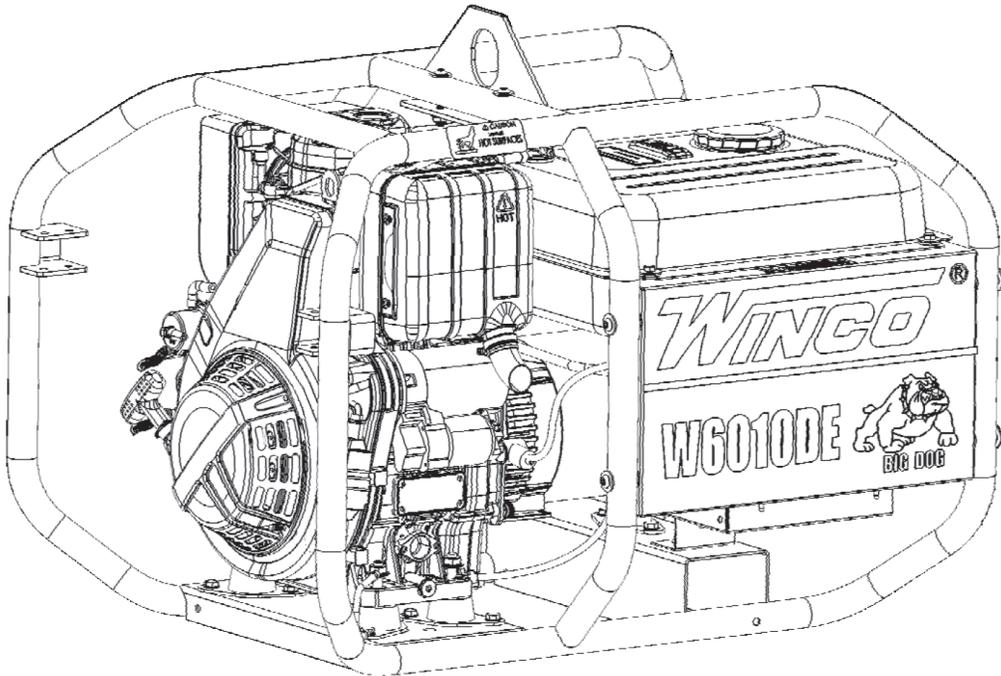


# WINCO®

## W6010DE/I GENERATOR



# INSTALLATION AND OPERATORS MANUAL

WINCO INC. 225 S. CORDOVA AVE. LE CENTER, MN 56057  
SALES DEPT. 507-357-6821  
SERVICE DEPT. 507-357-6831  
[www.wincogen.com](http://www.wincogen.com)

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COPY YOUR MODEL AND SERIAL NUMBER HERE  
No other WINCO generator has the same serial number as yours.  
If you should ever need to contact us on this unit, it will help us to respond to your needs faster.

MODEL \_\_\_\_\_

SERIAL NUMBER \_\_\_\_\_

PURCHASE DATE \_\_\_\_\_

DEALER NAME \_\_\_\_\_

DEALER PHONE # \_\_\_\_\_

## SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and maintenance of the generator. Read and understand all instructions in the manual before starting and operating the generator.

### USING THIS MANUAL

Congratulations on your choice of a WINCO generator. You have selected a high-quality, precision-engineered generator designed and tested to give you years of satisfactory service.

To get the best performance from your new generator, it is important that you carefully read and follow the operating instructions in this manual.

Should you experience a problem please follow the "Troubleshooting Tables" near the end of this manual. The warranty listed in the manual describes what you can expect from WINCO should you need service assistance in the future.

## SPECIFICATIONS

### GENERATOR

Model	W6010DE
Starting Watts	6,010
Running Watts	5,160
Volts	120/240
Starting Amps	50/25
Running Amps	43/21.5
Generator Manufacturer	Mecc Alte Spa
Generator Model Number	S20FS-160/A
Part Number	351836-1
Rotor Resistance	6.57 Ohms
Stator Resistance	0.124 Ohms
Cap Winding Resistance	0.60 Ohms
Capacitors	31.5 mF
Capacitor Part Number	300323-112

### ENGINE

Engine Manufacturer	Kohler
Engine Model Number	KD440
Fuel Type	Diesel
Oil Capacity	51.2 oz. (1.6 qts)

## TESTING POLICY

Before any generator is shipped from the factory, it is fully checked for performance. The generator is loaded to its full capacity, and the voltage, current, and frequency are carefully checked.

Rated output of generator is based on engineering tests of typical units, and is subject to, and limited by, the temperature, altitude, fuel, and other conditions specified by the manufacturer of applicable engines.

# SAFETY

## IMPORTANT SAFETY INSTRUCTIONS

### SAVE THESE INSTRUCTIONS

This manual contains important information that should be understood and followed before the installation, operation and maintenance of the generator. Failure to follow the safety instructions in this manual could result in serious injury or death. Keep this manual available for future reference.

## ANSI SAFETY DEFINITIONS

### DANGER:

*DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.*

### WARNING:

*WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*

### CAUTION:

*CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may be used to alert against unsafe practices.*

*NOTE: CAUTION is also used on the unit labels and in this manual to indicate a situation that could result in serious damage or destruction of the equipment and possible personal injury.*

### 1. ELECTRIC SHOCK -

The output voltage present in this equipment can cause a fatal electric shock. This equipment must be operated by a responsible person.

- A. Do not allow anyone to operate the generator without proper instruction.
- B. Guard against electric shock.
- C. Avoid contact with live terminals or receptacles.
- D. Use extreme care if operating this unit in rain or snow.
- E. Use only three-prong grounded plugs and extension cords.
- F. Be sure the unit is properly grounded to an external ground rod driven into the earth.

### 2. FIRE HAZARD -

- A. Keep a fire extinguisher nearby and know its proper use. Fire extinguishers rated ABC by NFPA are appropriate.

### 3. NOISE HAZARD -

Excessive noise is not only tiring, but continual exposure can lead to loss of hearing.

- A. Use hearing protection when working around this equipment for long periods of time.
- B. Keep your neighbors in mind when permanently installing this equipment.

### 4. CLEANLINESS -

Keep the generator and surrounding area clean.

- A. Remove all grease, ice, snow or materials that create slippery conditions around the unit.
- B. Remove any rags or other materials that could create a potential fire hazard.
- C. Carefully clean up any diesel or oil spills before starting the unit.

### 5. SERVICING EQUIPMENT -

All service, including the installation or replacement of service parts, **should be performed only by a qualified technician.**

- A. Use only factory approved repair parts.
- B. Do not work on this equipment fatigued.
- C. Use extreme caution when working on electrical components. High output voltages from this equipment can cause serious injury or death.
- D. Installing a generator is not a "do-it-yourself" project. Consult a qualified, licensed electrician or contractor. The installation must comply with all national, state, and local codes.

# INTRODUCTION

## INTENDED USES

This engine generator set has been designed primarily for portable heavy duty commercial use. Both 120 volt and 240 volt receptacles are provided in the control panel to plug in your loads (lights, portable tools, and small appliances). These units are dual wound generators, therefore the 120 volt loads must be equally split with 1/2 of the rated capacity available on each of the two 120 volt circuits.

This portable unit requires large quantities of fresh air for cooling the engine and generator. For safety, long life and adequate performance, these units should never be run in small compartments without positive fresh air flow.

## RESTRICTED USES

**DO NOT** operate generator where it could get wet or have pooling water near it. This generator is NOT weatherproof. Failing to keep generator in a dry area may cause an electrical shock, resulting in injury or death.

**DO NOT** remove from the cradle assembly. Removal of the generator from the cradle assembly may cause excessive vibration and damage to the engine-generator set.

**DO NOT** install and operate this generator in a small compartment, i.e. generator compartments of vehicles, motor homes or travel trailers. These compartments will not allow enough free flow of fresh air to reach the engine generator set for cooling and will cause the unit to overheat, damaging both the engine and generator. Small compartments will also develop hot spots where there is very little air flow and may cause a fire.

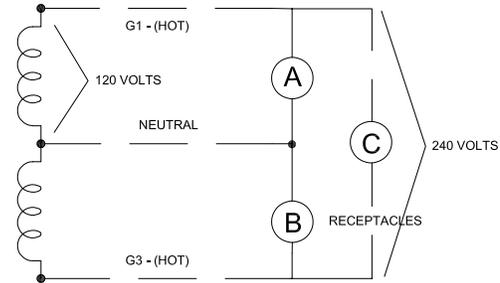
**PLEASE NOTE** There are 3rd party companies making enclosures for generators that have been properly engineered. The use of these 3rd party enclosures is acceptable as long as they have been engineered and meet applicable code.

**DO NOT** attempt to operate at 50 cycles. These units are designed and governed to operate at 60 cycles only.

# UNIT CAPABILITIES

## GENERATOR CONNECTIONS

W6010DE: 120 Volt and 240 Volt receptacles are provided for connection to various loads. The following diagram represents this 5,160 watt (rated output) generator. A & B represent the 120 volt output legs of this generator. Up to 2,580 watts at 120 volts (43 Amps) can be drawn from the receptacles attached to either A or B output legs. This generator is capable of producing 21.5 Amps of 240 volt current at C. Check the appliance or tool nameplates for the current and voltage to insure compatibility. Remember that power taken from C reduces the power available equally at both A and B and vice versa.



## STARTING ELECTRIC MOTORS

Electric motors require much more current (amps) to start them than to run them. Some motors, particularly low cost split-phase motors, are very hard to start and require 5 to 7 times as much starting current as running current. Capacitor motors are easier to start and usually require 2 to 4 times as much starting current as running current. Repulsion Induction motors are the easiest to start and require only 1 1/2 to 2 1/2 times as much starting as running current.

Most fractional horsepower motors take about the same amount of current to run them whether they are Repulsion Induction (RI), Capacitor (Cap), or Split-Phase (SP) type. The following chart shows the approximate current required to start and run various types and sizes of 120 Volt 60 cycle electric motors under average load conditions.

HP	Running Amps	STARTING AMPS		
		Split Phase Motor	Capacitor Motor	Repulsion Induction Motor
1/6	3.2	16 to 22	6 to 13	5 to 8
1/4	4.5	22 to 32	9 to 18	7 to 12
1/3	5.2	26 to 35	10 to 21	8 to 17
1/2	7.2	Not Made	14 to 29	11 to 18
1	13	Not Made	26 to 52	20 to 33

The figures given in the previous chart are for an average load such as a blower or fan. If the electric motor is connected to a hard starting load such as an air compressor, it will require more starting current. If it is connected to a light load, or no load such as a power saw, it will require less starting current. The exact requirement will also vary with the brand or design of the motor.

Self-exciting generators respond to severe overloading differently than utility power. When overloaded, the engine is not able to supply enough power to bring the electric motor up to operating speed. The generator responds with high initial starting current, but the engine speed drops sharply. The overload may stall the engine. If allowed to operate at very low speeds, the electric motor starting winding will burn out in a short time. The generator winding may also be damaged.

#### **CAUTION: EQUIPMENT DAMAGE**

*Running the generator set under these conditions may result in damage to the generator stator as well as the motor winding.*

The heavy surge of current required for starting motors is required for only an instant. The generator will not be damaged if it can bring the motor up to speed in a few seconds of time. If difficulty is experienced in starting motors, turn all other electrical loads off and if possible reduce the load on the electric motor.

Motor starting capacity - 2HP code 'G' capacitor start engine.

Trying to start a larger motor or higher code motor, i.e. 'J' or 'K', may result in damage to both the generator and the electric motor, especially 120 Volt motors.

## **PREPARING THE UNIT UNPACKING**

#### **CAUTION: EQUIPMENT DAMAGE**

*Always check oil level prior to use. Failure to maintain the engine oil at the proper level will result in serious engine damage.*

When you unpack your engine-generator set be sure to remove all the information sheets and manuals from the carton.

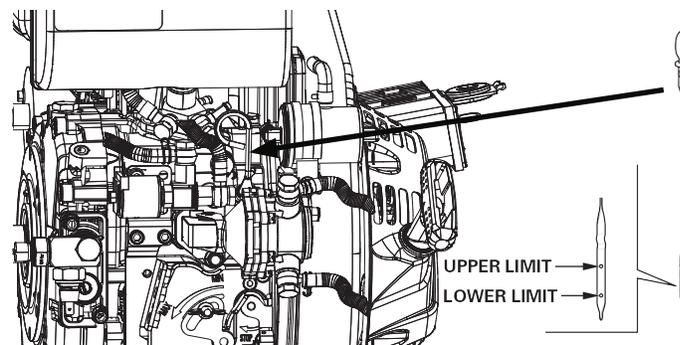
1. As you receive your unit, it is critical to check it for any damage. If any damage is noted, it is always easiest to refuse the shipment and let WINCO take care of the freight claim. If you sign for the unit, the transfer of the ownership requires that you file the freight claim
2. Before proceeding with the preparations of your new generator for operation, take a couple of minutes to ensure the unit you have received is the correct model and review the specification pages in this manual to ensure that this unit meets your job requirements.

## **LUBRICATION**

#### **CAUTION: EQUIPMENT DAMAGE**

*Failure to maintain the engine oil at the proper level will result in serious engine damage.*

Before starting the engine, verify the crankcase is filled to the proper level with a good quality oil. The recommended grade oil and quantity of oil required is listed in the engine operator's manual and under the service tab in this manual. This unit was shipped with oil in it. The engine normally holds 1.6 quarts (51.2 oz.) of oil. Use the dipstick to ensure that you have the proper oil level in the crankcase. The full oil level mark on the dipstick is depicted in the following image.

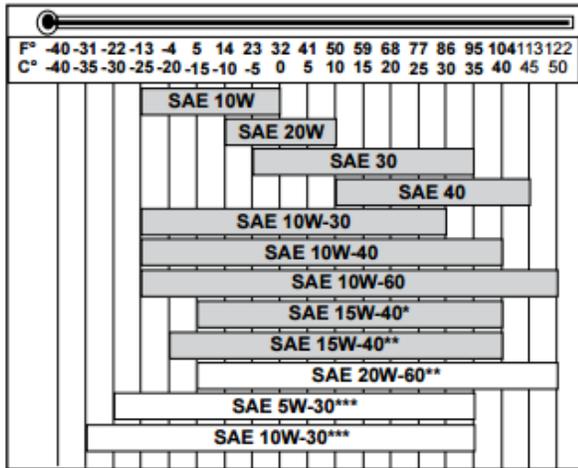


Oil is added to the engine by removing the oil cap and adding oil at this point. After filling the crankcase to the proper level, be sure you properly tighten the oil fill cap. NOTE: This engine generator must be on a level surface before you check or add oil to the system.

The necessity of using the correct oil and keeping the crankcase full cannot be overemphasized. Engine failures resulting from inadequate or improper lubricant are considered abuse and not covered by the generator or engine manufacturer's warranty.

## OIL RECOMMENDATIONS

Outdoor temperatures determine the proper oil viscosity for the engines. Use the chart to select the best viscosity for the outdoor temperature range expected.



## DIESEL FUEL

Always use a good grade of # 2 diesel fuel. For cold weather, blended #1 fuel may be used. Fuel cetane number should be 45 or higher and the fuel MUST be low sulfur or ultra low sulfur fuel. See engine operators manual for additional fuel recommendations including Bio-Diesel fuel. Never use gasoline or gasohol. Always ensure that the fuel is clean and free of all impurities. Always be sure to keep the strainer in place when filling the fuel tank.

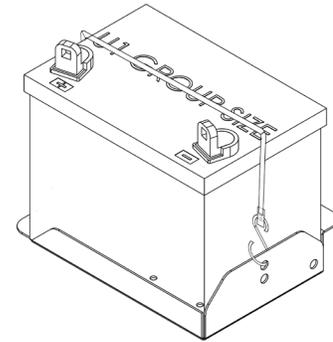
### WARNING: FIRE DANGER

*Diesel fuel is flammable and can be ignited, causing or enlarging fires when proper precautions are not taken.*

Never use fuel that has been stored for an extended period of time. Fuel will lose its volatile properties and you will be left with a 'gum' or varnish residue. This varnish-like substance will clog the filters, fuel lines, and injectors. Old, contaminated, stale fuel will not burn properly. The use of a fuel additive, such as Sta-Bil, or an equivalent will minimize the formation of fuel gum deposits. If a unit has been out of operation for an extended period of time, it is best to drain old fuel from the engine and replace with fresh fuel before attempting to start.

## BATTERY INSTALLATION

This engine generator set is shipped with a battery tie down for customer installation.



A customer supplied 12 Volt battery, BCI group U1 rated at 300 CCA or larger is recommended for this electric start engine-generator set. Follow the battery manufacturers recommendations for servicing and charging prior to use. Connect the battery to the electric start system using the cables provided.

Installation and servicing of batteries must be performed or supervised only by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

When installing or replacing batteries, use proper group/size starting battery. The battery should be a maintenance free lead acidic design. Deep cycle batteries will NOT work for this application.

### CAUTION: EQUIPMENT DAMAGE

*These electric start engines are NEGATIVE GROUND. Use extreme caution when connecting the battery. Connect the NEGATIVE battery terminal to GROUND.*

For your safety, always connect the positive battery cable to the "bat+" terminal first. Then connect the negative battery cable to the "Bat-" terminal. Make sure all connections are clean and tight. Reverse the sequence when disconnecting, disconnect the negative cable first. These engines produce enough direct current to keep the battery charged under normal operating conditions, but were not intended to be used as a battery charger.

### WARNING: PERSONAL INJURY

*Lead acid batteries produce explosive hydrogen gas when charging. Keep sparks, flames, and burning cigarettes away from the battery. Ventilate the area when charging or using the battery in an enclosed space. Lead acid batteries contain sulfuric acid, which causes severe burns. If acid contacts eyes, skin, or clothing, flush well with water. **For contact with the eyes, get immediate medical attention.***

### CAUTION:

*Do NOT open or mutilate the battery. Released electrolyte is known to be harmful to the skin and eyes and to be very toxic.*

*A battery presents a risk of electrical shock and high short circuit current. The following precautions must be observed when working with batteries:*

1. Remove watches, rings and other metal objects.

2. Use tools with insulated handles.
3. Check both the battery cable ends and the battery posts to be sure they are free of corrosion.
4. Always connect the battery positive first and then connect the battery negative cable. When removing the battery cables from the battery reverse the procedure, disconnect the negative cable first and then the positive cable.
5. Be sure all connections are tight and coat the terminals and cable end with dielectric grease.

**WARNING:**

The electrolyte is diluted sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. The following precautions must be always be taken.

1. Always wear full eye protection and protective clothing.
2. Where electrolyte contacts skin, wash off immediately with water.
3. If electrolyte contacts the eyes, flush thoroughly and immediately with water and seek immediate medical attention.
4. Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of one pound of bicarbonate of soda (baking soda) to one gallon of water. The bicarbonate of soda solution is to be added until the evidence of reaction, foaming, has ceased. The resulting liquid is to be flushed water and the area dried.

**DANGER: EXPLOSIVE FIRE RISK**

Never smoke when near batteries. Do not cause a flame or spark in the battery area. Always discharge static electricity from your body before touching batteries by first touching a ground metal surface.

**SERVICING BATTERIES**

Batteries used on these units may over time lose water. This is especially true if you are using a trickle charger to maintain your battery. When refilling the battery with water use only distilled water. Tap water will shorten the service life of the battery.

Never fill the battery above the fill line. Overfilling above the upper level line may cause the electrolyte to overflow, resulting in corrosion to the engine or nearby parts. Immediately wash off any spilled electrolyte following the procedure above.

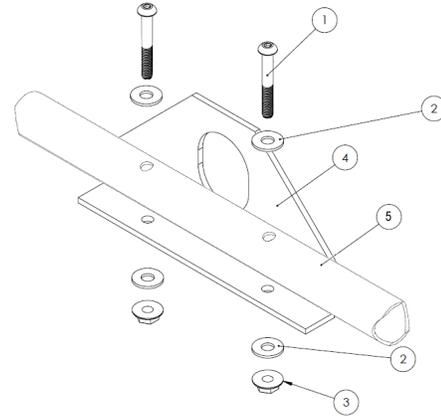
Note: always make sure that a new battery is fully charged before installing it on a generator set.

All connections must be clean and tight. Check the electrolyte (fluid) in the battery periodically to be sure it is above the plates. Never allow the battery to remain in a discharged condition.

**BATTERY CHARGING**

Units have a small flywheel charger built into the engine flywheel assembly for recharging the starting battery. This flywheel charger generates a small AC current that passes through a diode assembly to produce DC charging current of about 1 to 3 Amps. This circuit is not designed to be used as a battery charging circuit to recharge dead batteries.

**LIFTING EYE INSTALLATION**



In the bag of parts for the lifting eye, ensure all of the required materials are included: 2 qty - 5/16-18 x 2.25 button head socket screws (#1); 4 qty - washers (#2); 2 qty - .3125-18 flange (#3); 1 qty - lifting eye (#4).

1. Place the bottom of the lifting eye (#4) under the cross bar (#5).

**CAUTION: EQUIPMENT DAMAGE**

Ensure the lifting eye is NOT installed on top of the cross bar.

2. In each hole, place 1 washer (#2) between the top of the cross bar and the button head screw (#1). Place 1 washer (#2) between the base of the lifting eye and flange (#3). Secure the screw and flange, ensuring it is torqued.

# INITIAL START UP

The throttle control on these generators is preset and locked to operate at 3600 RPM (nominal) with no load speed set at 3690 RPM. Only a trained service technician should be allowed to adjust this speed setting.

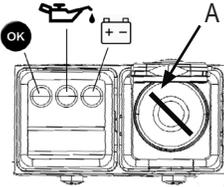
## NOTICE: ENGINE START LOCKOUT

This unit will not start if it is low on oil. The lubricating oil level must be at the full mark before the engine will start and run. This engine will not start without a battery. The fuel shut-off solenoid requires 12V DC to operate.

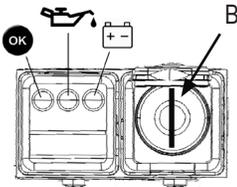
## BASIC OPERATION

If the engine is cold and stiff or if the battery is not fully charged, starting can be made easier by slowly hand cranking the engine through the compression stroke before pushing the starter switch. This permits the starter to gain momentum before the heavy load of the compression stroke occurs. This minimizes the drain on the battery and improves the possibility of starting under such adverse conditions. Always keep the battery charged, especially during cold weather operation.

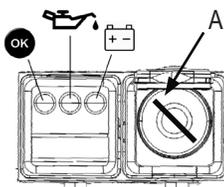
1. Check oil level, refill as needed.
2. Turn on the fuel supply. Lever pointing up is on, lever pointing down is off.
3. Turn key to 1st position (Ref A).



4. Turn key to the 2nd position - starting (Ref B).



5. Return key to 1st position when engine is running (Ref A).



**NOTE:** While the engine is running, all warning lights should be off except the OK light.

# STARTING HINTS

## 1. COLD WEATHER

Use the proper oil for the temperature expected.

## CAUTION: EQUIPMENT DAMAGE

Never use ether or any other starting aides. Serious engine damage or personal injury may result from ignoring this simple warning.

## 2. HOT WEATHER

Use the proper oil for the temperature expected.

# STOPPING

1. Move the key to the "OFF" position.
2. Turn off the fuel supply valve.
3. Before extended storage (over 30 days) certain precautions must be taken to ensure the fuel doesn't deteriorate and clog the fuel system.

**NOTE:** Running the engine to use up the fuel in the lines and carburetor will still leave a small amount of fuel in carburetor. It is best extended storage to treat the fuel before draining.

D. While the engine is warm, drain the oil and refill with fresh oil.

E. Clean dirt and chaff from cylinder, cylinder head fins, blower housing, screen, and muffler areas.

F. Store in a clean and dry area.

## OPERATING SPEED

The engine-generator must be run at the correct speed in order to produce the proper electrical voltage and frequency.

## CAUTION: EQUIPMENT DAMAGE

The output voltage should be checked to ensure the generator is working properly prior to connecting a load to the generator. Failure to do so could result in damage to equipment plugged into the unit and possible injury to the individual.

All engines have a tendency to slow down when a load is applied. When the electrical load is connected to the generator, the engine is more heavily loaded, and as a result, the speed drops slightly. This slight decrease in speed, together with the voltage drop within the generator itself, results in a slightly lower voltage when the generator is loaded to its full capacity than when running no load. The slight variation in speed also affects the frequency of the output current. This frequency variation has no appreciable effect in the operation of motors, lights, and most appliances. However, electronic equipment and clocks will be affected if correct RPM is not maintained. See Load vs. Output chart.

Although individual units and models vary slightly, the normal voltage and frequency of the engine-generator described in this manual are approximately as follows, under varying loads:

## LOAD vs. OUTPUT

Generator Load	Speed (RPM)	Frequency (Hz)	Voltage	
			120V Recpt	240V Recpt
None	3690	61.5	125V	258V
Half	3600	60.0	120V	240V
Full	3510	58.5	115V	230V

The speed of the engine was carefully adjusted at the factory so that the generator produces the proper voltage and frequency. For normal usage, the speed setting should not be changed. If the generator is being run continuously on a very light load, it is often advisable to lower the operating speed slightly.

The engine will govern itself at full speed. Intentionally overriding the governor and operating the generator at low voltage may damage both the generator and any load connected to it. Running the engine at excessively high speeds results in high voltage, which may significantly shorten the life of light bulbs and appliances being used, as well as possibly damaging the engine.

### **CAUTION: EQUIPMENT DAMAGE**

**SPEED ADJUSTMENTS SHOULD ONLY BE MADE BY A QUALIFIED SERVICE TECH.** Whenever making any speed adjustments, check the unit with a voltmeter and a frequency meter or a tachometer and be sure the voltage and speed are correct.

Output voltage should be checked periodically to ensure continued proper operation of the generating plant and appliances. If the generator is not equipped with a voltmeter, it can be checked with a portable meter.

## CONNECTING THE LOADS

The engine-generator covered in this manual was designed for portable use. Do NOT operate indoors. The unit should be stored in a warm, dry location. Move the unit outdoors to a flat dry location for use.

## APPLYING THE LOADS

Allow the engine to warm up for two or three minutes before applying any load. This will allow the engine to reach normal operating temperature and oil to circulate throughout the engine. A short warm-up time will permit the engine to work more efficiently when the load is applied and will reduce the wear in the engine, extending its life. Receptacles have been provided to allow loads to be connected to the generator.

The loads should be added one at a time. If a large motor is being started: or multiple motors are being started, they should be started individually and the largest should be started first.

### **CAUTION: EQUIPMENT OVERLOAD**

*Keep the generator load within in the generator and receptacle nameplate rating. Overloading may cause damage to the generator and/or the loads.*

Most electric tools and appliances will have the voltage and amperage requirements on their individual nameplates. When in doubt, consult the manufacturer or a local electrician. The nameplate amperage rating for electric motors can be misleading. See "Starting Electric Motors" in the Unit Capabilities.

These engine-generator sets are inherently self regulating based on engine speed. The engine governor will automatically adjust itself to the load. No harm to the generator will result if it is operated with no load connected.

### **CAUTION: EQUIPMENT DAMAGE**

*Diesel engines should never be run for an extended period of time with a very light load or no load on them, it may do permanent damage to the engine if run under these conditions.*

Proper utilization of the receptacles located on the control panel is necessary to prevent damage to either the receptacles or the generator. The generator is a limited source of electrical power, therefore, pay special attention to the receptacle and generator ratings. The nameplate rating can be obtained through a single receptacle as long as the receptacles amperage rating is not exceeded.

## GROUNDING

All units must be grounded. Drive a 3/4 or 1" copper pipe or rod into the ground close to the engine-generator set. The pipe must penetrate moist earth. Connect an approved ground clamp to the pipe. Run a no. 10 Awg wire from the clamp to the generator ground lug on the receptacle panel. Do not connect to a water pipe or to a ground used by a radio system. The engine-generators covered in this manual were designed primarily for portable use. If you are connecting into a building

wiring system that is already grounded using the 14-30 4 wire plug, you do not have to ground the unit.

**WARNING: PERSONAL DANGER**

**DO NOT OPERATE THIS GENERATOR INDOORS,** *The unit should be stored in a warm, dry location. During a power outage, move the unit outdoors to a flat, dry location such as a driveway or sidewalk.*

## **WIRING**

Plug your tools such as drills, saws, blowers, sump pump, and other items to be powered directly into the generator receptacles. Before plugging in all the tools and cord sets, recheck the rating of the generator set. Be sure it can handle the intended load and is compatible with the voltage, phase, and current ratings. 'Hard wiring' this unit directly into a temporary construction site electrical system is NOT A SIMPLE DO-IT-YOURSELF JOB. For your safety, all wiring must be done by a qualified electrician and conform to the National Electric Code and comply with all state/local codes and regulations. Check with local authorities before proceeding.

**WARNING: PERSONAL DANGER**

*A fully isolated, double pole double throw manual transfer switch must be installed any time a generator is being connected to an existing distribution system.*

1. These engine-generator sets are designed for portable heavy duty commercial use. Receptacles are provided on the control panel to permit 120 and 240 Volt portable appliances and tools to be plugged directly into them. Please note that the 3-wire 240 Volt receptacle(s) on these units are designed to power only 240 Volt tools. There are two hot leads and a ground wire, but no neutral connection, in the 3-wire 240Volt receptacle. A 4-wire receptacle (two hot, one ground, and one neutral) has been provided on the control panel for use in temporary power applications requiring 120/240 Volt power. Consult a licensed electrician for wiring the TemPower plug and connecting it as temporary service.

To connect these units directly to an un-powered, isolated construction site TemPower panel, have your electrician connect to the control panel using a 120/240 Volt, 4-wire twist-lock plug (L14-30P).

2. If the generator set is connected to an existing distribution system, a fully isolated manual transfer switch must be installed. The transfer switch prevents damage to the generator and the other circuit components if main line power is restored while the generator is connected. This generator is GFCI protected, so the transfer switch needs to be GFCI compatible. If the transfer switch is not GFCI compatible, the breaker on the generator will always trip.

3. Many homes and construction sites are wired for at least 60 to 100 Amp entrance service, much greater than the capacity of this portable generator. When installing the generator at these sites, a secondary emergency distribution panel may have to be installed. The emergency distribution panel must be installed by a licensed electrician according to all applicable codes. The electrician will move the critical circuits to be powered during the outage to the emergency panel. Keep in mind only a limited amount of amperage is available from the generator set.

Some circuit breakers may still have to be turned off to prevent an overload on the generator during the initial start up. See the nameplate on your generator for the amperage capabilities of your unit.

**CAUTION: EQUIPMENT DAMAGE**

*Failure to properly limit and balance the load applied to the generator will cause the generator to produce low voltage and may damage the engine generator set. It may also cause severe damage to the loads connected to the generator at that time. Improper loading of the generator set constitutes abuse and will not be covered by warranty.*

# ENGINE CARE

## MAINTENANCE SCHEDULE

	Daily or Every 10 hrs	Every 250* hrs	Every 500** hrs
Check Oil	✓		
Check oil filter	✓		
Check dry air cleaner	✓		
Fuel tank cleaning			✓
Clean cooling fins			✓
Replace engine oil		✓	
Replace oil filter		✓	
Replace fuel filter			✓
Set and clean injectors			✓
Rocker arm adjustment			✓

\* If engine use is infrequent; every year  
 \*\*If engine use is infrequent; every 2 years

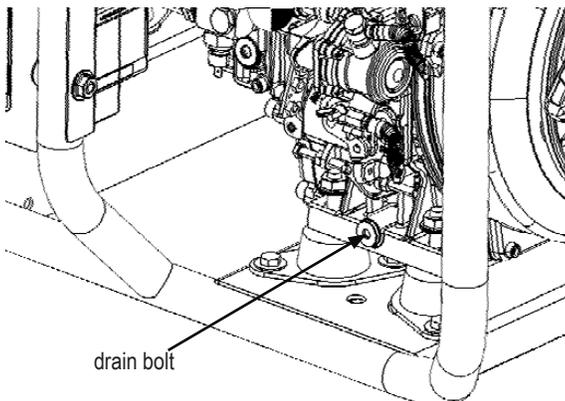
If you are using oil of a quality lower than the recommended one then you will have to replace it every 150 hours

If major engine service or repair is required, contact an authorized engine service center. The manufacturer of these engines has established an excellent world-wide engine service organization. Engine service is very likely available from a nearby authorized dealer or distributor.

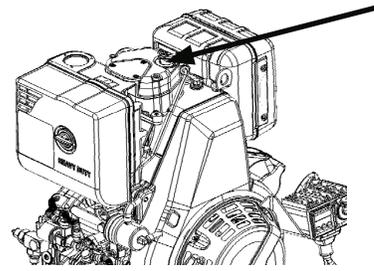
## CHANGING THE OIL

Change the oil after the first 50 hours of operation and yearly or 250 hours thereafter under normal operating conditions.

- Change oil while the engine is still warm, the oil will flow more freely.
- Remove the oil drain bolt at base of the engine and drain the oil into an approved container.



- Replace oil drain plug.
- Remove oil fill cap.



- Fill to correct level with oil. Reinstall cap.
- Remove the oil filter and dispose of it properly.



**NOTE:** This engine requires 51.2 oz. (1.6 qts) of oil if it is completely drained. Use caution when refilling the engine as some residual oil may have remained in the engine. Always use the dipstick when filling the engine with oil to prevent overfilling.

- Replace oil filter and filter plug.
- Start the engine and warm it up.
- After warming up the engine, recheck the oil level and refill as necessary to bring it to the proper level.

## CHECKING THE OIL LEVEL

The oil level must always be checked before the engine is started. Take care to remove any dirt or debris from around the oil plug before removing. Be sure the oil level is maintained. Fill to the "FULL" mark on the dipstick.

## AIR FILTER

Clean the filtering element with air blast. Air must be blown from inside to outside the cartridge at a distance of at least 6 inches from the paper. Lightly and repeatedly tap the element on a hard surface to eliminate all excess dirt.

## WARNING: EQUIPMENT DAMAGE

Never start or run the engine with the air filter removed.

- A. Remove the cover.



- B. Remove the wing nut.



- C. Remove the filter element.



- D. Check the rubber seal is undamaged.



- E. To loosen debris, gently tap the air filter on a hard surface. If the air filter is excessively dirty replace with a new filter. You can use pressurized air (not to exceed 30 psi) to clean the filter. Always blow the compressed air from inside to the outside.
- F. Clean the dirt from the inside of the air cleaner body and cover. Reinstall the filter in housing. Tighten the wing nut securely.
- G. Install and secure the cover.
- H. Remove and clean the pre-filter if clogged.

## GENERATOR CARE

Proper care and maintenance of the generator is necessary to ensure a long trouble free life.

## EXERCISING THE GENERATOR

The generator should be operated every three to four weeks. It should be operated for a period of time sufficient to warm the unit up and to dry out any moisture that has accumulated in the windings. If left, this moisture can cause corrosion in the winding. Frequent operation of the engine-generator set will also ensure that the set is operating properly should it be needed in an emergency.

## GENERATOR MAINTENANCE

Any major generator service, including the installation or replacement of parts, should be performed only by a qualified electrical service technician. **USE ONLY FACTORY APPROVED REPAIR PARTS.**

- A. Bearing - The bearing used in these generators is a heavy duty, double sealed ball bearing. They require no maintenance or lubrication.
- B. Receptacles - Quality receptacles have been utilized. If a receptacle should become cracked or otherwise damaged, replace it. Using damaged or cracked receptacles can be both dangerous to the operator and destructive to the equipment.

## CLEANING

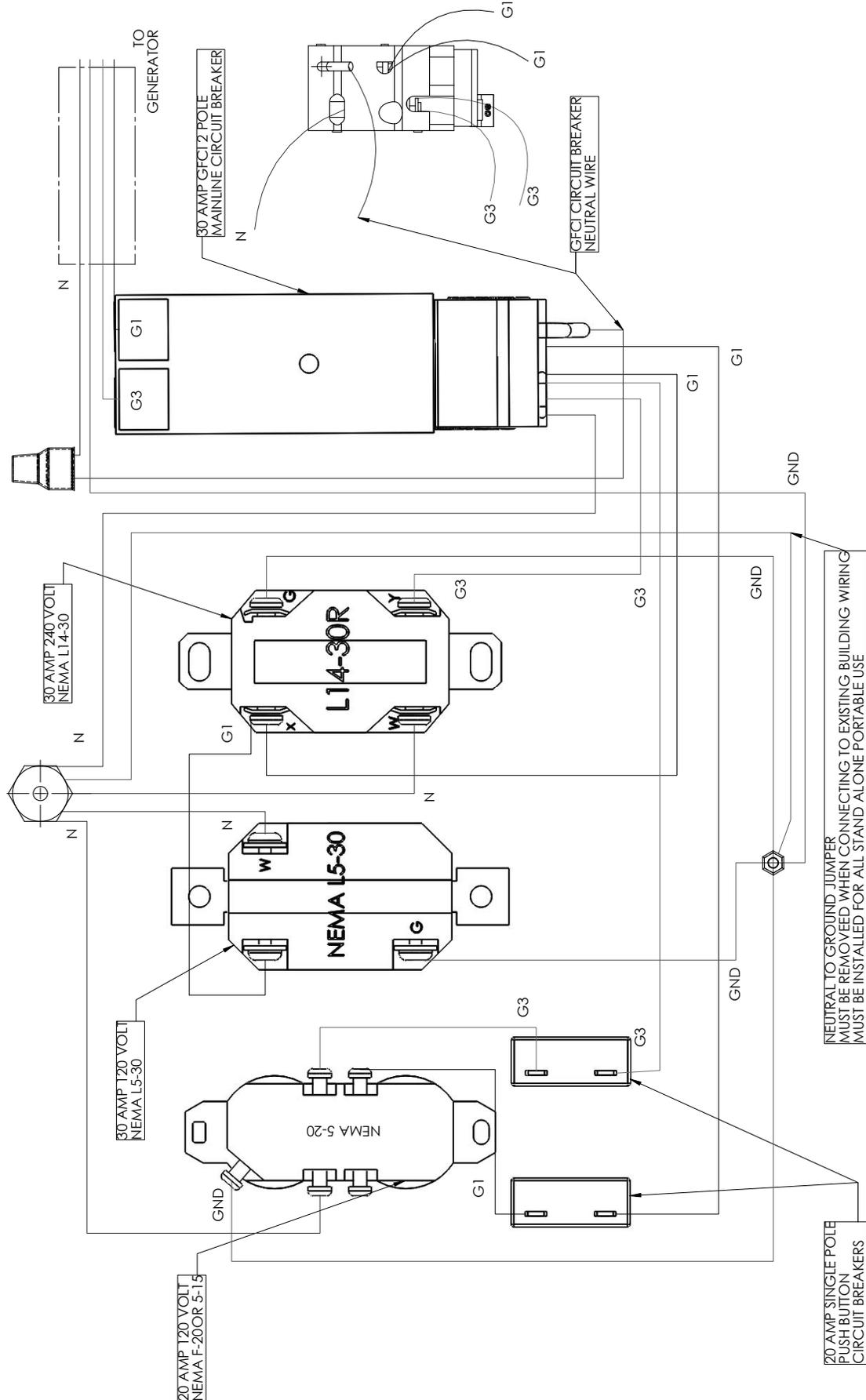
Remove dirt and debris with a cloth or brush. DO NOT use high pressure spray to clean either the engine or the generator. The high pressure spray could contaminate the fuel system and the generator components.

1. Keep the air inlet screen on both the engine and generator free of any dirt or debris to ensure proper cooling. At least yearly, remove the blower housing on the engine and clean the chaff and dirt out of the engine cooling fins and fly wheel. Clean more often if necessary. Failure to keep these areas clean may cause overheating and permanent damage to the unit.
2. Periodically clean muffler area to remove all grass, dirt, and combustible debris to prevent a fire.
3. On engine mufflers equipped with spark arresters, the spark arrester must be removed every 50 hours for cleaning and inspection. Replace if damaged.

# TROUBLESHOOTING

Problem	Possible Causes
Won't start	<ul style="list-style-type: none"> <li>Low oil level</li> <li>Out of fuel</li> <li>Start switch in OFF position</li> <li>Fuel Valve turned off</li> <li>Plugged fuel filter</li> <li>Blown fuse in key switch</li> <li>Battery required to open solenoid</li> </ul>
Voltage too low	<ul style="list-style-type: none"> <li>Engine speed is too low</li> <li>Generator overloaded</li> <li>Defective stator</li> <li>Defective rotor (field)</li> <li>Defective capacitor</li> </ul>
Circuit breaker trips	<ul style="list-style-type: none"> <li>Defective load</li> <li>Defective receptacle</li> <li>Excessive load</li> <li>GFCI type of load i.e. a building with bonded neutral</li> </ul>
Voltage too high	<ul style="list-style-type: none"> <li>Engine speed is too high</li> </ul>
Generator overheating	<ul style="list-style-type: none"> <li>Overloaded</li> <li>Insufficient ventilation</li> </ul>
No output voltage	<ul style="list-style-type: none"> <li>Short in load (disconnect)</li> <li>Tripped or defective circuit breaker</li> <li>Broken or loose wire</li> <li>Defective receptacle</li> <li>No residual magnetism (in generator)</li> <li>Defective stator</li> <li>Defective rotor (field)</li> <li>Shorted capacitor</li> <li>Shorted diodes on rotor</li> <li>GFCI receptacle tripped</li> </ul>

# CONTROL PANEL WIRING DIAGRAM



NEUTRAL TO GROUND JUMPER  
MUST BE REMOVED WHEN CONNECTING TO EXISTING BUILDING WIRING  
MUST BE INSTALLED FOR ALL STAND ALONE PORTABLE USE



## **36 MONTH LIMITED WARRANTY**

WINCO warrants to the original purchaser for 36 months or 1000 hours, whichever occurs first, 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 WINCO written instructions and applicable codes.

WINCO's sole liability, and Purchaser's sole remedy for a failure under this warranty, shall be limited to the repair of the product. At WINCO's option, material found to be defective in material or workmanship under normal use and service will be repaired or replaced. For warranty service, return the product within the warranty period, to your nearest WINCO Authorized Service Center or to WINCO in Le Center Minnesota.

### **Duration Consumer, Commercial and Rental**

Parts & Labor: 24 Months

Parts Only: 24-36 Months

### **EXCLUSIONS:**

- Normal maintenance consumables or labor.
- This warranty does not cover travel time, mileage or labor for removal or re-installation of WINCO product from its application.
- Normal wear and tear.
- Costs of rental equipment.
- WINCO does not warrant engines. Engines are covered exclusively by the warranties of their respective manufacturers.
- WINCO does not warrant component parts that are warranted by their respective manufacturers.
- WINCO does not warrant modifications or alterations which were not made by WINCO.
- WINCO does not warrant products which have been subjected to misuse and/or negligence or have been involved in an accident. Proof of proper maintenance must be furnished upon request.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE DESCRIBED HEREIN. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, OR OTHERWISE CREATED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, OR WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE.

WINCO is liable for the repair or replacement of the product only and is not liable for incidental or consequential damages as permitted by your state. This warranty gives you specific legal rights which may vary from state to state.