



## ***SERVICE & PARTS MANUAL***



***trade***



***recreation***



***farming***

# ***Portable Generators***

**5GRBA 378A / 7GRBB 377A**

# Safety Precautions

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**Before operating the generator set**, read the Operator's Manual and become familiar with it and your equipment. **Safe and effective operation can be achieved only if the equipment 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.*

Fuels, electrical equipment, batteries, exhaust gases and moving parts present potential hazards that could result in severe personal injury. Take care in following these recommended procedures.

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

- DO NOT fill fuel tanks with the engine running. 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.
- ALWAYS shut off fuel to engine before moving, transporting or storage.
- 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**

- Engine exhaust contains CARBON MONOXIDE, a dangerous gas that is potentially lethal. Avoid carbon monoxide inhalation by operating the generator set outdoors where exhaust gases can be discharged directly into the open air.
- DO NOT OPERATE in confined areas where exhaust gases can accumulate.

## **Moving Parts Can Cause Severe Personal Injury or Death**

- Before performing any maintenance on the generator set, disconnect the spark plug wire (and the starting battery negative [-] cable on electric start sets) to prevent accidental starting.
- If adjustments must be made while the generator set is running, use extreme caution around hot manifolds and moving parts, etc.

- 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.
- Keep hands away from moving parts.

## **Electrical Shock can Cause Severe Personal Injury or Death**

- Disconnect starting battery 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 surface 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 applicable 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 GENERATOR SET DIRECTLY TO ANY BUILDING ELECTRICAL 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**

- Have a fire extinguisher nearby. Maintain extinguisher properly and become familiar with its 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.
- 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.
- Used engine oils have been identified by some state or federal agencies as causing cancer or reproductive toxicity. When checking, draining or adding oil, take care not to ingest, breathe the fumes, or contact used oil or its vapor.
- Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and engine damage, and present a potential fire hazard.
- DO NOT store anything on the generator set such as oil cans, oily rags, chains, wooden blocks, etc. A fire could result or operation could be adversely affected. Keep the generator set clean and dry at all times.
- 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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## California

### Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

# Introduction

## INTRODUCTION

This manual contains service information on the control system and generator of the Dunlite by Onan portable generator sets. Subjects include:

- Generator troubleshooting and disassembly
- Control troubleshooting and disassembly
- Genset and control repair adjustments.

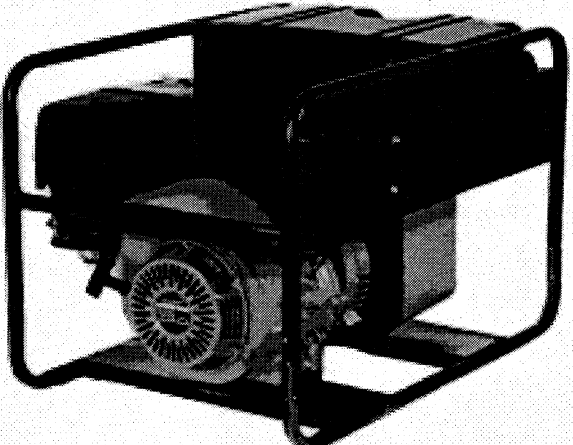
Specifications are listed for all generator sets. For engine service information, refer to the Honda Repair Manuals.

Schematic/wiring diagrams are included for all Dunlite by Onan series generator sets.

Read all service procedures completely before beginning any repair work and observe all cautions and warnings. It is extremely important that the generator set be operated in compliance with all applicable state, local, U.S. Forest Service and EPA codes or restrictions. Improper service can result in an unsafe condition that could result in severe personal injury, death, and/or equipment damage.

## MODEL IDENTIFICATION

When obtaining parts, provide the model and serial numbers from the genset nameplate (Figure 1-1).




Model No. 7 GRBB 377A	Model No. 5 GRBA 378A
Serial No. _____ Spec. _____	Serial No. _____ Spec. _____
<b>IMPORTANT:</b> Model + Serial No. required when ordering parts.	
 1400 73RD Avenue, N.E. Minneapolis, MN 55432 USA	
<b>Onan</b>	
Made in Australia	
<b>Rated Watts:</b> 6600	<b>Rated Watts:</b> 4800
<b>Rated Amps:</b> 55/27.5	<b>Rated Amps:</b> 40/20
<b>Volts:</b> 120/240	<b>Volts:</b> 120/240
<b>Hz:</b> 60	<b>Hz:</b> 60
<b>Phase:</b> 1	<b>Phase:</b> 1
<b>PF:</b> 1.0	<b>PF:</b> 1.0
<b>RPM:</b> 3600	<b>RPM:</b> 3600
<b>Batt:</b> 12V	<b>Batt:</b> N/A
<b>Wiring Diagram:</b> 0612-6748	<b>Wiring Diagram:</b> 0612-6749

FIGURE 1-1. GENSET IDENTIFICATION

# Model Identification

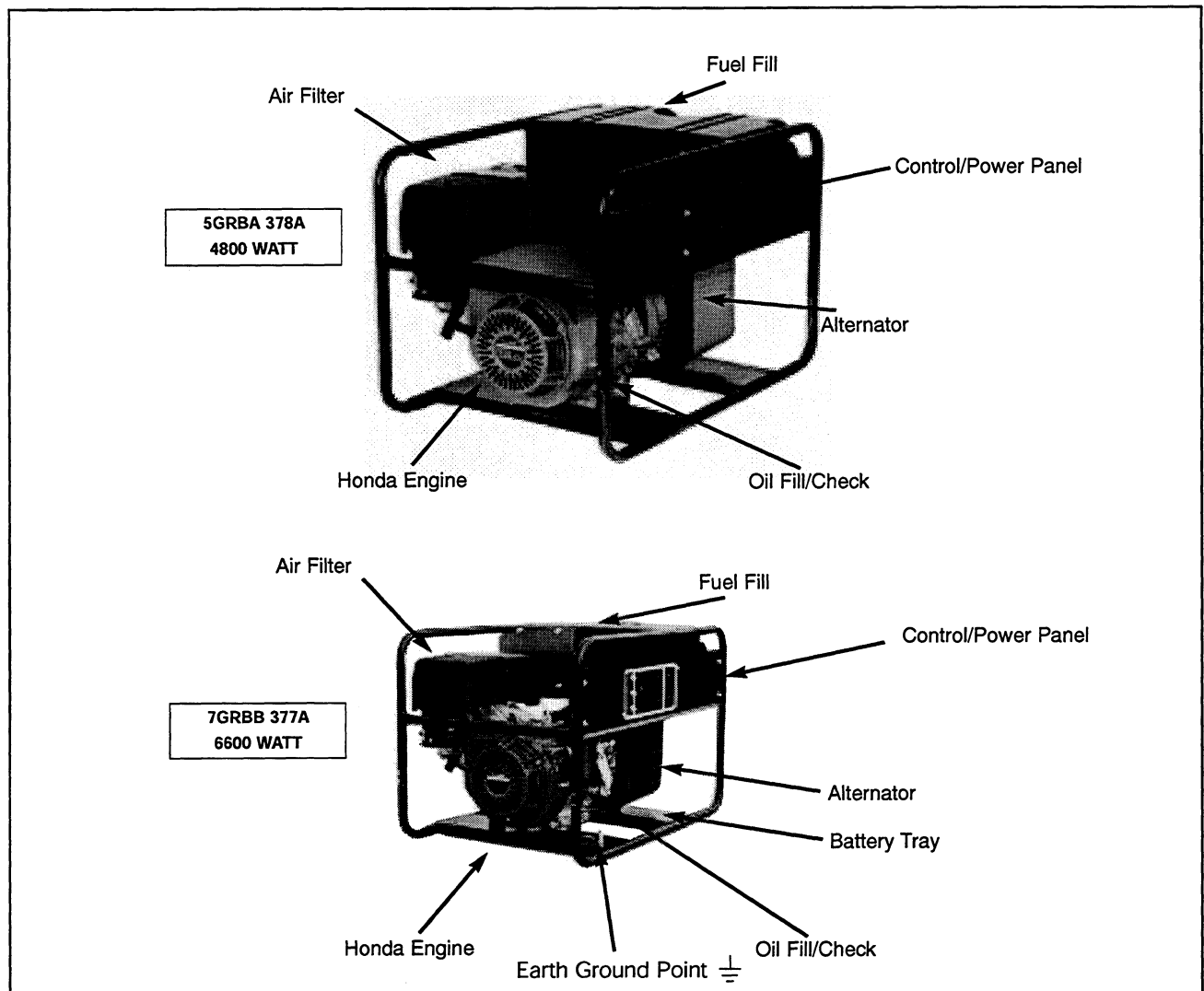


FIGURE 1-2. STANDARD SERIES GENERATOR SETS

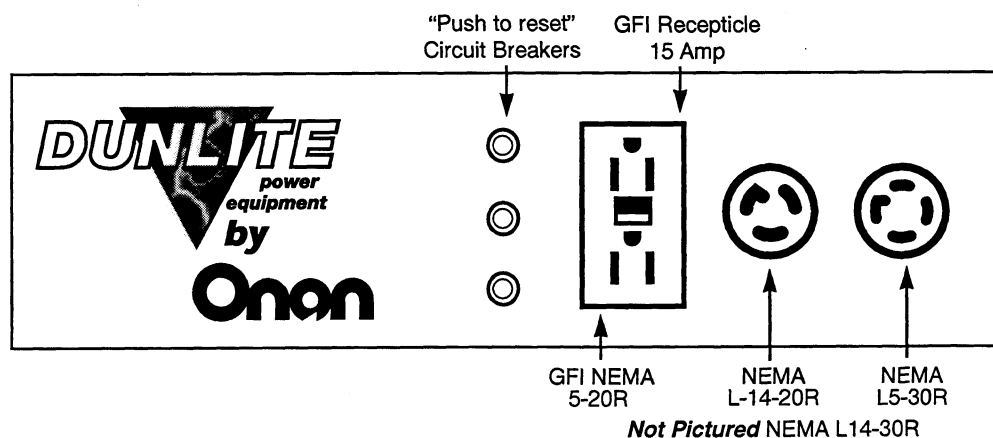


FIGURE 1-3. DUNLITE BY ONAN 60HZ OUTPUT PANELS

# Specifications

SPECIFICATIONS	5 GRBA 378A	7 GRBB 377A
<b>A/C OUTPUT</b>		
FREQUENCY	60	60
VOLTAGE	120/240	120/240
WATTAGE (MAX. POWER)	5000	7000
WATTAGE (RATED POWER)	4800	6600
CURRENT RATED (AMPS)	40/20	55/27.5
<b>ENGINE DETAILS</b>		
ENGINE TYPE	GX340 HONDA	GX390 HONDA
ENGINE SPEED (RPM)	3600	3600
FUEL	UNLEADED	UNLEADED
ENGINE OIL CAPACITY	1.16qt (1.1L)	1.16qt (1.1L)
SPARK PLUG GAP	0.02-0.03in (0.7-0.8mm)	0.02-0.03in (0.7-0.8mm)
IGNITION SYSTEM	TRANSISTOR MAGNITO	TRANSISTOR MAGNITO
STARTING SYSTEM	RECOIL	RECOIL/ELECTRIC
HORSE POWER (CC)	11hp / 337CC	13hp / 389CC
<b>GENERATOR DETAILS</b>		
DRY WEIGHT	174lb (79KG)	217lb (94KG)
<b>DIMENSIONS</b>		
LENGTH MM	33.6in (855mm)	33.6in (855mm)
WIDTH MM	22.8in (580mm)	22.8in (580mm)
HEIGHT MM	22.2in (565mm)	22.2in (565mm)
FUEL TANK CAPACITY	4 gal (15Lt)	4 gal (15Lt)
RATED OUTPUT OPERATING HRS @ 80% LOAD	6.7hrs	5.1hrs
BATTERY REQUIREMENTS	N/A	18amp/hr 12V

TABLE 2-1. STANDARD SERIES GENERATOR SET

# Preparing to Service

## TROUBLESHOOTING

Before servicing the generator set, follow a systematic troubleshooting procedure to locate the problem. For servicing purposes, the generator set can be divided into the following sections:

- Control
- Generator

Control schematic/wiring diagrams are included for the Dunlite by Onan generator sets.

The trouble shooting sections list typical problems along with possible causes and corrective actions. Note that some problems might have several possible causes. It may be necessary to investigate each possible cause in order to isolate the actual source of the problem.

## SPECIAL TOOLS

### CONTROL AND GENERATOR

A complete set of standard and metric shop tools are required to service the control and generator.

Also needed are:

- Lead or dead blow hammer
- Battery hydrometer
- Torque wrench
- VOM multimeter
- Frequency meter
- Armature growler
- Load test panel
- Jumper wires

## SAFETY CONSIDERATIONS

Always consider the safety aspects of any service procedure. Servicing presents several hazards that the service technician must be aware of to safely complete the job. Study the safety precautions on page one of this manual and familiarize yourself with the hazards listed in Table 3-2.

Approach the job in a safety-conscious manner. Being safety conscious is the most effective way to avoid injury to yourself and to others. Reduce the risk of an accident by adopting the following safeguards.

### Safeguards to Avoid Hazards

**Use personal protection:** Protect your body by wearing the appropriate safety equipment such as:

- Safety shoes
- Gloves
- Safety glasses

Do not wear rings, jewelry or loose clothing: they might get caught on equipment, or conduct electricity.

**Reduce the hazard:** A safe, orderly work area and well-maintained equipment reduce the risk of hazard. Leave all guards and shields in place on machinery, and maintain equipment in top condition. Store flammable liquids in approved containers, away from flame, spark, pilot light, arc-producing equipment and other ignition sources. Keep the work area clean, well-lighted, and well ventilated. Keep fire extinguishers and safety equipment nearby, and be prepared for any emergency.

**DEVELOP SAFE WORK HABITS:** Unsafe practices are the cause of most accidents involving tools or machinery. Be familiar with your tools and machines and learn how to use them safely. Use the right tool for the right job, and check its condition before starting.

Follow all warnings and cautions in this manual, and take extra precautions when working around electrical equipment. Avoid working alone, and do not take risks. Do not work when tired or after consuming any alcohol or drug that makes the operation of equipment unsafe.

**BE PREPARED FOR A POTENTIAL ACCIDENT:** The Red Cross and public safety departments offer courses in first aid, CPR, and fire control. Use this information to be ready for an accident.

Be safety-conscious, and make safety procedures part of the work routine.

TABLE 3-2. HAZARDS AND THEIR SOURCES

<ul style="list-style-type: none"><li>● Fire and explosions<ul style="list-style-type: none"><li>Leaking or spilled fuel</li><li>Hydrogen gas from charging battery</li><li>Oily rags improperly stored</li><li>Flammable liquids improperly stored</li><li>Any fire, flame, spark, pilot light or arc producing equipment &amp; ignition sources</li></ul></li><li>● Fire and explosions<ul style="list-style-type: none"><li>Carbon monoxide from faulty exhaust</li><li>Operating power unit where exhaust gases can accumulate</li></ul></li></ul>	<ul style="list-style-type: none"><li>● Burns<ul style="list-style-type: none"><li>Hot exhaust pipes 2 mufflers</li><li>Hot engine surfaces</li><li>Hot engine oil</li><li>Electrical short in DC wiring system</li></ul></li><li>● Rotating Machinery<ul style="list-style-type: none"><li>Jewelry or loose clothing catching in moving parts</li></ul></li><li>● Heavy Objects<ul style="list-style-type: none"><li>Removing power unit from vehicle</li><li>Removing heavy components</li></ul></li><li>● Slippery Surfaces<ul style="list-style-type: none"><li>Leaking or spilled oil</li></ul></li></ul>
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# Control

## INTRODUCTION

The control system includes all the functions that relate to starting, monitoring for fault conditions, instrumentation, battery charging and stopping.

## DUNLITE BY ONAN SERIES GENSETS

The only components found on the Dunlite by Onan control panels are circuit breakers and output receptacles.

## CONTROL PANEL

This section describes generator set controls. Some control features are not available on certain sets. Review the control descriptions that apply to your specific model.

### Control Components

**On/Stop Switch (Manual Start Models):** Allows starting with recoil when the switch is in the On position. Stops engine operation when turned to the Stop position. Refer to Fig 4-4.

**Start/On/Stop Switch (Electric Start Models):** Turning key switch to the Start position begins engine cranking. When engine starts, release the switch and it will return to the On position. To stop the engine, turn the switch to the Stop position. Refer to Fig 4-4.

### Oil Alert\*

Oil Alert\* automatically shuts engine off if oil level gets below a safe level. Engine will NOT start if oil level is low.

**AC Circuit Breakers:** Provide protection for the generator from short circuits or overloads.

## ADDITIONAL CONTROLS

**Fuel Valve:** Controls fuel flow to engine. Setting fuel valve to Open position allows fuel to flow to engine. Set fuel valve to Closed position when generator set is not in use. Refer to Fig 4-5.

**Choke Lever:** Restricts air flow to the carburetor for starting a cold engine. Refer to Fig 4-5.

## CONTROL OPERATION

This section describes the control operation for both the electric start and recoil start models. Follow the control operation that is similar to your specific model. Refer to the schematic diagram for your specific model to help follow the circuit description (see Section 11). For actual engine starting, refer to the Operator's Manual to review important safety precautions and operating instructions.

### Electric Start

Holding the Start/On/Stop switch in the Start position connects battery positive (B+) to the start solenoid. The solenoid energizes and closes the solenoid switch. The solenoid switch connects the battery positive (B+) to the starter and the engine begins to crank. As the engine starts to run, the Start/On/Stop switch should be released. The switch will automatically return to the centre (On) position and the engine will continue to run. In the On position, power is no longer connected to the starter solenoid and the solenoid switch opens removing power from the starter motor.

Electric start models can also be recoil started when the start/on/stop switch is placed in the On position.

### Recoil Start

Move the On/Off switch to the On position. This opens a ground path from the Ignition Control Unit and allows ignition spark to develop in the magneto type ignition when the recoil starter is pulled.

### Battery Charge Circuit - Electric Start Models Only

The charging circuit supplies battery charge voltage. It consists of an AC output voltage from the Ignition Control Unit. The output is rectified to DC by a diode on the engine. This charges the battery at a 5 amp maximum during set operation. The charge rate varies with the battery condition.

### Stopping

Turning the Start/On/Stop or On/Stop switch (depending on model) to the Off position causes the output from the Ignition Control Unit to be grounded. This interrupts ignition voltage and stops the engine. If switch does not stop engine, check to make sure switch wiring is making proper contact.

## CONTROL TROUBLESHOOTING

Use the following troubleshooting guide to help locate problems related to the control components only. Refer to the appropriate wiring diagram in Section 7 for wiring terminal identification.

The troubleshooting guide covers both the electric start model and the recoil start model. After identifying the problem, refer to the guide for the possible cause and the recommended corrective action.

Always refer to the specific wiring diagram that corresponds to the model number of the generator set when troubleshooting.

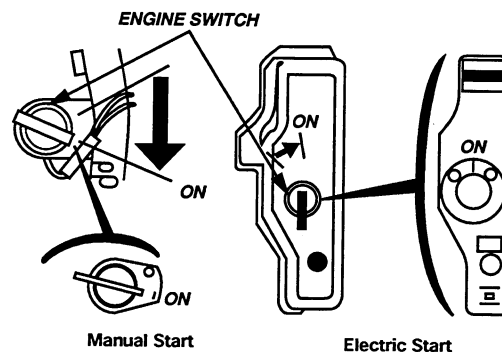


FIGURE 4-4. ON/STOP SWITCH

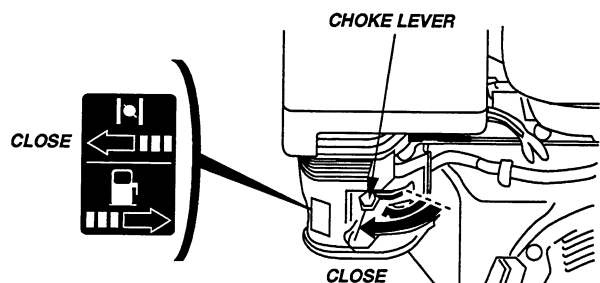


FIGURE 4-5. FUEL/CHOKE

# Control Troubleshooting

TABLE 4-3. TROUBLESHOOTING CAUSES AND ACTIONS

**⚠ WARNING** Many troubleshooting procedures present hazards that can result in severe personal injury or death. Only qualified service personnel with knowledge of fuels, electricity, and machinery hazards should perform service procedures. Review safety precautions on inside cover page.

Trouble	Possible Cause	Corrective Action
Engine Does Not Crank (Electric Start Models only)	<ol style="list-style-type: none"> <li>Insufficient voltage for cranking due to:               <ol style="list-style-type: none"> <li>battery not charged, or</li> <li>terminal connections loose or dirty</li> <li>defective charge circuit</li> <li>defective Ignition Control Unit charge circuit.</li> </ol> </li> <li>Defective Start/ON/Stop switch.</li> <li>Open circuit in wiring between Start/On/Stop switch and starter solenoid or between battery and starter.</li> <li>Defective starter solenoid or starter.</li> </ol>	<ol style="list-style-type: none"> <li> <ol style="list-style-type: none"> <li>Check condition of battery and recharge or replace as needed.</li> <li>Clean and tighten battery cable connections, starter connections and ground connections.</li> <li>Check diode and replace if defective.</li> <li>Refer to Engine Manual for test procedures</li> </ol> </li> <li>Check switch for continuity and replace if defective.</li> <li>Check wiring and connections for continuity and repair if defective.</li> <li>Refer to Engine Manual for test procedures</li> </ol>
Engine Does Not Start	<ol style="list-style-type: none"> <li>No fuel or fuel valve is not open.</li> <li>On/Off switch in incorrect position.</li> <li>Defective Ignition Module</li> <li>Low oil level</li> </ol>	<ol style="list-style-type: none"> <li>Add fuel/ Open valve. On engine and/or under tank</li> <li>Turn to On.</li> <li>Refer to Engine Manual for test procedures.</li> <li>Check oil level and fill if necessary.</li> </ol>
Engine Cannot Be Turned Off With Switch	<ol style="list-style-type: none"> <li>Defective Start/On/Stop switch, On/Start switch, or Engine On/Off switch.</li> <li>Open circuit in switch wiring</li> </ol>	<ol style="list-style-type: none"> <li>Check switch for continuity and replace if defective.</li> <li>Check wire connections to switch.</li> </ol>

# Generator

## INTRODUCTION

The generator is a revolving field, self exciting, 2-pole design. A capacitor-based voltage regulator is used on genset model. AC load connections are made through outlets on the control panel.

The generator components are:

- Stator
- Rotor
- Diode Assembly
- Generator Cooling

### Stator

The stator consists of two coils: a main coil & a sub coil. These coils are wound around slots in the stator laminations. The main coil generates the AC output. The sub coil provides excitation to magnetize the rotor.

### Rotor

The rotor has the two outer poles for initial excitation. Coils are wound around each of the two poles to magnetize the entire core.

The rotor consists of a center shaft that holds the rotor laminations, a press fit bearing, and a centrifugal cooling fan. The entire assembly is connected directly to the tapered engine crank-shaft by means of a through bolt. The rotor is supported on the other end by the end bell, which is placed over the rotor bearing and secured to the adapter.

### Generator Cooling

Cooling airflow for the generator is provided by a centrifugal fan that is mounted on the engine end of the rotor shaft. Air is drawn through the end cover and across the stator and rotor assemblies, then discharges out the adapter openings.

The engine and generator are air-cooled. A constant airflow is critical for the engine and generator to prevent excessive heat buildup.

The engine is cooled by a centrifugal fan that is part of the engine flywheel. Air is drawn in through the openings in the recoil starter and is forced out between the engine cowlings and the engine cooling fins. Figure 5-6 illustrates air flow on a typical Dunlite by Onan portable genset.

The generator is cooled by a centrifugal fan inside the generator assembly, mounted on the engine end of the rotor shaft. The generator fan draws cooling air in through the generator end cover, across the stator and rotor, then discharges the heated air through the air outlet in the adapter plate.

Keep the air inlet openings and the air discharge openings free of any obstructions, to avoid restricting airflow. Dirt, dust, and other debris that can clog the air openings should be removed during periodic maintenance. Debris might also become lodged between the cooling fins on the engine block and cylinder head. If this happens, heat transfer is greatly reduced and engine overheating can occur.

Use a brush or low-pressure compressed air to remove any dirt or debris that may be lodged in the engine cooling fins.

**CAUTION** Use Caution with compressed air and wear Safety Glasses as flying debris can cause injury.

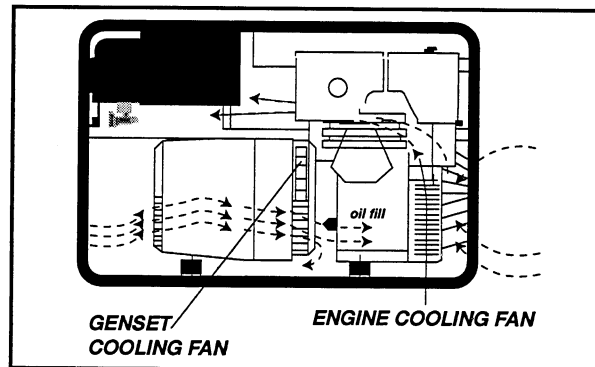


FIGURE 5-6. TYPICAL COOLING AIRFLOW

### Capacitor Regulator-Equipped Generator Operation

The schematic shown in Figure 7-10 is provided to help follow the generator operating description. Always refer to the specific schematic that corresponds to the model number of the generator set when troubleshooting.

When the rotor assembly begins revolving, the rotor induces a small amount of AC voltage across the stator main coil and sub coil. With the capacitor connected to the stator sub coil, this voltage causes a leading current to flow through the coil producing magnetism in the coil. This magnetism induces a voltage in the coils of the revolving rotor. The diode connected to the rotor coil rectifies the current in the coil to produce a DC current. DC current flowing through the coil increases the magnetism of the rotor to create a more powerful magnet.

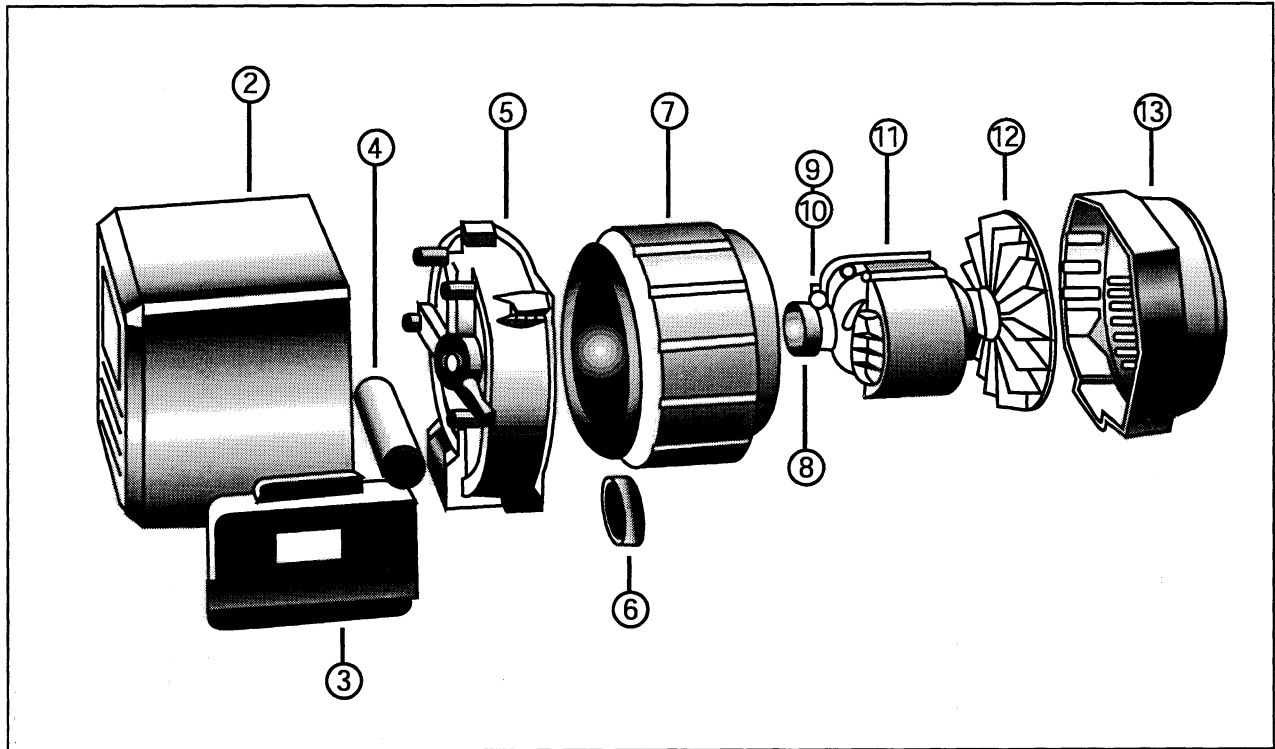
The strongly magnetized rotor causes an increase in the amount of AC voltage induced in the stator, which causes a stronger leading current to flow through the stator sub coil. This process continues until the engine comes up to speed and a constant voltage is reached.

When a load is connected to the generator, an increase in the stator main coil current would cause a drop in the output voltage due to the impedance (AC resistance) of the winding; however, the leading current caused by the capacitor connected to the sub coil, reduces the winding resistance to a value below the no-load condition. This current, coupled with the load current, increases the main coil magnetism to compensate for the voltage drop due to the load. In this way, the voltage output remains fairly constant with varying loads.

## GENERATOR TROUBLESHOOTING

Use the following troubleshooting guide to help locate problems related to the generator. Figures 5-7 show the location of most of the generator components. Refer to the wiring diagrams in Figure 7-10 for location of the wiring terminal connections. It is not necessary to remove the stator or rotor for troubleshooting. All of the test points are located inside the generator end cover. After identifying the problem, refer to the troubleshooting guide for the possible cause and the recommended corrective action. Refer to the Generator Testing section for component test procedures.

# Diagrams



NO.	DESCRIPTION
2	ALTERNATOR COVER
3	DASHBOARD
4	CAPACITOR
5	NON DRIVE END PLATE
6	BEARING RETAINER
7	STATOR ASSEMBLY
8	BEARING
9	DIODES
10	VARISTORS
11	ROTOR ASSEMBLY
12	FAN
13	DRIVE END PLATE

FIGURE 5-7. TYPICAL GENERATOR WITH CAPACITOR-TYPE REGULATION

**TABLE 5-4. CHART FOR MODELS WITH  
CAPACITOR-TYPE VOLTAGE REGULATOR**

**⚠ WARNING** *Many troubleshooting procedures present hazards that can result in severe personal injury or death. Only qualified service personnel with knowledge of fuels, electricity, and machinery hazards should perform service procedures. Review safety precautions on inside cover page.*

<b>Trouble</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
No AC Output Voltage	<ol style="list-style-type: none"> <li>1. Open AC circuit breaker.</li> <li>2. Open circuit between stator main coil and AC receptacle. Defective receptacle.</li> <li>3. Defective Rotor.</li> <li>4. Defective stator main coil.</li> </ol>	<ol style="list-style-type: none"> <li>1. Locate cause of overload and correct as required. Reset breaker.</li> <li>2. Check for continuity and correct if circuit is open. Check for defective receptacle/extension cords.</li> <li>3. Test Rotor coil.</li> <li>4. Test stator main coil.</li> </ol>
AC output voltage only 3 to 18 VAC	<ol style="list-style-type: none"> <li>1. Defective stator sub coil.</li> <li>2. Defective rotor winding diode or rotor coil.</li> <li>3. Open or shorted capacitor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Test stator sub coil for open, shorted, or grounded windings and replace if defective.</li> <li>2. Replace Diode if defective. Test rotor coil for open, shorted, or grounded winding and defective diode. Replace rotor if defective.</li> <li>3. Test capacitor for open or short and replace if defective.</li> </ol>
AC output voltage too low or too high	<ol style="list-style-type: none"> <li>1. Engine governor incorrectly adjusted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to Honda Engine Owner's Manual.</li> </ol>
Noisy Generator	<ol style="list-style-type: none"> <li>1. Worn rotor shaft bearing</li> <li>2. Rotor and stator rubbing together due to: <ol style="list-style-type: none"> <li>a. varnish lumps</li> <li>b. rotor misaligned with crankshaft</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Replace end bearing</li> <li>2a. Check for varnish lumps between rotor and stator and remove as required.</li> <li>2b. Follow specified assembly procedures to correct rotor to crankshaft alignment.</li> </ol>
Generator Overheats	<ol style="list-style-type: none"> <li>1. Generator overloaded due to defective circuit breaker.</li> <li>2. Airflow restricted due to dirt or debris covering vent openings in cover or adapter.</li> <li>3. Stator windings covered with oil or dirt.</li> <li>4. Defective windings in rotor or stator.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace circuit breaker. Do not exceed specified load when operating set.</li> <li>2. Clean away all dirt or debris as required.</li> <li>3. Clean stator windings</li> <li>4. Test each component for open, grounded, or</li> </ol>

# Generator Service

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This section describes the procedures for generator stator and rotor removal and installation for all models. Refer to Figure 5-7 to identify the various generator components described in each section.

**⚠ WARNING** *Careless handling of the rotor or stator can damage the insulation on the windings. Do not allow windings to be brushed or scraped during service.*

## Dismantling the Alternator

1. Remove the engine-alternator assembly from carry frame.
2. Remove two cover securing screws and withdraw cover.
3. Remove power outlet socket from dashboard and disconnect wires (note terminal connections).
4. Remove (socket mounting) dashboard.
5. Disconnect leads from Stator to Capacitor (note terminal connections).
6. Undo Non Drive End Plate retaining bolts and remove Non Drive End Plate.

**Note:** End Plate is a light press, fit into centre bearing and may require light tapping with rubber hammer on inner face to dislodge.

7. Mark Stator and Drive End Plate with marking pen to ensure correct location on re-assembly. Using flat screwdriver, carefully dislodge Stator from pilot of Drive End Plate, taking care not to damage stator windings. Withdraw Stator.
8. Remove rotor shaft retaining bolt and withdraw Rotor Assembly. If, after loosening rotor shaft retaining bolt, rotor assembly remains fixed to engine, firmly tap rotor poles with a rubber or plastic faced hammer and try again.

## Assembling the Alternator

Assembly is the reverse to the above procedure.

**Note 1:** When re-assembling, care must be taken to ensure Stator is correctly located in Drive End Plate housing and keyway of Stator aligned with key of Drive End Plate. Similarly, the same procedure applies when refitting Non-Drive End Plate to Stator.

**Note 2:** Test components before assembly also test after assembly. Non-Drive End Plate retaining bolts should be tightened to a torque of 9.0 Nm (80 in lbf). If alternator still does not function, then winding resistances, rotor diodes, suppressors and capacitor will have to be checked, and parts replaced as required.

**TABLE 6-5. GENERATOR WINDING RESISTANCE**

	<b>5GRBA 378A</b>	<b>7GRBB 377A</b>
<b>Rotor</b>	5.5ohms per pole	4.29 ohms per pole
<b>Stator Excitor</b>	2.82 ohms	0.627 ohms
<b>Stator Main</b>	0.527 oms	0.265 ohms

All readings at 70 °F (20 °C).

**TABLE 6-6 TORQUE SPECIFICATIONS**

<b>Body Bolts</b>	<b>7GRBB 377A</b>	5/16 UNF	x 7in	18-22Nm
<b>Body Bolts</b>	<b>5GRBA 378A</b>	M8	x 150in	8-10Nm
<b>Rotor Bolt</b>	<b>5GRBA 378A</b>	5/16 UNF	x 7in	18-22Nm
<b>Rotor Bolt</b>	<b>7GRBB 377A</b>	5/16 UNF	x 6in	18-22Nm
<b>Alternator to Engine Bolts</b>		3/8 UNF	x 1in	33-38Nm

Reommended torque (grade 5 bolt)

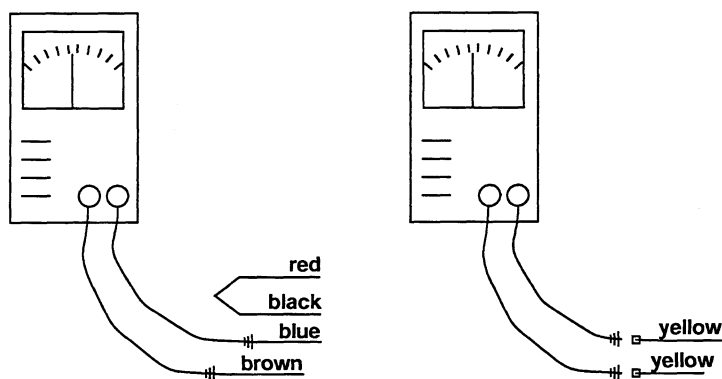
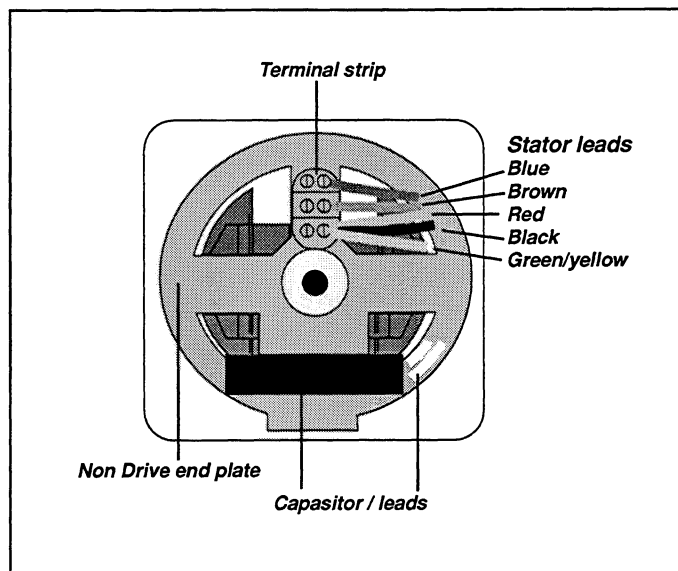
#### **GENERATOR TESTING FOR MODELS WITH CAPACITOR VOLTAGE REGULATION**

This section covers test procedures for the generator windings, the regulator capacitor, and for the diode assembly. Follow the troubleshooting procedures in this section to locate the problem, then perform the recommended corrective action. Remove the generator and cover and perform tests as described. If the generator set has been running, allow it to cool down completely before making resistance measures.

Check all wire harness connectors and leads for continuity prior to component testing or generator disassembly. Refer to wire diagrams for lead locations.

#### **Stator Test**

The stator main, sub coils can be tested with an ohm meter. Testing for shorted windings requires a digital type ohmmeter that can read to within 0.01 ohms. The stator can be tested without removing it from the generator. See Figure 6-8.



**FIGURE 6-8. GENERATOR TESTING**

**Stator Main Coil Test:**

Remove the stator main coil leads from the terminal strip (Figure 6-8) and connect the Red and Black leads together then connect the meter leads to the Blue and Brown leads. Refer to Table 6-5 for the stator main coil resistance value. A high resistance value reading indicates an open winding. A reading of less than the value shown indicates a shorted winding. If an open or shorted winding is indicated, replace the stator.

**Stator Sub Coil Test:**

Remove the connector from the stator sub coil and connect the meter leads (Figure 6-8) to the yellow leads from the stator sub coil. Refer to Table 6-5 for the stator sub coil resistance value. A high resistance reading indicates an open winding. A reading of less than the value shown indicates a shorted winding. If an open or shorted winding is detected, replace the stator.

#### **Stator Ground Test:**

Remove the wire connectors from the stator main coil terminal block, subcoil. Set the ohmmeter to the highest resistance scale and then connect one test prod to the metal stator lamination stack. Touch the other test prod to red or black terminal from the main coil. Repeat the test for the sub coil by measuring between the stator stack and one of the yellow leads from the stator sub coil. A reading of less than one megohm indicates a ground. Replace a grounded stator with a new stator.

If stator tests good, proceed to rotor tests.

#### **Rotor Test**

The rotor can be tested without removing it from the generator. Remove the generator end cover and refer to Figure 6-9 for the test points.

#### **Rotor Coil Test**

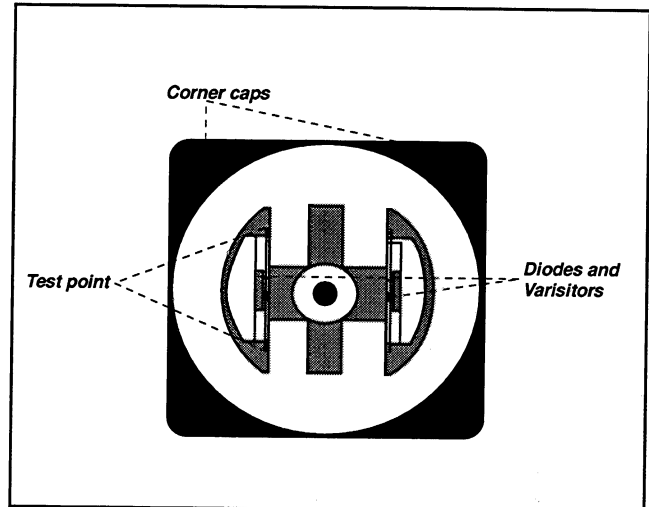
The rotor coil winding has a diode connected in series with it. Using pointed meter test prods, touch ohmmeter test prods to the two posts that yellow rotor winding leads attach to (see Figure 6-8). It is necessary to pierce the insulation on the posts to obtain an accurate reading of the winding resistance. Also, because a diode is attached in series with the windings, the meter leads must be reversed for a second reading. Refer to Table 6-5 for the rotor coil resistance value. It is normal to measure a high resistance reading in one direction and the listed resistance reading in the other direction. A high resistance reading in both directions indicates an open winding or diode. A reading of less than the value shown in Table 6-5 in one direction indicates a shorted winding or diode. If an open or short condition is detected, replace the rotor.

#### **Rotor Coil Ground Test:**

To test for grounds, set the ohmmeter to the highest resistance scale. Touch one test prod to the rotor shaft and hold it there. Touch the other test prod to one of the posts that the yellow rotor winding leads attach to (see Figure 6-8). It is necessary to pierce the insulation on the posts to obtain an accurate reading. A reading of less than one megohm indicates the rotor is grounded. Replace a grounded rotor with a new rotor.

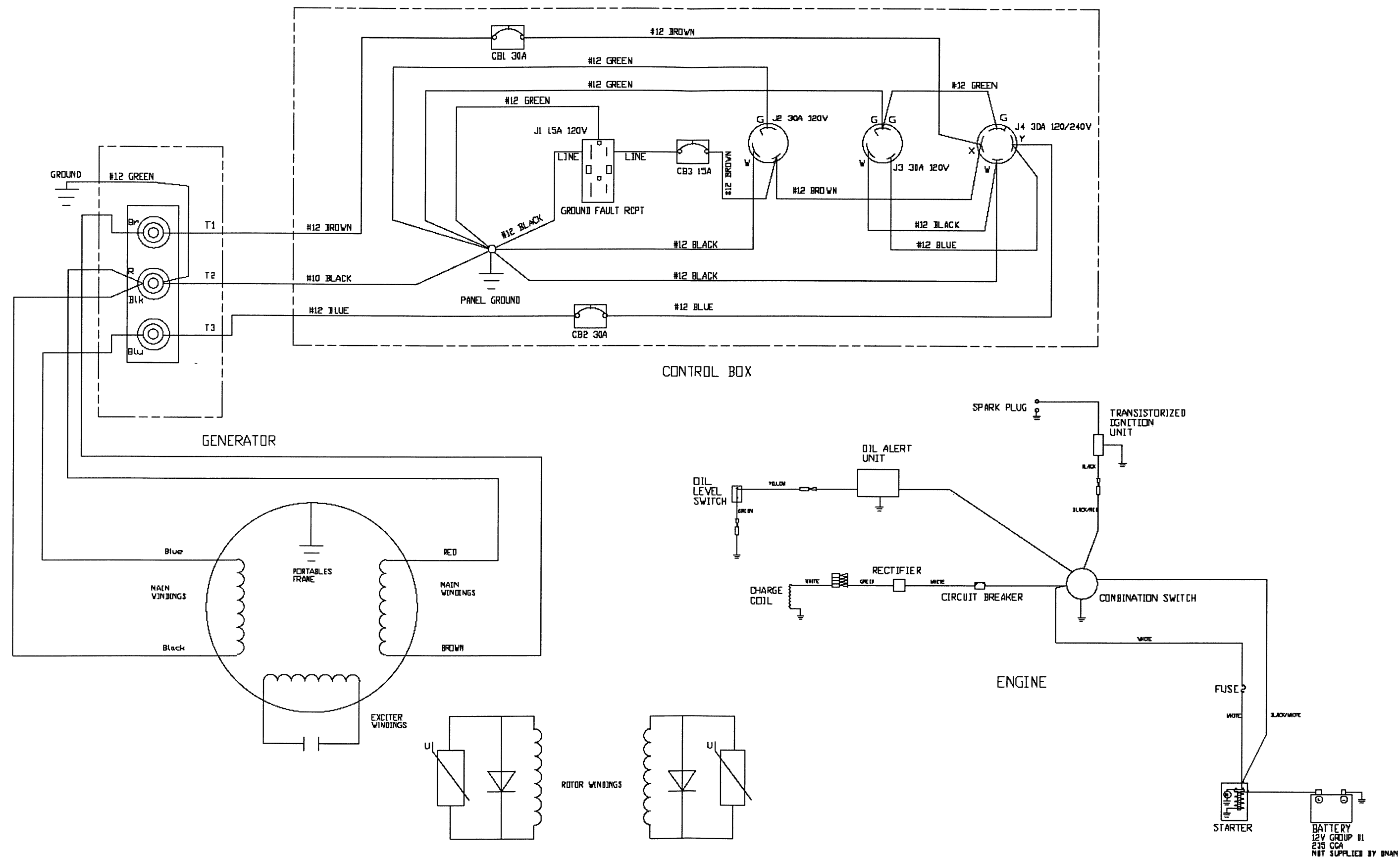
#### **Capacitor Test**

The capacitor can be tested with a capacitor checker or an analog ohmmeter. Disconnect both wire leads connected to the capacitor and attach meter. A capacitor checker attached to the capacitor leads should indicate approx. 13 mfd. An analog ohmmeter connected to the capacitor leads should cause the meter to momentarily deflect toward continuity and then indicate infinity. Reversing the meter should provide the same indication. Replace a shorted or open capacitor.

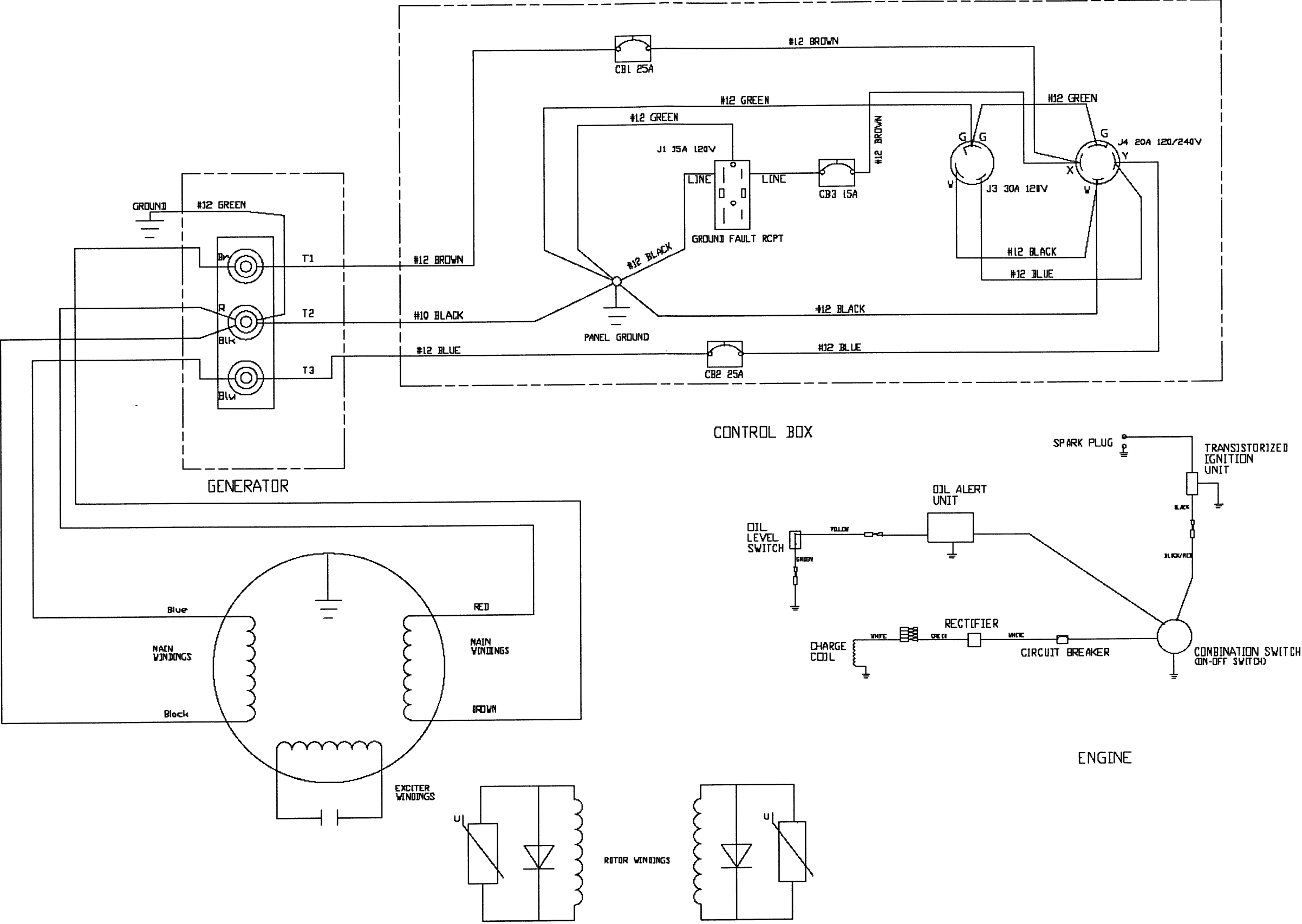


**FIGURE 6-9. ROTOR TESTING**

# WIRING DIAGRAMS



# WIRING DIAGRAMS



# Parts

## 7GRBB 377A - US GENSET

Onan #	Dunlite #	QTY	Description
0327-1236	21002051	1	CONTROL PANEL ASSY 6.6KW
	30100063	1	ENG HONDA GX390KI VDE2
	73000016	1	ALT XPT F89 8000VA BARE KIT
0327-1250	19100769	1	FRAME BOTTOM E/S U.S.
0327-1241	19100770	1	FRAME ROLL OVER U.S.
	25100163	1	EARTH LINK
	9301495	1	COVER FOR GOVERNOR U.S.
	25100362	1	BATT. LEAD POSITIVE 700LG
	25100361	1	BATT. LEAD NEG. 700LG
	20170178	1	CLAMP ASSY, BATT, ELEC ST P'P
0327-1224	10400276	3	MNT RUBR M505-520520 MACKAY
	36400310	4	SCREW SET HEX M10 X 16 STL ZP
	36200068	4	WSH/SP M10 X 1/8 X 3/32 STL Z
	36200134	12	WSH/FL M10 X 21 STL ZP
	36000302	1	BOLT HEX M8 X 25 STL ZP G4.6
	36200133	2	WSH/FL M8 X 17 STL ZP
	36100265	1	NUT M8 STL ZP NYLOC
	36481571	14	SCREW WAFER HD TEK 10-24X16 Z
	23460512	1	LBL "TESTED O.K."
	9401106	1	COVER ALT P/P BLACK
0327-1225	31000419	1	HAND BOOK U.S.
	31020420	1	WARRANTY CARD U.S.
	35300332	1	CARTON U.S.
	23020763	1	LBL PORTABLES DATA BLANK
	36481792	2	SCRW S/TAP 6G X 3/4 PAN ZP
0327-1226	22210547	1	FUEL TANK U.S.
	9411404	1	COVER ELECTRICS
	38401522	1	HOSE FUEL 4.8MM ID DAYCO MPT
	38500099	1	CLAM HOSE
0098-6074-02		1	LABEL-GENERAL WARNING
0098-6190		1	LABEL-EXHAUST GAS
0098-6192		1	LABEL-HAZARD VOLTAGE
0327-1109	21002051		CONTROL PANEL U.S.
	32354965	1	POWER OUTLET NEMA L14-30R U.S
	32354966	2	POWER OUTLET NEMA L5-30R U.S.
	32354967	1	POWER OUTLET DUPLEX GF1 15A
	32302881	0.4	COND.FLEX.CLIPSAL 9020EH
	32312882	1	GLAND STRGHT CLIPSAL 279C20E
	32311820	1	GLAND ANGLE CLIPSAL 279AC20
	32372476	1	BLANK MNT PLATE HPM#770/IPL
	21002049	1	CONTROL PANEL U.S. 6.6KW
	32104945	1	WIRING DIAGRAM STD 6.6KW
0327-0883	32100033	1	C/B 15A
0327-0886	32100034	2	C/B 30A
	73000016		ALTERNATER
0327-1242	9200122	1	DEP F89 AL CSTG
	36001236	1	FASTENERS, DEP/ENG, 385KVA P'P
0327-1237	47000190	1	ROTOR WOUND 881F89 BODYLESS
0327-1228	13300027	1	FAN PLSTC (WK 4), F89
0327-1229	41000034	1	BBRG 6204-2RS1/QE6
0327-1249	36021457	5	BOLT HEX 5/16UNF X 7 1/4STL G
0327-1244	36200053	5	WSH/SP 5/16 X 1/8 X 1/16 Z
0327-1245	36200121	1	WSH/FL 5/16"ID X 5/8 X 18 STL
	13400029	1	BAFFLE F89 8KVA
	36481308	8	SCREW S/TAP 6GX1/4 PAN CR ZP

FIGURE 8-12. PARTS FOR 7GRBB 377A-US

## 7GRBB 377A - US GENSET

Onan #	Dunlite #	QTY	Description
0327-1251	47000190		ROTOR
	1200080	1	SHAFT ALT F89 7.5/8KVA
	1200083	1	SHAFT ALT F89 8KVA
	2011515	167	LAM ROTOR P/P
	11500571	2	HOLDER DIODE
	36401078	2	SCRW S/TAP 8GX1/2 CSK CR STLZ
0327-1230	11000084	2	DIODE IN5627
0327-1231	11100469	2	VARISTOR S20K 420
0327-1232	11101096	2	VARISTOR S20K 510 USE11100469
	40000014	3.15	WIRE ENAML 1.00MM PE1 2
	34700331	0.25	VARN ISONEL 1400
	34300021	2.06	TAPE VIDA SHRINK 16*.125MM
	34300020	3	TAPE INSUL 25MM PE510
	34211817	2	INSUL INSERT ROTOR END CAPPIN
	34212185	4	INSUL INSERT 25MM
	34212184	2	INSUL INSERT 8MM
	34300213	0.036	TAPE FOAM DBL SCOTCH 4008 *
0327-1238	28000190	1	STAT WND 881F89 XPT NIL B/CH
0327-1247	9200121	1	NDEP, MCHND CSTG,USE42200313
0327-1234	41300064	1	BRG RTNR 6204 081004702
	36121468	4	NUT HEX 5/16 UNF STL ZP
	21020441	1	DASHBOARD POLYPROP F89
	9500248	0.9	EXTRUSION RUBR F89
	36200071	2	WSH/STAR INT 1/8-M3 STL ZP
	8500179	2	LUG PREINS H2278 P/
	36400885	2	SCRW S/TAP 8G X1/2 PAN PHHD Z
	36200071	1	WSH/STAR INT 1/8-M3 STL ZP
0327-1239	11700883	1	CAP 35MFD 440V O/C
	32301542	2	TIE, CABLE, NMCT2001B #CT200M
0327-1248	9400169	4	CAP,CORNER,DEP.5000VA,ALT,F86
	36400661	2	SCREW S/TAP 8GX3/4 PHIL/HD Z
	36200072	2	WSH/STAR INT 5/32-M4 STL Z
	28000190		STATOR
	2111514	167	LAM STAT P/P 1=0.092KG
	34000117	3.12	INSUL PYLM 22MM 5-10-5
	34000111	0.912	INSUL PYLM 133MM 5-5-5
	40000015	4.54	WIRE ENAML 1.12MM PE1 2
	34700331	0.32	VARN ISONEL 1400
	34300021	5.1	TAPE VIDA SHRINK 16*.125MM
	34300207	0.103	TAPE FOAM DBL SCOTCH 4016
	8500187	2.06	CONN DRAGON TOOTH T&B 22L007P
	8500188	2.06	CONN DRAGONTOOTH T&B 22L006 P
	8500134	1	RECPTL QC H2594A P/
	34400071	0.071	INSUL SLVE 10MM BLACK PVC
	34400096	0.51	INSUL SLVE 6MM 942 PYGS
	34400090	0.51	INSUL SLVE PYGS 942 IMM
	23460512	1	LBL "TESTED O.K "
	34300028	1.6	MT TAPE INSUL 48MM PE590

# Parts

## 5GRBA 378A - US GENSET

Onan #	Dunlite #	QTY	Description
0327-1223	21002052	1	CONTROL PANEL ASSY 4.8KW1
	30100062	1	ENG HONDA GX340K1 VW12
	73000018	1	ALT XPT F89 5000VA BARE KIT
0327-1240	19100771	1	FRAME BOTTOM M/S U.S.
0327-1241	19100770	1	FRAME ROLL OVER U.S.
0327-1224	25100163	1	EARTH LINK
	9301495	1	COVER FOR GOVERNOR U.S.
	10400276	3	MNT RUBR M505-520520 MACKAY
	36400310	4	SCREW SET HEX M10 X 16 STL ZP
	36200068	4	WSH/SP M10 X 1/8 X 3/32 STL ZP
	36200134	12	WSH/FL M10 X 21 STL ZP
	36000302	1	BOLT HEX M8 X 25 STL ZP G4.6
	36200133	2	WSH/FL M8 X 17 STL ZP
	36100265	1	NUT M8 STL ZP NYLOC
	36481571	14	SCREW WAFER HD TEK 10-24X16
	23460512	1	*LBL **TESTED O.K ***
	9401106	1	COVER ALT P/P BLACK
0327-1225	31000419	1	HAND BOOK U.S.
	31020420	1	WARRANTY CARD U.S.
	35300332	1	CARTON U.S.
	23020763	1	LBL PORTABLES DATA BLANK
	36481792	2	SCRW S/TAP 6G X 3/4 PAN ZP
0327-1226	22210547	1	FUEL TANK U.S.
	9411404	1	COVER ELECTRICS
	38401522	1	HOSE FUEL 4.8MM ID DAYCO MPT
	38500099	1	CLAMP HOSE UTILUX H538 11-17MM
0098-6074-02		1	LABEL-GENERAL WARNING
0098-6190		1	LABEL-EXHAUST GAS
0098-6192		1	LABEL-HAZARDOUS VOLTAGE
CONTROL PANEL U.S 4.8KW			
0327-1106	32354968	1	POWER OUTLET NEMA L14-20R U.S
0327-1107	32354966	2	POWER OUTLET NEMA L5-30R U.S.
0327-1048	32354967	1	POWER OUTLET DUPLEX GFI 15A
	32302881	0.4	COND.FLEX.CLIPSAL 9020EH
	32312882	1	GLAND STRGHT CLIPSAL 279C20EH
	32311820	1	GLAND ANGLE CLIPSAL 279AC20
	32372476	1	BLANK MNT PLATE HPM770/1PL
	21002050	1	CONTROL PANEL U.S 4.8KW
	32100035	2	C/B 25A
0327-0972	32100033	1	C/B 15A
0327-0883			
	73000018	1	ALTERNATOR
0327-1242	9200122	1	DEP F89 AL CSTG
	36001236	1	*FASTENERS, DEP/ENG,3&5KVA P*P*
0327-1227	47000136	1	ROTOR WOUND 5B1F86 BODYLESS
0327-1228	13300027	1	*FAN PLSTC (MK 4), F89"
0327-1229	41000034	1	BORG 6204-2RS1/OE6
0327-1243	36001306	1	*BOLT HEX 5/16UNF X 6"" STL G5"
0327-1244	36200053	1	WSH/SP 5/16 X 1/8 X 1/16 Z
0327-1245	36200121	1	*WSH/FL 5/16"" ID X 5/8 X 18 STL"

FIGURE 8-13. PARTS FOR 5GRBA 378A-US

## 5GRBA 378A - US

Onan #	Dunlite #	QTY	Description
0327-1246	47000136	1	ROTOR
	1200046	1	SHAFT ALT F86/F89 5KVA
	1200084	1	SHAFT ALT F86/F89 5KVA
	2011515	126	LAM ROTOR P/N
	11500571	2	HOLDER DIODE
	36401078	2	SCRW S/TAP 8GX1/2 CSK CR STLZ
0327-1230	11000084	2	DIODE 1N5627
0327-1231	11100469	2	VARISTOR S20K 420
0327-1232	11101096	2	VARISTOR S20K 510 USE11100469
	40000012	1.99	WIRE ENAML 0.85MM PEI 2
	34700331	0.25	VARN ISONEL 1400
	34300021	2.06	TAPE VIDA SHRINK 16*.125MM
	34300020	0.309	TAPE INSUL 25MM PES10
	34000421	0.08	INSUL PYLM 200MM 3-5-3
	34211817	2	INSUL INSERT ROTOR END CAPPIN
	34212185	4	INSUL INSERT 25MM
	34212184	2	INSUL INSERT 8MM
	34300213	0.036	TAPE FOAM DBL SCOTCH 4008
	23460512	1	*LBL **TESTED O.K ***
0327-1233	28000186	1	STAT WND 5BIF89 XPT NIL B/CH
0327-1247	9200121	1	*NDEP. MCHND CSTG,USE42200313
0327-1234	41300064	1	BRG RTNR 6204 08100470.
	36001216	4	BOLT HEX M8 X 150 STL G4.6 ZP
	36200067	4	WSH/SP M8 X 1/8 X 1/16 STL Z
	36100236	4	NUT HEX M8 STL ZP
	21020441	1	DASHBOARD POLYPROP F89
	36200071	2	WSH/STAR INT 1/8-M3 STL ZP
	8500179	2	LUG PREINS H2278 P/N
	36400885	2	SCRW S/TAP 8G X1/2 PAN PHHD Z
	36200071	1	WSH/STAR INT 1/8-M3 STL ZP
0327-1235	11700560	1	CAP 25MFD 440V O/C
	32301542	2	*TIE, CABLE, NMCT2001B #CT200M
0327-1248	9400169	4	*CAP,CORNER,DEP.5000VA,ALT,F86"
	36400661	2	SCREW S/TAP 8GX3/4 PHIL/HD Z
	36200072	2	WSH/STAR INT 5/32-M4 STL Z
	28000186		STATOR
	2111514	126	LAM STAT P/P I=0.092 KG
	34000117	2.4	INSUL PYLM 22MM 5-10-5
	34000110	1.009	INSUL PYLM 106MM 5-5-5
	40000012	2.219	WIRE ENAML 0.85MM PEI 2
	40000014	0.915	WIRE ENAML 1.00MM PEI 2
	34700331	0.25	VARN ISONEL 1400
	34300021	6	TAPE VIDA SHRINK 16*.125MM
	8500187	3	CONN DRAGON TOOTH T&B 22L007P
	8500188	3	CONN DRAGONTOOTH T&B 22L006 P
	8500134	2	RECPTL OC H2594A P/
	34400071	0.071	INSUL SLVE 10MM BLACK PVC
	34400096	0.51	INSUL SLVE 6MM 942 PYGS
	8500179	2	LUG PREINS H2278
	23460512	1	*LBL **TESTED O.K ***
	34300028	1.6	TAPE INSUL 48MM

