

McGRAW-EDISON

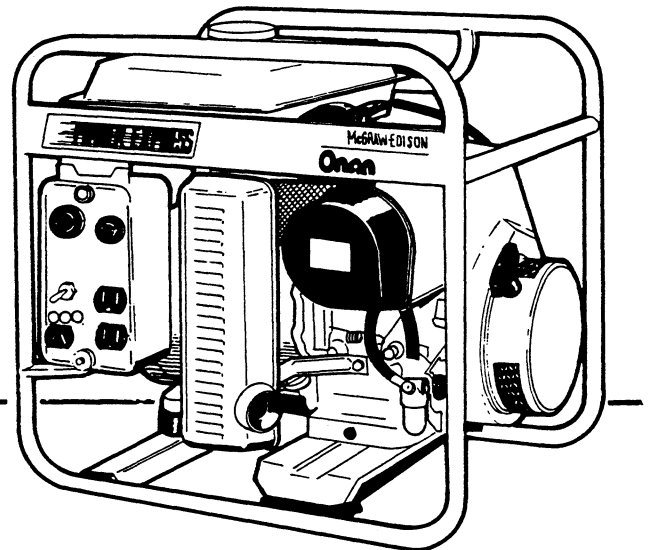
**Onan**

# Operator's Manual

1400 - 3500 Watts

K-Series  
**GenSets**

- **Portable Generators**



981-0123

12-83

Printed in U.S.A.

# Safety Precautions

---

The following symbols in this manual signal potentially dangerous conditions to the operator or equipment. Read this manual carefully. Know when these conditions can exist. Then, take necessary steps to protect personnel as well as equipment.

**WARNING** *This symbol is used throughout this manual to warn of possible serious personal injury.*

**CAUTION** *This symbol refers to possible equipment damage.*

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

- **Use Extreme Caution Near Gasoline. A constant potential explosive or fire hazard exists.**

Do not fill fuel tank with hot engine or engine running. Do not smoke or use open flame near the unit or the fuel tank.

Do not store or transport the generator set without first removing the fuel from the fuel tank.

Have a fire extinguisher nearby. Be sure extinguisher is properly maintained and be familiar with its proper use. Extinguishers rated ABC by the NFPA are appropriate for all applications. Consult the local fire department for the correct type of extinguisher for various applications.

- **Guard Against Electric Shock**

Disconnect electric power before removing protective shields or touching electrical equipment. Use rubber insulative mats placed on dry wood platforms over floors that are metal or concrete when around electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin surfaces to be damp when handling electrical equipment.

Jewelry is a good conductor of electricity and should be removed when working on electrical equipment.

**DO NOT PLUG PORTABLE GENERATOR SET DIRECTLY INTO A HOUSE RECEPTACLE TO PROVIDE EMERGENCY POWER.** It is possible for current to flow from generator into the utility line. This creates extreme hazards to anyone working on lines to restore power. Consult an electrician in regard to emergency power use.

Use extreme caution when working on electrical components. High voltages can cause severe injury or death.

Follow all state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician.

- **Do Not Smoke While Servicing Batteries**

Batteries emit a highly explosive gas that can be ignited by electrical arcing or by smoking.

- **Exhaust Gases Are Toxic**

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 away from areas where people are gathered and away from buildings or enclosures.

- **Keep the Unit and Surrounding Area Clean**

Remove all oil deposits. Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and subsequent engine damage and may 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 may be adversely affected. Keep clean and dry.

- **Protect Against Moving Parts**

Avoid moving parts of the unit. Loose jackets, shirts or sleeves should not be worn because of the danger of becoming caught in moving parts.

Make sure all nuts and bolts are secure. Keep power shields and guards in position.

If adjustments must be made while the unit is running, use extreme caution around hot exhaust, moving parts, etc.

Do not work on this equipment when mentally or physically fatigued.

# Important Safety Precautions

---

Read and observe these safety precautions when using or working on electric generators, engines and related equipment. Also read and follow the literature provided with the equipment.

Proper operation and maintenance are critical to performance and safety. Electricity, fuel, exhaust, moving parts and batteries present hazards that can cause severe personal injury or death.

## FUEL, ENGINE OIL, AND FUMES ARE FLAMMABLE AND TOXIC

Fire, explosion, and personal injury can result from improper practices.

- Used engine oil, and benzene and lead, found in some gasoline, have been identified by government agencies as causing cancer or reproductive toxicity. When checking, draining or adding fuel or oil, do not ingest, breathe the fumes, or contact gasoline or used oil.
- Do not fill tanks with engine running. Do not smoke around the area. Wipe up oil or fuel spills. Do not leave rags in engine compartment or on equipment. Keep this and surrounding area clean.
- Inspect fuel system before each operation and periodically while running.
- Equip fuel supply with a positive fuel shutoff.
- Do not store or transport equipment with fuel in tank.
- Keep an ABC-rated fire extinguisher available near equipment and adjacent areas for use on all types of fires except alcohol.
- Unless provided with equipment or noted otherwise in installation manual, fuel lines must be copper or steel, secured, free of leaks and separated or shielded from electrical wiring.
- Use approved, non-conductive flexible fuel hose for fuel connections. Do not use copper tubing as a flexible connection. It will work-harden and break.

## EXHAUST GAS IS DEADLY

- Engine exhaust contains carbon monoxide (CO), an odorless, invisible, poisonous gas. Learn the symptoms of CO poisoning.
- Never sleep in a vessel, vehicle, or room with a genset or engine running unless the area is equipped with an operating CO detector with an audible alarm.
- Each time the engine or genset is started, or at least every day, thoroughly inspect the exhaust system. Shut down the unit and repair leaks immediately.

- Warning: Engine exhaust is known to the State of California to cause cancer, birth defects and other reproductive harm.

*Make sure exhaust is properly ventilated.*

- Vessel bilge must have an operating power exhaust.
- Vehicle exhaust system must extend beyond vehicle perimeter and not near windows, doors or vents.
- Do not use engine or genset cooling air to heat an area.
- Do not operate engine/genset in enclosed area without ample fresh air ventilation.
- Expel exhaust away from enclosed, sheltered, or occupied areas.
- Make sure exhaust system components are securely fastened and not warped.

## MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not remove any guards or covers with the equipment running.
- Keep hands, clothing, hair, and jewelry away from moving parts.
- Before performing any maintenance, disconnect battery (negative [–] cable first) to prevent accidental starting.
- Make sure fasteners and joints are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- If adjustments must be made while equipment is running, use extreme caution around hot manifolds and moving parts, etc. Wear safety glasses and protective clothing.

## BATTERY GAS IS EXPLOSIVE

- Wear safety glasses and do not smoke while servicing batteries.
- Always disconnect battery negative (–) lead first and reconnect it last. Make sure you connect battery correctly. A direct short across battery terminals can cause an explosion. Do not smoke while servicing batteries. Hydrogen gas given off during charging is explosive.
- Do not disconnect or connect battery cables if fuel vapors are present. Ventilate the area thoroughly.

## **DO NOT OPERATE IN FLAMMABLE AND EXPLOSIVE ENVIRONMENTS**

Flammable vapor can be ignited by equipment operation or cause a diesel engine to overspeed and become difficult to stop, resulting in possible fire, explosion, severe personal injury and death. **Do not operate diesel equipment where a flammable vapor environment can be created by fuel spill, leak, etc., unless equipped with an automatic safety device to block the air intake and stop the engine.**

## **HOT COOLANT CAN CAUSE SEVERE PERSONAL INJURY**

- Hot coolant is under pressure. Do not loosen the coolant pressure cap while the engine is hot. Let the engine cool before opening the pressure cap.

## **ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH**

- Do not service control panel or engine with unit running. High voltages are present. Work that must be done while unit is running should be done only by qualified service personnel.
- Do not connect the generator set to the public utility or to any other electrical power system. Electrocutation can occur at a remote site where line or equipment repairs are being made. An approved transfer switch must be used if more than one power source is connected.
- Disconnect starting battery (negative [–] cable first) before removing protective shields or touching electrical equipment. Use insulative mats placed on dry wood platforms. Do not wear jewelry, damp clothing or allow skin surface to be damp when handling electrical equipment.
- Use insulated tools. 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.
- With transfer switches, keep cabinet closed and locked. Only authorized personnel should have cabinet or operational keys. Due to serious shock hazard from high voltages within cabinet, all service and adjustments must be performed by an electrician or authorized service representative.

If the cabinet must be opened for any reason:

1. Move genset operation switch or Stop/Auto/Handcrank switch (whichever applies) to Stop.
2. Disconnect genset batteries (negative [–] lead first).
3. Remove AC power to automatic transfer switch. If instructions require otherwise, use extreme caution due to shock hazard.

## **MEDIUM VOLTAGE GENERATOR SETS (601V TO 15kV)**

- Medium voltage acts differently than low voltage. Special equipment and training are required to work on or around medium voltage equipment. Operation and maintenance must be done only by persons trained and qualified to work on such devices. Improper use or procedures will result in severe personal injury or death.
- Do not work on energized equipment. Unauthorized personnel must not be permitted near energized equipment. Induced voltage remains even after equipment is disconnected from the power source. Plan maintenance with authorized personnel so equipment can be de-energized and safely grounded.

## **GENERAL SAFETY PRECAUTIONS**

- Do not work on equipment when mentally or physically fatigued or after consuming alcohol or drugs.
- Carefully follow all applicable local, state and federal codes.
- Never step on equipment (as when entering or leaving the engine compartment). It can stress and break unit components, possibly resulting in dangerous operating conditions from leaking fuel, leaking exhaust fumes, etc.
- Keep equipment and area clean. Oil, grease, dirt, or stowed gear can cause fire or damage equipment by restricting airflow.
- Equipment owners and operators are solely responsible for operating equipment safely. Contact your authorized Onan/Cummins dealer or distributor for more information.

**KEEP THIS DOCUMENT NEAR EQUIPMENT FOR EASY REFERENCE.**

**Supplement** 981-1000

Date: 1-85

Insert with K-Series GenSets

Title: Operator's Manual (12-83)

Number: 981-0122, 981-0123

The following supplement instructions apply to the K-Series portable generator sets. Correct the spark plug gap in the *Specifications* section. Add the battery charging information to the *Operation* section of these manuals.

**SPECIFICATIONS (page 2 of manual)**

	<b>Was</b>	<b>Should be</b>
Spark Plug Gap	0.28 in. (0.7 mm)	0.028 in. (0.7 mm)

**OPERATION****Adding DC Loads**

Connect the DC loads to the DC receptacles on the control panel. Make sure load wires + and - agree with the polarities at the receptacle on the control panel. Maximum DC output is 8.3 amperes, 12 volts, or 100 watts.

**WARNING** *Batteries emit a highly-explosive gas that can be ignited by electrical arcing or by smoking. For battery charging, make sure first to connect the cables to the battery before connecting the cables to the generator set. This will prevent any arcing at the battery which can cause an explosion. When battery charging is complete, also make sure first to remove the cables at the generator set before removing the cables from the battery.*

Do not use AC receptacles while using DC power.

Since the battery charging circuit of the subject units are not regulated, output current from the generator is determined by the condition of the battery being charged. A battery with a very low charge could possibly draw a current above the 10 ampere rating of the circuit breaker, causing it to trip.

Should this condition exist, the following steps should be followed.

1. Disconnect all AC loads from the generator.
2. Slow the generator down to idle speed with the manual speed control lever on the side of the engine.
3. Reset the 10 ampere DC circuit breaker.
4. Reconnect the charging leads to the battery.
5. Charge the battery at the reduced speed for 1/2 hour before returning to full speed.
6. If the breaker trips again, repeat steps 2 and 3.

Reducing the speed will cut the charge rate to the battery in half and allow the battery to be charged without tripping the breaker. After partially recharging the battery in this manner, the generator can be returned to full speed for faster charging without tripping the breaker.

The time required to charge at the reduced rate will vary, depending on the battery size and state of charge.

Running AC loads while charging at low speeds can result in damage to both the generator and loads.



# Table of Contents

---

<b>Introduction</b> .....	2
About This Manual .....	2
Your Generator Set .....	2
How to Obtain Service .....	2
Specifications .....	2
<b>Operation</b> .....	4
Pre-Starting Checks .....	4
Starting .....	5
Adding Loads .....	7
Circuit Breakers .....	10
Operation Indicators .....	10
Stopping .....	10
High/Low Operating Temperatures .....	10
Extremely Dusty/Dirty Conditions .....	11
Long Term Storage .....	11
<b>Maintenance</b> .....	12
Maintenance Schedule .....	12
Change Engine Oil .....	13
Engine Fuel System .....	13
Spark Plug .....	13
Air Cleaner .....	14

**WARNING**

MANUFACTURER RECOMMENDS THAT ALL SERVICE INCLUDING INSTALLATION OF REPLACEMENT PARTS BE DONE BY QUALIFIED ELECTRICAL AND/OR MECHANICAL SERVICE PERSONNEL. TO PREVENT POSSIBLE INJURY AND/OR EQUIPMENT DAMAGE IT IS IMPORTANT THAT ALL SERVICE PERSONNEL BE QUALIFIED.

# Introduction

## ABOUT THIS MANUAL

This manual provides operation and maintenance information for your portable generator set. Read the manual completely before operating your generator set. Observe all cautions and warnings.

## YOUR GENERATOR SET

Your generator set is designed for convenient, portable power. Using the generator set properly and following a regular maintenance schedule can result in longer unit life and safer operation. The SPECIFICATIONS table lists your model, generator rating, capacities, and engine data.

## HOW TO OBTAIN SERVICE

When the generator set requires servicing, contact an Onan service representative. Always furnish the complete model number and serial number.

For future reference, fill in the model number from the nameplate in the space provided here. Also note the serial number located on the engine blower housing and list that here too.

Model Number	
Serial Number	

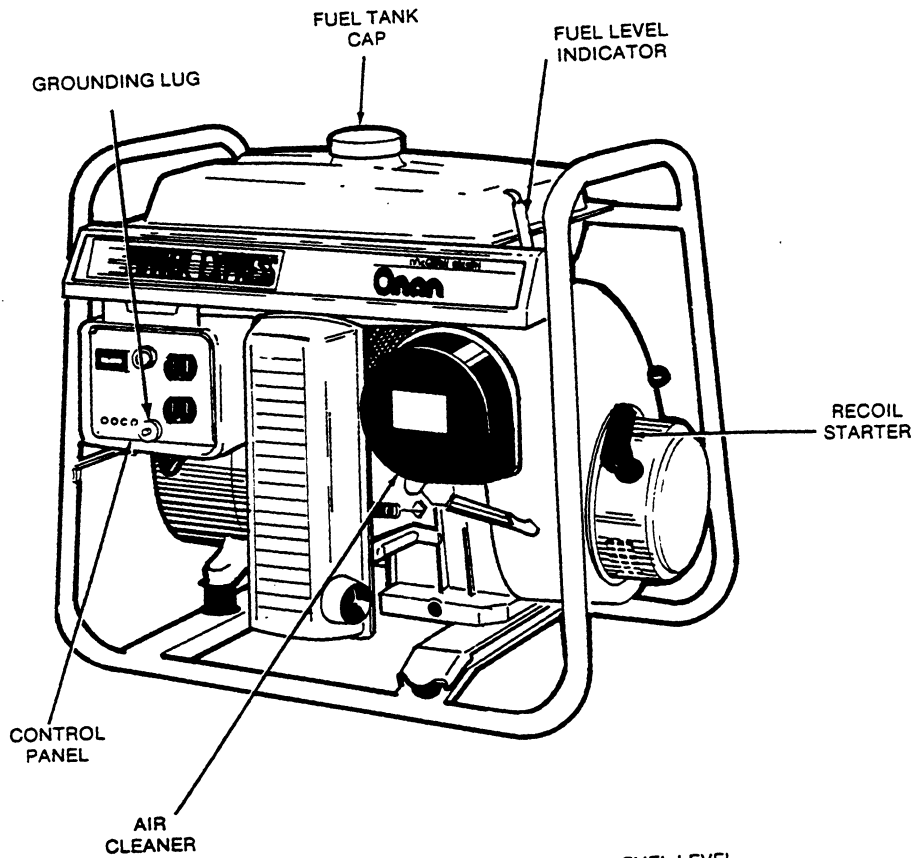
# Specifications

	K1400 (1.4KK-1P/1A)	K2100 (2.1KM-1P/1A)	K3000 (3.0KN-3P/1A)	K3500 (3.5KP/3P/1A)
AC Output - 60 Hertz				
Voltage	120	120	120/240	120/240
Watts - Max. Output	1400	2100	3000	3500
Watts - Rated Output	1200	1800	2500	3000
Amperes - Rated Current	10	15	20.8/10.4	25/12.5
DC Output				
Watts			100	
Volts x Amperes			12 x 8.3	
Engine Displacement	7.9 in <sup>3</sup> (130 cm <sup>3</sup> )	11.2 in <sup>3</sup> (183 cm <sup>3</sup> )	15.4 in <sup>3</sup> (252 cm <sup>3</sup> )	16.8 in <sup>3</sup> (276 cm <sup>3</sup> )
Starting System			recoil starter	
Fuel			regular-grade gasoline	
Fuel Tank Capacity			8.5 qt (8 L)	
Oil Capacity*	18.6 oz (0.55 L)	20.3 oz (0.6 L)	27.1 oz (0.8 L)	30.4 oz (0.9 L)
Spark Plug Gap	0.28 in (0.7 mm)	0.040 in (1.0 mm)	0.040 in (1.0 mm)	0.028 in (0.7 mm)

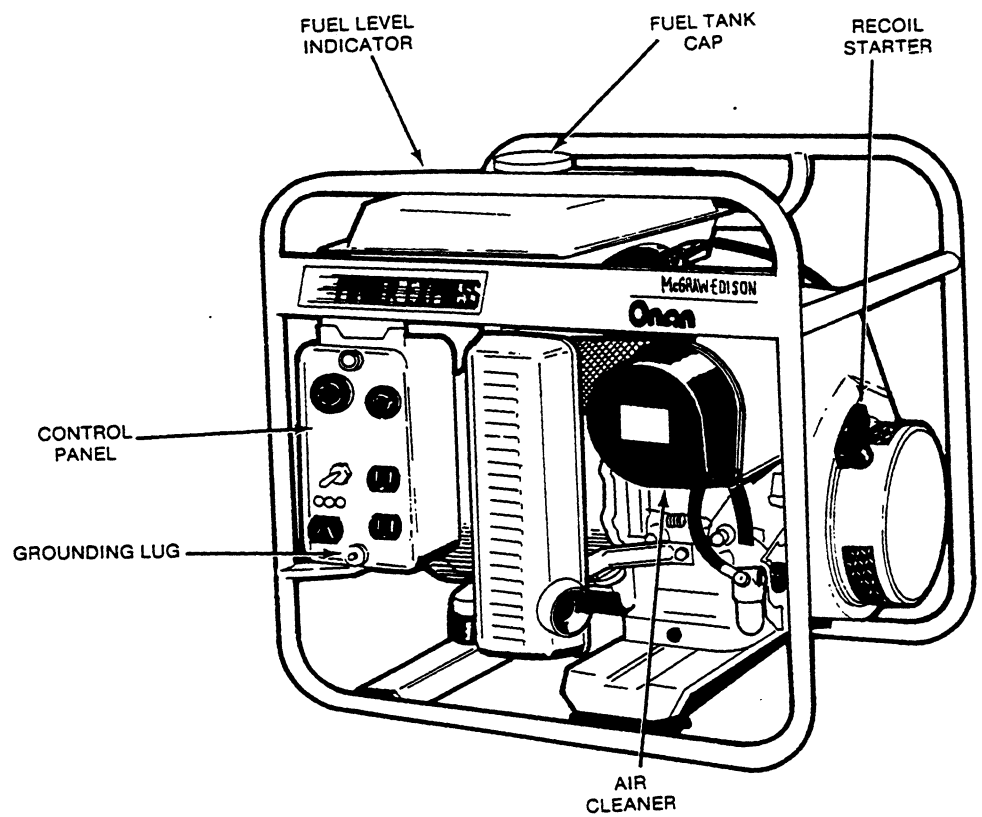
\*See MAINTENANCE for oil requirements.



**Models K1400 and K2100  
(K2100 shown)**



**Models K3000 and K3500  
(K3000 shown)**



**FIGURE 1. ONAN PORTABLE MODELS**

# Operation

## PRE-STARTING CHECKS

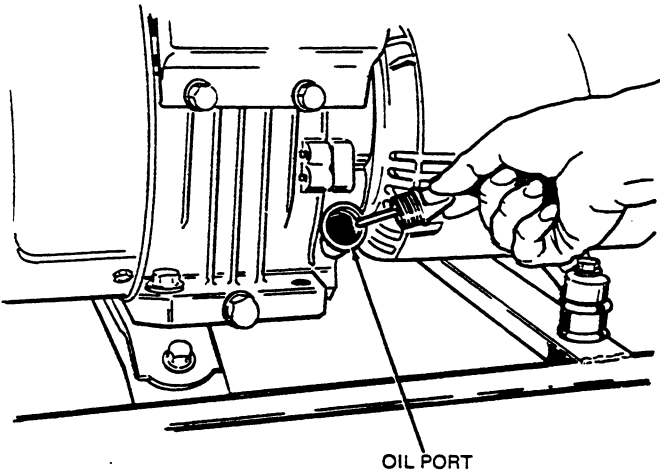
Before starting the generator set, be sure it has sufficient oil and gasoline, and that it is generally ready for operation. Note the separate checks following.

### Engine Oil

Make sure the generator set is level when you are checking the engine oil. Otherwise, you will have an inaccurate oil level indication. Remove the oil cap from the engine. The oil level should appear to the top of the oil port. See Figure 2.

**WARNING** Crankcase pressure might blow out hot oil and cause serious burns. Do not attempt to check oil while the generator set is running.

If you do need to add oil, add oil until it reaches the top of the oil port. Use an oil as specified in the MAINTENANCE section.



LS-1122

FIGURE 2. CHECKING OIL LEVEL

## Fuel

**WARNING** Ignition of fuel might cause serious personal injury or death by fire or explosion. Never fill the fuel tank when the engine is hot or running, and never permit any flame, cigarette, or other ignition source near the fuel system.

Note the preceding warning. Fill the fuel tank with regular-grade gasoline. Figure 1 shows location of the fuel-level indicators and fuel tank cap. If generator set will operate on a slight grade, do not fill completely.

**WARNING** Ignition of fuel might cause serious personal injury or death by fire or explosion. Be sure fuel level indicator is secure and undamaged before starting generator set. If it looks damaged or loose, install a new indicator before starting generator set.

## Grounding Requirements

Local code enforcement might require that the generator set be electrically connected to a grounding electrode (water pipe, earth-driven grounding rod, etc.) during operation. A grounding lug is provided for connecting the generator set to a grounding electrode conductor if required. See Figure 1.

**WARNING** 1. If faulty electrical equipment is connected to the generator, an electrical shock hazard exists which might result in serious personal injury or death. Check all electrical equipment for frayed cords or breaks in the insulation before using.

2. Properly applied and maintained ground fault circuit interrupters, often required by local codes, can afford additional protection against the hazard of electrical shock.

## General

Give the generator set a visual inspection for loose bolts and nuts, oil leaks, fuel leaks, and exhaust leaks. Repair any problems before starting the generator set.

## WARNING

### EXHAUST GAS IS DEADLY!

**Exhaust gases contain carbon monoxide, a poisonous gas that might cause unconsciousness and death. It is an odorless and colorless gas formed during combustion of hydrocarbon fuels. Symptoms of carbon monoxide poisoning are:**

- Dizziness
- Headache
- Weakness and Sleepiness
- Vomiting
- Muscular Twitching
- Throbbing in Temples

**If you experience any of these symptoms, get out into fresh air immediately, shut down the unit and do not use until it has been inspected.**

**The best protection against carbon monoxide inhalation is proper installation and regular, frequent visual and audible inspections of the complete exhaust system. If you notice a change in the sound or appearance of exhaust system, shut the unit down immediately and have it inspected and repaired at once by a competent mechanic.**

## STARTING

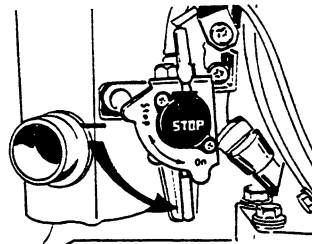
After checking the generator set as described under *Pre-Starting*, follow these steps in sequence.

### WARNING

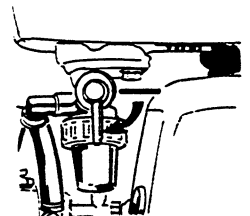
**1. Inhalation of exhaust gases might result in serious personal injury or death. Do not operate generator set in poorly-ventilated areas such as indoors, tanks, confined areas, depressions, or any areas where exhaust gases might accumulate. Face the exhaust toward well-ventilated areas so exhaust gases will not accumulate during operation.**

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

**3. Because a generator set presents the hazard of electrical shock that might cause serious personal injury or death, never expose the generator set to rain, snow, or other similar wet conditions when operating.**



**Model K3000**



**Models K1400,  
K2100 & K3500**

FS-1536

**FIGURE 3. OPENING FUEL VALVE**

1. Open the fuel valve. See Figure 3.

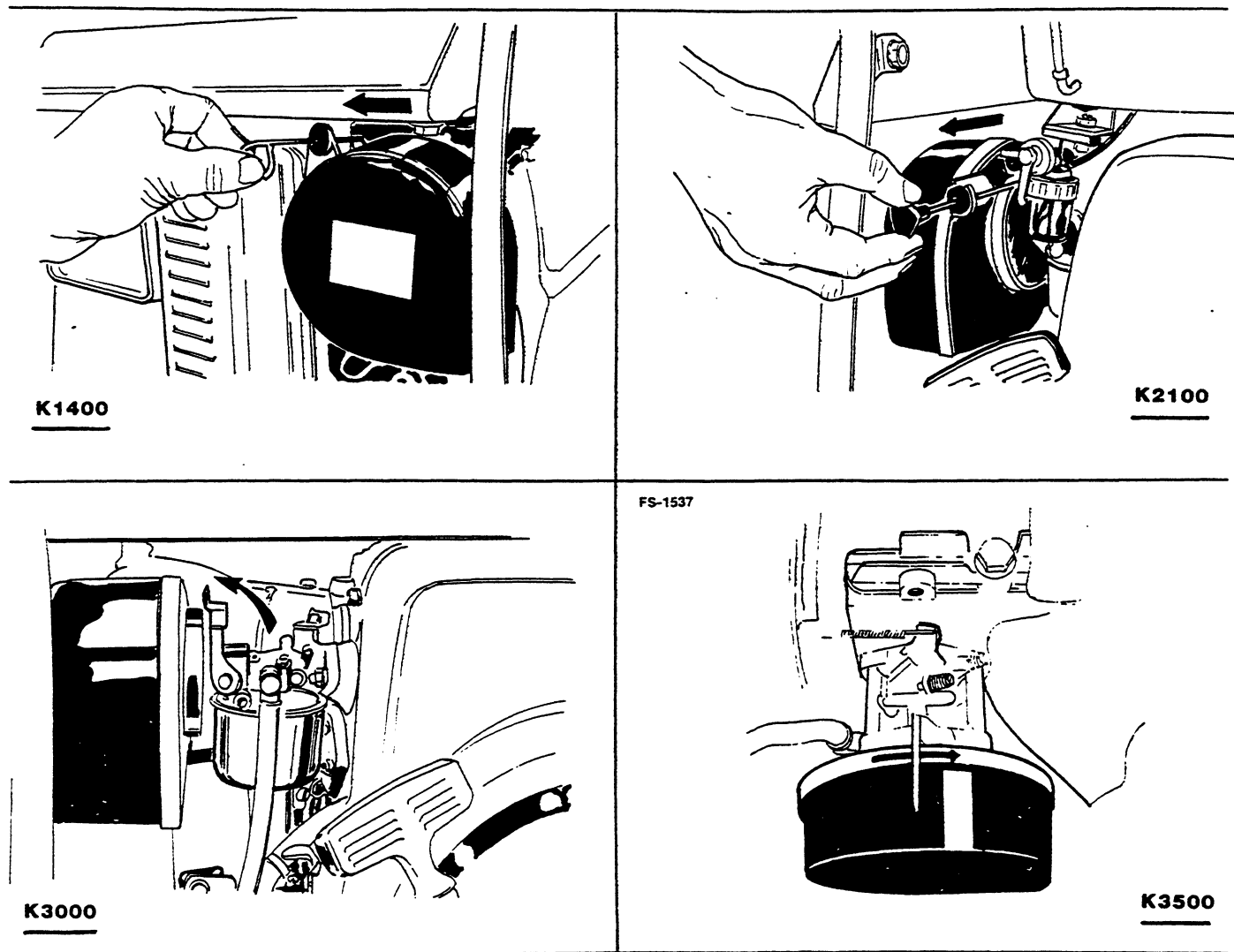
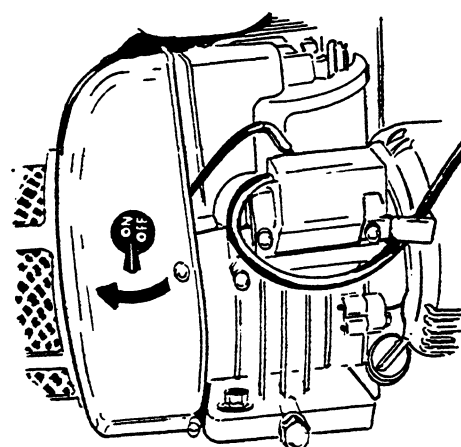


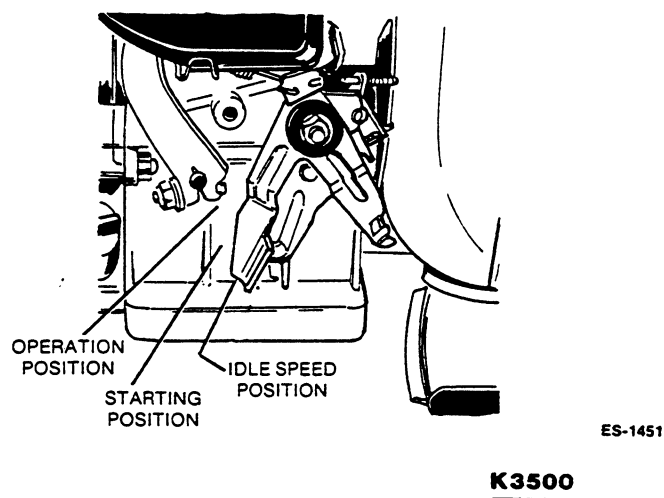
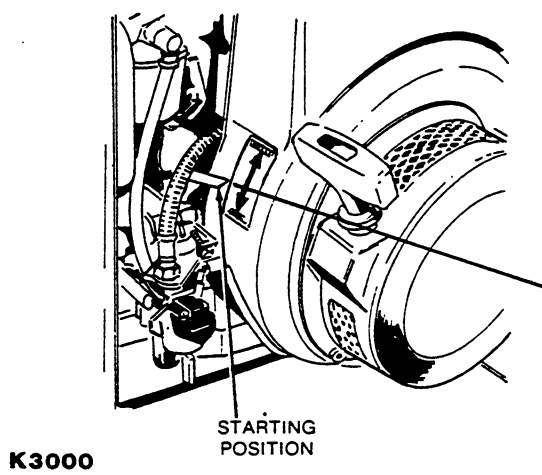
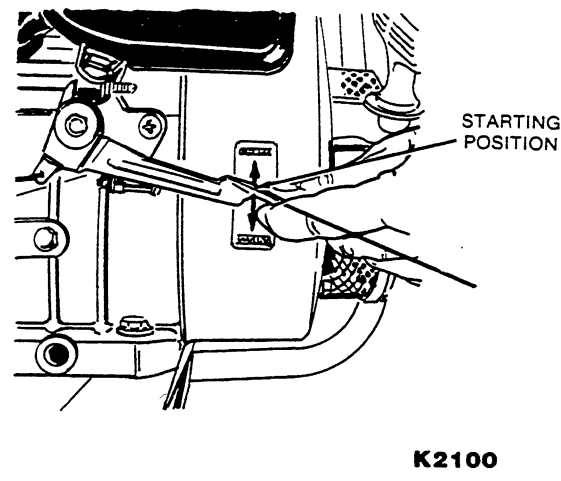
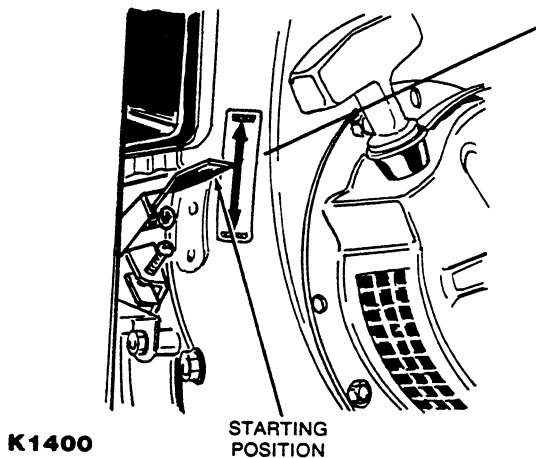
FIGURE 4. CLOSING THE CHOKE

2. Close the choke if the engine is cold (engine has not run for awhile). Figure 4 shows the chokes of the different models.
3. **Models K1400, K2100, and K3500:** Move the Engine Switch to ON. See Figure 5.
4. Set the Speed Control Lever about midway between IDLE SPEED and OPERATING. See Figure 6.
5. With one hand on the generator set to steady it during cranking, grip the recoil starter handle and pull out smoothly and quickly. Repeat as necessary.



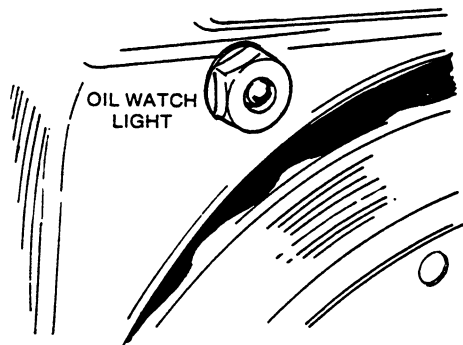
ES-1450

FIGURE 5. ENGINE SWITCH LOCATION  
(K1400, K2100, and K3500)



**FIGURE 6. SETTING SPEED CONTROL LEVER FOR STARTING**

If the Oil Watch Indicator flashes during cranking, add oil as described under "Pre-Starting Checks." Figure 7 shows an Oil-Watch Indicator.



LS-1123

**FIGURE 7. OIL WATCH INDICATOR**

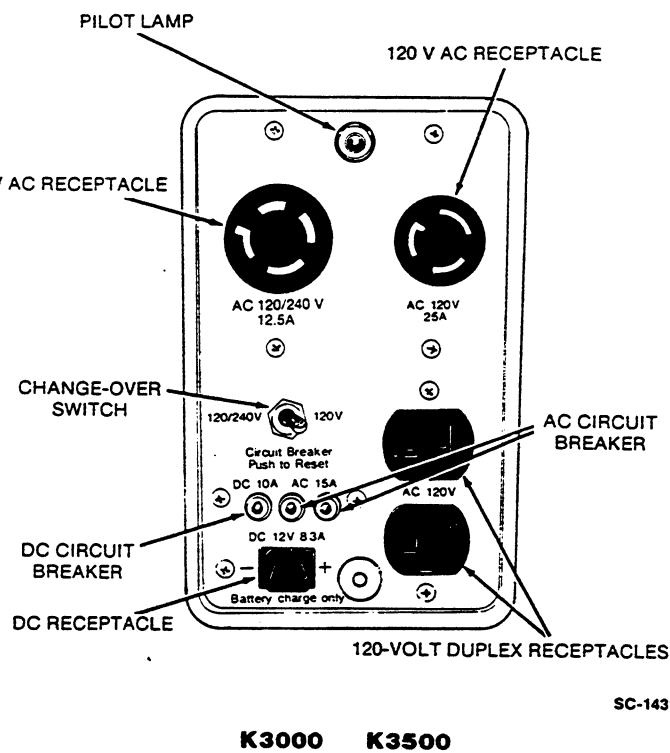
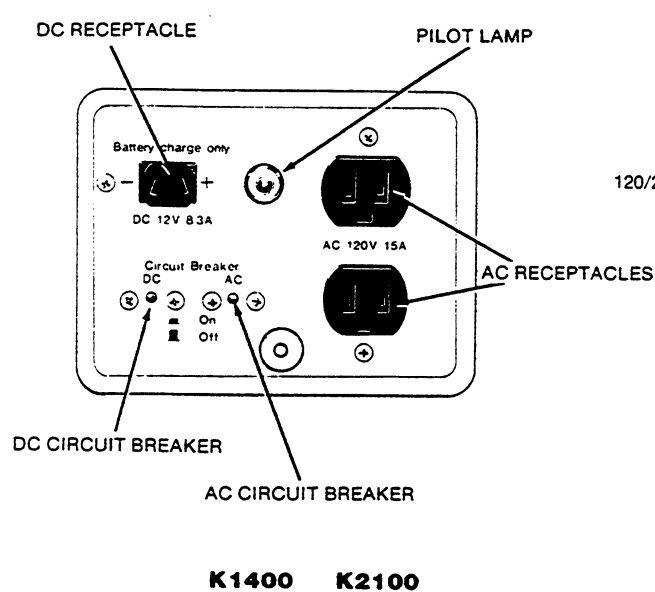
6. As engine warms up, gradually open the choke until it is completely open. Let the generator set run a few minutes without load to warm up the engine.

The PILOT LAMP on the control panel will light to indicate generator output is available. Figure 8 shows the control panels.

**WARNING** *The muffler can cause serious burns when the engine is running or right after the engine has run. Do not touch.*

### ADDING LOADS

Follow the appropriate procedure for either AC loads or DC loads. Do not use AC and DC power supplies at the same time.



SC-1431

FIGURE 8. CONTROL PANELS OF GENERATOR SETS

## Adding AC Loads

1. Note the rated output of the generator set (from either nameplate or from *SPECIFICATIONS*).
2. Check the load rating of the items you plan to connect to the generator set. Table 1 lists typical wattages for common appliances and tools.
3. Add the wattages of the items you want to operate and make sure the total wattage is not more than the generator set rated output. Note the examples following.

*Example 1: For a K1400 model with a 1200-watt rated output, you wish to operate a circle saw and some lighting. Since this saw uses 900 watts (from Table 1), there is 300 watts available for lighting or other loads.*

*Example 2: For a K2100 model with an 1800-watt rated output, you wish to operate a portable heater (1500 watts), a coffee percolator (850 watts), and a 100-watt light. Since the total is 2450 watts, you can not operate all these at the same time. For this example, we suggest you first use the heater and light, then the percolator and light, or vice versa.*

TABLE 1. TYPICAL WATTAGE REQUIREMENTS

Electrical Equipment	Typical Running Watts*
Circle Saw (7-1/4 in.)	900
Drill (3/8 in.)	400
Bench Grinder (8 in.)	1400
Trimmer (12 in. heavy duty)	500
Portable Heater	1500
Electric Water Pump	550
Sump Pump	350
Coffee Maker (drip)	1500
Coffee Percolator	850
TV (B & W)	60
TV (Color)	200
Range (small burner)	1275
Range (large burner)	2400
Refrigerator	600

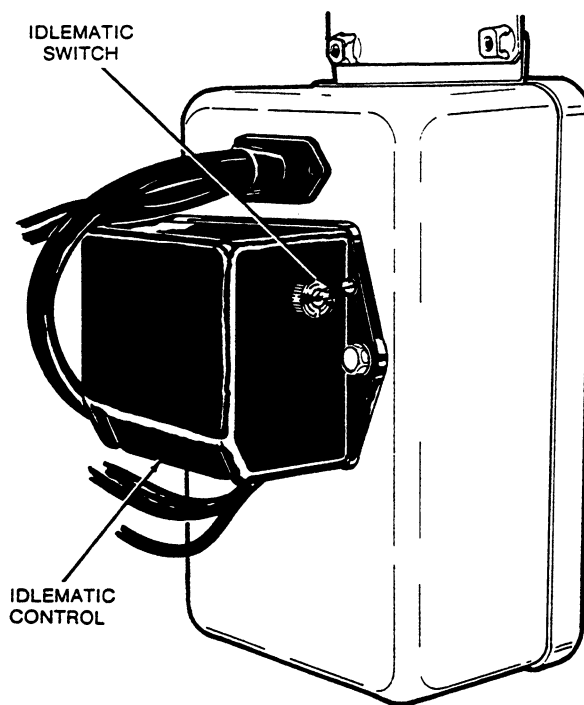
\*See text for typical starting watts of motor loads.

*If a motor load and another load total very close to the generator set rating, Onan recommends starting the motor load first. Motors consume much more current during starting than running (some as much as three times running load).*

4. **Models K3000 and K3500:** Move the Change-over switch to 120 V for use of the 120-volt duplex receptacle or 120-volt twist-lock receptacle, or to 120/240 V for the 120/240-volt twist-lock receptacle that corresponds to the equipment plug.
5. **Model K3500:** Move the Idlematic Switch to ON if you want the idlematic feature to operate automatically. This feature automatically controls engine speed to rise when loads are connected. If you do not want to use it, keep the switch at OFF (Figure 9).

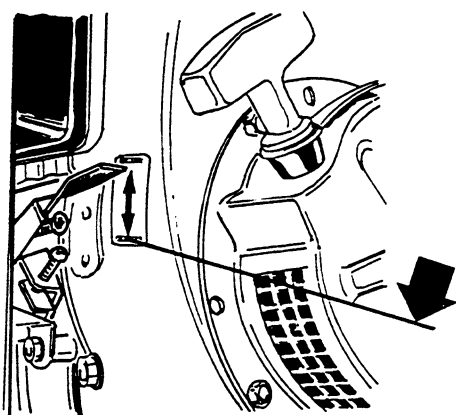
Keep the Idlematic Switch at OFF if you have a lot of small interrupted loads or loads under 0.8 ampere.

6. Move the Speed Control Lever to OPERATING. See Figure 10.

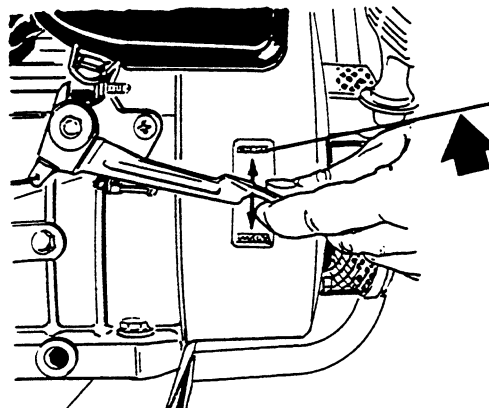


ES-1452

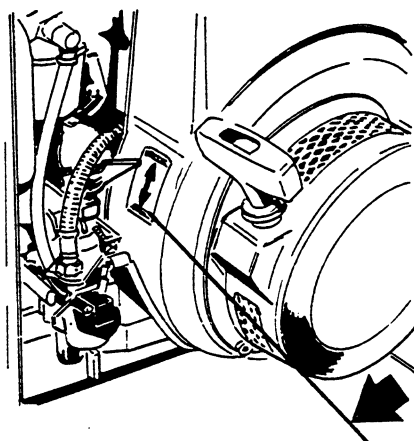
FIGURE 9. IDLEMATIC SWITCH LOCATION



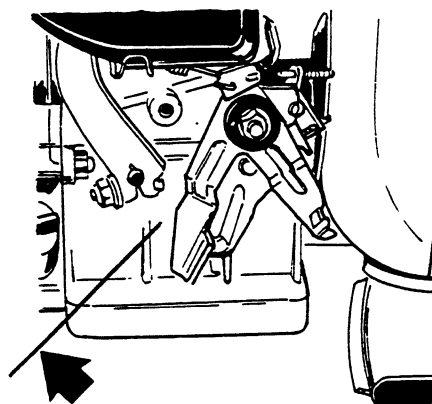
**K1400**



**K2100**



**K3000**



**K3500**

FIGURE 10. SPEED CONTROL LEVER OPERATION POSITION

FS-1538

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

**WARNING** *Cord and plug equipment with a ground terminal can provide additional protection against electrical shock which might cause serious personal injury or death.*

Do not use DC receptacles while using AC power.

### Adding DC Loads

Connect the DC loads to the DC receptacles on the control panel. Make sure load wires + and - agree with the polarities at the receptacle on the control panel. Maximum DC output is 8.3 amperes, 12 volts, or 100 watts.

**WARNING** *Batteries emit a highly-explosive gas that can be ignited by electrical arcing or by smoking. For battery charging, make sure first to connect the cables to the battery before connecting the cables to the generator set. This will prevent any arcing at the battery which can cause an explosion. When battery charging is complete, also make sure first to remove the cables at the generator set before removing the cables from the battery.*

Do not use AC receptacles while using DC power.

### CIRCUIT BREAKERS

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

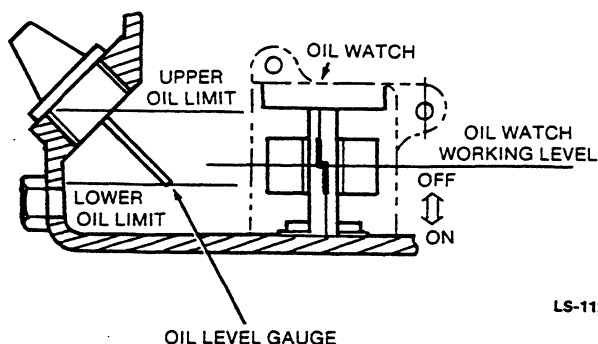
### OPERATION INDICATORS

#### Pilot Lamp

This lamp is located on the generator set control panel. It lights anytime the generator set is running to indicate generator power is available.

#### Oil Watch Indicator

The oil watch flashes during cranking if the oil level is low. It also stops the generator set if it is running and reaches the low working level of the oil watch (oil watch indicator lights while engine is stopping). See Figures 1 and 11. Add oil as necessary before attempting to restart.

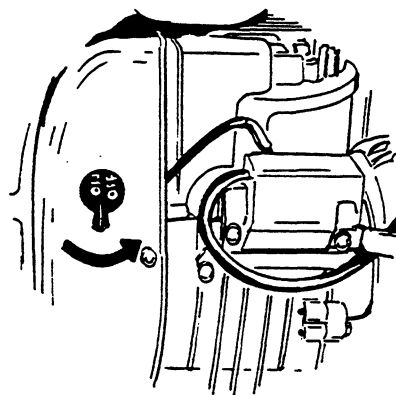


LS-1124

FIGURE 11. OIL WATCH

### STOPPING

1. Remove all loads from the generator set.
2. Set the Speed Control Lever to IDLE SPEED.
3. Let the generator set run at least a few minutes without load to allow for cool-down of the engine.
4. Close the fuel valve (K3000 stops with fuel valve at STOP).
5. **Models K1400, K2100, and K3500:** Stop the generator set by moving Engine Switch to OFF. See Figure 12. (Model K3000 stops when fuel valve is moved to STOP - Step 4.)



ES-1453

FIGURE 12. ENGINE SWITCH  
(K1400, K2100, and K3500)

### HIGH/LOW OPERATING TEMPERATURES

The generator will operate satisfactorily in both high and low temperatures. Use the oil recommended in the *MAINTENANCE* section for the expected temperature conditions.



### High Operating Temperatures

1. See that nothing obstructs airflow to and from the generator.
2. Keep the engine cooling fins clean. Air housings should be properly installed and undamaged.

### Low Operating Temperatures

1. Use fresh gasoline and keep the tank filled to avoid condensation.
2. Keep the spark plug clean and correctly gapped.

### EXTREMELY DUSTY/DIRTY CONDITIONS

Observe the following 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 gasoline in dust-tight containers suitable for storage of fuels.

### LONG-TERM STORAGE

For storage longer than 30 days, Onan recommends the following procedure.

1. Run the generator set until it has reached warm operating temperatures.
2. Close the fuel valve and stop the generator set.
3. Change the oil while the engine is still warm.

#### **WARNING**

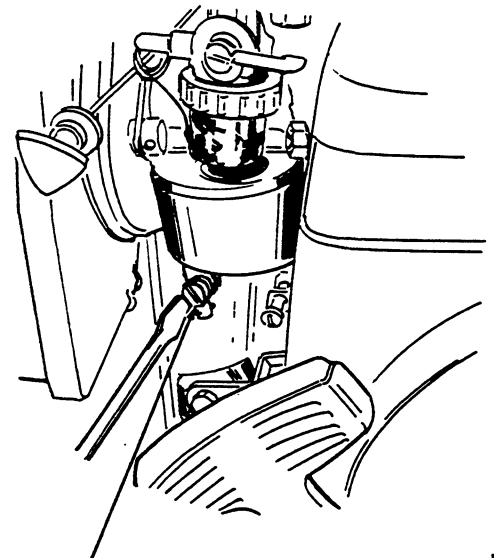
*Hot oil can cause serious burns if spilled or splashed on the skin. Keep fingers and hands clear when removing the oil drain plug, and wear protective clothing.*

4. Let the engine cool. Then drain the gasoline from the fuel tank into a container designed for fuel usage.

#### **WARNING**

*Ignition of fuel might cause serious personal injury or death. Do not permit any flame, cigarette, or other ignition source near the fuel system. Do not store generator set and fuel together. Proceed with care for any of the steps involving the fuel system!*

5. Drain gasoline from the carburetor float bowl by loosening the drain screw (make sure fuel valve is closed). Figure 13 shows a typical carburetor. Tighten the drain screw when finished.
6. Clean the fuel valve sediment bowl and screen.
7. Slowly pull the recoil handle until you feel heavy resistance. The engine is now in the compression stroke.
8. Cover the generator set and store it in a dry, protected area.



LOOSEN DRAIN SCREW

FS-1539

FIGURE 13. LOCATION OF CARBURETOR DRAIN SCREW

# Maintenance

Regularly-scheduled maintenance is the key to lower operator costs and longer service life. Use the time intervals shown in the schedule as a guide for regular maintenance. However, actual operating conditions should determine the schedule. Intervals must be

reduced when operating in very dusty or dirty conditions or in hot and cold temperature extremes. Instructions for the maintenance items follow the schedule.

## MAINTENANCE SCHEDULE

Maintenance Item	Interval				
	8 Hours (every day)	25 Hours (every week)	50 Hours (every week)	200 Hours (every month)	500 Hours
Clean generator set & check for loose parts	x <sup>1</sup>				
Check engine oil	x				
Clean air cleaner element		x <sup>2</sup>			
Change engine oil	(first 10 hours)		x <sup>2</sup>		
Clean spark plug			x		
Clean fuel filter				x	
Check spark plug gap				x	
Remove carbon deposits from cylinder head					x <sup>3</sup>
Clean carburetor and tank					x
Adjust intake and exhaust valves					x <sup>3</sup>
Overhaul					x <sup>3</sup>

Change fuel pipe indicator every year (where applicable).

x<sup>1</sup> - Check for oil, fuel, and exhaust leaks. Make any repairs before operating.

x<sup>2</sup> - Perform more often for extremely dusty conditions.

x<sup>3</sup> - Have Onan service representative perform.

## CHANGE ENGINE OIL

Change the engine oil only after the engine has run and is still warm. This ensures most particulates in the oil are still suspended and will leave the crankcase with the oil.

The engine oil drain plug is at the base of the engine (Figure 14). Remove carefully to drain the oil and catch the old oil in a container. Re-install the drain plug when all the oil is drained.

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

Use oils with the API (American Petroleum Institute) designation SE or SF class. Note the following temperature requirements.

Above 40° F (4.5° C)	SAE 30
Below 40° F (4.5° C)	SAE 20

Add oil to the engine until it reaches the top of the oil port (Figure 14). The *SPECIFICATIONS* section lists oil capacities.

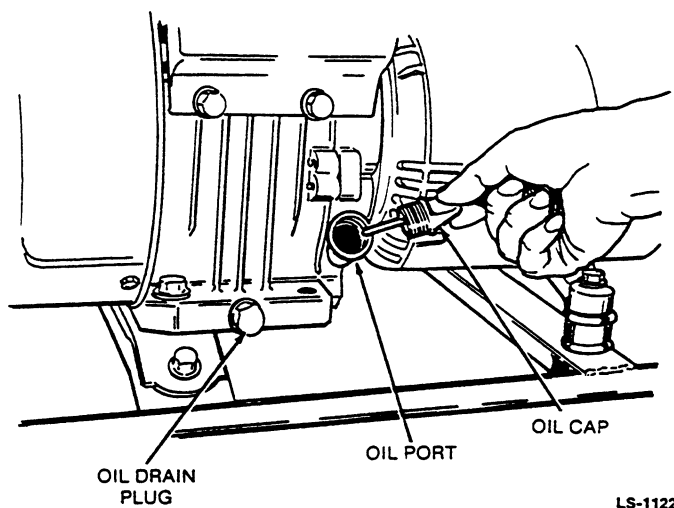


FIGURE 14. ENGINE OIL CAP, OIL PORT, AND OIL DRAIN PLUG

## ENGINE FUEL SYSTEM

### Fuel Filter

Periodically clean the fuel filter as follows:

1. Turn the fuel valve closed.
2. Turn the sediment bowl off the fuel valve. Be careful not to spill gasoline.

**WARNING** *Ignition of fuel might cause serious personal injury or death. Do not permit any flame, cigarette, or other ignition source near the fuel system. Proceed with care for any steps involving the fuel system!*

3. Remove the screen and clean out any dirt and particulate.
4. Re-install the screen and sediment bowl.

### Drain Carburetor

1. Turn the fuel valve closed.
2. Loosen the carburetor float bowl drain screw and run gasoline into a container designed for gasoline usage. Figure 13 of *OPERATION* section shows drain screw location.

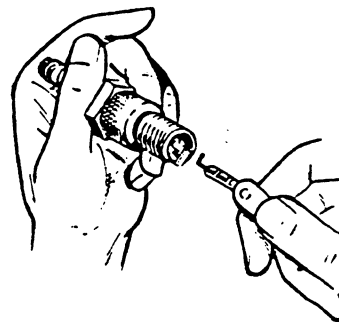
**WARNING** *Ignition of fuel might cause serious personal injury or death. Do not permit any flame, cigarette, or other ignition source near the fuel system. Proceed with care for any steps involving the fuel system!*

3. Tighten the carburetor bowl drain screw.

## SPARK PLUG

A badly-fouled spark plug will cause misfiring, poor operation, poor economy, or stopping with a load applied. Remove the spark plug and clean any carbon and deposits with a wire brush. Adjust the plug gap after cleaning (Figure 15). Plug gaps are listed in the *SPECIFICATIONS* section.

**CAUTION** *Do not clean spark plug by sand-blasting. Deposits remaining on the plug can cause premature engine wear.*



ES-1374

FIGURE 15. CHECKING SPARK PLUG GAP

## AIR CLEANER

1. Loosen the air cleaner cover. See Figure 16.
2. Take out the air cleaner element.
3. Remove the foam wrapper, and wash it in detergent and water. Dry thoroughly when finished.
4. Re-oil the foam wrapper and squeeze out excess oil.
5. Shake and tap the cartridge-type element to remove the dust and dirt. If still dirty, install new element.
6. Install the foam wrapper back onto the cartridge-type element.
7. Clean out the air cleaner housing and cover.
8. Re-install the element into the housing and put on the air cleaner cover.

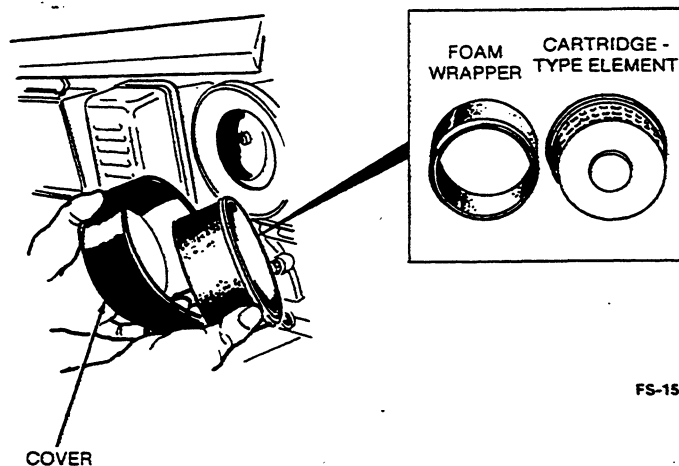


FIGURE 16. DUAL-ELEMENT AIR CLEANER

## MANUFACTURER'S LIMITED WARRANTY

### K Series Portable Generator U.S. AND CANADA

Onan extends to the original purchaser of goods for use, the following warranty covering goods manufactured or supplied by Onan, subject to the qualifications indicated.

THERE IS NO OTHER EXPRESS WARRANTY.

IMPLIED WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO PERIODS OF WARRANTY SET FORTH BELOW AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED.

IN NO EVENT IS ONAN LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

**Note:** Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply in every instance.

- (1) Onan warrants to original purchaser for the periods set forth below that goods manufactured or supplied by it will be free from defects in workmanship and material, provided such goods are installed, operated, and maintained in accordance with Onan's written instructions.

#### PRODUCT APPLICATION

- ☐ Goods used in personal, family and household applications.
- ☐ Goods used in commercial-industrial applications.
- ☐ Repair or replacement parts.

#### PERIOD OF WARRANTY

One (1) year from date of purchase.  
Ninety (90) days from date of purchase  
Ninety (90) days from date of purchase, excludes labor.

- (2) Onan's sole liability and Purchaser's sole remedy for a failure of goods under this warranty and for any and all other claims arising out of the purchase and use of the goods, including negligence on the part of the manufacturer, shall be limited to the repair of the product by the repair or replacement, at Onan's option, of parts that do not conform to this warranty, provided that the product or parts are returned to Onan's factory at 1400 73rd Avenue NE, Minneapolis, Minnesota 55432, or to an Onan Authorized Distributor or its designated service representative, transportation prepaid.
- (3) All claims must be brought to the attention of Onan or an Authorized Distributor or its designated service representative within thirty (30) days after discovery that goods or parts fails to meet this warranty.
- (4) THIS WARRANTY SHALL NOT APPLY TO:
- a) Cost of maintenance, adjustments, installation and start-up.
  - b) Failures due to normal wear, accident, misuse, abuse, negligence or improper installation, or lack of reasonable and necessary maintenance.
  - c) Products which are altered or modified in manner not authorized by manufacturer in writing.
  - d) Failure of goods caused by defects in the system or application in which the goods are installed.
  - e) Telephone, telegraph, teletype or other communication expenses.
  - f) Living and travel expenses of persons performing service.
  - g) Rental equipment used while warranty repairs are being performed.
  - h) Overtime labor requested by purchaser.

No person is authorized to give any other warranties or to assume any other liabilities on Onan's behalf, unless made or assumed in writing by an officer of Onan, and no person is authorized to give any warranties or assume any other liability on behalf of Seller unless made or assumed in writing by Seller.

- (5) This warranty gives the user specific legal rights, and the user may also have other rights which vary from state to state.

# **Important**

**Here is your Operator's Manual and other important information. Please save for future reference.**

## **For Models —**

**K1400**  
**(1.4KK-1P/1A)**

**K2100**  
**(2.1KM-1P/1A)**

**K3000**  
**(3.0KN-3P/1A)**

**K3500**  
**(3.5KP-3P/1A)**

**Onan Corporation**  
*A Subsidiary of*  
*McGraw-Edison Company*  
1400 73rd Avenue N.E.  
Minneapolis, MN 55432

612 574-5000  
Telex 29 0476 (U.S.)  
Telex 29 0856 (foreign)  
TWX 910 576-2833  
Cable ONAN