	34.2/17.1	34.2/17.1	45/22.5	45/22.5
Voltage (Code)	53A	100/200	100/200	100/200	100/200	100/200	100/200	100/200	100/200
	53B	110/220	110/220	110/220	110/220	110/220	110/220	110/220	110/220
	53C	120/240	120/240	120/240	120/240	120/240	120/240	120/240	120/240
RPM		3000	3000	3000	3000	3000	3000	3000	3000

Spec J - 50 Hz Models Only

Generator Set Model No.		1.4PE-53AP	1.8PE-53AP	2.7PL-53AP	3.1PP-53AP	3.1PFI-53AP	4.1PN-53AP	4.1PN-53AE	4.1PKI-53AP
		1.4PE-53BP	1.8PE-53BP	2.7PL-53BP	3.1PP-53BP	3.1PFI-53BP	4.1PN-53BP	4.1PN-53BE	4.1PKI-53BP
		1.4PE-53CP	1.8PE-53CP	2.7PL-53CP	3.1PP-53CP	3.1PFI-53CP	4.1PN-53CP	4.1PN-53CE	4.1PKI-53CP
Watts		1400	1800	2700	3100	3100	4100	4100	4100
Amperes (Code)	53A	14/7.0	18/9.0	27/13.5	31/15	31/15.5	41/20.5	41/20.5	41/20.5
	53B	12.7/6.3	16.4/8.2	24.6/12.3	28.2/14.1	28.2/14.1	37.2/18.6	37.2/18.6	37.2/18.6
	53C	11.6/5.8	15/7.5	22/11	25.8/12.9	25.8/12.9	34/17	34.2/17.1	34.2/17.1
Voltage (Code)	53A	100/200	100/200	100/200	100/200	100/200	100/200	100/200	100/200
	53B	110/220	110/220	110/220	110/220	110/220	110/220	110/220	110/220
	53C	120/240	120/240	120/240	120/240	120/240	120/240	120/240	120/240
RPM		3000	3000	3000	3000	3000	3000	3000	3000

Electrical Data - Belt Driven Alternators

Single-Phase, *60-Hertz Models - Spec A Through C Only

ALTERNATOR MODEL	CAPACITY WATTS	VOLTS	AMP	WIRE	RPM	NET WEIGHT LB (MASS)
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	37.5/18.8	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 Models - Spec A Through C Only

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.

Single-Phase, 60-Hertz Models - Spec H and J

ALTERNATOR MODEL NO.	kW	VOLTS	AMPS	WIRE	RPM	CIRCUIT BREAKERS	APPROX. NET WEIGHT LB (MASS)
1.7YCB-1S	1750	120 ONLY	*14	2	3600	NO	36 (16 kg)
2.2YCB-1S	2250	120 ONLY	*18	2	3600	NO	40 (18 kg)
3.0YCB-3S	3000	120/240	*25/12.5	3	3600	YES	47 (21 kg)
3.7YCB-3S	3750	120/240	*31/15.5	3	3600	YES	54 (24 kg)
5.0YCB-3S	5000	120/240	*41/20.5	3	3600	YES	65 (29 kg)
6.5YCB-3S	6500	120/240	*54/27	3	3600	YES	80 (36 kg)

* - *Indicates 120 volt current rating.*

Shaft diameter is 7/8 inches (22.2cm) on all models

Alternator Specifications

Design: Revolving field, two pole, compound wound for improved voltage regulation. Self-excited. Drip proof construction. Connected directly to the engine and permanently aligned.

Bearing: Prelubricated, double-sealed needle bearing.

Exciter: Isolated exciter winding, solicon diodes or bridge rectifier, no commutator. Collector rings and brushes carry only rectified excitation current to the field coils.

Insulation: Class F per NEMA MG1-1.65 definition. Insulating varnish conforms to MIL-I-24092. Type M, Class 155.

Temperature Rise: Temperature rise at rated load is within NEMA MG1-22.40 definition.

Cooling: Direct drive centrifugal blower. Air required 67-cfm.

Rotor: Laminated steel stack, press fitted to shaft. Heavy polyester with insulated copper wire field coils. Balanced.

Stator: Laminated electrical steel welded stack. Machine wound and laced AC windings in class F slot liners.

Brushes: Electrographitic. Long life, easily serviced.

Collector Rings: Sintered copper alloy, concentric annular rings molded in phenolic.

Frequency Regulation: 3 hertz maximum, no load to rated load.

Voltage Regulation: ± 5%.

Battery Charging Circuit: A separate alternator winding internally wired to an insulated terminal inside the generator end bell. This simplifies installation of the optional, customer installed battery charging kit. Output is 12 volts only at 5-8 amperes of continuous charging current.

Description

INTRODUCTION

This manual provides detailed disassembly, troubleshooting, service and testing procedures for Onan "P"-series portable generator sets and belt driven, two-bearing YCB alternators. Service and testing procedures are illustrated and explained on most electrical components. Optional accessory items are also covered. This manual covers ONLY the generator portion of the portable generator sets. Contact the engine manufacturer's authorized dealer for service and parts information on the engine. The prime mover may be either Briggs & Stratton or Tecumseh. Information is also applicable to all Onan manufactured private label models. This manual is intended for use by authorized Onan distributors and dealers.

TEST EQUIPMENT

Most tests outlined in this manual can be made with an AC-DC multimeter, such as Simpson 270. Other suggested instruments are:

- Onan Multitester 420-0303
- Wheatstone or Kelvin bridge—(Testing Resistance Values below 1 ohm)
- Jumper Wires

ALTERNATOR DESIGN DESCRIPTION

The YCB alternator family is a two pole, revolving field (rotor) unit, with a stationary armature (stator) containing two 120 volt AC windings as the power source. The stator contains a separate AC excitation winding. AC voltage of this winding is rectified to DC by two silicon diodes that are mounted in the end bell (Spec A and B models ONLY). These diodes were replaced by a bridge rectifier (beginning Spec C). DC passes to the field (rotor) through slip rings and low current brushes allowing the alternator to produce its own excitation current. Current is taken from the stator through a connector plug on the end bell (Spec A and B ONLY) to the receptacles. On later models (beginning Spec C) current is taken from the stator through individual internal output load wires (T1,T2,T3 and T4) directly to each receptacle. Some models have fuses or circuit breakers in series with the output load wires. Larger dual voltage models may have a full power voltage selector switch on the control panel which allows full nameplate current to be drawn from the 120 volt receptacles. Refer to appropriate wiring diagram according to Spec letter and nameplate rating. Alternator output leads are individually marked and color coded for positive identification.

The rotor connects directly to the engine crankshaft with a tapered fit on portable generator sets. On two bearing belt driven separate generators, a gasoline engine is the usual power source driven through a pulley/V-belt connection. Engine speed in both types is 3600 RPM for 60 hertz and 3000 RPM for 50 hertz operation.

RECEPTACLES

Two, 120 volt duplex receptacles are standard on all 120 volt only models. One, 120 duplex and one, 240 volt duplex receptacle are standard on all 120/240 volt models. Location and types of receptacles, fuses, circuit breakers, switches and optional accessories such as battery charging, voltmeters, Idlematic speed control, etc. vary according to Spec letter and kilowatt size. See Figures 1 through 6 for typical receptacle panel variations on Onan portable generator sets. All belt-driven two bearing alternators have a voltmeter in the receptacle panel as shown in Figures 7 and 8.

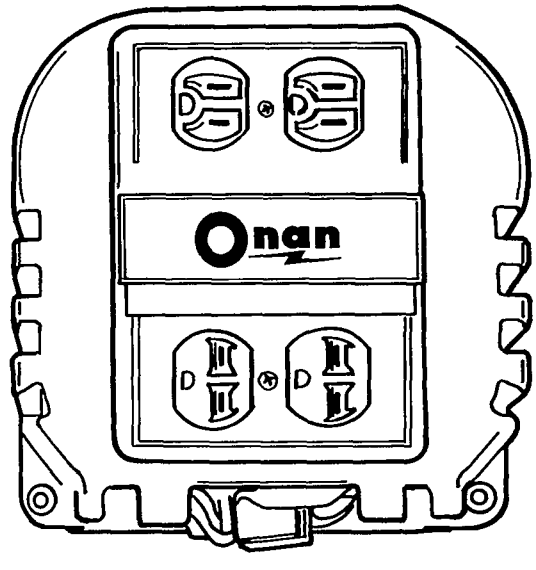

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FIGURE 1. STANDARD RECEPTACLE PANEL (SPEC A AND B ONLY)

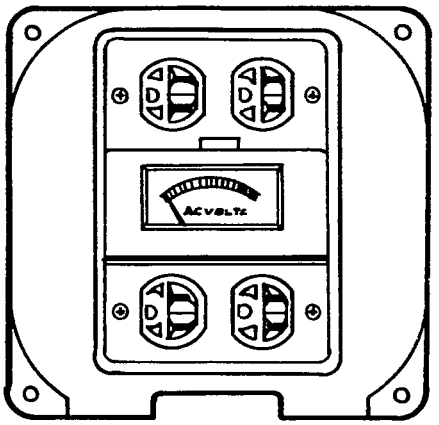

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FIGURE 2. OPTIONAL RECEPTACLE PANEL WITH VOLTMETER (SPEC A AND B ONLY)

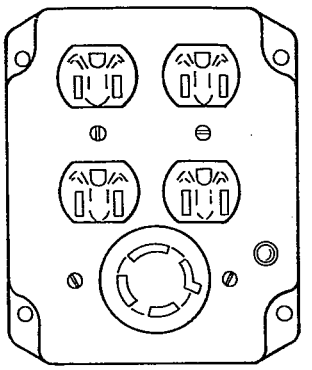

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FIGURE 5. STANDARD RECEPTACLE BOX FOR 120 VOLT MODELS (SPEC J ONLY)

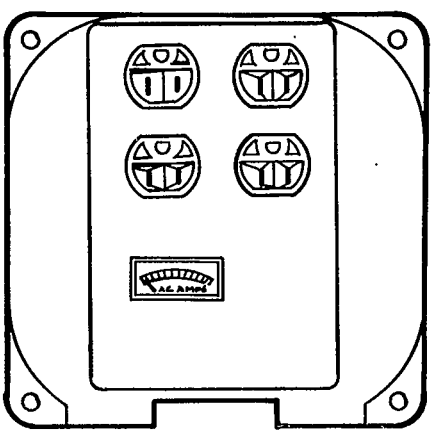

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FIGURE 3. STANDARD RECEPTACLE BOX FOR 120 VOLT MODELS WITH VOLTMETER (SPEC C THROUGH F ONLY)

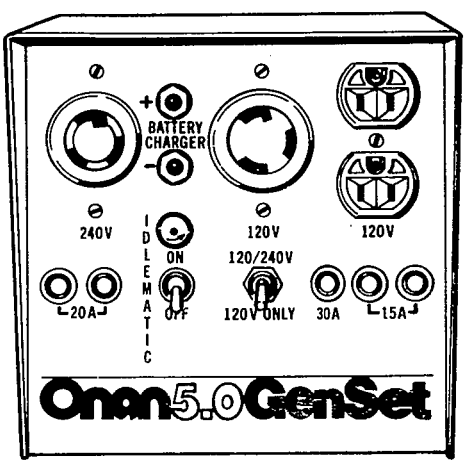

FIGURE 6. STANDARD RECEPTACLE PANEL AND WRAP AROUND HOUSING (3.0 kW AND LARGER DUAL VOLTAGE MODELS SPEC H AND J ONLY)

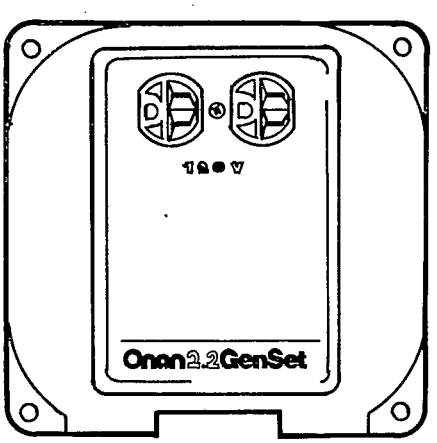

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FIGURE 4. STANDARD RECEPTACLE BOX FOR 120 VOLT MODELS. (SPEC H ONLY)

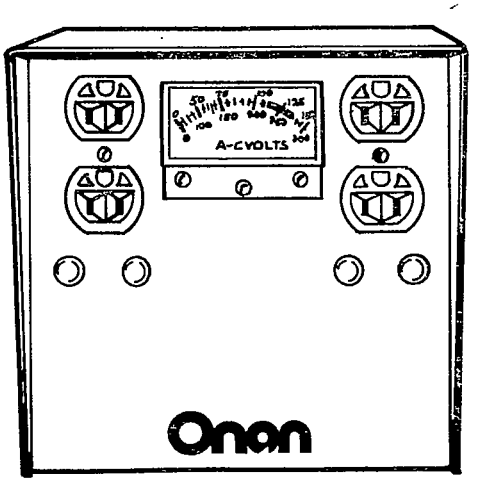

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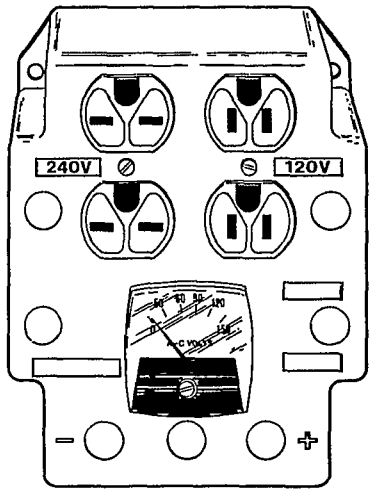
FIGURE 7. TYPICAL RECEPTACLE PANEL FOR SPEC H BELT DRIVEN ALTERNATORS



M-1326

FIGURE 8. TYPICAL RECEPTACLE BOX FOR SPEC J BELT DRIVEN, TWO BEARING ALTERNATORS

BATTERY CHARGING (Optional)

Most models can be equipped with a 12 volt, fused battery charging circuit. This circuit operates from a separate alternator winding and charges at 5-8 amps continuous charging current. See Figure 6.

VOLTMETER

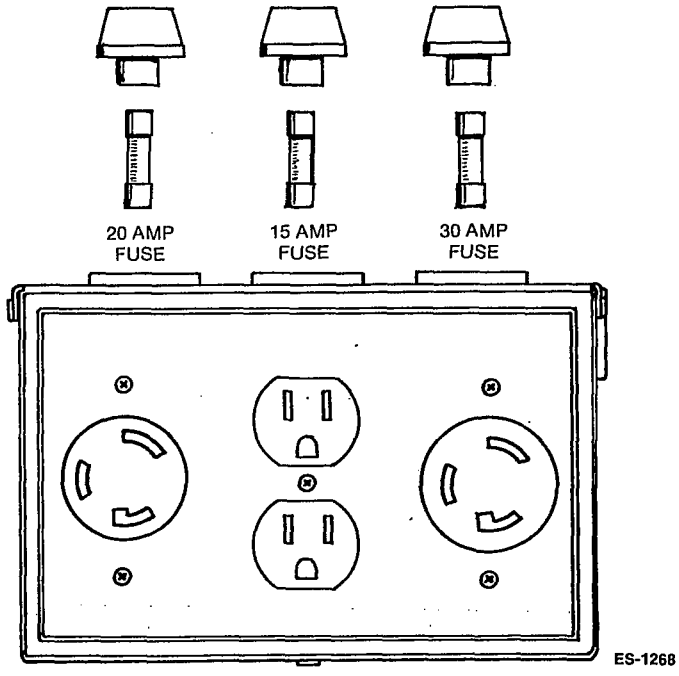
All 120 volt portable generator set models (through Spec C ONLY) may be equipped with a voltmeter as a factory installed optional receptacle panel. All separate two bearing belt driven alternators have a voltmeter as standard equipment. Alternator output voltage and frequency are directly proportional to engine speed. Engine (governed) speed must be constant and not fluctuate under varying loads. Adjust engine governor to maintain proper output on voltmeter.

EXTERNAL RECEPTACLE BOX (Optional)

Spec A and B portable generator sets were available with a blank cover in the end bell and a separate receptacle box mounted on top or either side of the end bell. This optional receptacle box has one, 120 volt, 30-amp twistlock receptacle; one, 240 volt, 20-amp twistlock receptacle and one, 120 volt, 15 amp duplex receptacle. They are available with or without fuse protection corresponding to the ampere rating of each receptacle. See Figure 9.

IDLEMATIC SPEED CONTROL (Optional)

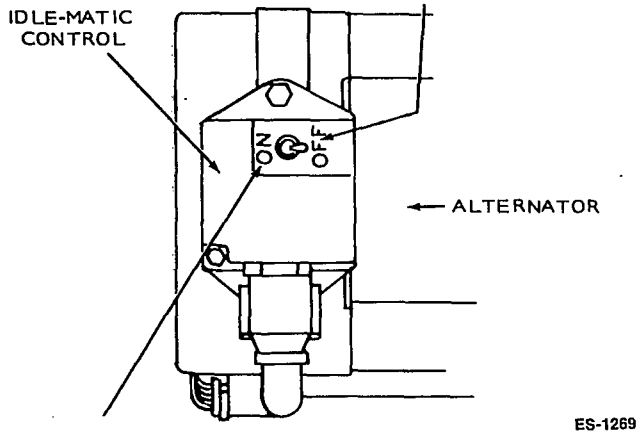
This solid state idle speed control device slows engine speed from the normal 3600 RPM operating speed to 2250 RPM (after a 12-15 second time delay) when electrical load is removed from the generator set. This allows longer engine life, lower fuel consumption and a lower average noise level.



ES-1268

FIGURE 9. OPTIONAL EXTERNAL RECEPTACLE BOX FOR SPEC A AND B PORTABLE GENERATOR SETS

A number of design changes and linkage modifications have been made to various Idlematic kits since the first external models were offered as a factory installed option on Spec A and B units ONLY. See Figure 10.



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ON POSITION: PROVIDES AUTOMATIC IDLE CONTROL. WITH NO LOAD CONNECTED TO SET. SET RUNS AT APPROXIMATELY 1800 RPM. WITH LOAD CONNECTED, SET RUNS AT 3600 RPM.

FIGURE 10. EXTERNAL IDLEMATIC SPEED CONTROL (SPEC A AND B ONLY)

The 150-1667 Idlematic kit (Optional in Spec C through F ONLY) or 150-1763 Idlematic kit (Optional in Spec H ONLY); are obsolete and no longer available. Both kits are superseded by Replacement P.C. Board kit 150-1905. When servicing any Idlematic equipped unit in Spec C through H that requires replacement of the original printed circuit board; order kit 150-1905.

If asked to install a complete Idlematic kit on any Spec H or J model, order kit 150-1904. All electrical components in these kits (except the on/off switch) are installed inside the control (receptacle) panel.

Complete Idlematic kits are no longer available for any Spec A through C generator sets.

IDLEMATIC CONTROL OPTION (1.7 Through 6.5 kW Briggs & Stratton Powered Models Only)

The operating characteristics, initial linkage and carburetor throttle stop screw adjustments are critical in diagnosing proper operation or troubleshooting and repair of any Spec H or J models equipped with the 150-1904 kit. Any Spec C through H models equipped with an obsolete 300-1801 printed circuit board and solid wire throttle linkage MUST be converted to the new linkage and 300-2298 printed circuit board supplied in the 150-1905 kit.

IDLEMATIC CONTROL OPERATION

When a load is placed on the alternator, the Idlematic control senses the load and opens the throttle so the set runs at 3600 RPM. A toggle switch mounted on the receptacle panel turns the Idlematic on or off.

Using the Idlematic Control: Place the Idlematic switch in the Off (down) position and start the generator set. place the switch in the ON (up) position with no load connected to the generator set. Within 30 seconds, the engine RPM should drop from full load speed to idle speed. Connecting a load of at least 30 watts or more will cause the engine RPM to increase immediately to full load speed. After the first load/no load cycle, time delay from full load speed to idle speed is approximately 15 seconds. Remove load and place Idlematic switch in OFF position prior to stopping the generator set.

If unit is operated with the Idlematic circuit inoperative, place the Idlematic on/off switch in "off" (down) position to protect circuits from any further electrical damage.

INITIAL LINKAGE ADJUSTMENT

1. Push solenoid plunger completely into solenoid case (by hand) until plunger is completely bottomed out (seated). See Figure 11 or 12.
2. Depress solenoid plunger until fully seated. If low speed throttle stop screw on engine carburetor does not touch throttle stop on carburetor, loosen jam nut on the solenoid plunger to allow for additional travel as required. *Be careful not to stretch linkage spring.*
3. Adjust inside jam nut (closest to plunger) until it touches the solenoid linkage spring. See Figure 11 or 12.
4. While holding solenoid plunger, linkage spring and inside jam nut from rotating, torque outside jam nut to 8 inch pounds. See Figure 11 or 12.

CAUTION ***Proper solenoid adjustment is critical for speed control to function. If linkage spring is too taut, engine solenoid will not remain seated in idle mode of operation.***

CARBURETOR THROTTLE STOP SCREW ADJUSTMENT

Start the generator set and place the Idlematic on/off switch in "off" (down) position with no load connected to set. Connect an accurate AC voltmeter to any 120 volt duplex receptacle. Manually over-ride engine governor by holding the throttle stop screw against stop on carburetor at idle speed. Adjust throttle stop screw for 75 volts AC output. Release governor and allow engine to come up to governed RPM.

Turning throttle stop screw inward (clockwise) increases voltage and backing screw out (counter-clockwise) decreases the output voltage.

Torque locknut on throttle stop screw of carburetor to 20-24 inch pounds (2.3-2.7 N•m) to hold the proper adjustment.

Place the Idlematic switch in "on" (up) position and within 30 seconds RPM should drop from full load speed to idle speed with no load connected to the set.

Connect a light bulb, fan or drill to any 120 volt duplex receptacle for a momentary load. Solenoid should now de-energize and RPM should increase to accommodate load. After initial start-up, cycle time from full load speed to no load speed is approximately 15 seconds after load is removed.

CAUTION ***An electrical load less than 30 watts will not be sensed by the Idlematic control. Application of such a small load will result in improper engine speed fluctuations.***

If the unit idle speed is not stable, but the output voltage is correct (75 volts AC at idle without load and throttle held on idle stop); the engine solenoid plunger was not fully seated during initial linkage spring adjustment. Loosen jam nuts on plunger rod and readjust spring setting on plunger rod per instructions under INITIAL LINKAGE ADJUSTMENT Section. Then repeat steps 3 and 4 and be sure locknut is tightened properly to hold this adjustment.

CAUTION ***Too low an idle speed (solenoid energized) will result in low AC voltage to the engine solenoid which in turn may cause the Idlematic speed to vary (cycle) up and down continuously. AC output voltage (no load) MUST be adjusted for 75 volts AC by adjusting throttle stop screw on carburetor to obtain this voltage.***

If control does not reduce set speed at all, stop unit, remove receptacle panel and recheck all wiring step by step for proper and tight connections. If all connections are correct, check one amp fuse on printed circuit board which controls solenoid operation. If speed control still does not operate and external governor linkage is not binding and throttle stop screw is properly adjusted for 75 volts AC, replace printed circuit board with a known good 300-2298 P.C. Board.

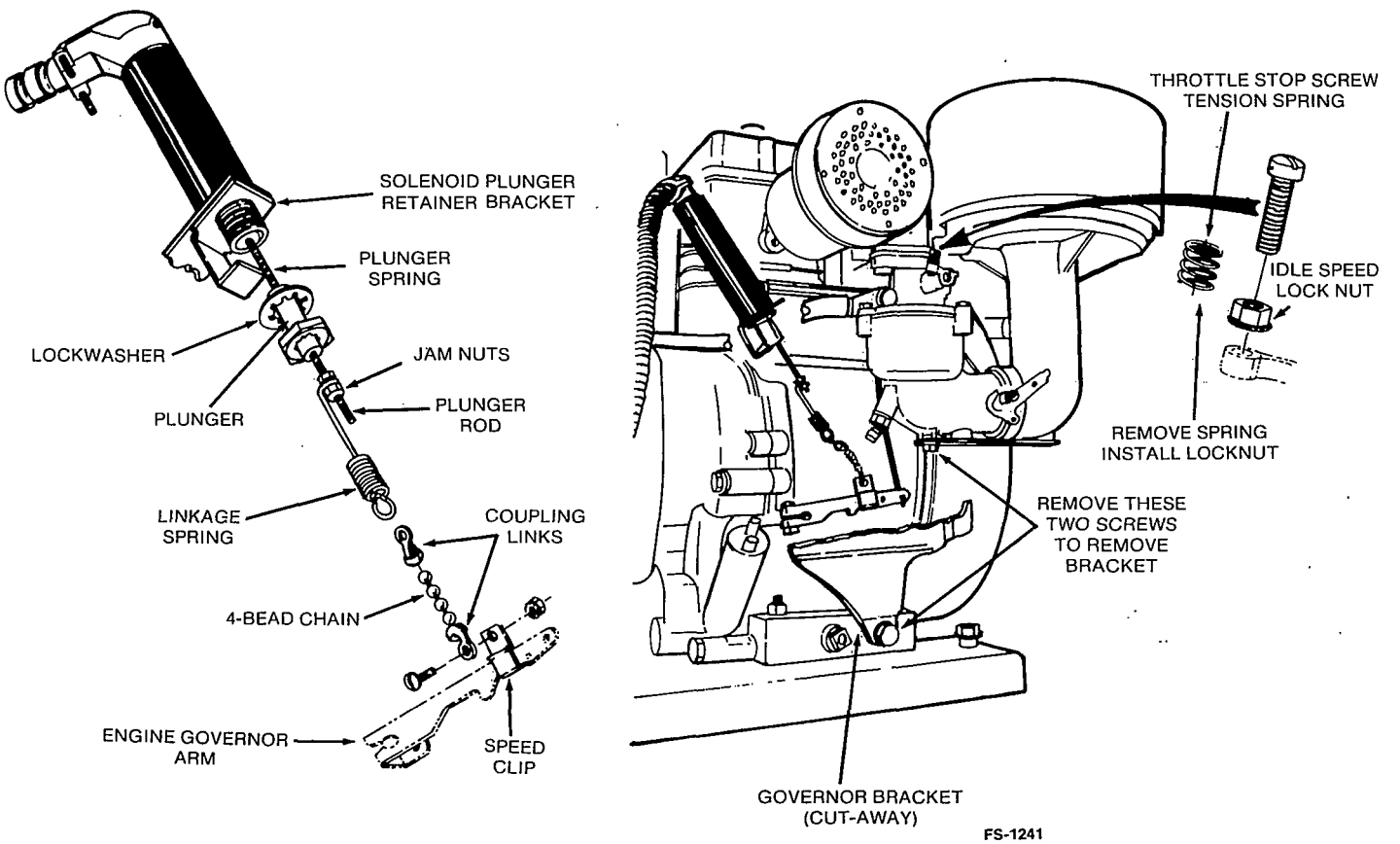


FIGURE 11. SOLENOID LINKAGE ASSEMBLY ON 3.0, 3.2, 3.7, and 5.0 kW MODELS (8, 10 and 11 HORSEPOWER)

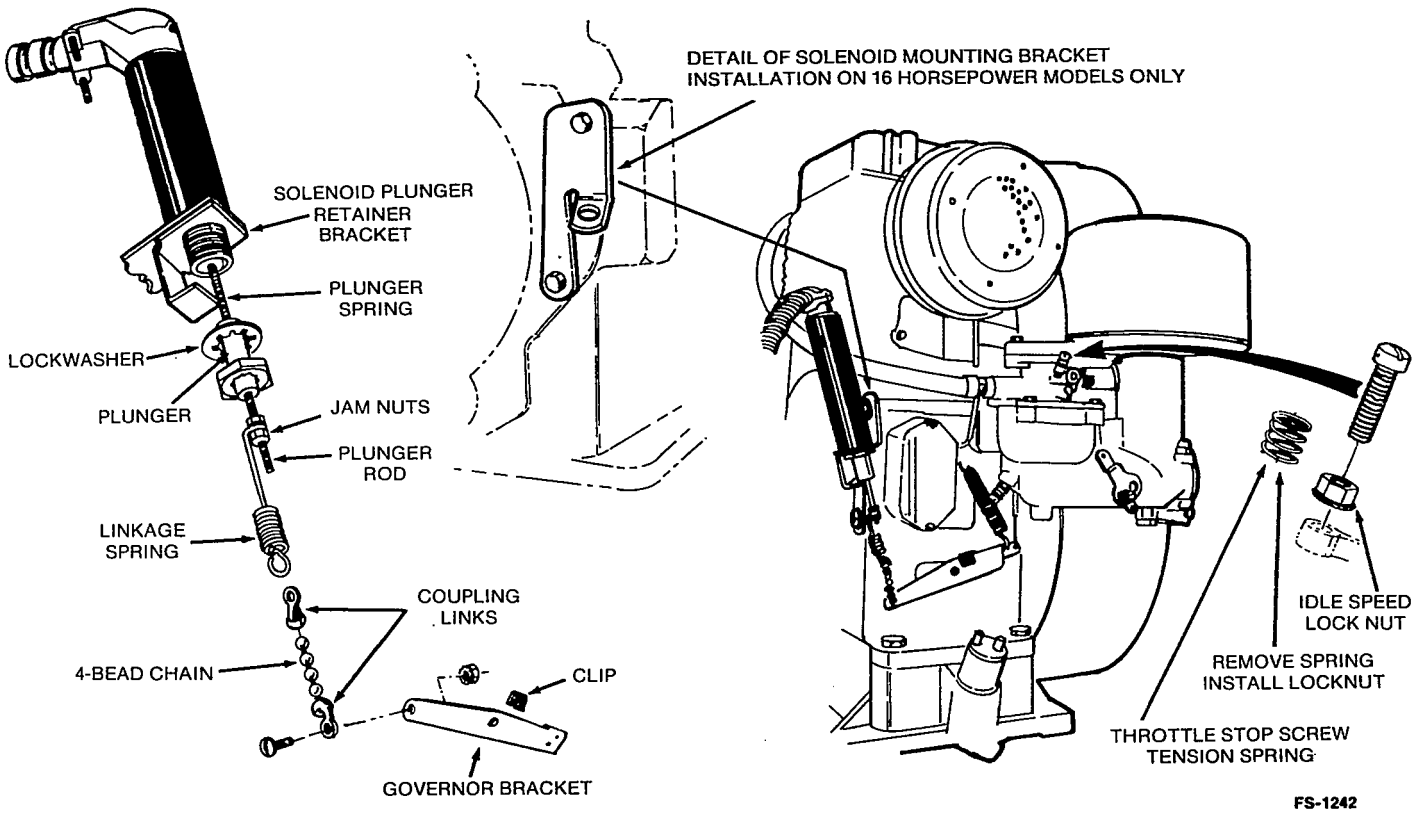


FIGURE 12. SOLENOID LINKAGE ADJUSTMENT AND MOUNTING BRACKET INSTALLATION ON 6.5 kW MODELS ONLY

Alternator Disassembly

Disassembly procedures for stator to end bell connections and physical location of receptacle panel components vary between models depending on kilowatt size and Spec letter. Battery charging winding B1 (large orange lead with large insulated terminal) is not always used and the ground terminal strip physical location and number of terminals varies according to model, Spec letter and number of accessory options installed. Figure 13 illustrates typical disassembly sequence for Spec A or B sets. Figure 14 illustrates typical disassembly sequence for Spec C through F models. Figure 15 illustrates typical disassembly sequence for Spec H and J models. Alternator disassembly for separate, two-bearing, belt driven alternators is similar to portable generator sets except for the end bell and bearing on the shaft (driving power) end of the alternator. Receptacle (control) panel components vary according to kilowatt rating and Spec letter. Proceed as follows:

1. Remove receptacle panel or cover (Spec A & B), receptacle box (Smaller kW models Spec C through J) or receptacle panel with wrap around housing (Larger kW models Spec F through J). Some Private Label larger kW models have a blank cover over the end bell with a side mounted wrap around housing and receptacle panel rotated 90° (toward service side) on generator end of set.
2. Disconnect plug between stator and end bell on Spec A and B models ONLY. On all other models, disconnect the individual internal leads between stator and various components on receptacle panels. Also disconnect the Positive (+Black) and Negative (-White) brush leads.
3. Remove the four long capscrews, lockwashers and nuts that fasten end bell, stator and generator adapter together. Pull end bell straight out from stator and set it aside.

ALL PARTS INSIDE OF END BELL INCLUDING DIODES, CAPACITOR, RECEPTACLES, BEARING, WIRES AND CONNECTIONS CAN BE TESTED AT THIS TIME. ROTOR, STATOR AND COLLECTOR RINGS CAN ALSO BE CHECKED OR TESTED AT THIS TIME WITHOUT FURTHER DISASSEMBLY. BRUSHES MAY BE REMOVED FOR INSPECTION.

4. Remove internal allen screw, sleeve and rotor through stud. Tap rotor gently with a soft faced hammer (brass or lead) to loosen rotor from the tapered engine crankshaft. When loose, pull straight out.

   Internal wrenching allen screw and rotor through stud may come out as one piece or separately.

5. Some models (primarily 8 horsepower Tecumseh and 13 and 16 horsepower Briggs & Stratton powered generator sets prior to Spec H) may use a tapered adapter sleeve on engine crankshaft ahead of rotor. Remove this sleeve when used.
6. Remove four capscrews securing the alternator adapter to engine block and remove adapter.
7. Alternator assembly is the reverse of disassembly, following torque values listed below. Be sure internal wrenching allen nut is fully threaded onto rotor through stud (course thread end) prior to installing rotor through stud into engine crankshaft.

ASSEMBLY TORQUES

DIODES (End Bell Spec A & B Only)	12-15 in. lbs.
Rotor Through Stud	
All Models except BFAB	19 ft. lbs.
BFAB (Spec J ONLY)	27 ft. lbs.

All other bolt torques are the same as SAE grade 5 hardware according to nominal size and threads per inch.

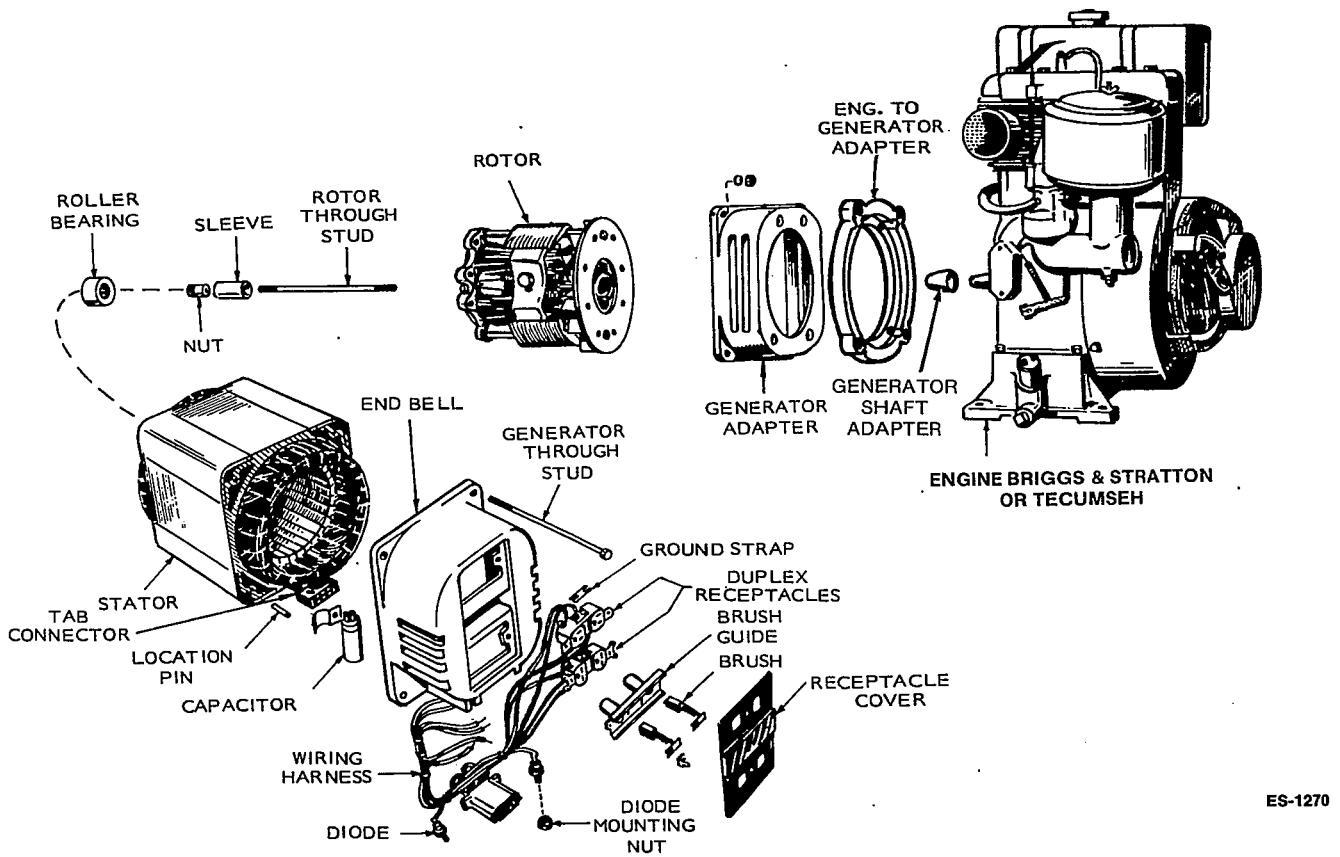


FIGURE 13. TYPICAL EXPLODED VIEW OF ALTERNATOR (SPEC A AND B ONLY)

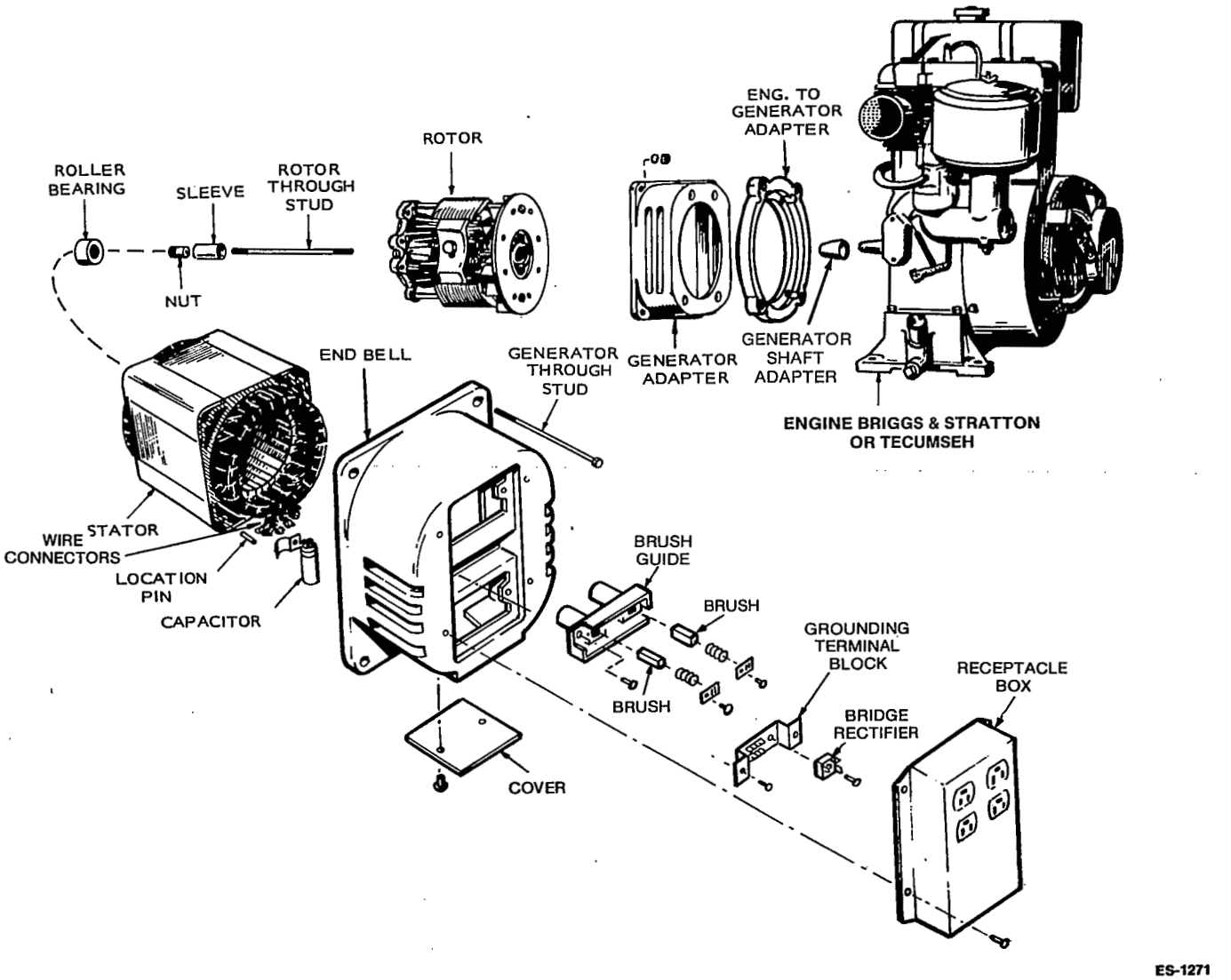
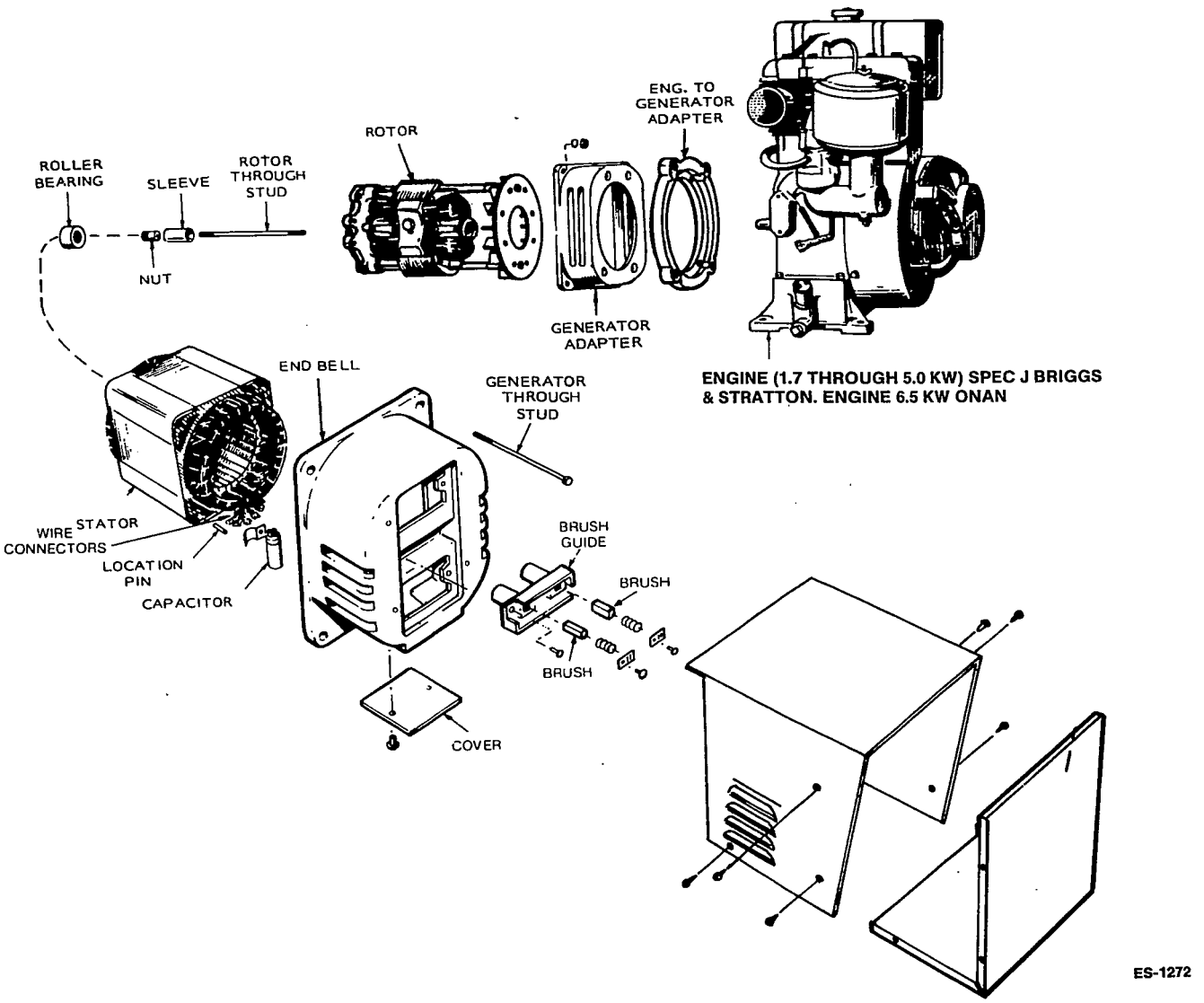
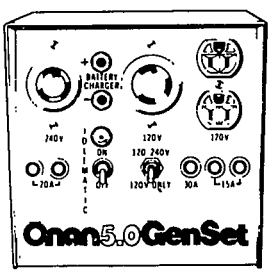


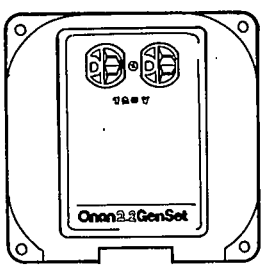
FIGURE 14. TYPICAL EXPLODED VIEW OF ALTERNATOR (SPEC C THROUGH F ONLY)



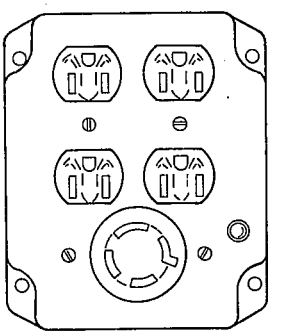
ENGINE (1.7 THROUGH 5.0 KW) SPEC J BRIGGS & STRATTON. ENGINE 6.5 KW ONAN



120/240 VOLT MODELS
SPEC H AND J ONLY



120 VOLT MODELS
SPEC H ONLY



120 VOLT MODELS
SPEC J ONLY

FIGURE 15. TYPICAL EXPLODED VIEW OF ALTERNATOR
(SPEC H AND J ONLY)

Troubleshooting Chart

*Letter in column refers to specific section in SERVICE AND TESTING PROCEDURES portion of this manual.

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION	★
No Output	1. Open fuse(s) or circuit breaker (s) in receptacle box (if used).	1. Replace	C
	2. Faulty receptacle. (60 Hz only)	2. Replace	D
	3. Brushes worn excessively.	3. Replace	A
	4. Brushes sticking or broken spring.	4. Replace	A
	5. Loss of residual.	5. See *Troubleshooting Procedures*	E
	6. Dirty collector rings.	6. Clean or replace	A
	7. Loose or broken wire.	7. Repair	B
	8. One or both diodes shorted or defective bridge rectifier (if used).	8. Replace	F
	9. Faulty capacitor.	9. Replace	G
	10. Faulty rotor.	10. Replace	H
	11. Faulty stator.	11. Replace	J
Low Output (Requires Frequent Field Flashing)	1. Alternator speed too low.	1. Speed should be 3600 rpm. (3000 rpm 50 Hz)	
	2. Engine low on power.	2. See Engine Manual.	
	3. Worn brushes.	3. Replace	A
	4. One open diode.	4. Replace	F
	5. Open Capacitor.	5. Replace	F
	6. Rotor windings shorted.	6. Replace	H
	7. Stator windings shorted.	7. Replace	J
	8. Loss of Residual.	8. See *Troubleshooting Procedures*	E
Alternator Overheats	1. Overloaded.	1. Remove part of load.	C
	2. Alternator air intake plugged, with dirt, leaves, etc.	2. Clean	
	3. Windings covered with dirt or oil.	3. Clean	

Service and Testing Procedures

ALTERNATOR TROUBLESHOOTING

There are four main items to check if generator output does not build up to nameplate rating.

1. Brushes in end bell.
2. Diode rectifiers (2) or bridge rectifier in end bell.
3. Capacitor (C1) inside end bell.
4. Loss of residual magnetism which requires flashing the field.

[A]
ALTERNATOR BRUSHES

To inspect the brushes, refer to Figure 16 using the following procedures:

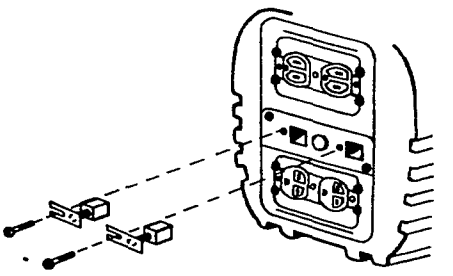
1. Remove receptacle cover plate, receptacle box or receptacle panel (NOT wrap around sheet metal housing) from end bell.

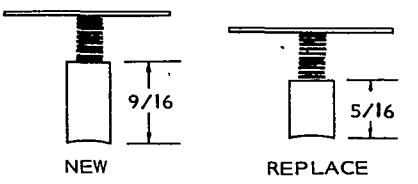
   Some models will have duplex receptacles, a ground terminal strip or a bridge rectifier mounted in the end bell. These items will not interfere with brush removal and replacement.

2. Unfasten brush mounting (Phillips) screws.
3. Slide brushes out of their holders.
4. Replace if worn to 5/16 inch or less as shown in Figure 16.

Use only the replacement brushes specified in the parts manual. Other brushes may have entirely different electrical characteristics. Be sure brushes slide freely in their holders, without any binding.

If collector rings are rough, smooth the ring surfaces with #240 sandpaper. Do not use emery cloth.





ALTERNATOR BRUSH WEAR LIMITS

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FIGURE 16. BRUSH REMOVAL AND REPLACEMENT (ALL MODELS)

[B]

BROKEN WIRE OR LOOSE CONNECTION

Check all internal wiring for loose or broken connections or terminals. Check especially around all receptacles and switches, terminal strip or circuit board connections, stator output leads (T1 through T4), ground connections, etc.

[C]

FUSES

Some models with separate receptacle boxes are equipped with fuses. If fuse is open or blown, turn fuse cover counterclockwise and replace (Figure 17) with an identical fuse. Blown fuses are caused by too much load on the receptacle, or an external short circuit.

CAUTION ***Don't exceed current rating stamped below receptacles. Be sure to replace with the correct rated fuse to avoid damage to power tools.***

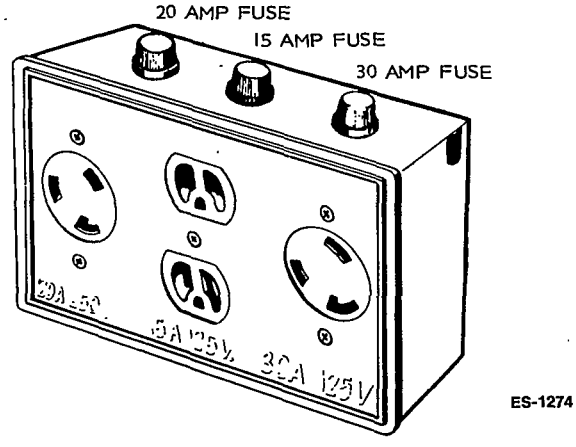


FIGURE 17. FUSE REPLACEMENT IN EXTERNAL RECEPTACLE BOX (SPEC A AND B)

[D]

FAULTY RECEPTACLE(S)

Receptacles mounted on or within the end bell can be removed and replaced without removing the end bell from the generator. Remove the receptacle cover plate or receptacle box from endbell, then remove mounting screws of each individual receptacle. On larger size 120/240 volt models, remove the side mounting screws which secure the receptacle panel to the sheetmetal wrap around housing. Pull the receptacle panel out as far as the interconnecting wiring allows. Each receptacle can now be removed by disconnecting wires and removing screw(s) which secure receptacle to panel. Mark all wires for easier replacement before disconnecting.

WARNING ***Do NOT attempt to remove any receptacles with unit running. Touching "live" wires or terminals could cause serious injury or death.***

[E]

LOSS OF RESIDUAL MAGNETISM (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 cover plate, receptacle box or receptacle panel (NOT wrap around sheetmetal housing) from end bell.
2. Construct a field flashing circuit as shown in Figure 18. The diode and resistor in series with the positive 6 volt lantern battery lead prevents the possibliity of damage to the field flashing components.
3. Connect a 6 volt lantern battery with leads as shown in Figure 18.
4. Start unit with no load connected to alternator.
5. Momentarily touch positive brush with positive (+) lead of lantern battery while grounding the negative (-) 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.)

   Positive brush is on the left side when facing the end bell.

6. Stop set. Start generator set again and check output voltage with a voltmeter before reassembling receptacles to generator end bell. If it is necessary to flash the field daily or each time the generator set is used, the problem is most likely a defective capacitor.

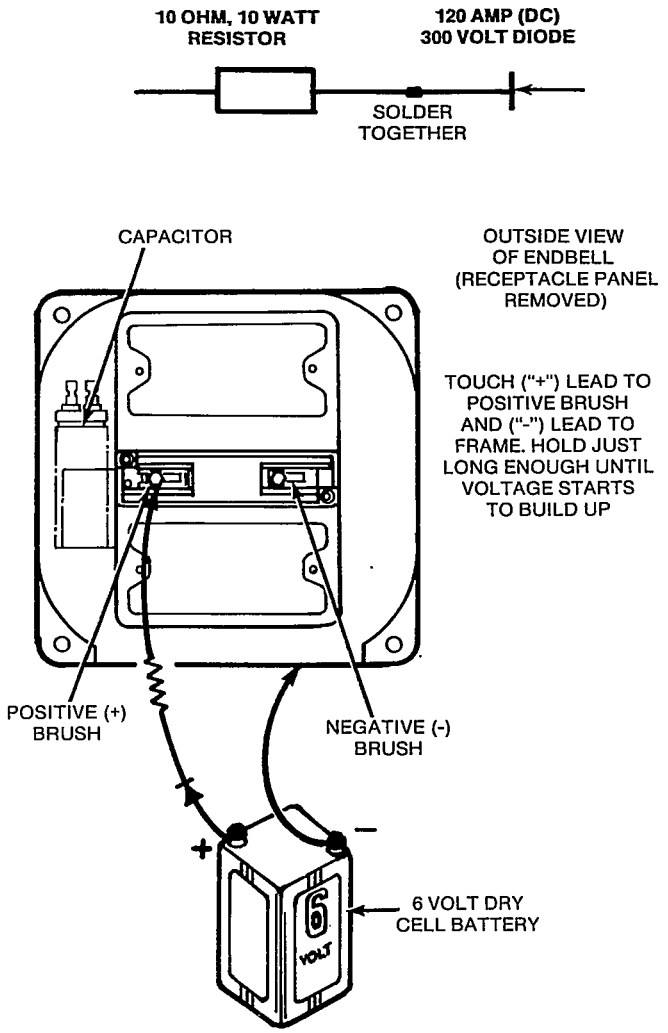
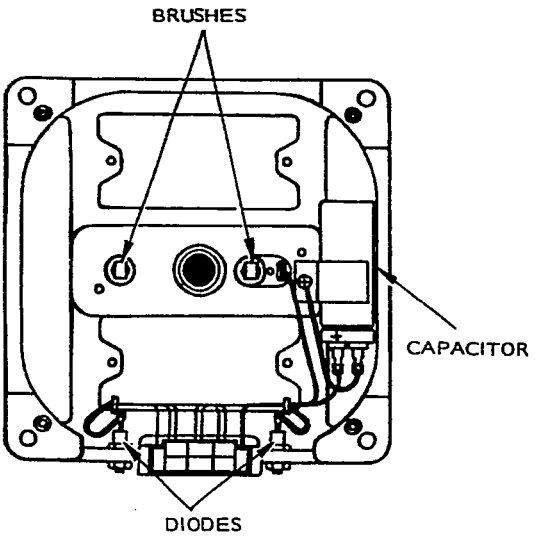
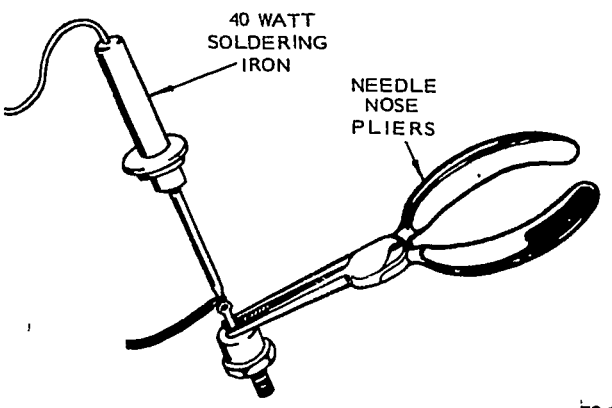


FIGURE 18. FIELD FLASHING CIRCUIT AND CONNECTIONS



DIODE LOCATION IN END BELL (SPEC A AND B ONLY)



SOLDERING DIODE LEAD

CAUTION ***When unsoldering or soldering wire to diode, hold a needle-noise pliers (Figure 19) between diode terminal and soldering point to prevent heat from destroying diode.***

[F]

DIODES (Spec A and B Models ONLY)

Diodes can be tested without removal from end bell or unsoldering wire leads. Disconnect plug between stator and end bell located underneath end bell. Diodes and connector plug are shown in Figure 19. Using an accurate ohmmeter, connect one lead to each end of each diode and observe reading. Reverse ohmmeter leads and again observe resistance readings as shown in Figure 19.

A good diode will have a high resistance reading in one direction and a low reading when ohmmeter leads are reversed. If both readings are high, or low, diode is defective and must be replaced with a new, identical part.

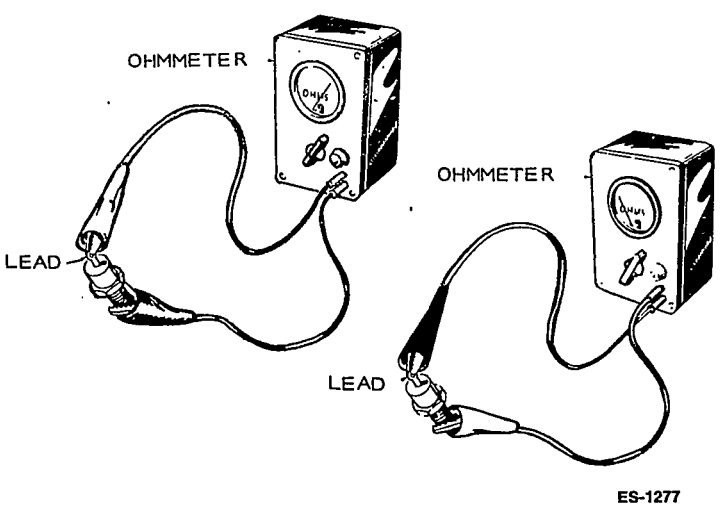


FIGURE 19. DIODE LOCATION, TESTING AND REPLACEMENT

CHECKING BRIDGE RECTIFIER
(Begin Spec C)

Remove the two small AC leads (X2 & X3) and the positive (+) DC lead from the bridge rectifier. Connect one lead of the ohmmeter to one of the AC terminals and the other ohmmeter lead to the positive (+) DC terminal of the bridge rectifier. Observe reading. Now reverse ohmmeter leads and again observe the meter. (Check both AC terminals to positive (+) in this manner.) A good rectifier will have a higher reading in one direction than the other. If both readings (on one AC terminal) are high or low, the rectifier is defective and must be replaced with a new identical part. Bridge rectifier location varies according to kilowatt size and spec letter as shown in Figures 20 through 23.

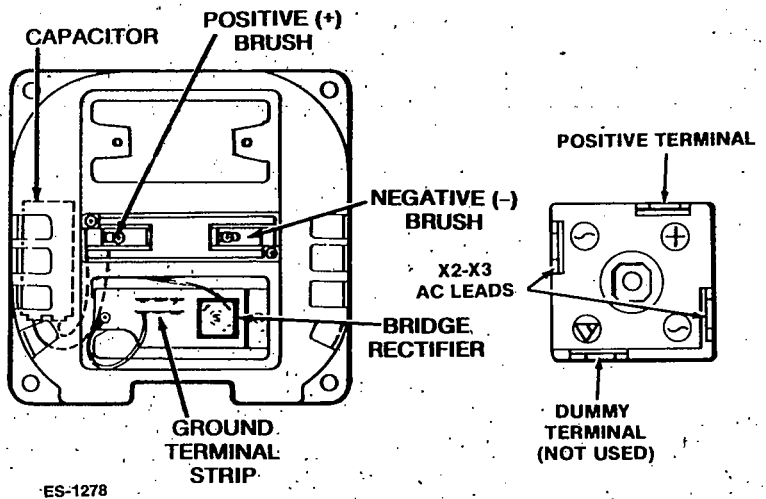


FIGURE 20. BRIDGE RECTIFIER LOCATION SPEC C THROUGH F MODELS ONLY

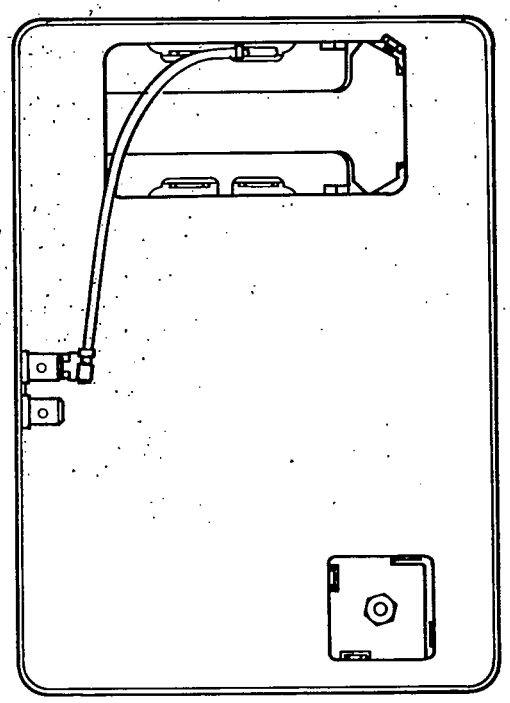


FIGURE 21. BRIDGE RECTIFIER LOCATION ON 120 VOLT MODELS IN SPEC H ONLY

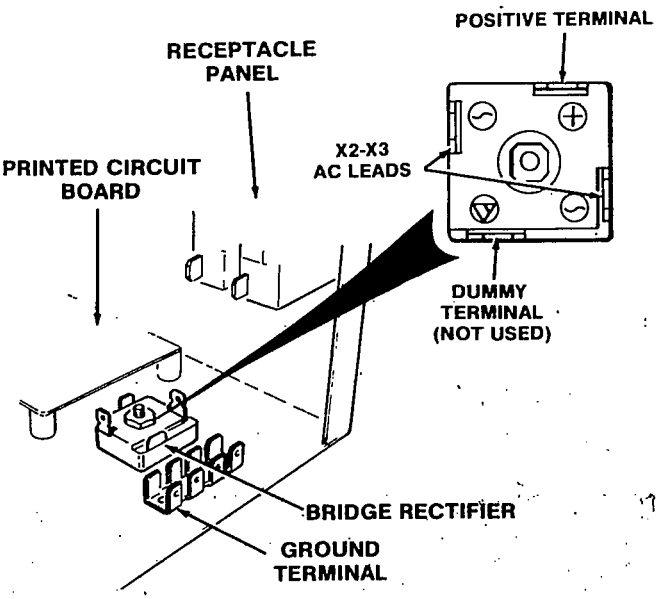


FIGURE 22. BRIDGE RECTIFIER LOCATION ON 120/240 VOLT MODELS IN SPEC H ONLY

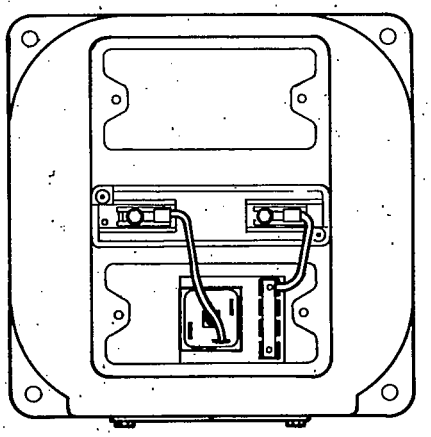


FIGURE 23. BRIDGE RECTIFIER LOCATION ON SPEC J MODELS

[G]
CAPACITOR

If it is necessary to flash the field daily or each time the alternator is used, the problem is probably a defective capacitor. Capacitor is located in end bell (Figure 20). If generator set is running at a constant speed (no fluctuation) but voltage rises and falls, the capacitor may also be defective. If suspecting a defective capacitor, replace with one known to be good.

Replacing the Capacitor

To replace the capacitor:

1. Remove the screw that secures the capacitor mounting bracket to the end bell. Remove the bracket. See Figure 20.
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.

[H]

TESTING ROTOR WINDINGS

Measuring Rotor Winding Resistance

Use an accurate ohmmeter for this test. Connect meter leads to each collector ring (Figure 24). Resistances should be within the values specified in Table 1. Readings are taken at 68F (20C).

TABLE 1. RESISTANCE VALUES FOR ROTORS

WATTS	STACK LENGTH	*ROTOR RESISTANCE
Up to 1200	1-1/2"	25.7-31.5 Ohms
1201-2000	2-1/4"	18.5-22.6 Ohms
2001-3000	3"	21.0-25.6 Ohms
3700	3-1/2"	22.5-27.5 Ohms
3001-4500	4-1/2"	26.2-32.0 Ohms
4501-6500	6"	31.0-37.9 Ohms

*Measured between collector rings.

Testing for Grounds

Connect an ohmmeter from each collector ring to rotor shaft (ground). If rotor is serviceable, there should be *no* reading on ohmmeter (Figure 25).

If either of the above tests do not comply, replace with a new rotor.

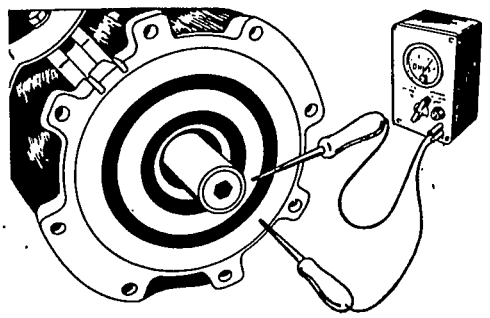


FIGURE 24. MEASURING ROTOR RESISTANCE

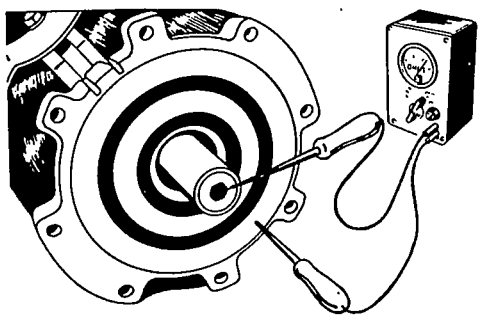


FIGURE 25. CHECKING ROTOR WINDINGS FOR GROUND

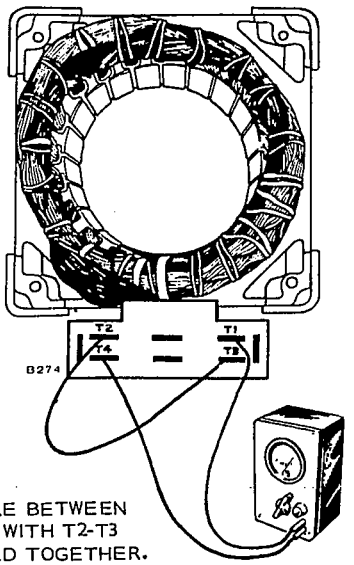
ES-1282

[J]

TESTING STATOR WINDINGS

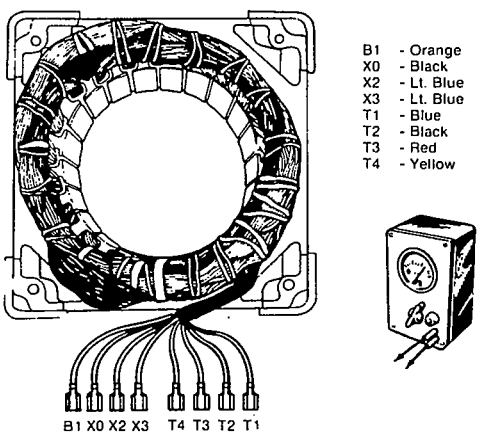
Check stator windings by connecting ohmmeter leads between terminals on stator plug. Figure 26 illustrates location of terminals on early and later single phase units. Table 2 lists stator winding resistance values.

A Wheatstone or Kelvin bridge is required for testing low resistance values (below 1 ohm).



MEASURE BETWEEN T1-T4 WITH T2-T3 JUMPERED TOGETHER. VALUES ARE GIVEN IN TABLE 2.

SPEC A AND B MODELS ONLY



MEASURE BETWEEN T1-T4 WITH T2-T3 JUMPERED TOGETHER. VALUES ARE GIVEN IN TABLE 2.

ALL MODELS BEGINNING SPEC C AND LATER

ES-1283

FIGURE 26. TESTING STATOR WINDINGS

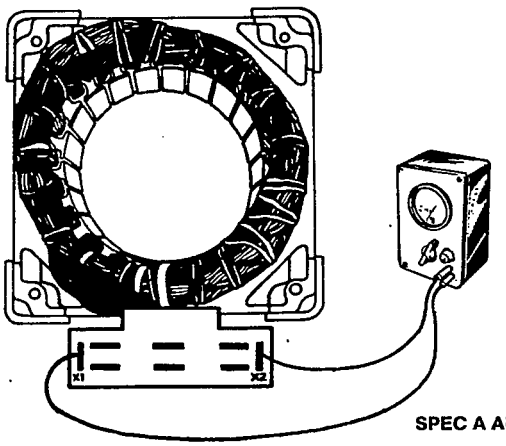
TABLE 2. RESISTANCE VALUES FOR STATOR WINDINGS

RATING OF ALTERNATOR IN WATTS	STACK LENGTH	RESISTANCE (OHMS) (1 ϕ ONLY)	
		60 HERTZ	50 HERTZ
Up to 1200	1-1/2"	2.57-3.30 Ohms	2.56-4.54 Ohms
1201-2000	2-1/4"	1.22-1.57 Ohms	1.22-2.15 Ohms
2001-3000	3"	0.75-0.96 Ohms	0.75-1.32 Ohms
3750	3-1/2"	0.55-0.67 Ohms	
3001-4500	4-1/2"	0.37-0.47 Ohms	0.37-0.66 Ohms
4500-6500	6"	0.25-0.33 Ohms	0.25-0.93 Ohms

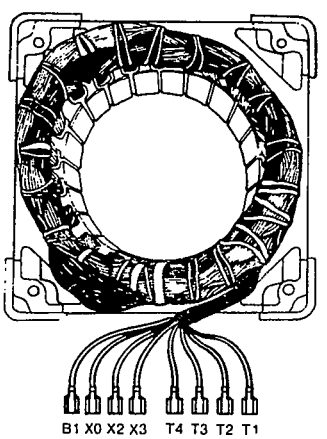
[K]

EXCITER WINDINGS

Check exciter windings by connecting ohmmeter across X1 and X2 (early models) or X2 and X3 (later models). Figure 27illustrates location of terminals on single phase units. Table 3 lists exciter winding resistance values.



SPEC A AND B MODELS ONLY



B1 - Orange
X0 - Black
X2 - Lt. Blue
X3 - Lt Blue
T1 - Blue
T2 - Black
T3 - Red
T4 - Yellow

ALL MODELS BEGINNING SPEC C AND LATER

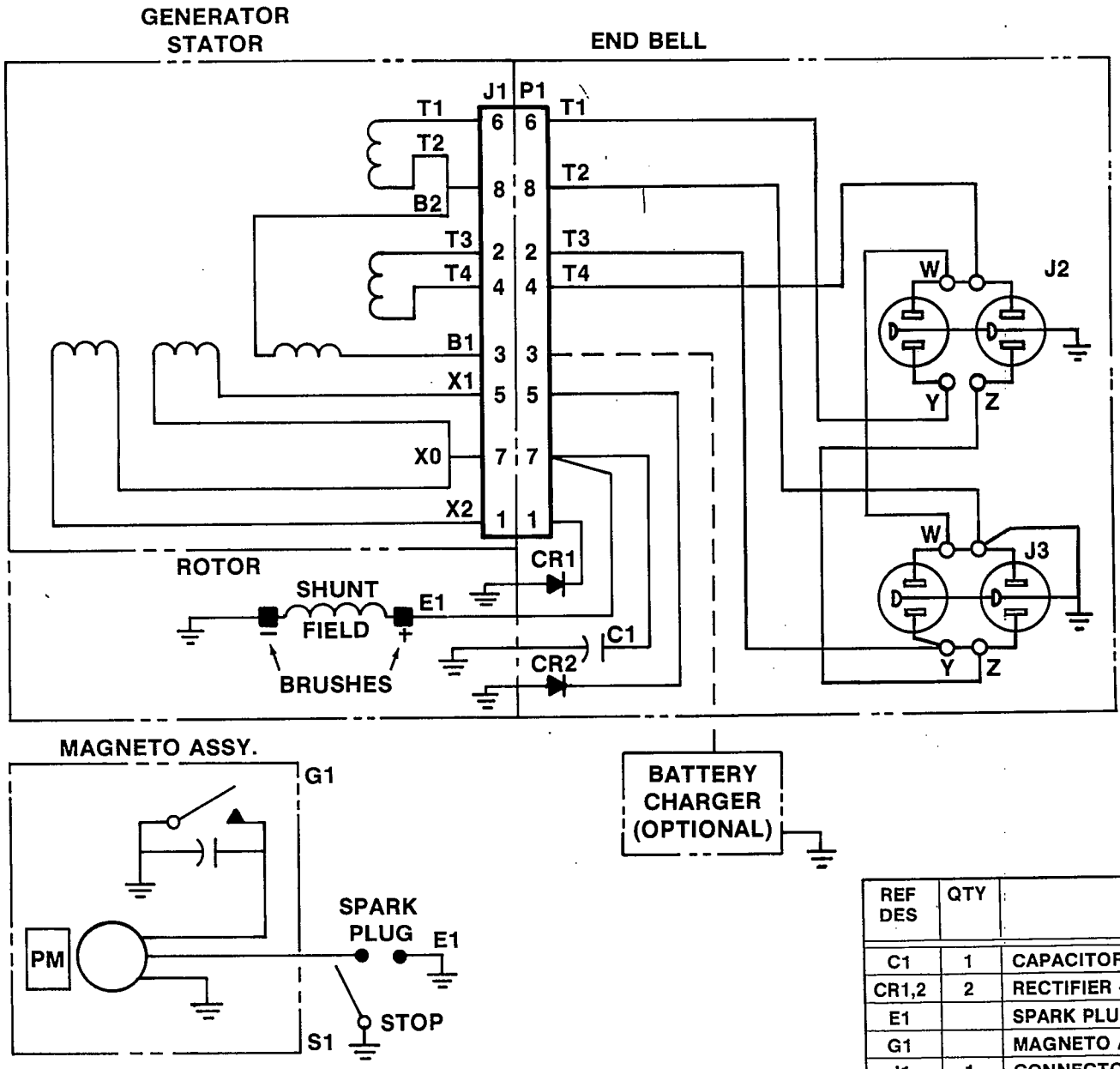
FIGURE 27. TESTING EXCITER WINDINGS

ES-1284

TABLE 3. RESISTANCE VALUES FOR EXCITER WINDINGS

RATING OF ALTERNATOR IN WATTS	STACK LENGTH	RESISTANCE (OHMS)	
		60 HERTZ	50 HERTZ
Up to 1200	1-1/2"	2.04-3.30 Ohms	4.10-5.02 Ohms
1201-2000	2-1/4"	1.54-2.75 Ohms	3.11-3.71 Ohms
2001-3000	3"	1.54-2.31 Ohms	2.07-2.53 Ohms
3750	3-1/2"	1.52-1.86 Ohms	
3001-4500	4-1/2"	1.29-2.20 Ohms	1.98-2.42 Ohms
4500-6500	6"	1.14-2.20 Ohms	1.98-2.42 Ohms

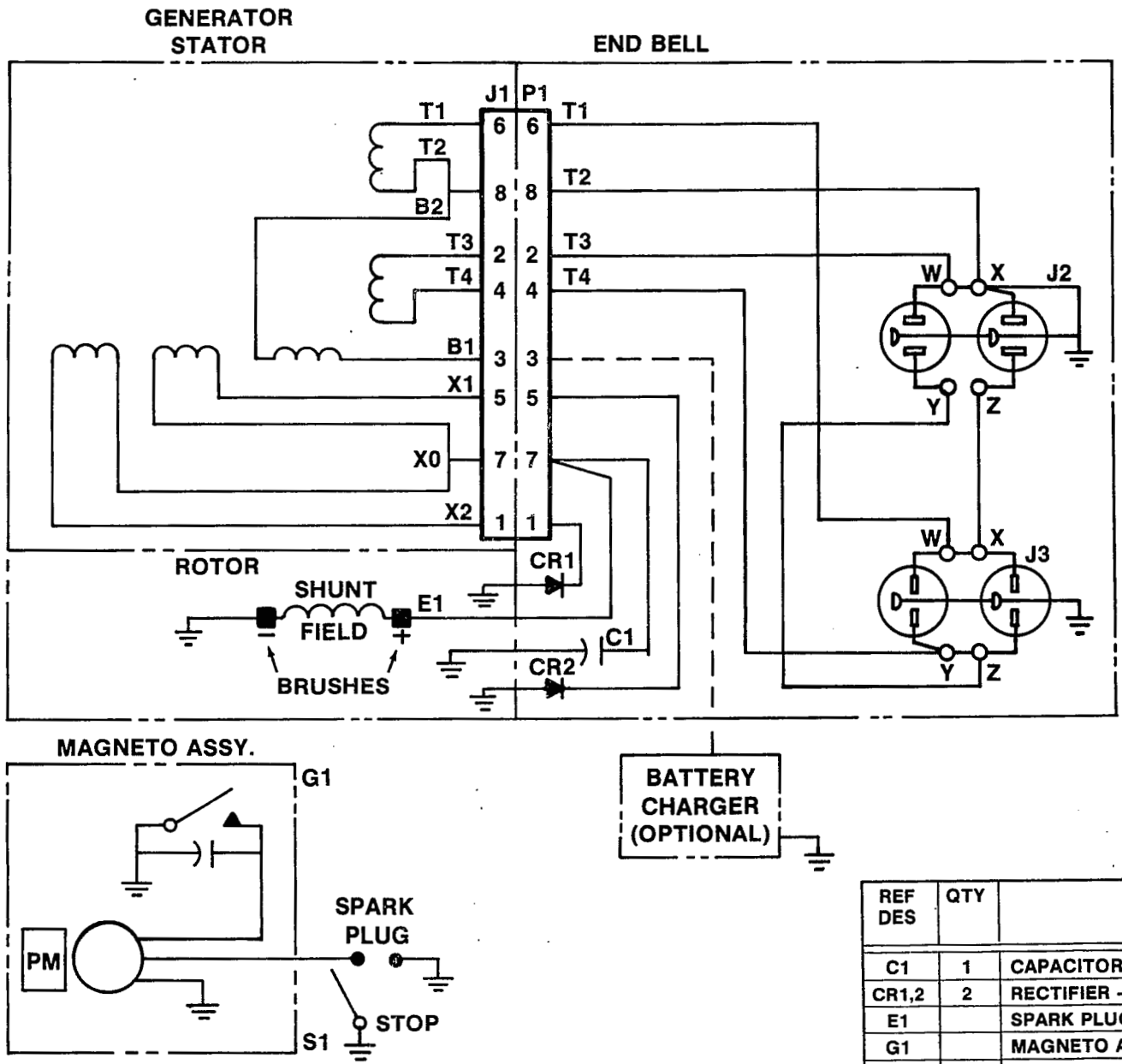
601-0203 (SPEC A-C)



REF DES	QTY	DESCRIPTION
C1	1	CAPACITOR
CR1,2	2	RECTIFIER - DIODE
E1		SPARK PLUG
G1		MAGNETO ASSY
J1	1	CONNECTOR
J2,3	2	RECEPTACLE DUPLEX
P1	1	CONNECTOR
S1		SWITCH STOP

120 VOLT, RECEPTACLES IN END BELL

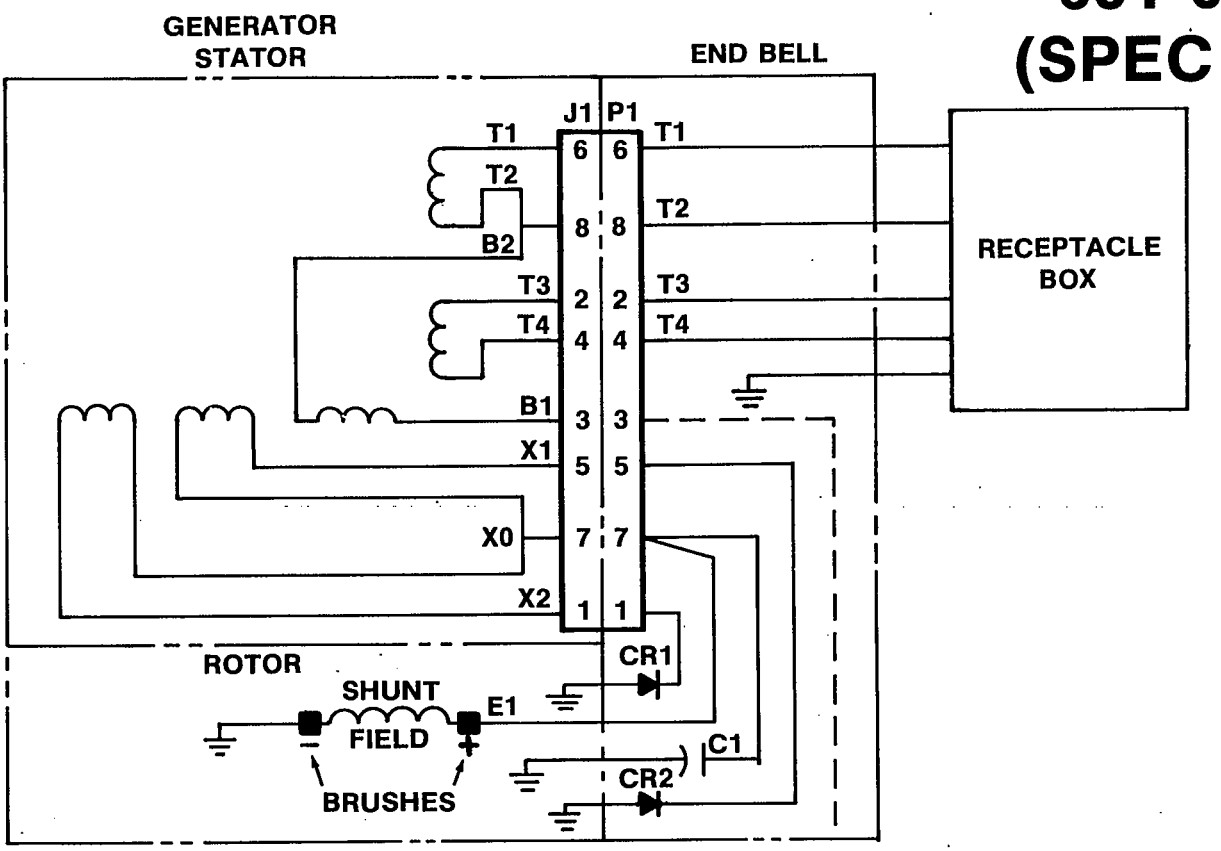
601-0204 (SPEC A-C)

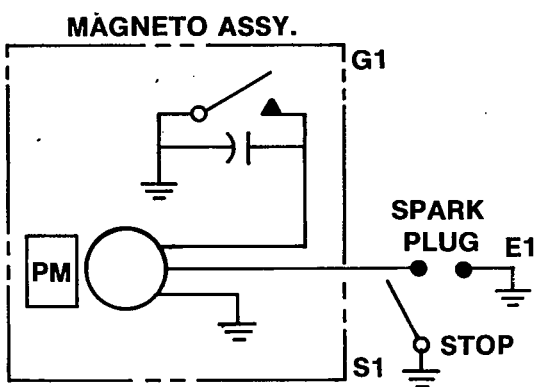


120/240 VOLT, RECEPTACLES IN END BELL

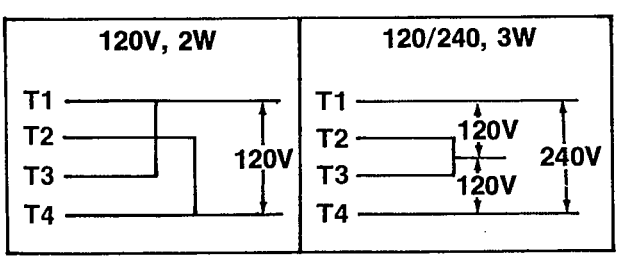
REF DES	QTY	DESCRIPTION
C1	1	CAPACITOR
CR1,2	2	RECTIFIER - DIODE
E1		SPARK PLUG
G1		MAGNETO ASSY
J1	1	CONNECTOR
J2	1	RECEPTACLE DUPLEX (120 V)
J3	1	RECEPTACLE DUPLEX (240V)
P1	1	CONNECTOR
S1	1	SWITCH STOP

601-0205
(SPEC A-C)





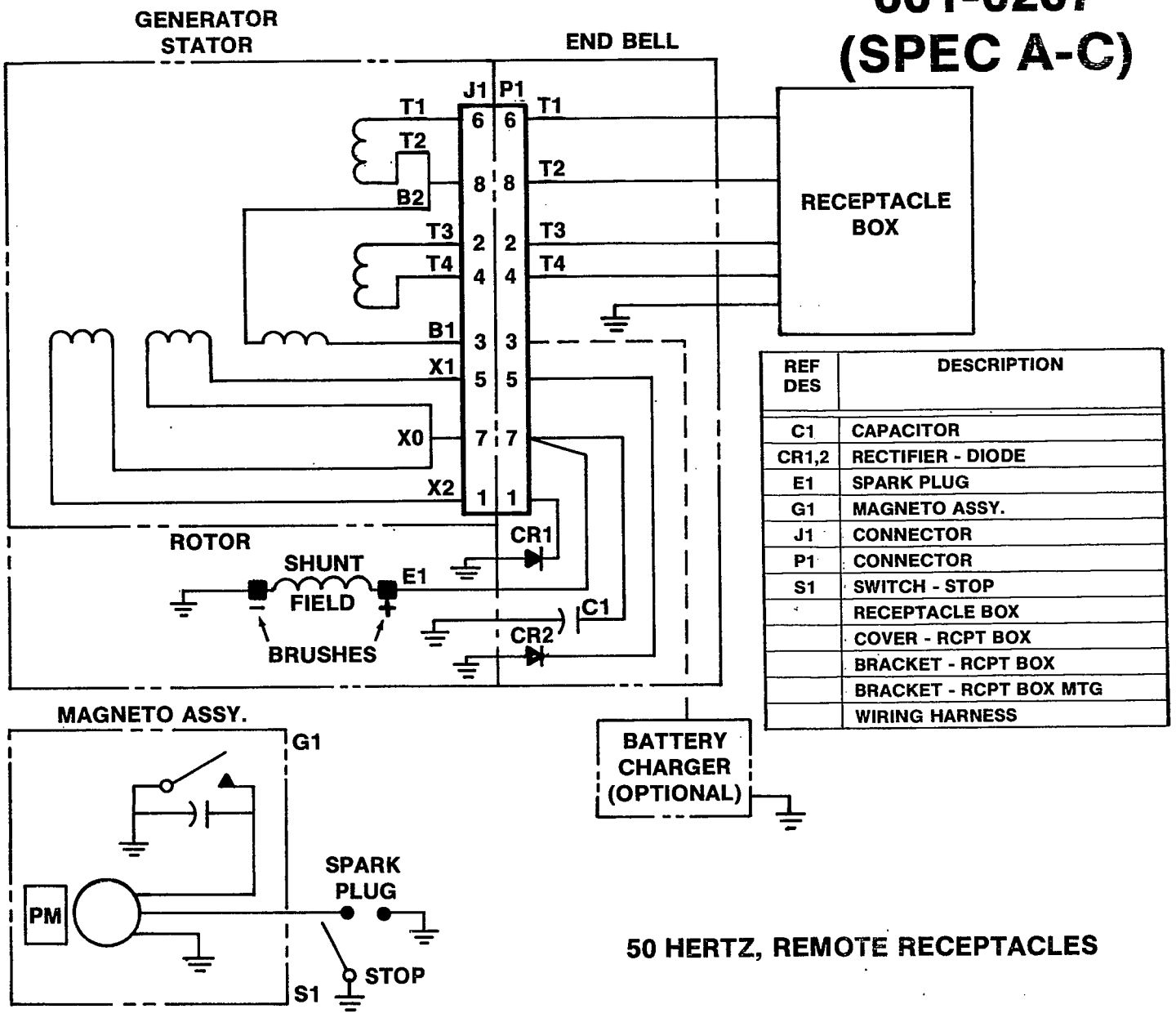
RECONNECTION CHART



REF	QTY	DESCRIPTION
C1	1	CAPACITOR
CR1,2	2	RECTIFIER - DIODE
E1		SPARK PLUG
G1		MAGNETO ASSY.
J1	1	CONNECTOR
P1	1	CONNECTOR
S1		SWITCH - STOP

60 HERTZ, REMOTE RECEPTACLES

601-0207
(SPEC A-C)

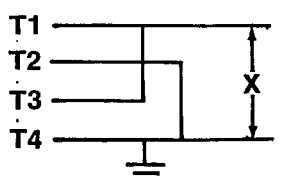
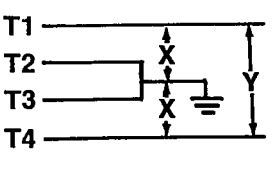
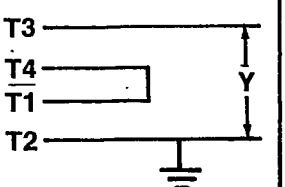


REF DES	DESCRIPTION
C1	CAPACITOR
CR1,2	RECTIFIER - DIODE
E1	SPARK PLUG
G1	MAGNETO ASSY.
J1	CONNECTOR
P1	CONNECTOR
S1	SWITCH - STOP
	RECEPTACLE BOX
	COVER - RCPT BOX
	BRACKET - RCPT BOX
	BRACKET - RCPT BOX MTG
	WIRING HARNESS

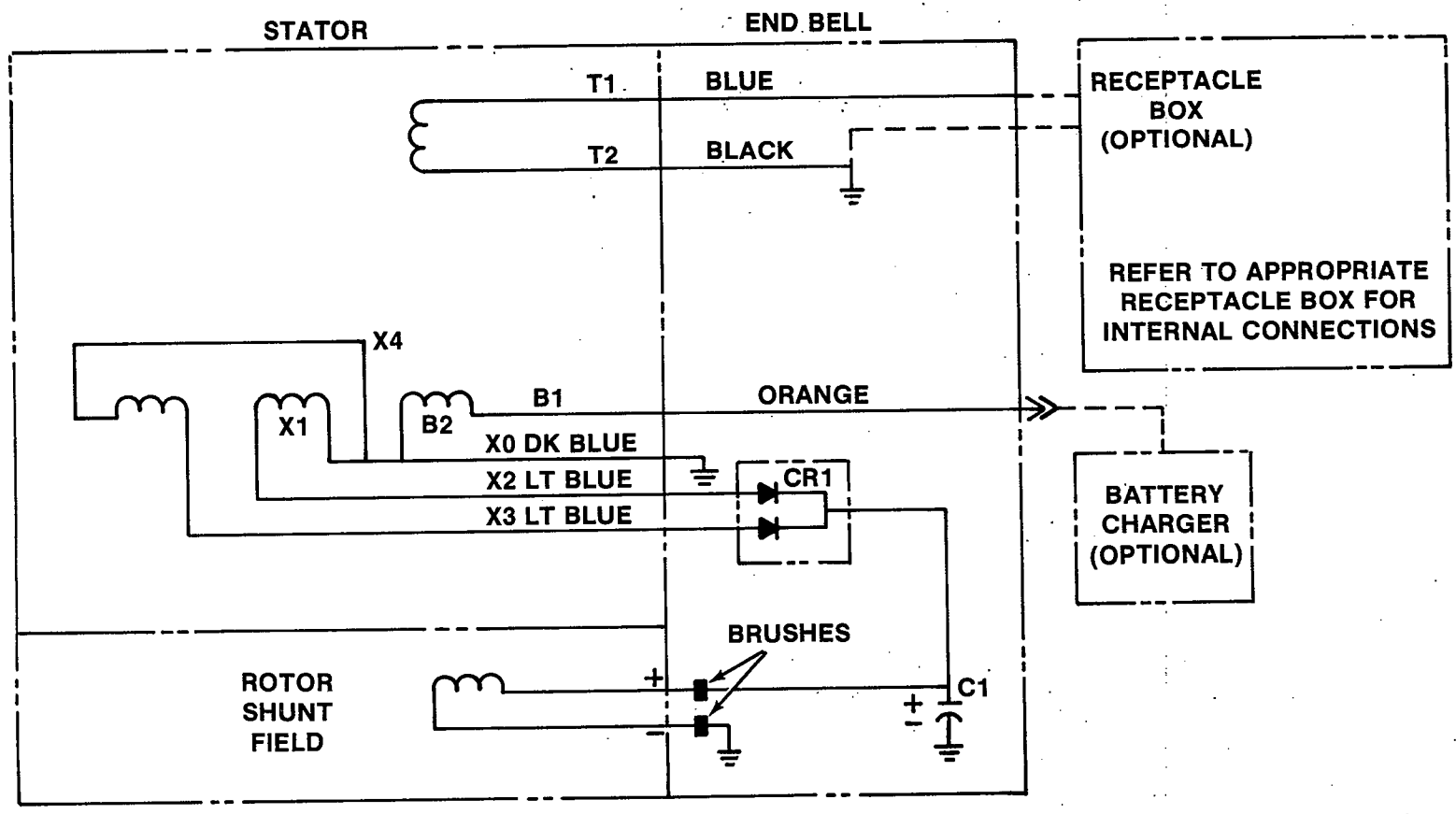
50 HERTZ, REMOTE RECEPTACLES

NOTE:
T2 MUST BE GROUNDED

RECONNECTION CHART

	X		Y
53CP 53CP 53AP	2W, 50 Hz 120V 110V 100V	3W, 50 Hz 120/240V 110/220V 100/200V	2W, 50 Hz 240V 220V 200V
			

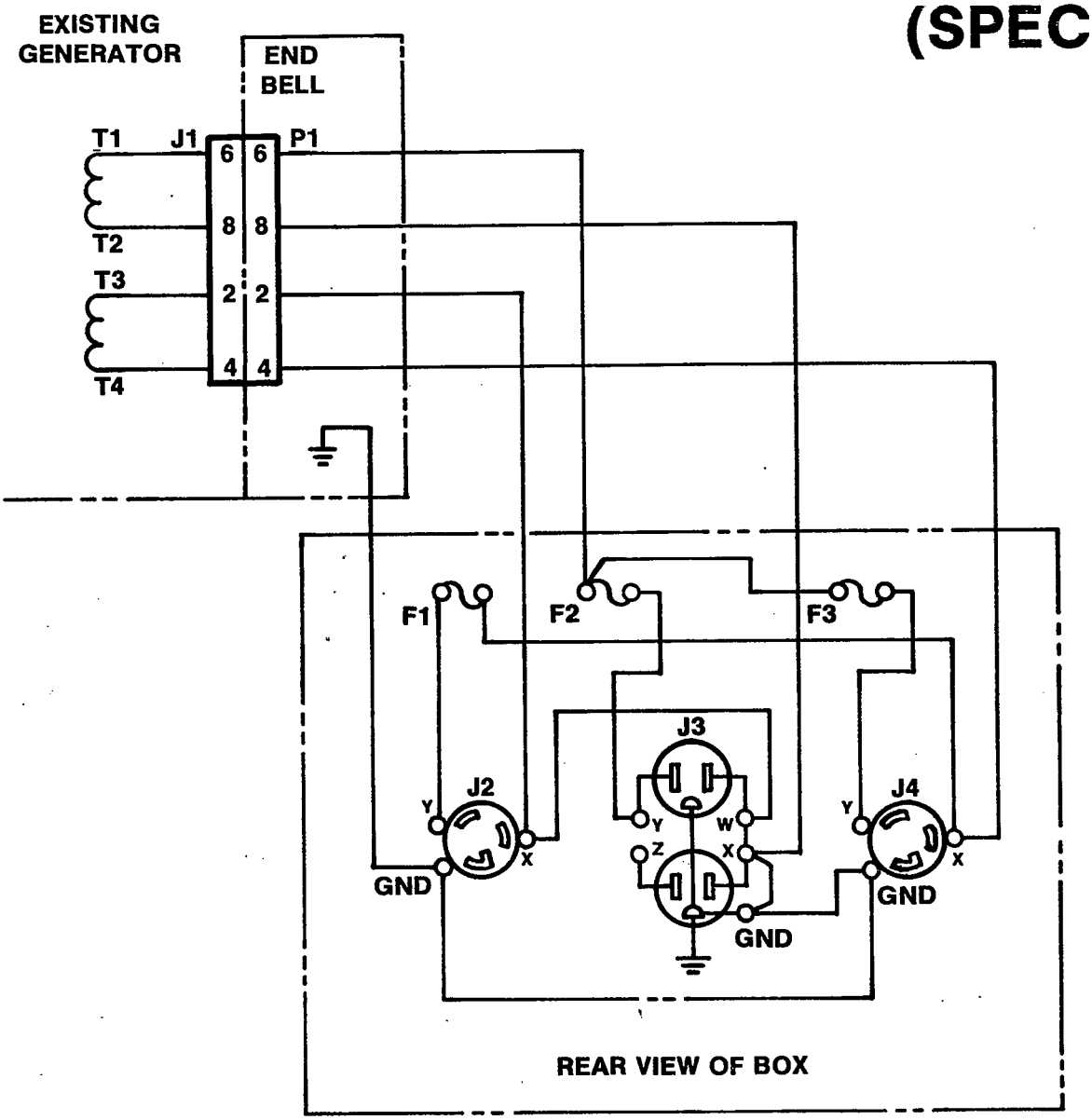
601-0212
(SPEC A-C)



CONTROL - GEN SET
(WIRING DIAGRAM)

REF DES	QTY	DESCRIPTION
C1	1	CAPACITOR (REF)
CR1	1	BRDIGE-RECTIFIER (REF)
E1	1	SPARK PLUG
G1	1	MAGNETO
S1	1	SWITCH-ON OFF (WHEN USED)
S2	1	SWITCH-STOP (WHEN USED)

625-1302
(SPEC A-C)

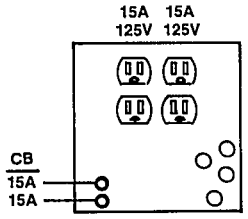


REF	QTY	DESCRIPTION
F1	1	FUSE - 30 AMP
F2	1	FUSE - 15 AMP
F3	1	FUSE - 20 AMP
J1	1	CONNECTOR
J2	1	RCPT - LOCKING (30A, 225V)
J3	1	RCPT - DUPLEX (15A, 125V)
J4	1	RCPT - TWIST LOCK (20A, 250V)
P1	1	CONNECTOR
	1	RECEPTACLE BOX ASSY W/FUSE

REMOTE RECEPTACLE BOX WITH FUSES

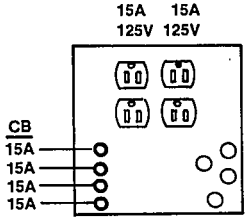
CONTROL PANELS; REAR AND SIDE MOUNTED - ENGINE DRIVEN

STD PANEL 1.2 THRU 2 kW



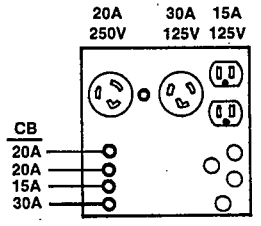
323-1052 — max W @ 120V: 3750 CSA

STD PANEL 3 kW THRU 6 kW



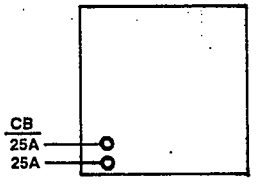
323-1061 — W @ 120V: 3750; W @ 120V: 3750 CSA

STD CONTRACTORS PANEL WITH FULL PWR AT 120 VOLT SWITCH



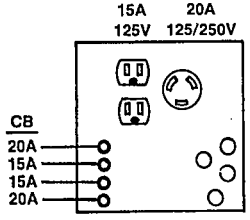
323-1051 CSA

STD 50 HZ PANEL



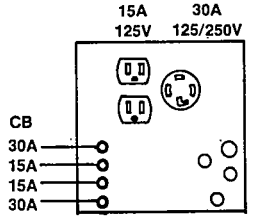
323-1045

STD HOME STANDBY: USA



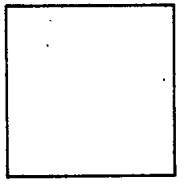
323-1063

STD HOME STANDBY: CANADA



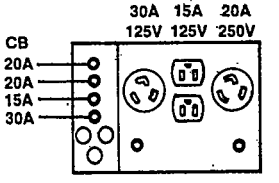
323-1062

BLANK PANEL



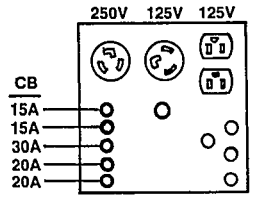
301-4331

STD CONTRACTORS PANEL WITH FULL PWR AT 120 VOLT SWITCH



323-1066

STD CONTRACTORS PANEL WITH FULL PWR AT 120 VOLT SWITCH

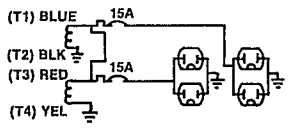


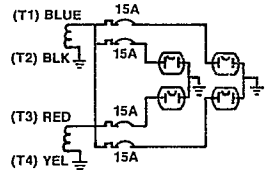
323-1073

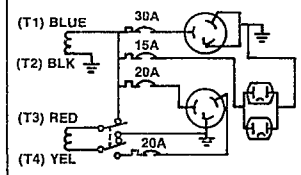
RATING	RCPT CONFIG.	NEMA CONFIG. NO.
15A, 125V	W, G	5-15R
15A,250V	G	6-15R
30A, 125V	G, W	L5-30R
20A, 250V	G, X, Y	L6-20R
20A, 125/250V	Y, W, X	UL LISTED
30A, 125/250V	G, X, W, Y	L14-30R

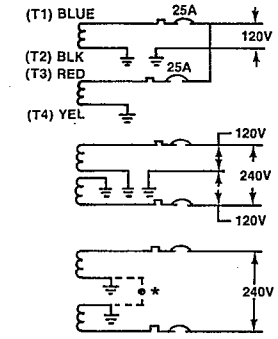
601-0211
SHEET 1 OF 2

CONTROL - GEN SET (WIRING DIAGRAM)
SPEC F ONLY

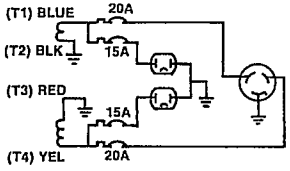


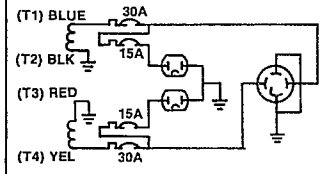


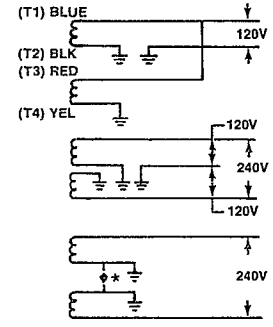




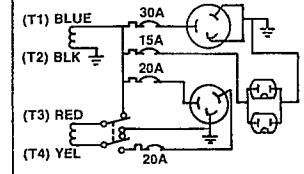
*FOR 2 WIRE UNGROUNDED USE 332-1556

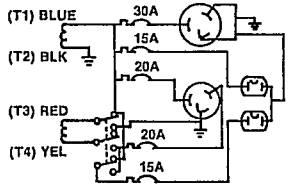


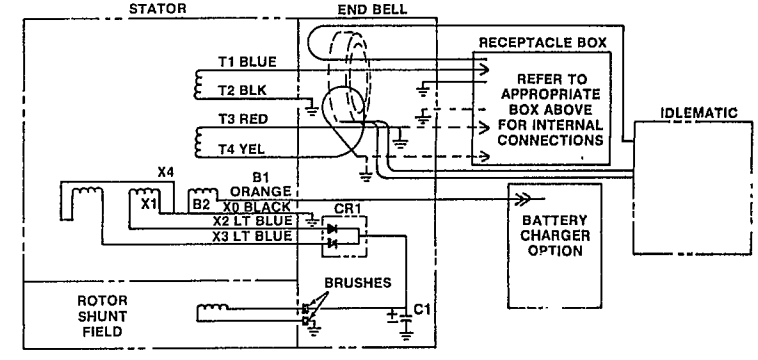




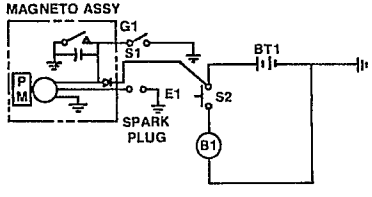
*FOR 2 WIRE UNGROUNDED USE 332-1556



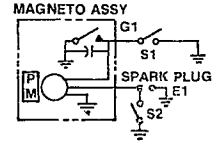




ENGINE WIRING DIAGRAM
ELECTRIC START

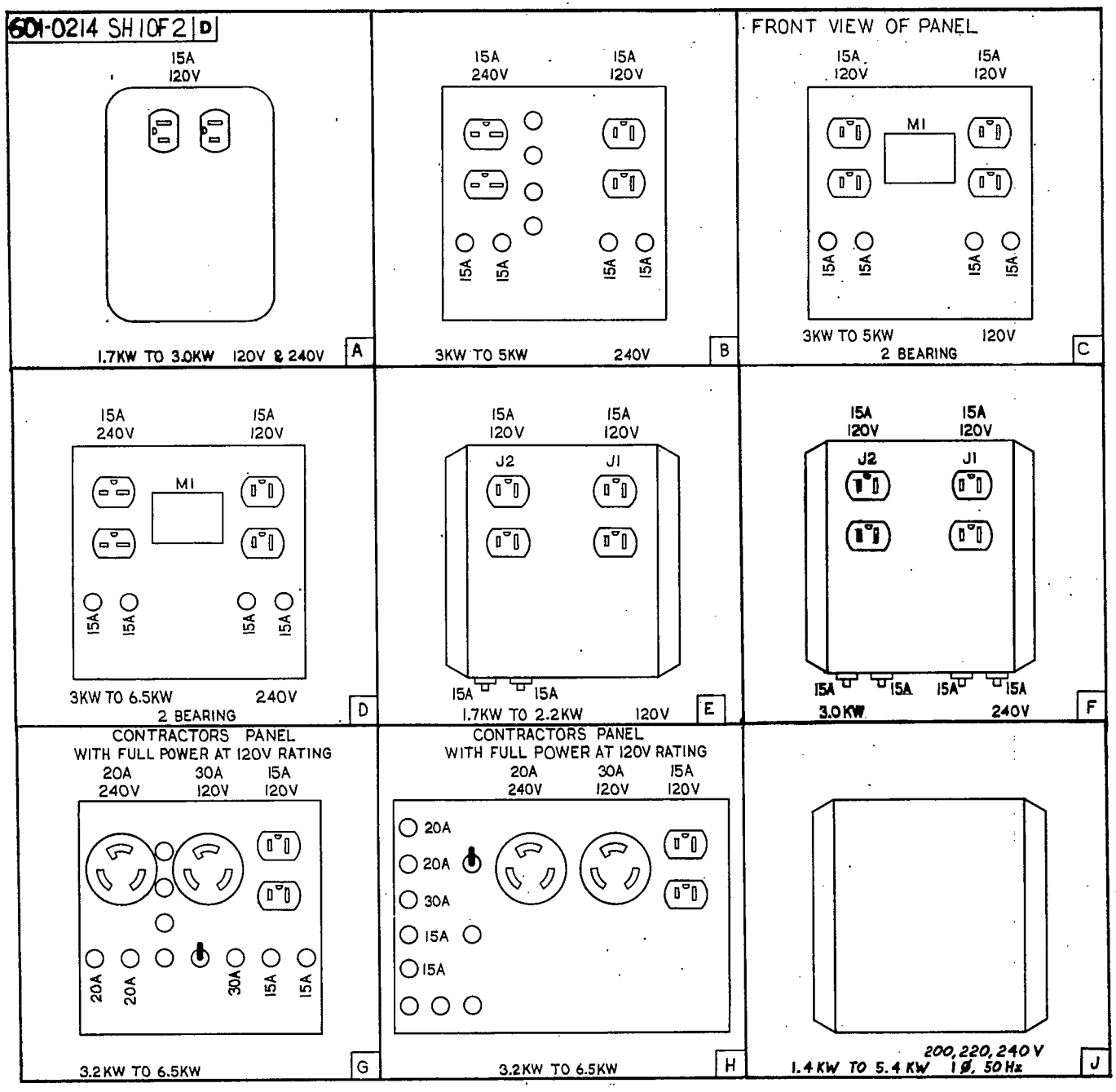


ENGINE WIRING DIAGRAM
MANUAL START



CONTROL - GEN SET
(WIRING DIAGRAM)
SPEC F ONLY

601-0211
SHEET 2 OF 2



CONTROL - GEN SET (WIRING DIAGRAM) SPEC H ONLY

NOTES:

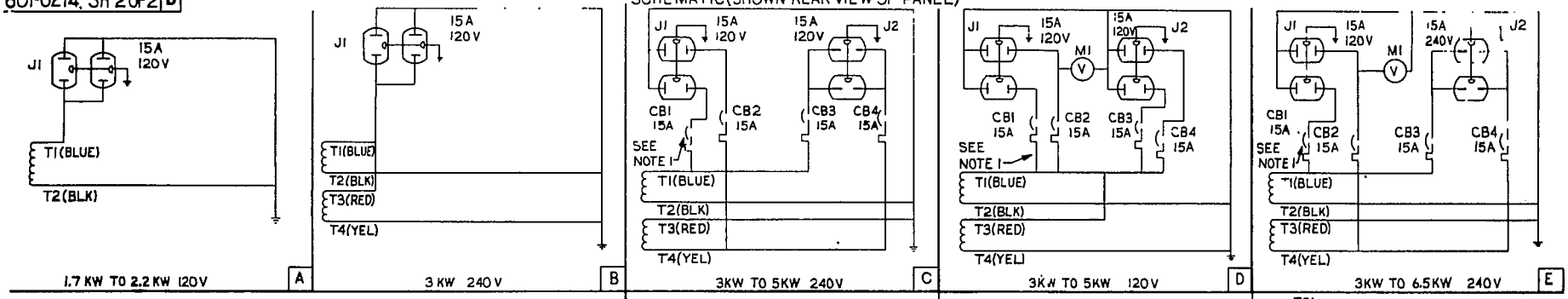
1. FUSES AND SWITCHES SHOWN ON PANEL

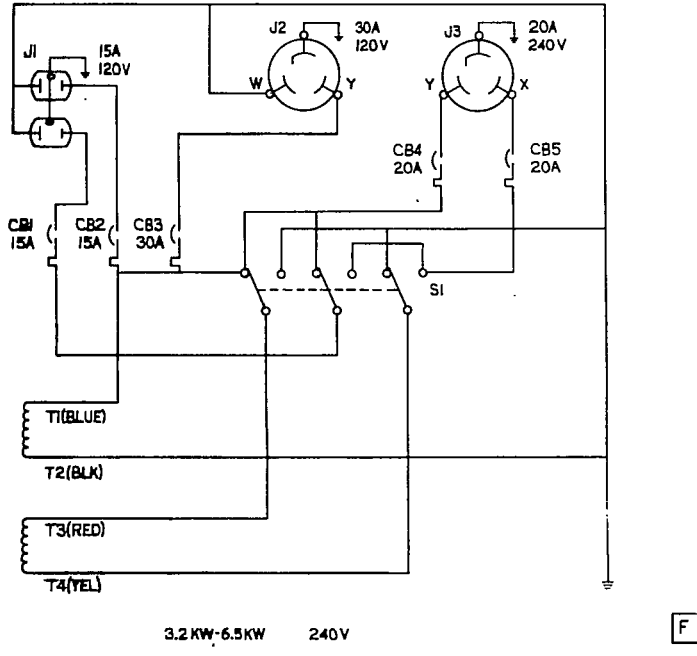
RATING	RCPT CONFIG	NEMA CONFIG NO
15A,125V		5-15R
15A,250V		6-15R
30A,125V		L5-30R
20A,250V		L6-20R
20A,125/250V		UL LISTED
30A,125/250V		L14-30R

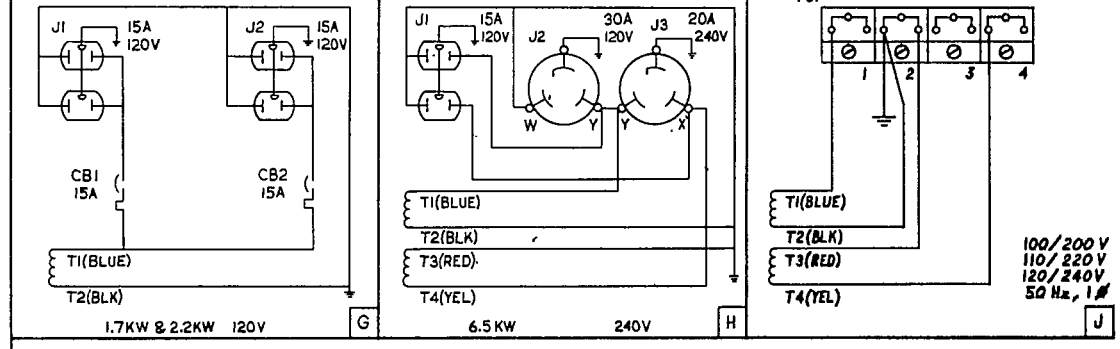
601-0214
SHEET 1 OF 2

601-0214, SH 2 OF 2 | D

SCHEMATIC (SHOWN REAR VIEW OF PANEL)





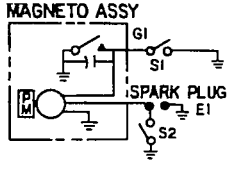


NOTES:

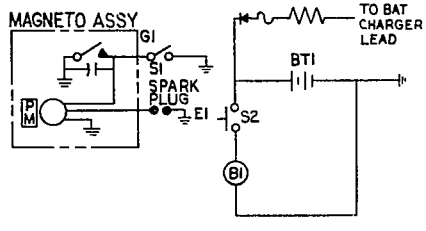
1. IF NO BREAKER IS IN THE CONTROL THE LEADS GO DIRECTLY TO THE LOAD.
2. 50 HZ GENERATORS: GROUND TERMINAL 2, DO NOT GROUND TERMINAL 1.

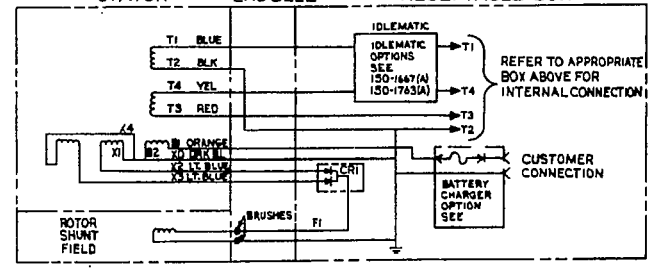
CONTROL - GEN SET (WIRING DIAGRAM) SPEC H ONLY

ENGINE WIRING DIAGRAM MANUAL START

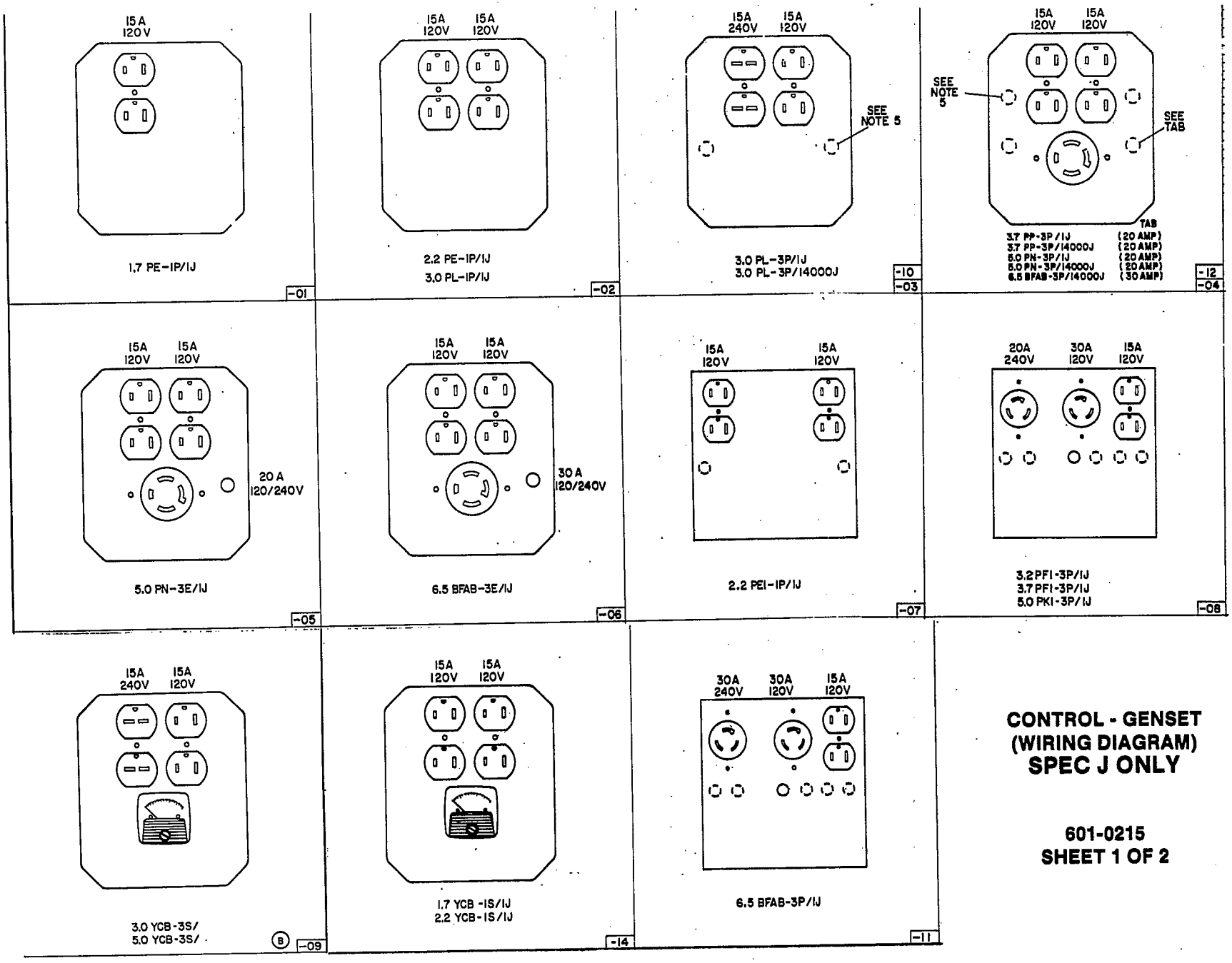


ENGINE WIRING DIAGRAM ELECTRIC START





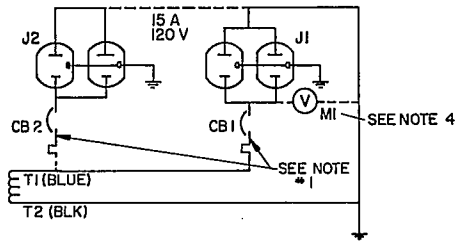
601-0214 SHEET 2 OF 2



CONTROL - GENSET
(WIRING DIAGRAM)
SPEC J ONLY

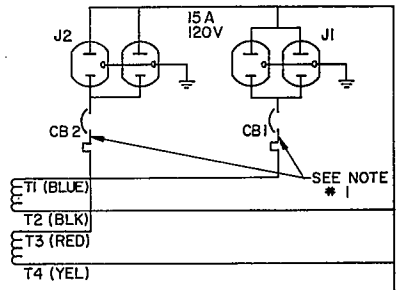
601-0215
SHEET 1 OF 2

CONTROL - GENSET (WIRING DIAGRAM) SPEC J ONLY



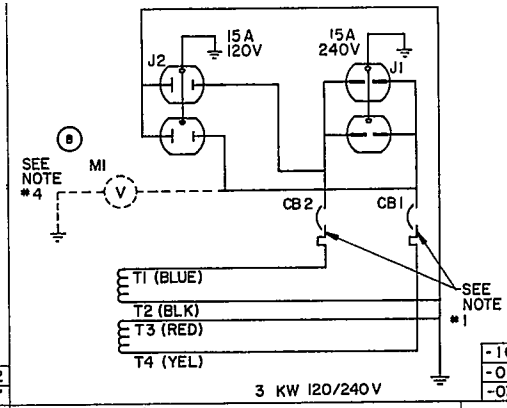
1.7 KW TO 2.2 KW 120V

-14
-01
-02



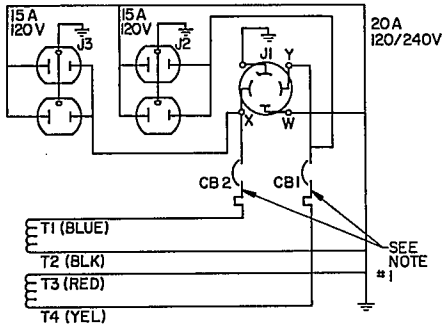
3KW 120V

-02
-07

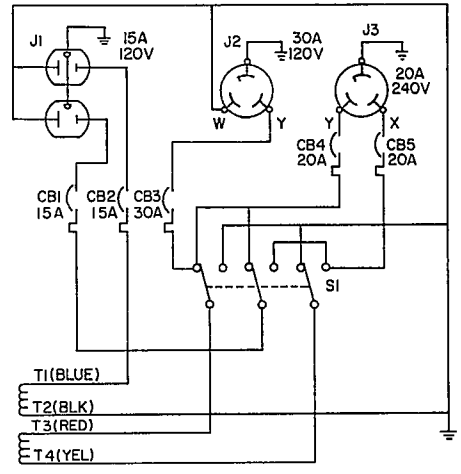


3 KW 120/240V

-10
-09
-03



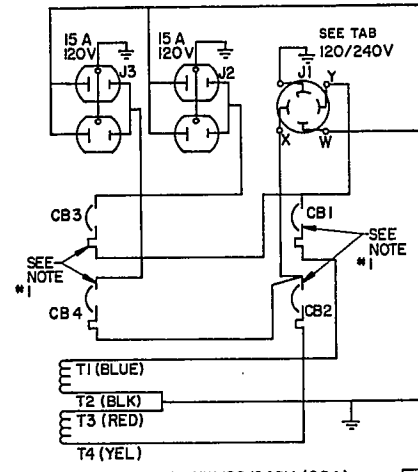
3.2/3.7 KW 120/240V



3.7/5.0 KW 120/240V

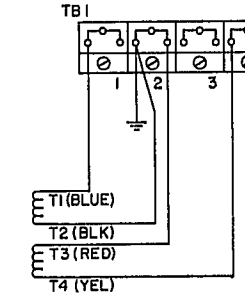
-04
-05
-08
-11

6.5 KW 120/240V SAME AS ABOVE EXCEPT J3 TO BE 30A 240V & CB4 & CB5 TO BE 30 A



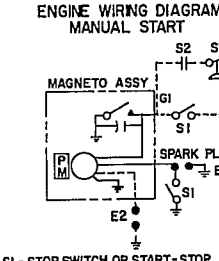
3.7/5.0KW 120/240V (20A)
6.5 KW 120/240V (30A)

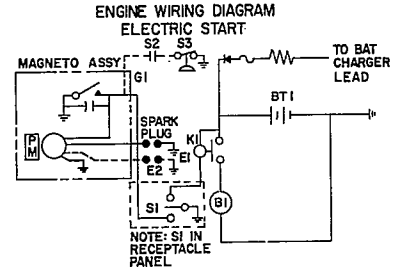
-12
-06

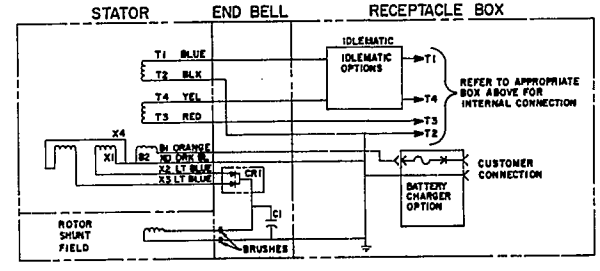


SEE NOTE 6

-13







NOTES:

1. IF NO BREAKER IS IN THE CONTROL THE LEADS GO DIRECTLY TO THE LOAD
2. 50 HZ GENERATORS: GROUND TERMINAL 2, DO NOT GROUND TERMINAL 1
3. WIRING DIAG REFLECTS REAR VIEW OF RECEPTACLES.
4. VOLTMETER USED ON 2 BRG ONLY.
5. ( ) DENOTES BREAKER LOCATION WHEN USED.
   ○ DENOTES SWITCH
6. USE BLANK CONTROL PANEL

601-0215
SHEET 2 OF 2

DICTIONARY OF BASIC ELECTRICAL TERMS

ALTERNATING CURRENT — Electricity that flows in one direction, then in the reverse direction through its conductors. The current reverses at regular intervals as each wire becomes positive then negative, reversing polarity typically 60 times per second.

ALTERNATOR — A machine that generates AC current.

AMPERE — A unit of measurement of electrical current flowing in a given time under a pressure of one volt, when there is a resistance of one OHM in the circuit.

CIRCUIT — The course followed by an electric current passing from its source through a succession of conductors, through a load, and back to its starting point.

CIRCUIT BREAKER — An automatic switch that opens its circuit upon detecting excess current. The circuit breaker replaces a fuse.

CONDUCTOR — Any material which conducts current readily. A material having low resistance.

DIODE — An electrical device that will allow current to pass through itself in one direction only.

DIRECT CURRENT — Current that always flows in the same direction.

FUSE — A ribbon of fusible metal that burns and opens its associated circuit on detecting excess current.

GROUNDING WIRE — Usually green in color and is used to ground electrical equipment to prevent electrical shock.

INSULATOR — Any material which has a very high resistance to current flow.

KILOWATT — 1000 Watts.

OHM — A unit of measurement of resistance in an electrical circuit.

PARALLEL CIRCUIT — A circuit where the parts are so connected that the current divides between them.

RESISTANCE — The opposing or retarding force offered by a circuit or component of a circuit to the passage of electrical current through it. Resistance is measured in ohms.

ROTOR — The rotating part of an electrical machine such as a generator, motor, or alternator.

SERIES CIRCUIT — A circuit in which the current has only one path to take.

STATOR — The stationary part of an alternator in which another part (the rotor) revolves.

VOLT — A unit of measurement of electrical pressure required to force one ampere through a resistance of one ohm.

VOLTAGE DROP — The voltage required to force current through the resistance of line wires or the power consuming device.

WATT — A unit of measurement of electrical power supplied to the circuit when one volt is forcing one ampere through one ohm resistance.

Onan

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