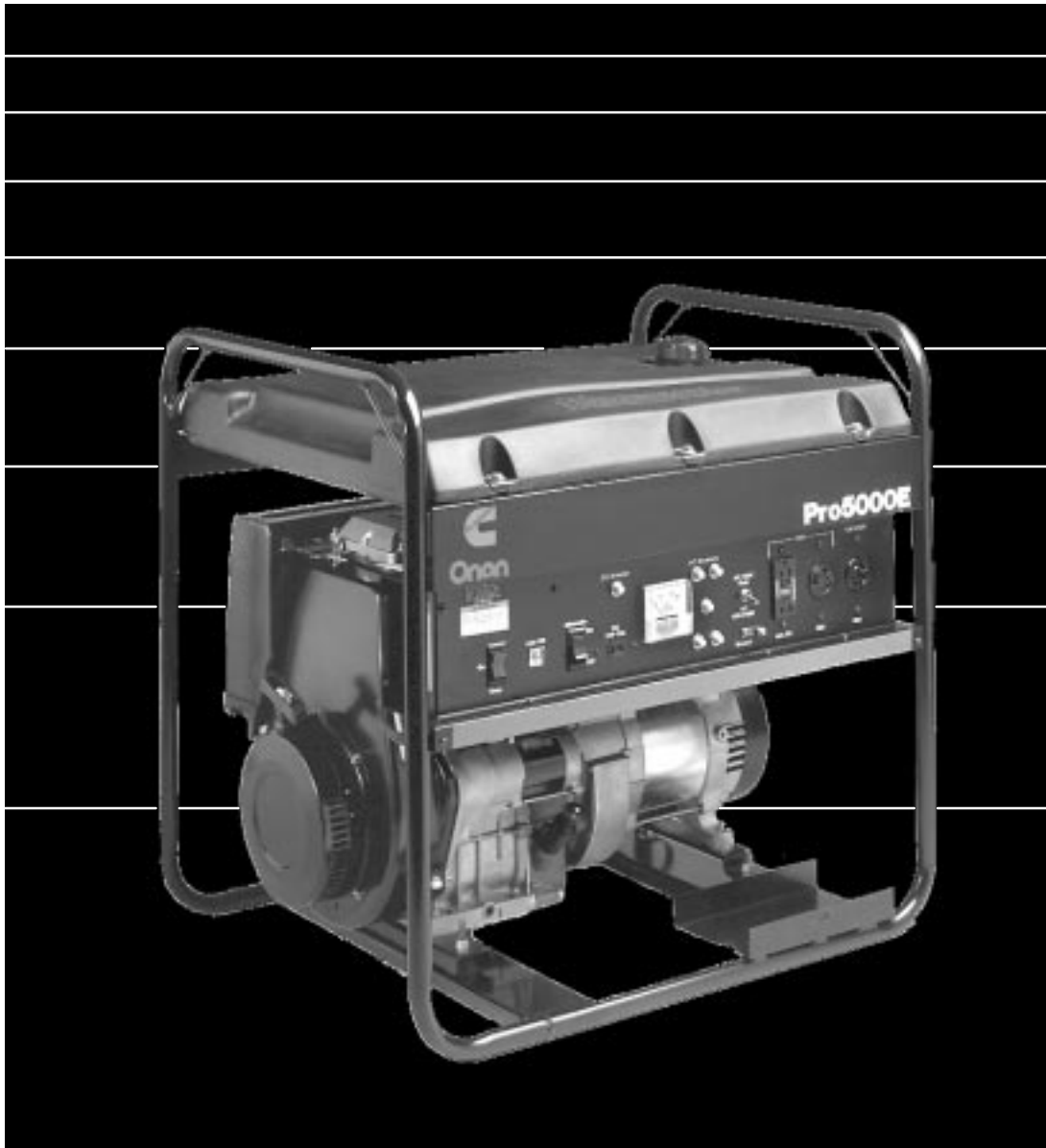




# Operator's Manual

## Models

**EGHAM, EGHEM, EGHAA, EGHAB, EGHEB  
Portable Generator Sets (Pro Series)**



# 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 efficient 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.
- DO NOT store or transport the generator set without first removing the fuel from the fuel tank.
- 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 the generator set in any type of enclosure that could allow exhaust gases to accumulate. Direct exhaust gas away from areas where people are gathered and away from buildings or enclosures.

## 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.
- Keep hands away from moving parts.
- 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.

- Make sure that fasteners on the generator set are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- If adjustments must be made while the generator set is running, use extreme caution around hot manifolds and moving parts, etc.

## 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 or changing engine oil, take care not to ingest, breathe the fumes, or contact used oil.
- 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.
- 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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**⚠️ WARNING** *Improper service or replacement of parts can result in severe personal injury and equipment damage. Service personnel must be qualified to perform electrical and/or mechanical service.*

**⚠️ WARNING: ⚠️**  
The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

# Introduction

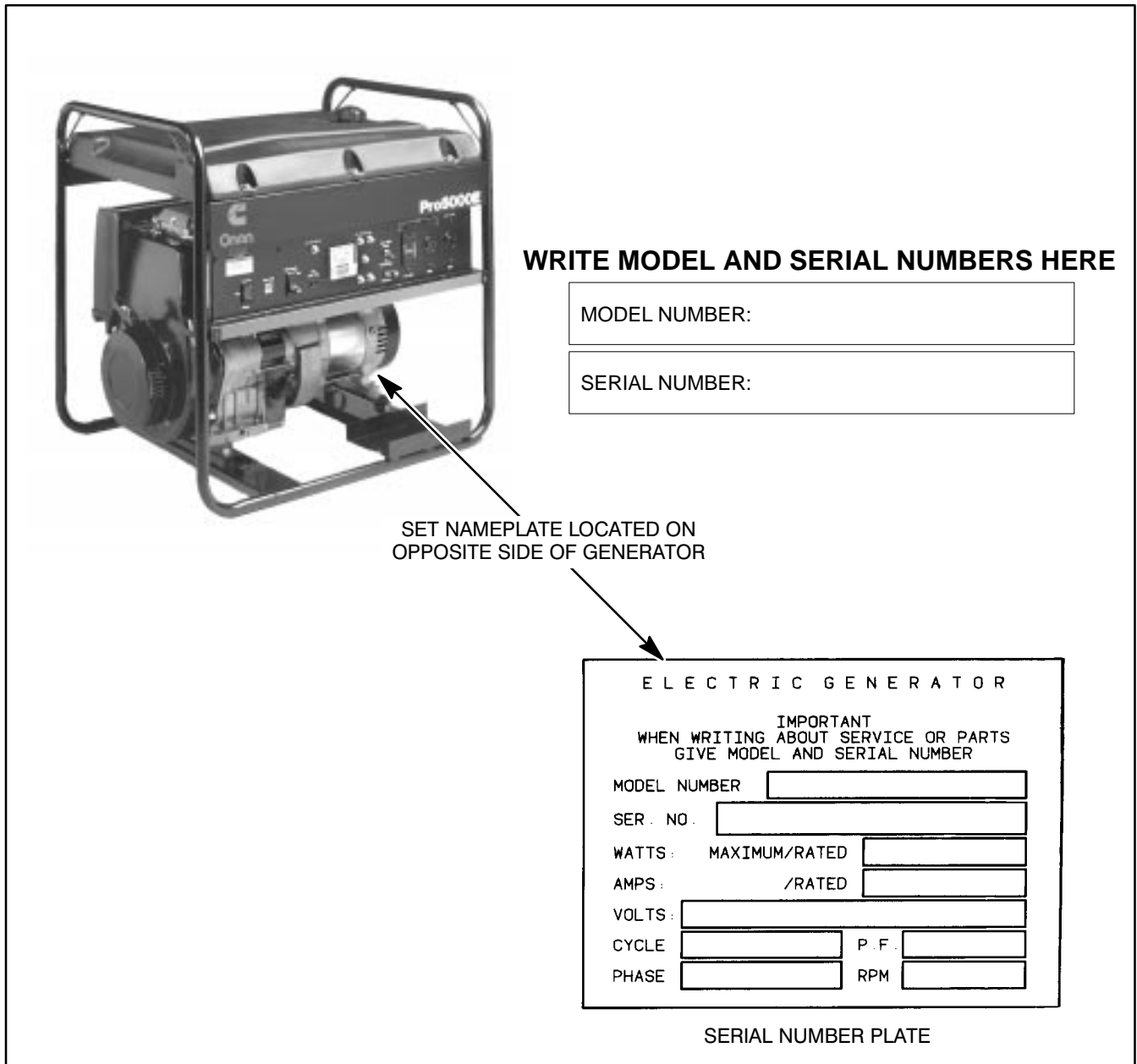
This manual describes the Onan Pro series portable generator sets. Study this manual and comply with all warnings and cautions. Using and maintaining the set correctly will result in longer set life, better performance, and safer operation.

The Onan warranty form (generator and control only) comes with the set manual. A service manual

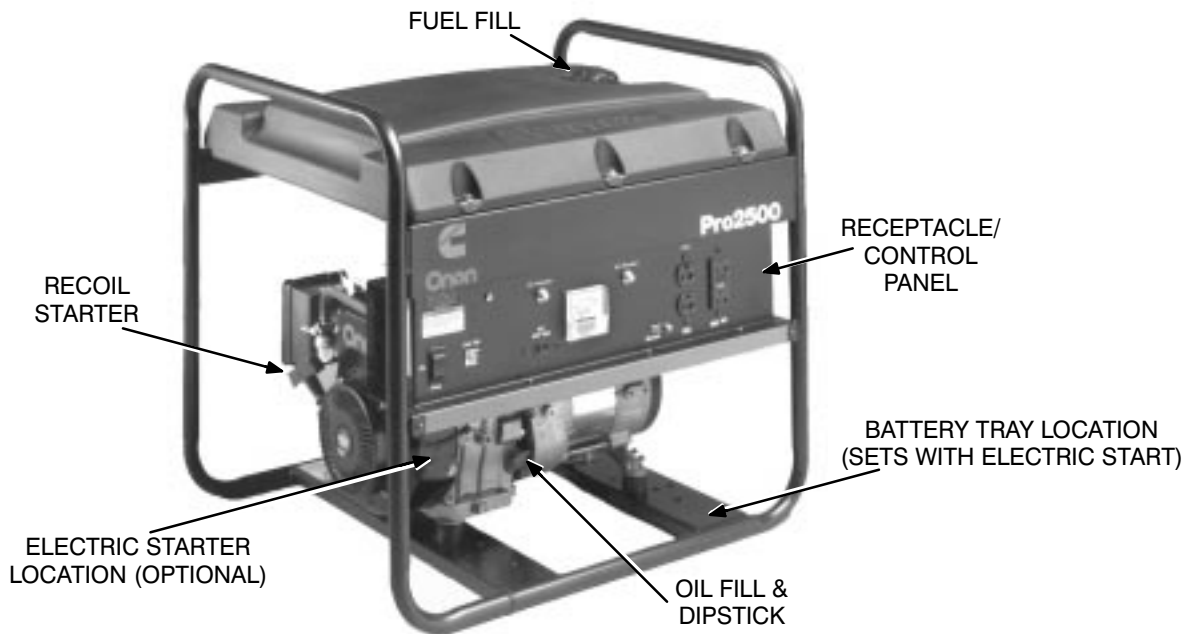
may be ordered through an Onan dealer or distributor.

## MODEL IDENTIFICATION

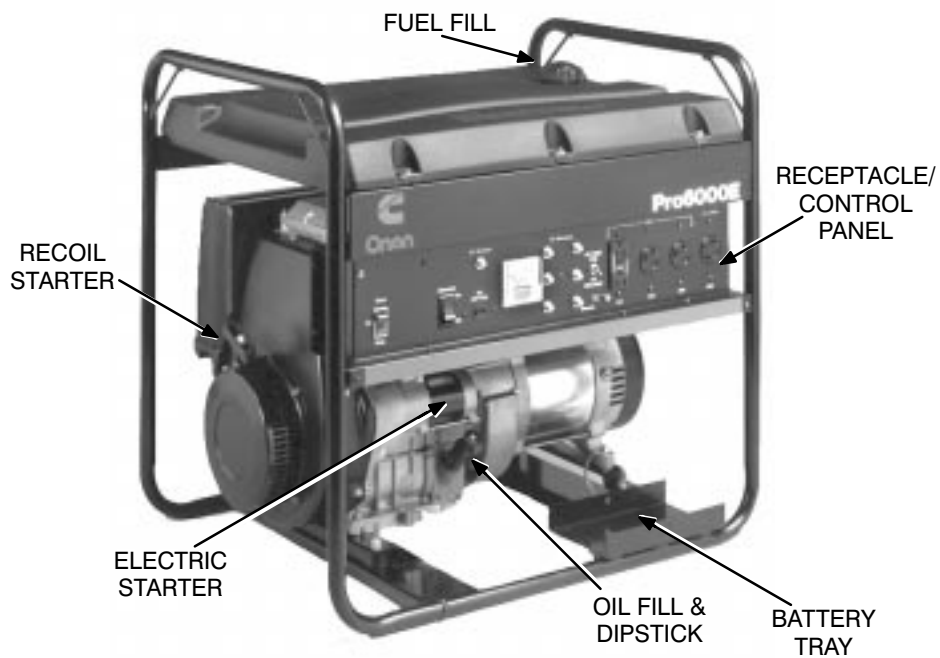
When contacting an Onan® dealer for parts or service, provide the model and serial numbers from the genset nameplate (Figure 1). Write the model and serial numbers in the boxes provided in Figure 1 to make them easy to find.



**FIGURE 1. GENSET IDENTIFICATION**



**2.0 KW, 2.5 KW, 3.5 KW, 4.0 KW GENERATOR SETS**



**5.0 KW, 6.0 KW GENERATOR SETS**

**FIGURE 2. COMPONENT LOCATIONS**

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## FUEL RECOMMENDATIONS

Use clean, fresh unleaded gasoline with an octane rating (anti-knock index) of 87 or higher.

During some times of the year only mandated “oxygenated” gasolines may be available; these are acceptable for use, but not preferable. Using leaded gasoline will result in the extra maintenance required for removing combustion chamber and spark plug deposits. Do not use gasoline or gasoline additives (de-icers) containing methanol, which can be corrosive to fuel system components.

**⚠ CAUTION** *Do not use gasoline or gasoline additives containing methanol because methanol can be corrosive to fuel system components.*

*Avoid using highly leaded gasolines and lead additives because of the extra engine maintenance that will be required.*

**⚠ WARNING** *Gasoline is highly flammable and can cause severe personal injury or death. Do not smoke if you smell gasoline or are near fuel tanks or gasoline-burning equipment or are in an area sharing ventilation with such equipment. Keep flames, sparks, pilot lights, electrical arcs and arc-producing equipment and all other sources of ignition well away.*

## ENGINE OIL RECOMMENDATIONS

Use premium quality motor oil. Look for the API (American Petroleum Institute) classification and use Class SG or SH oil (also SG/CD, SG/CE, SH/CD or SH/CE). Also look for the SAE (Society of Automotive Engineers) viscosity grade. See the Oil Change description for the viscosity grade appropriate for the temperatures expected.

Single-grade SAE 30 oil is better when temperatures are consistently above freezing. Multigrade oils are better when wide temperature variations are expected.

## STARTING BATTERIES

A set with an electric starter requires a 12 volt starting battery. Prompt starting requires sufficient battery capacity and battery cable size. Neither cranking performance nor starter service life will be adequate with an undersized battery.

See *Maintenance* and any instructions available from the battery manufacturer for battery maintenance. Note that as long as the set is run regularly, the automatic battery recharging system on the engine should maintain battery charge. See OUT-OF-SERVICE PROTECTION under *Starting and Running the Set* regarding battery care during storage for prolonged periods.

## EXHAUST SYSTEM

EXHAUST GAS IS DEADLY! Generator sets must never be operated inside buildings or other enclosed spaces without ample fresh air ventilation.

Gensets used inside buildings or other enclosed spaces must be equipped with a leak-free exhaust system that carries all exhaust gases to the outside, well away from all windows, doors, vents and other openings into the building or enclosure.

It is the responsibility of the equipment operator(s) to check for exhaust leaks on a daily basis and to have all leaks repaired before continuing to operate the equipment.

# Starting and Running the Set

## **⚠WARNING** EXHAUST GAS IS DEADLY!

Exhaust gases contain carbon monoxide, an odorless and colorless gas. Carbon monoxide is poisonous and can cause unconsciousness and death. Symptoms of carbon monoxide poisoning include:

- Dizziness
- Nausea
- Headache
- Weakness and Sleepiness
- Throbbing in Temples
- Muscular Twitching
- Vomiting
- Inability to Think Coherently

**IF YOU OR ANYONE ELSE EXPERIENCE ANY OF THESE SYMPTOMS, GET OUT INTO THE FRESH AIR IMMEDIATELY. If symptoms persist, seek medical attention. Shut down the engine and do not operate it until it has been inspected and repaired.**

**Make certain the exhaust system is properly installed. Inspect it every time the engine is started and after every eight hours of continuous operation.**

## PRE-START CHECKS

Before the first start of the day and after every eight hours of operation perform the maintenance listed in Table 2 (Periodic Maintenance Schedule) of this manual. Keep a log of maintenance and the hours run, and perform any maintenance that may be due. If the set has been in storage, return the engine to service as instructed in *Returning The Genset To Operation* under OUT-OF-SERVICE PROTECTION in this section.

**⚠WARNING** *Moving parts can cause severe personal injury or death. Hot exhaust parts can cause severe burns. Stay clear of hot or moving parts. Make sure all protective shields and guards are secure in place before starting up the equipment.*

## CONTROL PANEL

Figure 3 illustrates one of the control panels. Different sets use different receptacle panels: see Figure 4 for illustration of a control panel on a 50 Hz set.

### Components

**On/Stop Switch (Recoil-only Start Models):** Allows the engine to be started and run when the switch is in the On position. Stops the engine when held in the Stop position.

**Start/On/Stop Switch (Electric Start Models):** Pushing switch into the Start position begins engine

cranking. When engine starts, release the switch and it will return to the On position. To stop the engine, hold the switch in the Stop position until the engine stops running.

**NOTE: The engine can be recoil started when the switch is in the On position.**

**Low Oil Light (4.0 kW and below):** Indicates low engine oil level. Low Oil Light will flash during cranking or will flash during operation and the generator set will stop if the engine oil level is below the low working level.

**Voltmeter:** Shows generator AC output voltage.

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

**Full Power Switch:** Allows operator to select full power operation from the 120 VAC receptacles or shared power between the 120 VAC and 240 VAC receptacles. Switch setting also affects voltmeter readings; refer to voltmeter description.

**Idlematic Switch (3.5 kW and above):** Automatic engine speed control. In the On position, the engine operates at idle speed until a load is applied. The Idlematic automatically increases the engine to full speed when a load is applied. This feature reduces engine wear and conserves energy. In the Off position the engine operates at full speed.

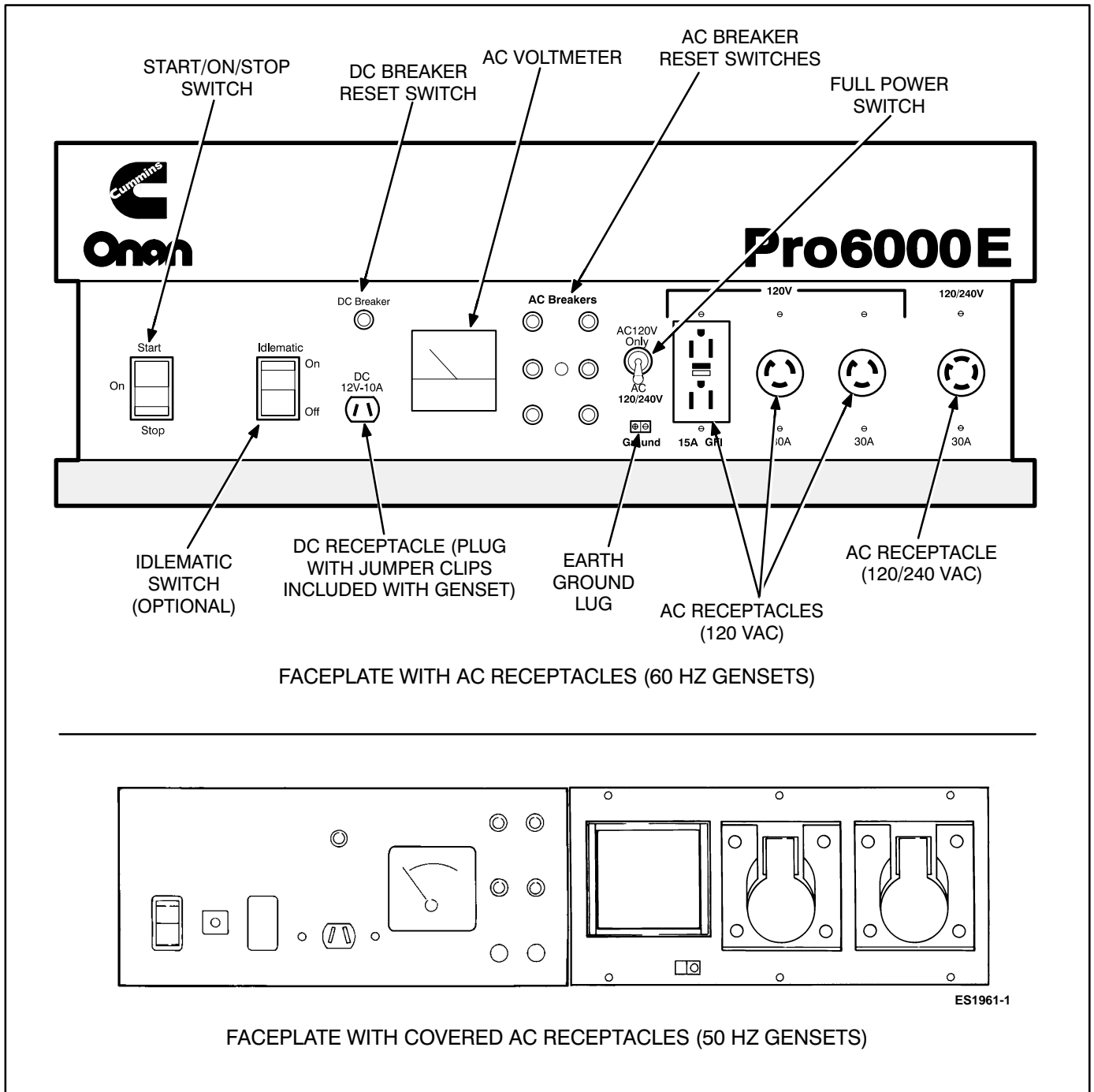
**Earth Ground Lug Terminal:** Allows the generator set to be grounded to earth ground.

**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 gener-

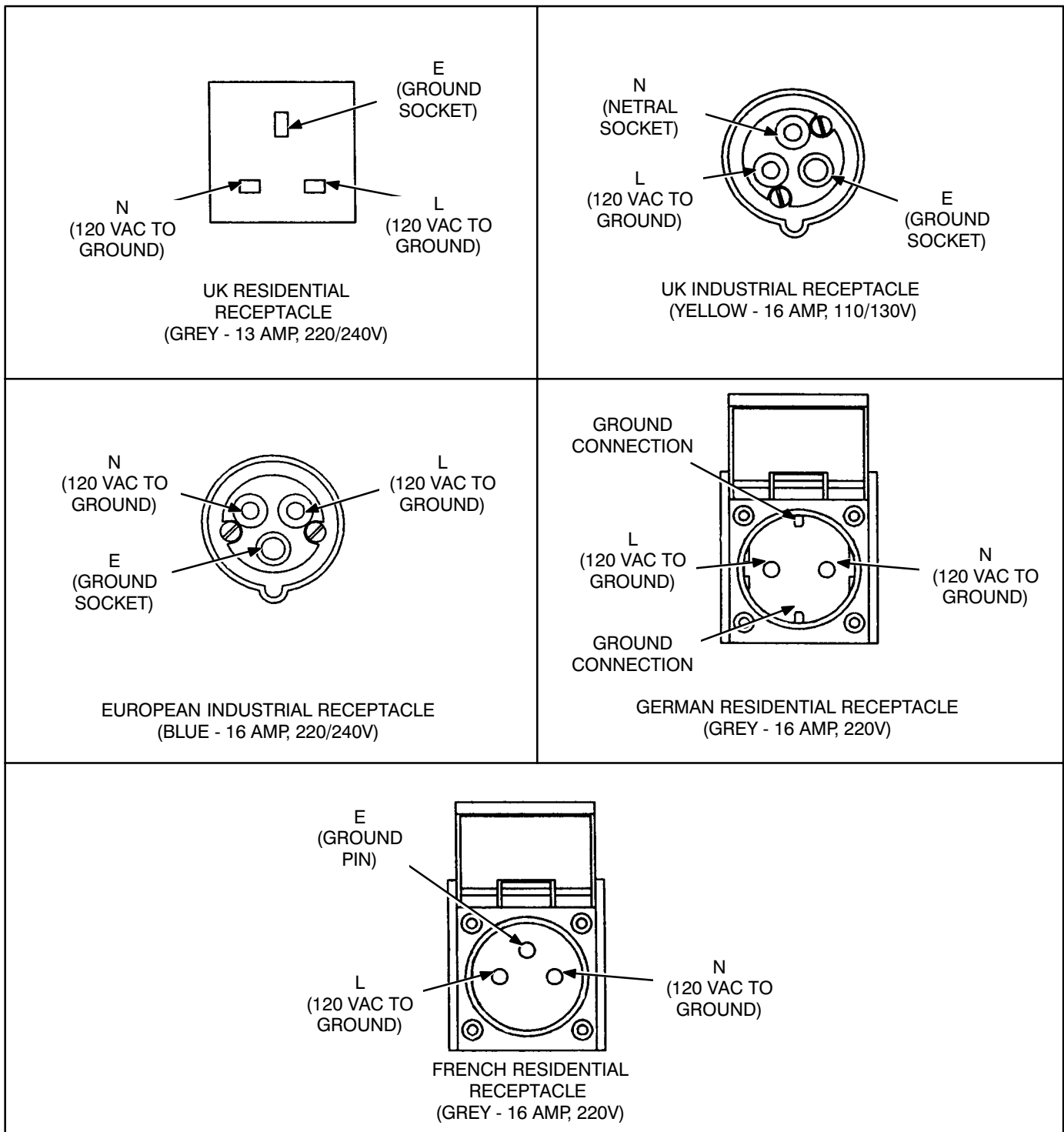
ator set is not in use. See Figure 5.

**Choke Lever:** Restricts air flow to the carburetor for starting a cold engine. See Figure 6 or Figure 7.



**FIGURE 3. CONTROL PANEL**





**FIGURE 4. RECEPTACLE VARIATIONS, 50 HZ GENERATOR SETS**

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## STARTING PROCEDURE

After checking the generator set as described in the Pre-Start Checks and disconnecting all loads from the generator set, follow each of the steps in sequence.

**⚠WARNING** *Inhalation of exhaust gas can result in severe personal injury or death. Do not operate the generator set in poorly ventilated areas such as indoors, inside tanks, confined areas, depressions, or any area where exhaust gases might accumulate. Locate the exhaust outlet so that exhaust gases will not accumulate during operation.*

**⚠WARNING** *Due to the danger of severe personal injury or death, do not operate the generator set in hazardous areas where it might ignite gases, combustibles, or explosive materials.*

**⚠WARNING** *Generator sets present the hazard of electrical shock that can result in severe personal injury or death. Never expose the generator set to rain, snow, or similar wet conditions when operating.*

**⚠WARNING** *The muffler becomes very hot during and after generator set operation and can cause severe burns. Do not touch hot muffler.*

**⚠CAUTION** *The voltage surge at start-up can damage appliances (TV sets, microwave ovens, computers, etc.). Always disconnect all loads before starting the generator set.*

### Electric Start Models

1. Open the fuel valve (Figure 5). (4.0 kW sets and below: Be sure that the speed control lever is in the high speed ("H" position [Figure 6]).
2. Set the choke lever to the CLOSE position (Figure 6 or Figure 7). If engine is warm from previous operation, do not close the choke.
3. On models equipped with Idlematic switch (3.5 kW and above), position the switch to the OFF position before starting. Let the engine warm

up for three to five minutes before switching the Idlematic switch to ON (if desired).

4. Start the engine by pressing the Start/On/Stop switch to the START position. Release switch when engine starts and it will return to the On position. Gradually open the choke lever as the engine warms up. Let the engine warm up for three to five minutes before applying load. The voltmeter on the control panel will indicate generator output voltage.

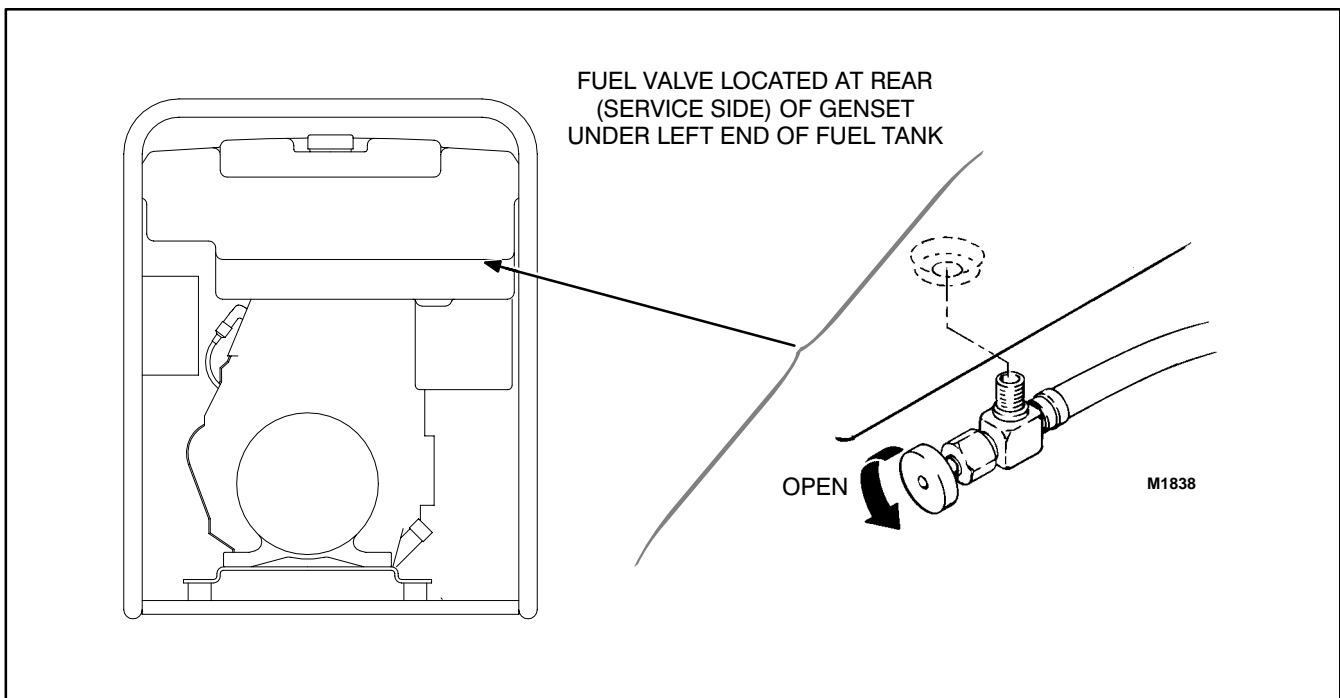
**If the oil watch lamp (on models so equipped) flashes during cranking or running, or if the engine starts and shuts off, stop the engine and check the oil level. Add oil as recommended in the Maintenance section.**

5. Proceed to *Adding Loads* in this section.

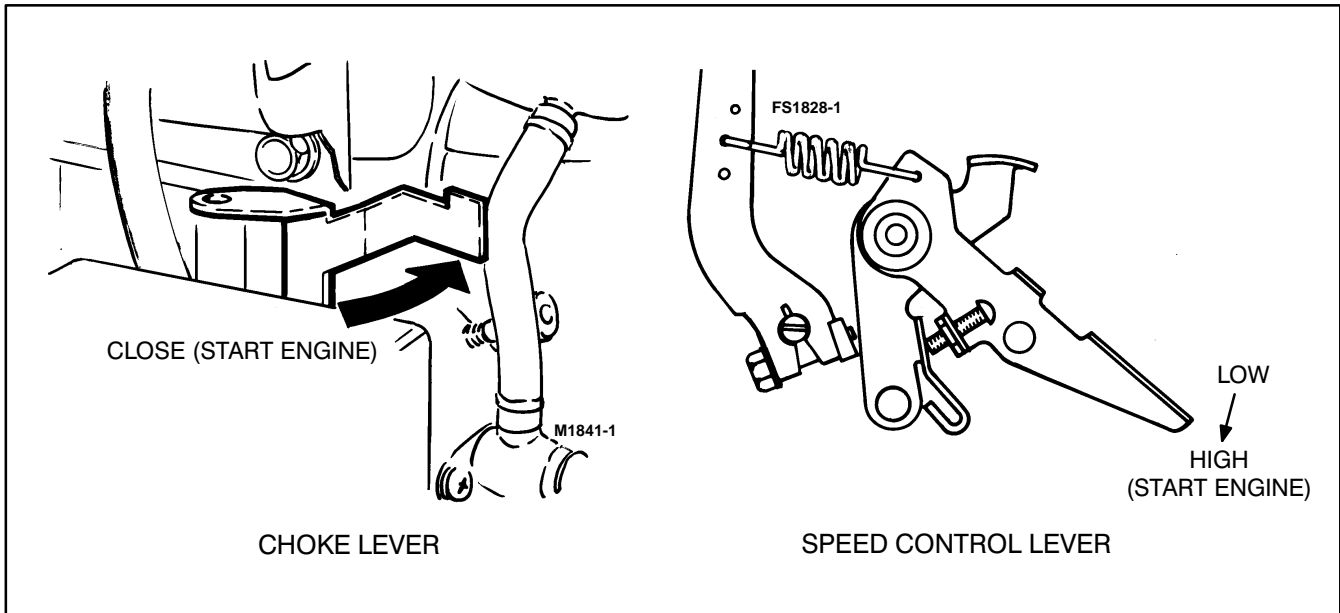
### Manual Start Models

1. Open the fuel valve: see Figure 5. (4.0 kW sets and below: Check to be sure that the speed control lever is in the high speed ("H") position [Figure 6]).
2. Set the choke lever to the CLOSE position (Figure 6 or Figure 7). If the engine is warm from previous operation, do not close the choke.
3. On models equipped with Idlematic switch (3.5 kW and above), position the switch to the OFF position before starting. Let the engine warm up for three to five minutes before switching the Idlematic switch to ON (if desired).
4. Move the engine switch to the On position.
5. With one hand on the generator set to steady it, grip the recoil handle and pull out smoothly and quickly. Repeat as necessary. When the engine starts, gradually open the choke lever as the engine warms up. Allow the engine to warm up for three to five minutes before applying a load.

**If the oil watch lamp (on models so equipped) flashes during cranking or running, or if the engine starts and shuts off, stop the engine and check the oil level. Add oil as recommended in the Maintenance section.**



**FIGURE 5. FUEL VALVE (ALL GENSETS)**



**FIGURE 6. SPEED CONTROL AND CHOKE OPERATION,  
GENSETS 4.0 KW AND BELOW**

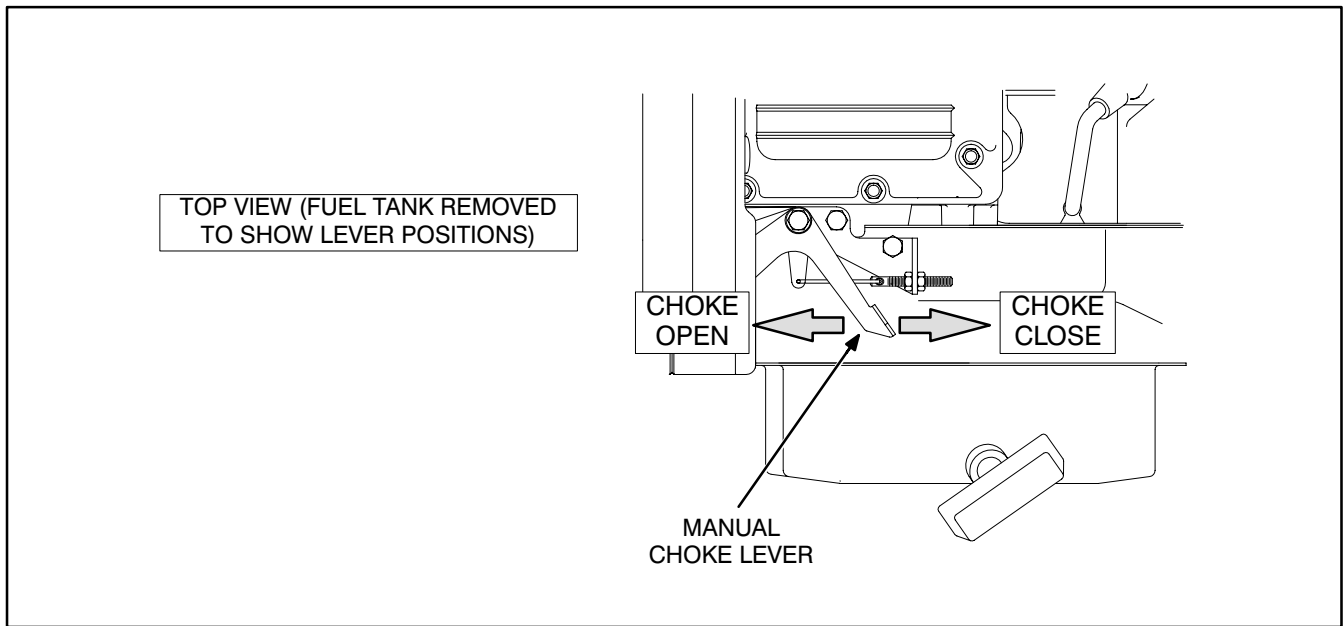


FIGURE 7. CHOKE OPERATION, 5.0 KW AND 6.0 KW GENSETS

## ADDING LOADS

**CAUTION** *Continuous overloading can cause high operating temperatures that could damage the generator set. Keep the load within the nameplate rating.*

### Adding AC Loads

1. Note the rated output of the generator set (from the generator set nameplate or the *Specifications* section).
2. Check the load rating of each load. Table 1 lists typical wattages for common appliances and tools.
3. Add the wattages of the loads and make sure that the total wattage is not more than the gen-set rated output. Note the following example.

**Example:** The 3.5 kW models have a maximum power output of 3500 watts and a rated output of 3000 watts. A 1500 watt heater, 900 watt circular saw, 500 watt drill and a 100 watt light could all be operated at the same time. To operate a second saw rated at 900 watts, it

would be necessary to disconnect the 1500 watt heater.

If a motor load and another load have a combined wattage close to the rated output of the generator set, **start the motor load first** and let it run at normal speed before connecting the other load. Motor loads consume much more power during start up than they do when they are running (some motors draw up to three times their running load).

4. Connect the AC loads to the receptacle(s) on the control panel. Make sure the cord and plug connector have ground terminals.

**WARNING** *Electrical shock can cause severe personal injury or death. Cord and plug equipment must have a ground terminal to provide additional protection.*

### High Altitudes

Maximum power decreases roughly four percent for each 1000 feet (310 m) above sea level, after the first 1000 feet. When operating the generator set at an altitude above 1000 feet, calculate the altitude derating to determine maximum AC load capacity.

**Models with Idlematic:** Move the Idlematic switch to ON to activate this feature; it controls engine speed so the set will operate at idle speed with no load and full speed when a load is connected.

Leave the Idlematic Switch OFF if there will be many small interrupted loads or loads under 0.8 amperes.

**TABLE 1. APPROXIMATE POWER USAGE OF COMMON APPLIANCES**

Appliance or Tool	Approximate Running Wattage
Battery Charger	Up to 800
Bench Grinder (8 in.)	1400
Circular Saw (7-1/4 in.)	900
Coffee Maker	850
Drill (3/8 in.)	400
Electric Water Pump	550
Electric Broom	200-500
Electric Drill	250-750
Electric Stove (Per Element)	350-1000
Electric Water Heater	1000-1500
Portable Heater	1500
Refrigerator	600-1000
Space Heater	1000-1500
Sump Pump	350
Television	200-600
Trimmer (12-in. heavy duty)	500

See text for starting watts of motor loads.

### Adding DC Loads

Connect the DC loads to the DC receptacle on the control panel. Make sure that polarities are correct when attaching positive (+) and negative (-) leads. Refer to the Specification section for maximum DC output current at 12 volts.

**NOTE: The Idlematic switch must be off when only DC loads are connected.**

**NOTE: Do not leave DC load connected to the DC receptacle with the generator set not operating.**

**⚠WARNING** Batteries emit a highly explosive gas that can be ignited by electrical arcing, smoking, or other ignition source. When charging batteries, connect cables to the battery before connecting cables to the generator set. This will reduce the risk of arcing at the battery that could cause an explosion. When battery charging is complete, remove the cable at the generator set before removing cables from the battery. Always remove the negative (-) cable before the positive (+) cable, and replace it after the positive cable.

Do not connect AC loads while using DC power on 2.0 kW model.

### CIRCUIT BREAKERS

If an AC or DC circuit breaker opens, check to see if the generator set is overloaded. If so, remove some of the load from the generator set. Reset the circuit breaker by pushing in the indicator (reset after waiting a minimum of 10 seconds after tripping).

### GROUNDING

#### Receptacles

Generator set receptacles are internally grounded to the generator set frame.

#### Earth Ground Lug Terminal

Ground the generator set to earth ground by connecting a suitable ground wire to the earth ground lug terminal on the generator set control panel, then connect the other end of the wire to a suitable earth ground according to local electrical codes and conditions.

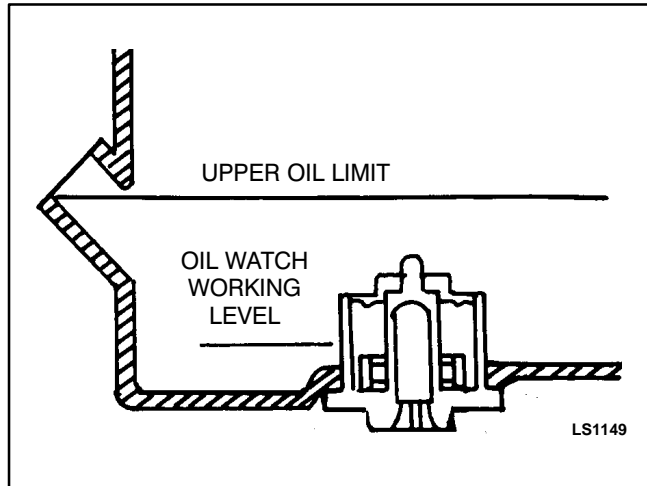
Do not connect grounds from appliance loads to the Earth Ground Lug terminal. Earth Ground Lug Terminal is for connecting the generator set to earth ground only.

### LOW OIL SHUTDOWN SYSTEMS

#### (4.0 kW and below)

The Oil Watch light flashes during cranking if the oil level is low. It also flashes and stops the generator set if the set is running and the oil level reaches the

low working level of the Oil Watch. See Figure 8. Add oil as recommended in the *Maintenance* section before attempting to restart.



**FIGURE 8. TYPICAL OIL WATCH (GENSETS 4.0 kW AND BELOW)**

### **(5.0 kW and above)**

These gensets are equipped with pressure-lubricated engines that will automatically stop if low oil pressure is sensed. A short time delay allows the engine to be started after an oil change. If the engine stops during running, or starts but then stops, check the oil level and add oil if needed, as described in the Maintenance section of this manual.

### **STOPPING**

1. Remove all loads from the generator set.
2. Let the generator set run for three to five minutes to allow the engine to cool down.
3. Close the fuel valve.

**⚠️WARNING** *Gasoline presents the hazard of fire or explosion that can result in severe personal injury or death. Always close the fuel valve when the engine is not in use to reduce the risk of fuel leakage.*

4. Stop the generator set by pressing and holding the Start/On/Stop or On/Stop switch in the OFF position, until the generator set comes to a complete stop.

## **OPERATING RECOMMENDATIONS**

### **High/Low Operating Temperatures**

#### **High Operating Temperatures:**

1. See that nothing obstructs the airflow to and from the generator set.
2. Keep the engine cooling fins clean. Air housings should be properly installed and maintained.
3. Use the proper viscosity oil as recommended in the oil change description.

#### **Low Operating Temperatures:**

1. Use fresh gasoline and keep the tank filled to avoid condensation.
2. Keep the spark plug clean and correctly gapped.
3. Use the proper viscosity oil as recommended in the oil change description.

### **Extremely Dusty or Dirty Conditions**

Observe the following procedures when operating the generator set in extremely dusty or dirty conditions.

1. Keep the generator set clean and do not allow dust and dirt to accumulate.
2. Clean the air cleaner more often than shown in the maintenance schedule.
3. Keep oil and gas in dust-tight containers suitable for storage of fuels.

### **Generator Set Exercise**

Infrequent operation of the generator set can result in moisture condensation in the engine and difficult starting. Moisture accumulates because the engine does not run often enough to reach normal operating temperature. This moisture can cause damage to the engine.

To prevent moisture damage, run the generator set at 50 percent capacity electrical load (see *Specifications* section) two hours every four weeks. A long exercise period is more effective than several short periods.

### **ENGINE BREAK-IN**

Correct engine break-in provides the ideal fitting of all internal moving metal parts, which is essential for top engine performance. For controlled engine break-in:

1. Operate the equipment as it is intended to be operated. However, for the first 1-1/2 hours, if possible, operate the equipment at half the available engine power, occasionally operating at full power for brief periods. Avoid prolonged low-speed, low-power operation during break-in.
2. Proper engine oil is especially critical during break-in because of the higher engine temperatures that can be expected. See RECOMMENDED ENGINE OIL in *Introduction*. Change the oil if it is not right for the temperatures during the break-in period. See Table 3.
3. Check the oil level twice a day or after every 4 hours of operation during the first 24 hours of operation.
4. Change the oil and oil filter (5.0 kW, 6.0 kW gensets) after the first 24 hours of operation and have the valves readjusted by a qualified technician.

## OUT-OF-SERVICE PROTECTION

If you are unable to exercise the generator set regularly, and the set will not be in use for more than 120 days, the following procedure is recommended. Failure to provide out-of-service protection can result in difficult starting, rough engine operation and reduced engine life.

### Preparing Generator Set For Storage

1. Add a fuel preservative and stabilizer, such as OnaFresh, to the fuel supply. Follow manufacturer's instructions for using the fuel additive. Run the generator at 50 percent load (see *Specifications* section) for 30 minutes.

**⚠WARNING** *Fuel additives can cause a risk of personal injury. Read and follow manufacturer's instructions.*

2. Disconnect the load. Turn the fuel supply valve off and remove the air filter. As the generator set runs out of fuel, squirt fogger, such as OnaGard™, into the carburetor intake, then reassemble the air filter.

OnaGard is a trademarks of Onan Corporation.

3. When the generator set runs out of fuel and stops running, remove the spark plug. Squirt

one tablespoon (about 30 ml) of clean engine oil into the spark plug hole. Turn the engine over for several revolutions. Replace the spark plug. Pull the recoil starter handle out slowly until compression is felt.

4. Drain the oil base while still warm. Refill the crankcase and attach a tag indicating viscosity of oil used.

**⚠WARNING** *Hot oil can cause severe burns if spilled or splashed on skin. Keep fingers and hands clear when removing oil drain plug, and wear protective clothing.*

5. **Electric start models only:** Disconnect the cables from the starting battery negative (-) cable first to reduce the risk of arcing. Store battery in a cool dry place and connect to a charger every 30 days to maintain full charge.

**⚠WARNING** *Battery electrolyte can cause severe eye damage and burns to the skin. Wear goggles, rubber gloves, and a protective apron when working with batteries.*

**⚠WARNING** *Batteries present the hazard of explosion, which can result in severe personal injury. Do not smoke or allow any spark, flame, pilot light, arc-producing equipment or other ignition sources around the battery area.*

6. Cover the generator set and store in a dry protected area.

### Returning the Generator Set to Operation

1. Perform an inspection of the generator set.
2. Check tag on set to verify that oil viscosity is still correct for existing ambient temperature.
3. **Electric start models only:** Clean and check battery. Measure specific gravity (1.260 at 80°F [27°C]) and verify level to be at split ring. If specific gravity is low, charge until correct value is obtained. If level is low add distilled water and charge until specific gravity is correct. DO NOT OVERCHARGE.

**⚠WARNING** *Battery electrolyte can cause severe eye damage and burns to the skin. Wear goggles, rubber gloves, and a protective apron when working with batteries.*

---

**⚠WARNING** *Batteries present the hazard of explosion, which can result in severe personal injury. Do not smoke or allow any spark, flame, pilot light, arc-producing equipment or other ignition sources around the battery area.*

4. Check the condition of the air filter and check the engine oil level.
5. Open the fuel supply valve.
6. Start the generator set. Initial start-up may be slow due to oil in the cylinder. Smoke and rough operation will occur until the oil in the cylinder is exhausted. If the engine does not start, check the spark plug.
7. Apply 50 percent load to the generator set until it runs smoothly. Run the generator set for an hour.
8. Remove the load and let the generator set run for three to five minutes to cool down. The generator set is now ready for operation.



# Maintenance

Periodic maintenance is essential for top performance. Use Table 2 as a guide. Under hot or dusty operating conditions some maintenance operations should be performed more frequently, as indicated by the footnotes in the table.

Keep a log of maintenance performed and the hours run. Recording maintenance will help you keep it regular and provide a basis for supporting warranty claims.

**⚠WARNING** *Accidental starting of the generator set during maintenance can cause severe personal injury or death. Before performing maintenance, disconnect the spark plug wire from the spark plug. Electric start models: disconnect both generator set starting battery cables. Remove the negative (-) cable first to reduce the risk of arcing.*

**⚠WARNING** *A hot generator set can cause severe burns. Always allow the generator set to cool before performing any maintenance or service.*

**TABLE 2. PERIODIC MAINTENANCE SCHEDULE**

SERVICE THESE ITEMS	SERVICE INTERVAL					
	8 HOURS	50 HOURS	EVERY MONTH	100 HOURS	200 HOURS	400 HOURS
General Inspection	x <sup>1</sup>					
Check Oil Level	x					
Change Engine Oil and Filter (if so equipped)				x <sup>2,3,4</sup>		
Clean Air Cleaner Foam Wrapper		x <sup>3</sup>				
Clean Cylinder Cooling Fins		x <sup>3</sup>				
Check Starting Battery (if equipped)			x <sup>5</sup>			
Clean Spark Plug				x		
Clean and Inspect Muffler				x		
Replace Fuel Filter					x <sup>6</sup>	
Inspect, Clean and Regap Spark Plug					x	
Replace Spark Plug						x <sup>6</sup>
Clean Carburetor and Fuel Tank						x <sup>6</sup>
Adjust Valve Lash Clearance					x <sup>2, 6</sup>	
Replace Air Cleaner Element					x <sup>3</sup>	

- 1 - Check for loose parts and for oil and fuel leaks. Check exhaust system audibly and visually with the generator set running. Repair any leaks immediately. Replace corroded exhaust and fuel line components before leaks occur.
- 2 - Perform after first 24 hours of operation on new sets.
- 3 - Perform more often in extremely dusty conditions.
- 4 - Perform more often when operating in hot conditions.
- 5 - See instructions for battery care provided by the equipment or battery manufacturer.
- 6 - Must be performed by a qualified mechanic (equipment or Onan dealer).

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## DAILY (8 HOUR) MAINTENANCE

The operator should check the following before the first start of the day and after every eight hours of operation:

1. Inspect fuel lines and fittings for leaks. Repair leaks immediately.
2. Look and listen for exhaust system leaks while the engine is running. Look for cracks and severe rusting in the muffler and tailpipe. Have all leaks repaired before continuing to operate the equipment.

**⚠ WARNING** *Hot exhaust parts can cause severe burns. Allow the engine time to cool before servicing the exhaust system.*

3. Check the engine for dirt and debris and clean the flywheel air inlet screen and cylinder cooling fins as necessary.

**⚠ CAUTION** *A clogged flywheel air inlet screen or dirty cooling fins can cause overheating and engine damage. Keep the cooling fins and air inlet screen clean.*

4. Check the engine oil level. The equipment must be parked on a level surface and the engine stopped. To get an accurate reading, wait a minute or so to allow the oil to settle in the crankcase if the engine has been running.

**⚠ WARNING** *Crankcase pressure can blow hot engine oil out the fill tube causing severe burns. Always stop the engine before removing the oil fill cap.*

**(Gensets 4.0 kW and below)** Remove the oil cap and observe the oil level. The oil level should appear at the top of the oil port.

**(Gensets 5.0 kW and above)** Pull the dipstick up to remove it from the fill tube. Wipe the dipstick clean, push it back into the oil fill tube until the cap seats and then withdraw it to check the oil level.

If the oil level is low, add API Class SG or SH oil (also SG/CD, SG/CE, SH/CD or SH/CE) having an SAE viscosity grade appropriate for the expected temperatures, as indicated by Table 3.

DO NOT FILL TO A LEVEL ABOVE THE FULL MARK ON THE DIPSTICK. Drain the excess oil if too much has been added.

**⚠ CAUTION** *Too much oil can cause high oil consumption, high operating temperatures and oil foaming. Too little oil can cause severe engine damage. Keep the oil level between the Full and Add marks on the dipstick.*

Reinstall the dipstick and cap after checking or adding oil, making sure the cap is properly seated. On engines with long oil fill tubes, secure the cap by pushing it down and turning it clockwise.

## OIL AND FILTER CHANGE

**NOTE:** Sets 4 kW and below do not use oil filters.

**⚠ WARNING** *State and federal agencies have determined that contact with used engine oil can cause cancer or reproductive toxicity. Do not contact or ingest. Use rubber gloves and wash exposed skin.*

See Table 2 for scheduled oil change and filter replacement. See Figures 9 and 10 for oil filter and oil drain locations.

1. Run the engine until it is warm. Stop the engine and disconnect the spark plug and, if so equipped, the battery (negative [-] cable). Make sure the set is level.

**⚠ WARNING** *Accidental starting of the engine can result in severe personal injury or death. Always disconnect the spark plug and the battery (negative [-] cable) before changing oil.*

2. Remove the oil fill cap.

**⚠ WARNING** *Crankcase pressure can blow hot engine oil out the fill opening causing severe burns. Always stop the genset before removing the oil fill cap.*

3. Place a pan under the oil drain opening and remove the oil drain plug. Reinstall the plug securely after the oil has drained completely.

**(Gensets 5.0 and above:)** Spin off the oil filter canister, drain the oil and discard the filter according to local regulations.

Thoroughly wipe off the filter mounting surface. Make sure the gasket is in place on the filter canister and apply a thin film of oil to the gasket.

Spin on the new filter canister by hand until the gasket just touches the mounting pad and then turn it an additional 1/2 to 3/4 turn. Do not overtighten.

4. Refill with API Class SG or SH oil (also SG/CD, SG/CE, SH/CD or SH/CE) having an SAE viscosity grade appropriate for the expected temperatures, as indicated by Table 3. See *Specifications* for the oil capacity.

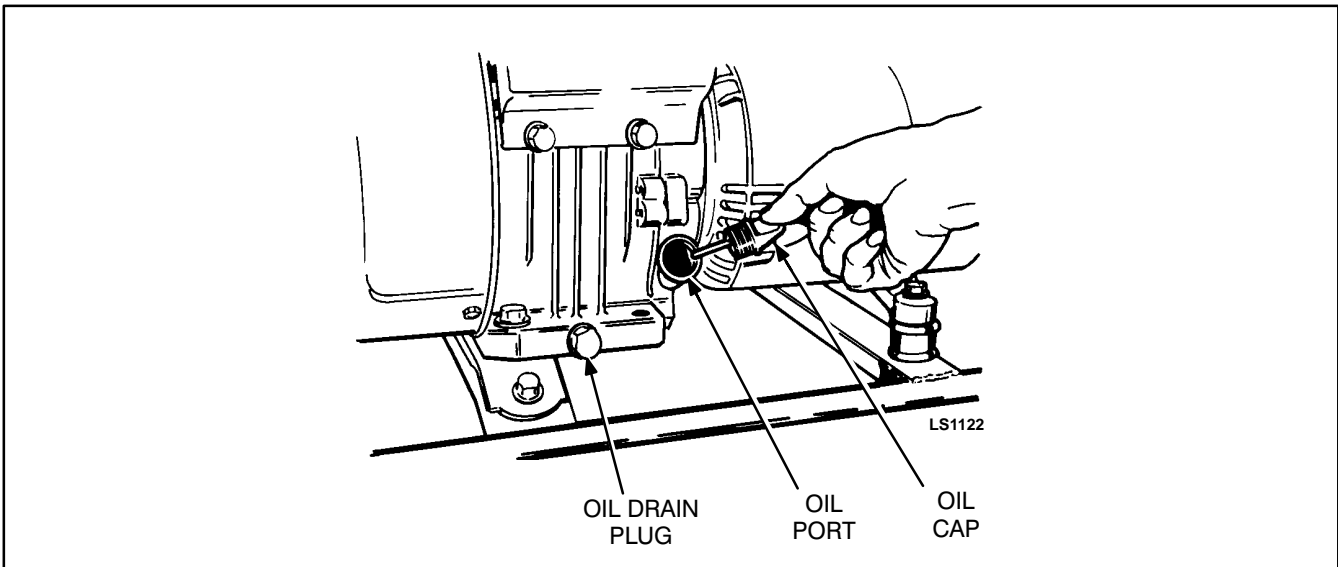
**TABLE 3. OIL VISCOSITY VS. TEMPERATURE**

EXPECTED AMBIENT TEMPERATURES	SAE VISCOSITY GRADE
32° F (0° C) and higher	30
10° F to 100° F (-12° C to 38° C)	15W-40 (OnaMax)
0° F to 80° F (-18° C to 27° C)	10W-30 10W-40
-20° F to 50° F (-28° C to 10° C)	5W-30

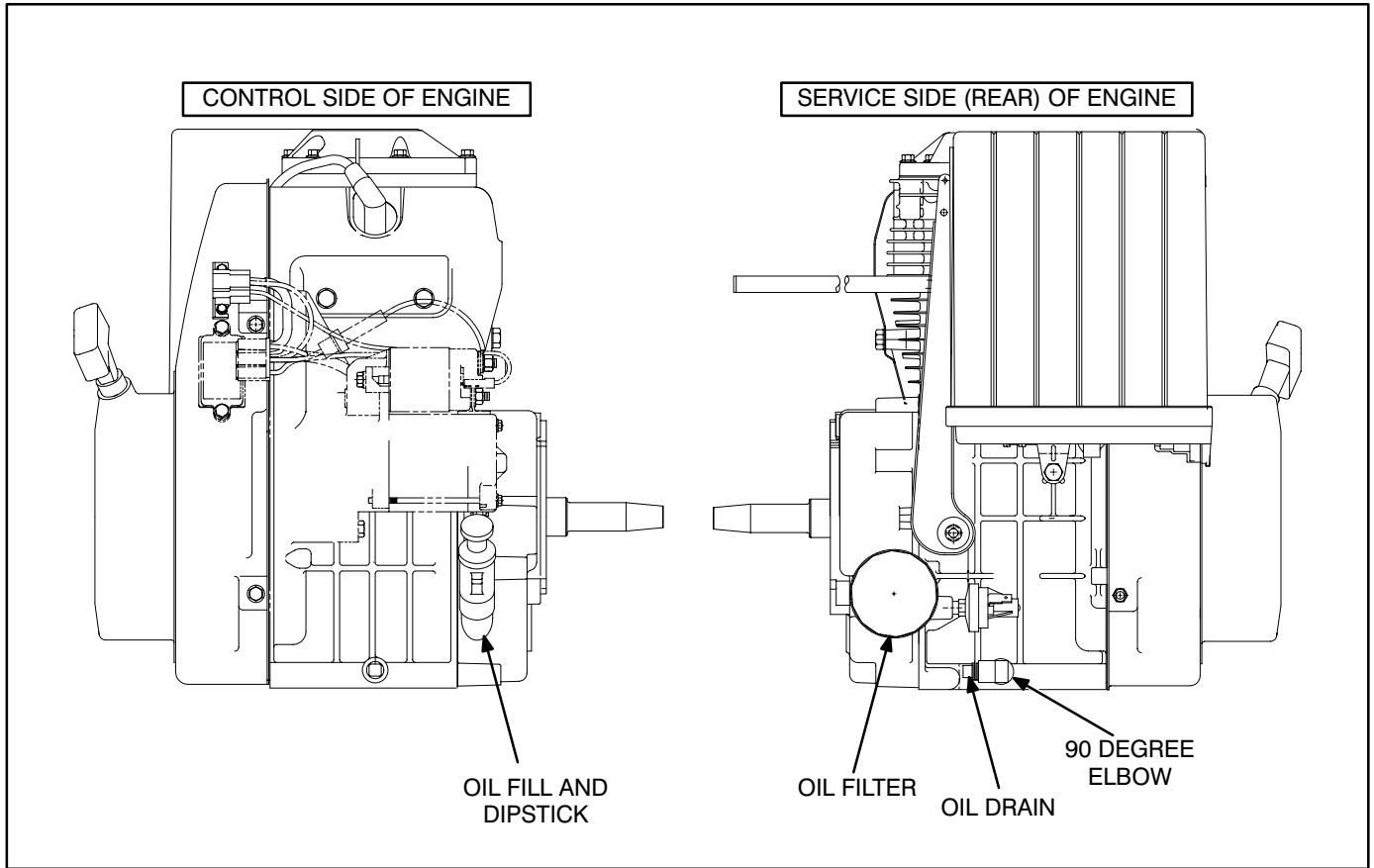
DO NOT FILL TO A LEVEL ABOVE THE FULL MARK ON THE DIPSTICK. Drain the excess oil if too much has been added.

**CAUTION** *Too much oil can cause high oil consumption, high operating temperatures and oil foaming. Too little oil can cause severe engine damage. Keep the oil level between the Full and Add marks on the dipstick.*

5. Reconnect the spark plug and battery.
6. Start the engine and run it for a short time while checking for oil leaks around the drain plug and oil filter. Do not overtighten: tighten only as necessary to eliminate leaks.
7. Used oil is harmful to the environment. Pour the used oil into a sealed container and deliver it to the nearest recycling center.



**FIGURE 9. OIL CHECK/REFILL, GENSETS 4.0 KW AND BELOW**



**FIGURE 10. OIL CHECK/REFILL, FILTER REPLACEMENT, 5.0 KW AND 6.0 KW GENSETS**

## **AIR CLEANER MAINTENANCE**

### **Gensets 4.0 kW And Below**

1. Carefully remove the air cleaner cover and the air cleaner element. See Figure 11.
2. Remove foam wrapper and wash in detergent and water. Dry foam wrapper thoroughly. Use low pressure air on the inside of the paper element to remove dust and dirt. Replace paper element at every sixth cleaning or sooner if dusty conditions exist or if the paper is torn.
3. Reassemble filter into the housing and carefully install the air cleaner cover.

### **5.0 And 6.0 kW Gensets**

1. Remove the outer cover by rotating the quarter-turn fastener counterclockwise to its vertical position. Then lift the cover and remove it. See Figure 12.

2. **(Foam wrapper only)** When cleaning the foam wrapper, do not remove the inner air cleaner cover. Remove and wash the foam wrapper in water and detergent. Squeeze the foam wrapper dry like a sponge. Rinse with clean water and allow it to dry. Coat the wrapper evenly with one tablespoon (14 grams) of SAE 30 engine oil. Knead the oil into the wrapper and wring out the excess oil.

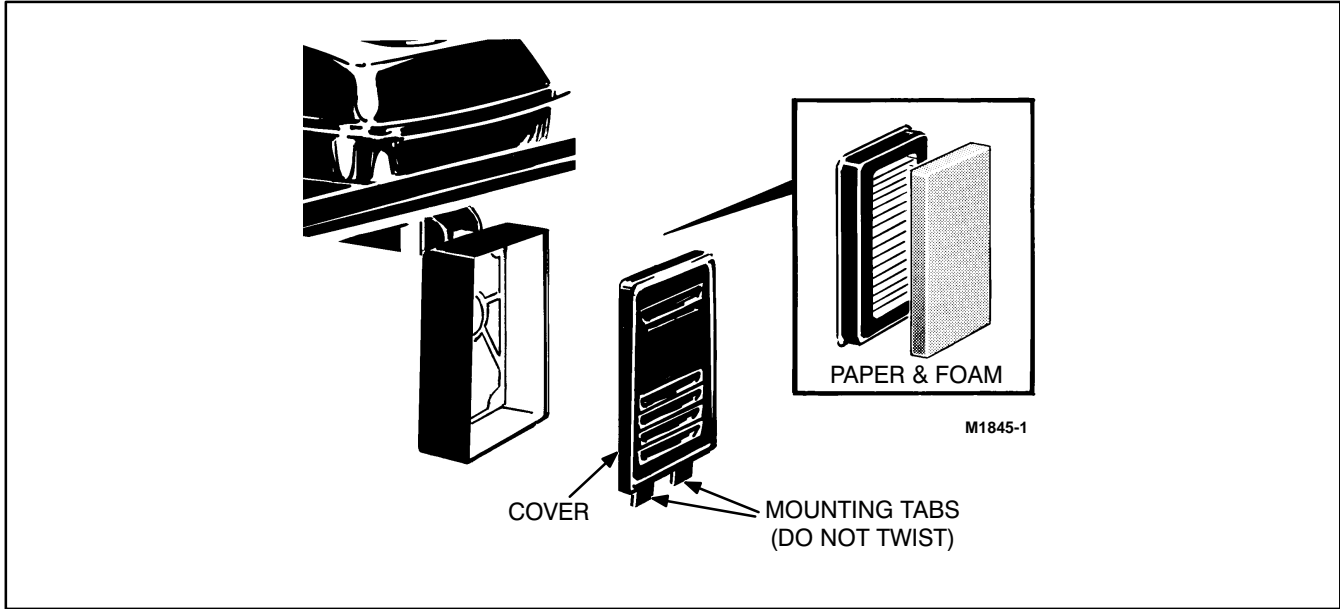
**Failure to adequately wring out excess oil from the wrapper may cause a drop in engine power due to a restriction of inlet air.**

3. Re-install the foam wrapper over the paper air cleaner element by stretching it over the inner cover. Completely cover all exposed paper pleats. Replace the foam wrapper when it becomes torn or stretched.
4. **(Air cleaner element replacement)** To keep debris out of the engine, move the choke lever to the full-choke position to close the choke

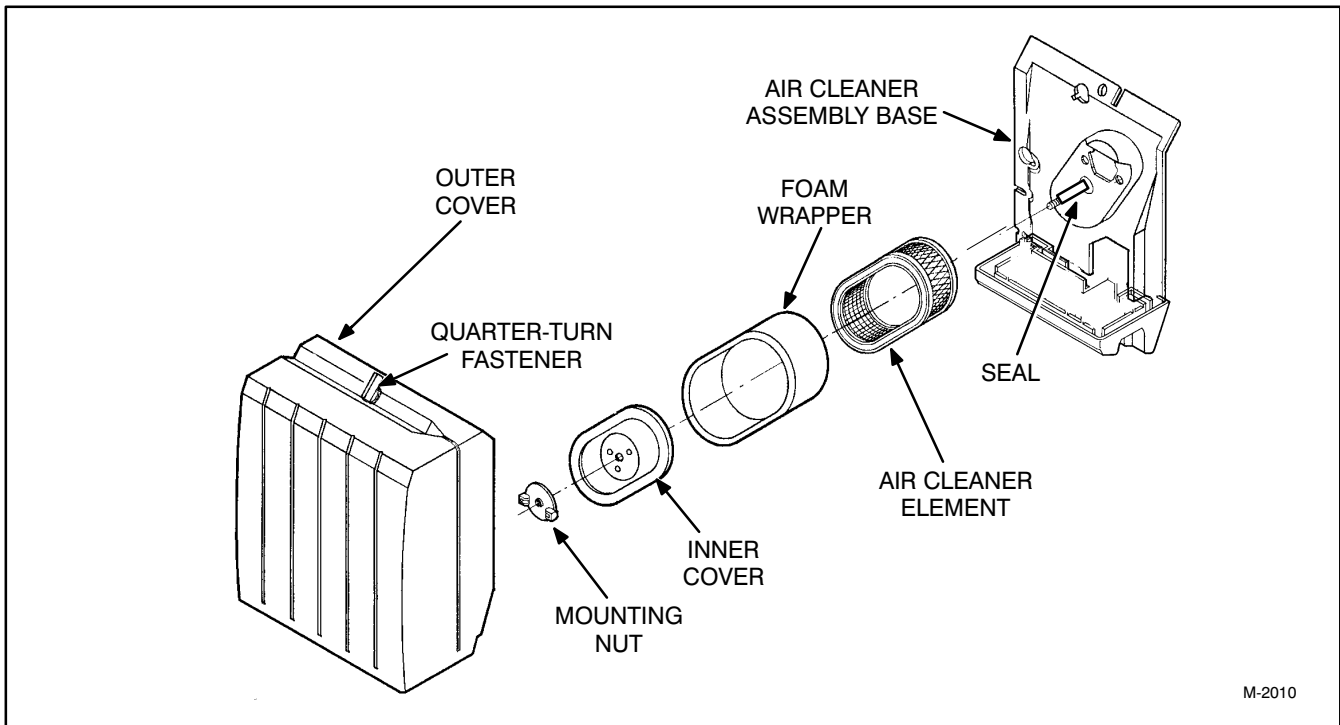
plate. Remove the mounting nut, inner cover and air cleaner element. Wipe off dust and debris from the air cleaner base.

5. Install the new paper element and secure it

with the inner cover and mounting nut. Tighten the nut 1-1/2 turns after seating it on the cover. Reinstall the foam wrapper and outer cover.



**FIGURE 11. AIR FILTER REPLACEMENT, GENSETS 4.0 KW AND BELOW**



**FIGURE 12. AIR FILTER REPLACEMENT, 5.0 KW AND 6.0 KW GENSETS**

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## BATTERY CARE

To increase battery life, perform these routine checks and preventive measures.

**⚠WARNING** *Accidental starting of the generator set during maintenance can cause severe personal injury or death. Disconnect both generator set starting battery cables before performing maintenance. Remove the negative (-) cable first to reduce the risk of arcing.*

**⚠WARNING** *Ignition of explosive battery gases can cause severe personal injury. Do not smoke or allow any flame, spark, pilot light, arc-producing equipment or other ignition sources near the battery.*

**⚠WARNING** *Battery electrolyte can cause severe eye damage and skin burns. Wear goggles, rubber gloves, and a protective apron when working with batteries.*

1. Keep the battery case clean and dry. Wipe battery case with a damp cloth whenever dirt accumulates.
2. Make certain that the battery cable connections are clean and tight. To remove the battery cables, use a battery puller tool.
3. Identify the cable as positive (+) or negative (-) before making the connection. Always connect the negative (-) cable last to reduce the risk of arcing. Apply a light coating of petroleum jelly or non-conductive grease to battery connections to retard corrosion.
4. Maintain the electrolyte level by adding distilled water as needed to reach the split-level marker in the battery. The water component of the electrolyte evaporates, but the sulfuric acid component remains. For this reason, only add water to a low battery.
5. Use a battery hydrometer to check the specific gravity of the electrolyte in each cell. A battery

should be charged if the specific gravity measures less than 1.215. When charging the battery, avoid overcharging. Stop charging battery when the electrolyte specific gravity reaches 1.260, at approximately 80°F (27°C).

## FUEL FILTER REPLACEMENT

**⚠WARNING** *Fuel presents the hazard of fire or explosion that can cause severe personal injury or death. Do not permit any flame, spark, pilot light, cigarette, arcing switch or equipment, or other ignition source near the fuel system. Inspect for fuel leaks any time service is performed on the fuel system. Keep a fire extinguisher rated ABC near work area.*

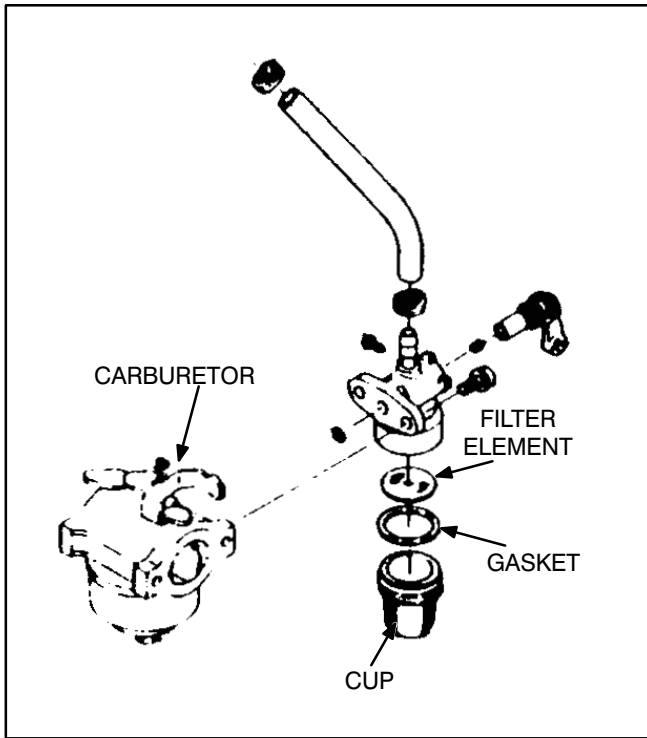
Clean or replace the fuel filter at the interval recommended in the Maintenance Schedule or if performance problems occur and bad fuel is suspected.

### Gensets 4.0 kW And Below

1. Turn the fuel supply valve to the closed position and allow the set to operate until it runs out of fuel. Let the generator set cool down before proceeding.
2. Remove the fuel line from the fuel shutoff valve and collect the fuel in a suitable container.
3. See Figure 13. Unscrew the sediment bowl from the fuel supply valve and clean it.
4. Remove the screen and clean any dirt and particulate off the screen.
5. Reinstall the screen and sediment bowl. Attach the fuel line securely to the fuel shutoff valve.

### 5.0 And 6.0 kW Gensets

These sets have a fuel filter screen mounted inside the gas tank at the fuel shutoff elbow. The screen should be replaced when performance problems occur or bad fuel is suspected. Have an Onan Service Center perform this maintenance.



**FIGURE 13. FUEL FILTER REPLACEMENT, GENSETS 4.0 KW AND BELOW**

## SPARK PLUG MAINTENANCE AND REPLACEMENT

A spark plug with heavy combustion deposits can cause the generator set to misfire, operate erratically, or stop running when a load is applied. Remove the spark plug and clean carbon and other deposits off with a wire brush, then inspect and measure plug gap. Plug gap measurements are listed in the *Specifications* section. If a plug is discolored or badly fouled, replace it.

If necessary, the fuel tank can be raised for easier service access as follows:

**⚠ WARNING** *Fuel presents the hazard of fire or explosion that can cause severe personal injury or death. Shut fuel valve and handle fuel tank carefully to prevent fuel leakage. Reduce fuel level in fuel tank to reduce the risk of spilling fuel. Do not permit any flame, spark, pilot light, cigarette, arcing switch or equipment, or other ignition source near the fuel system. Keep an ABC type fire extinguisher nearby.*

1. Let the generator set cool down before servicing. Check fuel level in the fuel tank and reduce the level if tank is full to avoid spilling. Use a pump designed for use with fuels to lower fuel tank level and store fuel in a clean container designed for fuel storage.
2. Close the fuel shutoff valve on the bottom of the fuel tank (Figure 5).
3. Remove the fuel tank mounting nuts and raise the control panel side of the fuel tank high enough to access the spark plug. Support the fuel tank to prevent tilting or dropping.
  - Black deposits indicate a rich mixture.
  - A wet plug indicates misfiring.
  - Badly or frequently fouled plug indicates the need for a major tune-up.

Refer to Table 2 for scheduled spark plug inspection and replacement and to *Specifications* for gap size.

To prevent crossthreading the spark plug always thread it in by hand until it seats. If the spark plug is being reused, turn it with a wrench an additional 1/4 turn. If the spark plug is new, turn it an additional 3/8 to 1/2 turn. If you have a torque wrench, tighten the spark plug to 20 lbs-ft (26 N•m).

## MUFFLER SERVICE

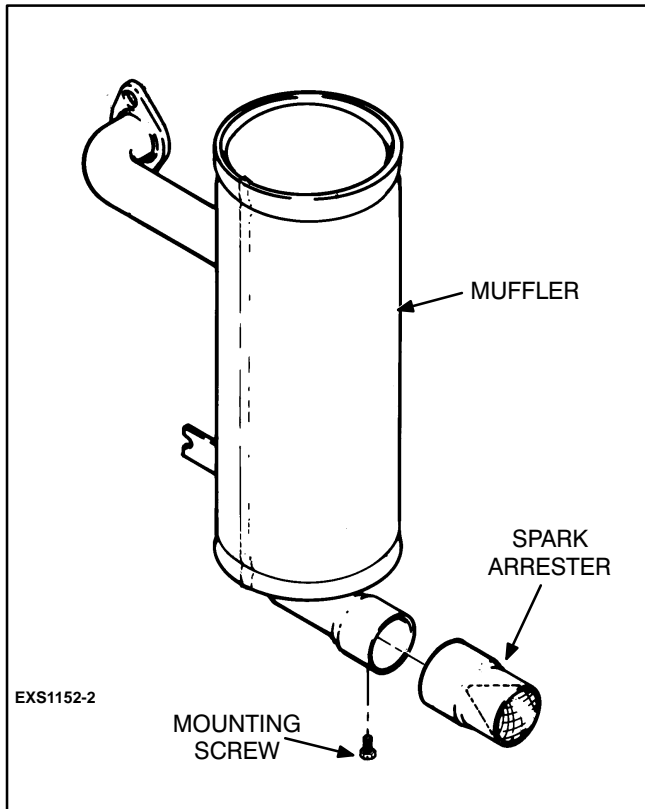
**⚠ WARNING** *A hot muffler can cause severe burns. Allow the generator set to cool before servicing the the muffler.*

Inspect the muffler for corrosion and physical defects. Operate and generator set and check for exhaust leaks and noisy operation. Replace a noisy or defective muffler before using the generator set.

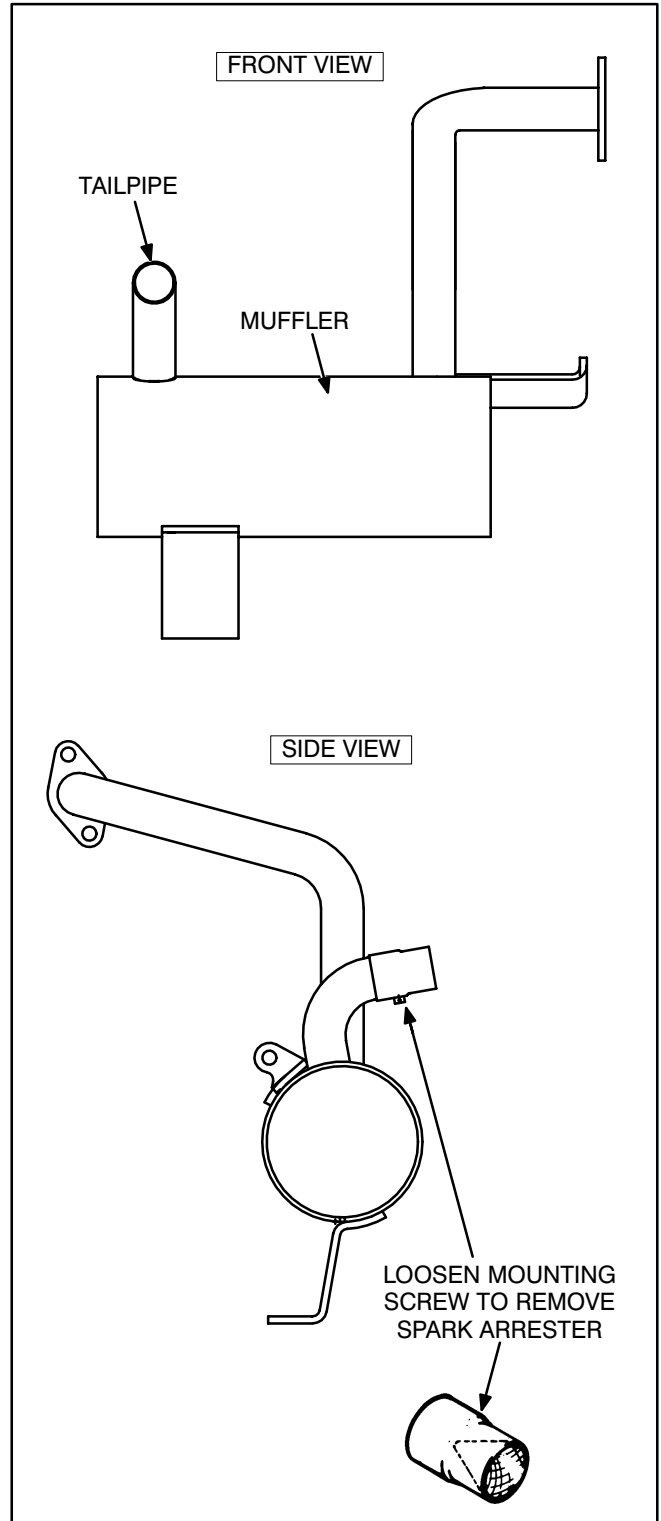
The exhaust spark arrester requires periodic cleaning for safe operation and to maintain maximum efficiency. Consult the maintenance schedule for recommended cleaning intervals. Allow the generator set to cool down before servicing the muffler.

Remove the spark arrester screen (Figure 15), inspect for damage, and replace if defective. To clean, lightly tap the screen and clean any deposits with a wire brush. Also use a commercial solvent if necessary. Allow screen to dry, then reassemble and attach securely.

**⚠WARNING** Most part cleaning solvents are flammable and misuse can result in severe personal injury or death. Follow the manufacturer's recommendations. Work in a well ventilated area and do not allow any spark, flame, pilot light, cigarette, or other ignition source near the generator set. Keep a fire extinguisher rated ABC near work area.



**FIGURE 14. SPARK ARRESTER CLEANING (GENSETS 4.0 KW AND BELOW)**



**FIGURE 15. SPARK ARRESTER CLEANING (5.0 AND 6.0 KW GENSETS)**



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## **CLEANING THE GENERATOR SET**

Remove spilled oil and fuel from the generator set immediately with a dry rag. Dispose of cleaning rag properly. Do not allow dirt to accumulate on the en-

gine cooling fins or on the control components and electrical connections. A damp cloth can be used to clean dust and dirt from the generator set. Cleaning solvents should not be used, because they can damage electrical connectors and components.

# Troubleshooting

The following troubleshooting guide can be used for basic problem diagnosis. If these recommendations do not resolve the problem, contact an authorized Onan service center.

**⚠WARNING** *Many troubleshooting procedures present hazards which 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.*

Problem	Probable Cause	Solution
FAILS TO CRANK (ELECTRIC START MODELS)	<ol style="list-style-type: none"> <li>1. Low battery.</li> <li>2. Bad battery connection.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check battery electrolyte level.</li> <li>2. Clean and tighten all battery and cable connections.</li> </ol>
CRANKS SLOWLY (ELECTRIC START MODELS)	<ol style="list-style-type: none"> <li>1. Low battery.</li> <li>2. Bad battery connection.</li> <li>3. Oil is too heavy.</li> <li>4. Load is connected.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check battery electrolyte level.</li> <li>2. Clean and tighten all battery and cable connections.</li> <li>3. Replace with recommended oil.</li> <li>4. Disconnect load while starting.</li> </ol>
ENGINE WON'T START	<ol style="list-style-type: none"> <li>1. Fuel below genset pickup level in tank.</li> <li>2. Fuel supply shutoff valve closed.</li> <li>3. Carbon deposits on spark plug.</li> <li>4. Low oil level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Add fuel.</li> <li>2. Fully open fuel supply valve.</li> <li>3. Remove spark plug and clean.</li> <li>4. Add oil if necessary.</li> </ol>
EXHAUSTING BLACK SMOKE	<ol style="list-style-type: none"> <li>1. Choke stuck.</li> <li>2. Dirty air filter.</li> <li>3. Rich fuel mixture.</li> </ol>	<ol style="list-style-type: none"> <li>1. Open choke</li> <li>2. Clean or replace air filter.</li> <li>3. Contact an Onan service center.</li> </ol>
UNIT RUNS THEN STOPS	<ol style="list-style-type: none"> <li>1. Out of fuel.</li> <li>2. Low oil level.</li> <li>3. Excess oil.</li> </ol>	<ol style="list-style-type: none"> <li>1. Add fuel.</li> <li>2. Add oil.</li> <li>3. Reduce engine oil level.</li> </ol>
UNIT RUNS THEN SURGES	<ol style="list-style-type: none"> <li>1. Loose or worn spark plug lead</li> <li>2. Faulty spark plug.</li> <li>3. Dirty fuel filter or generator set at too steep of an angle.</li> <li>4. Governor out of adjustment or lean fuel mixture.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check spark plug lead connection.</li> <li>2. Remove and clean or replace.</li> <li>3. Check fuel filter and angle of generator set.</li> <li>4. Contact an Onan service center.</li> </ol>
NO AC OUTPUT VOLTAGE	<ol style="list-style-type: none"> <li>1. Open AC circuit breaker due to an overload.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove all loads, reset breaker, check loads for defects. Do not exceed rated load specifications.</li> </ol>
NO DC OUTPUT VOLTAGE	<ol style="list-style-type: none"> <li>1. Open DC circuit breaker due to an overload.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove all loads, reset breaker, check for shorted battery or load defects. Do not exceed rated load specifications.</li> </ol>

**⚠WARNING** *A hot generator set can cause severe burns. Always allow the generator set to cool before performing any maintenance or service.*

# Specifications

60 HZ GENSETS	2.5 EGHAA		4.0 EGHAB	4.0 EGHEB
		Non-CSA Certified		
<b>GENERATOR DETAILS</b>				
AC OUTPUT:				
Frequency (Hertz)	60	60	60	60
Voltage	120	120	120/240	120/240
Wattage (Max. Power)	1800	2500	4000	4000
Wattage (Rated Power)	1800	2000	3500	3500
Current (Rated Amps)	15	16.7	29.2/14.6 W	29.2/14.6
DC OUTPUT:	12 VDC/120 W (10 A)	12 VDC/120 W (10 A)	12 VDC/120 W (10 A)	12 VDC/120 W (10 A)
<b>ENGINE DETAILS</b>				
Engine Type	GH170		GH280	GH280
Engine Speed (RPM)	3600		3600	3600
Fuel	Gasoline		Gasoline	Gasoline
Engine Oil Capacity	0.63 qt (0.6 L)		0.95 qt (0.9 L)	0.95 qt (0.9 L)
Spark Plug Gap	0.028 in. (0.7 mm)		0.028 in. (0.7 mm)	0.028 in. (0.7 mm)
Engine Valve Lash	Intake and Exhaust: 0.002 - 0.0039 in. (0.05 - 0.10 mm)		Intake and Exhaust: 0.002 - 0.0039 in. (0.05 - 0.10 mm)	Intake and Exhaust: 0.002 - 0.0039 in. (0.05 - 0.10 mm)
Ignition Timing (BTDC) (fixed)	21°		25°	25°
Starting System	Recoil		Recoil	Electric/Recoil
Horsepower	5.5 bhp max		9.0 bhp max	9.0 bhp max
Displacement (cc)	169		274	274
<b>GENERATOR DETAILS</b>				
Dry Weight	110 lb (50 kg)		145 lb (66 kg)	155 lb (70 kg)
Dimensions:				
Length - Inches	26.8 (681)		26.8 (681)	26.8 (681)
Width - Inches	22 (559)		22 (559)	22 (559)
Height - Inches	24.6 (625)		24.6 (625)	24.6 (625)
Fuel Tank Capacity	6.5 gal (24.6 L)		6.5 gal (24.6 L)	6.5 gal (24.6 L)
Rated Output Operating Hrs.	20		13	13
Battery Requirements:				
Battery (Group U1)	-		-	12 Volt
Cold Cranking Amps (at 32° F [0° C])	-		-	235

<b>60 HZ GENSETS</b>	<b>5.0 EGHAB</b>	<b>5.0 EGHEB</b>	<b>6.0 EGHEB</b>
<b>GENERATOR DETAILS</b>			
AC Output:			
Frequency (Hertz)	60	60	60
Voltage	120/240	120/240	120/240
Wattage (Max. Power)	5000	5000	6000
Wattage (Rated Power)	5000	5000	5500
Current (Rated Amperes)	41.6/20.8	41.6/20.8	45.8/22.9
DC Output:	12 VDC/120 W (10 A)	12 VDC/120 W (10 A)	12 VDC/120 W (10 A)
<b>ENGINE DETAILS</b>			
Engine Type	Elite E140H	Elite E140H	Elite E140H
Engine Speed (RPM)	3600	3600	3600
Fuel	Gasoline	Gasoline	Gasoline
Engine Oil Capacity	1.0 qt (0.95 L)	1.0 qt (0.95 L)	1.0 qt (0.95 L)
Spark Plug Gap	0.035 in. (0.89 mm)	0.035 in. (0.89 mm)	0.035 in. (0.89 mm)
Engine Valve Lash	Intake and Exhaust: .006 - .010 in. (0.15 - 0.25 mm)	Intake and Exhaust: .006 - .010 in. (0.15 - 0.25 mm)	Intake and Exhaust: .006 - .010 in. (0.15 - 0.25 mm)
Ignition Timing (BTDC) (fixed)	23°	23°	23°
Starting System	Recoil	Electric/Recoil	Electric/Recoil
Horsepower	14 bhp max	14 bhp max	14 bhp max
Displacement (cc)	390	390	390
<b>GENERATOR SET DETAILS</b>			
Dry Weight	175 lb (79 kg)	185 lb (84 kg)	205 lb (94 kg)
Dimensions:			
Length - Inches	29.2 (742)	29.2 (742)	29.2 (742)
Width - Inches	22.5 (572)	22.5 (572)	22.5 (572)
Height - Inches	28.3 (719)	28.3 (719)	28.3 (719)
Fuel Tank Capacity	8 gal (30.3 L)	8 gal (30.3 L)	8 gal (30.3 L)
Rated Output Operating Hours	10	10	9
Battery Requirements:			
Battery (Group U1)	-	12 volt	12 volt
Cold Cranking Amps (at 32° F[0° C])	-	235	235

<b>50 HZ GENSETS</b>	<b>2.0 EGHAM</b>	<b>3.5 EGHEM</b>	<b>5.0 EGHEM</b>
<b>GENERATOR DETAILS</b>			
AC Output:			
Frequency (Hertz)	50	50	50
Voltage	110/220	110/220	110/220
Wattage (Max. Power)	2000	3500	5000
Wattage (Rated Power)	1800	3000	4500
Current (Rated Amperes)	16.4/8.2	27.2/13.6	40.9/20.4
DC Output:	12 VDC/100 W (8.3 A)	12 VDC/100 W (8.3 A)	12 VDC/100 W (8.3 A)
<b>ENGINE DETAILS</b>			
Engine Type	GH170	GH280	Elite E140H
Engine Speed (RPM)	3000	3000	3000
Fuel	Gasoline	Gasoline	Gasoline
Engine Oil Capacity	0.63 qt (0.6 L)	0.95 qt (0.9 L)	1.0 qt (0.95 L)
Spark Plug Gap	0.028 in. (0.7 mm)	0.028 in. (0.7 mm)	0.035 in. (0.89 mm)
Engine Valve Lash	Intake and Exhaust: 0.002 - 0.0039 in. (0.05 - 0.10 mm)	Intake and Exhaust: 0.002 - 0.0039 in. (0.05 - 0.10 mm)	Intake and Exhaust: .006 - .010 in. (0.15 - 0.25 mm)
Ignition Timing (BTDC) (fixed)	21°	25°	23°
Starting System	Recoil	Electric/Recoil	Electric/Recoil
Horsepower	5.5 bhp max	9.0 bhp max	14 bhp max
Displacement (cc)	169	274	390
<b>GENERATOR SET DETAILS</b>			
Dry Weight	119 lb (54 kg)	165 lb (75 kg)	207 lb (94 kg)
Dimensions:			
Length - Inches	26.8 (681)	26.8 (681)	29.2 (742)
Width - Inches	22 (559)	22 (559)	22.5 (572)
Height - Inches	24.6 (625)	24.6 (625)	28 (719)
Fuel Tank Capacity	6.5 gal (24.6 L)	6.5 gal (24.6 L)	8.0 gal (30.3 L)
Rated Output Operating Hours	20.5	13.5	10.5
Battery Requirements:			
Battery (Group U1)	-	12 volt	12 Volt
Cold Cranking Amps (at 32° F[0° C])	-	235	235

# Important Information for California Users

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The Pro series Portable Gensets meets the requirements of California's Exhaust Emissions Standards for 1995 and later for Utility and Lawn and Garden Equipment Engines.

As a California user of this engine, please be aware that unauthorized modifications or replacement of fuel, exhaust, air intake, or speed control system components that affect engine emissions are prohibited. Unauthorized modification, removal or replacement of the engine label is prohibited.

You should carefully review Operator's and other manuals and information you receive with your genset. If you are unsure that the installation, use, maintenance or service of your genset is authorized, you should seek assistance from an approved Onan engine dealer or an approved dealer for your equipment.

California engine users may use the information below as an aid in locating information related to the California Air Resources Board requirements for emissions control.

## EMISSIONS CONTROL INFORMATION

Engine Warranty Information	The California emissions control warranty statement is located in the same packet of information as this manual when the engine is shipped from the factory.
Engine Valve Lash	See <i>Specifications</i> .
Engine Ignition Timing	See <i>Specifications</i> .
Engine Fuel Requirements	The engine is certified to operate on unleaded gasoline. See Fuel Recommendations in <i>Introduction</i> .
Engine Lubricating Oil Requirements	See Engine Oil Recommendations in <i>Introduction</i> .
Engine Fuel Mixture Settings	These engines have precision-manufactured carburetors which are not adjustable.
Engine Adjustments	See <i>Starting and Running the Set</i> .
Engine Emission Control System	The engine emission control system consists of internal engine modifications.



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