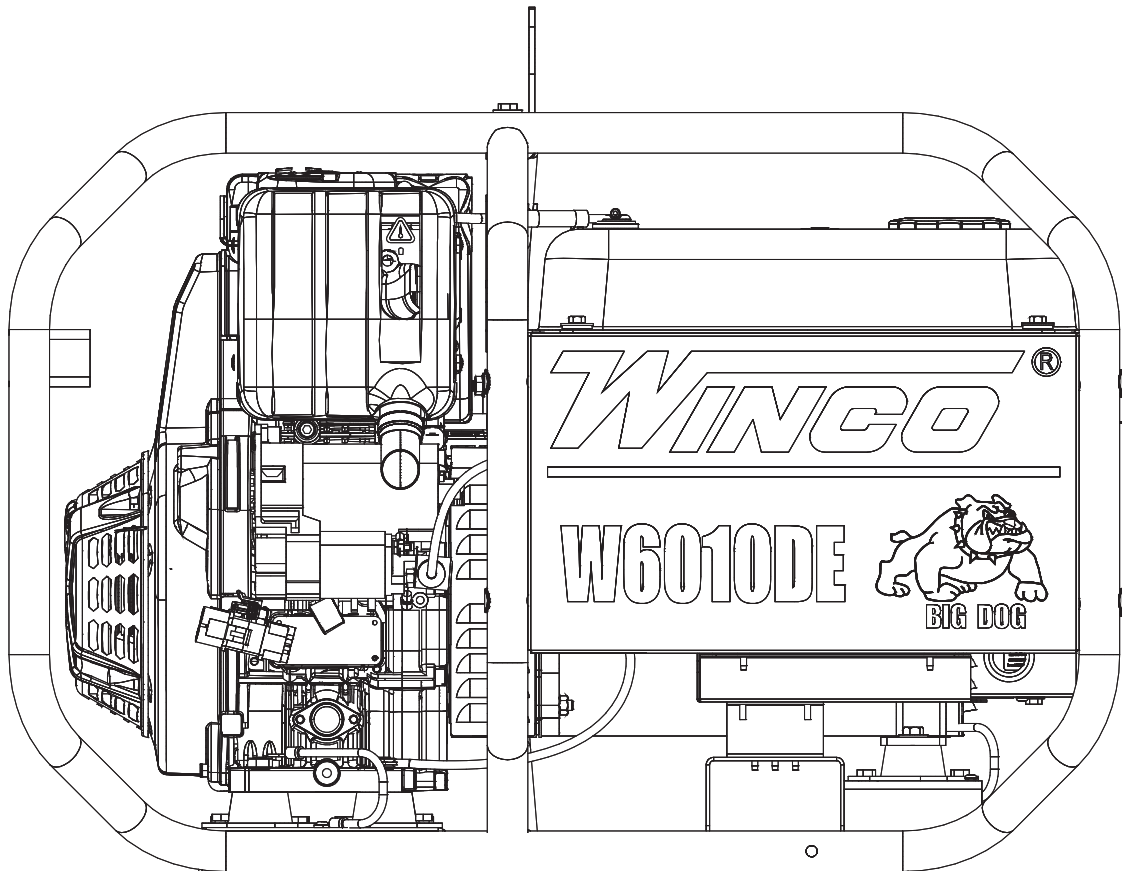




W6010KE-04/A
W6010KE-17/A
W6010KE-18/A
GENERATORS

INSTALLATION & OPERATORS MANUAL



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 concerning this unit, it will
help us to respond to your needs faster.

MODEL _____

SERIAL NUMBER _____

PURCHASE DATE _____

DEALER NAME _____

DEALER PHONE # _____



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2

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.

3

4

USING THIS MANUAL

5

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.

6

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

7

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.

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SAFETY INFORMATION

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.

SAFETY DEFINITIONS

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also 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.

CALIFORNIA PROPOSITION 65



WARNING: This product contains crude oil, gasoline, diesel fuel and other petroleum products, antifreeze to which can expose you to chemicals including toluene and benzene, Ethylene glycol (ingested) which are known to the State of California to cause cancer, birth defects or other reproductive harm and developmental issues. For more information go to www.P65Warning.ca.gov.

ELECTRICAL SHOCK

The output voltage present in this equipment can cause 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-pronged grounded receptacles and extension cords.
- F. Be sure the unit is properly grounded to an external ground rod driven into the earth.

DEADLY EXHAUST GAS

Exhaust fumes from any gasoline engine contain carbon monoxide, an invisible, odorless and deadly gas that must be mixed with fresh air.

- A. Operate only in well ventilated areas.
- B. Never operate indoors including attached garages
- C. Never operate the unit in such a way as to allow exhaust gases to seep back into closed rooms (i.e. through windows, walls, floors).

FIRE HAZARD

Gasoline and other fuels present a hazard of possible explosion and/or fire.

- A. Do not refuel when the engine is running or hot.
- B. Keep fuel containers out of reach of children.
- C. Do not smoke or use open flame near the generator set or fuel tank.
- D. Keep a fire extinguisher nearby and know its proper use. Fire extinguishers rated ABC by NFPA are appropriate.
- E. Store fuel only in an approved container, and only in a well ventilated area.
- F. Follow local codes for closeness to combustible material.

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 using this equipment.

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 gas or oil spills before starting the unit.

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 when fatigued.
- C. Never remove the protective guards, covers, or receptacle panels while the engine is running.
- D. Use extreme caution when working on electrical components. High output voltage from this equipment can cause serious injury or death.
- E. Always avoid hot mufflers, exhaust manifolds, and engine parts. They can cause severe burns instantly.
- F. The use of the engine-generator set must comply with all national, state, and local codes.

SPECIFICATIONS

W6010KE-04/A

Volts 120/208 3PH
Surge Watts 6,000
Continuous Watts 5,000
Amps @ 1.0 PF 20.8
Amps @ 0.8 PF 17.3

W6010KE-17/A

Volts 129/230 3PH
Surge Watts 6,000
Continuous Watts 5,000
Amps @ 1.0 PF 21.7
Amps @ 0.8 PF 15.7

W6010KE-18/A

Volts 277/480 3PH
Surge Watts 6,000
Continuous Watts 5,000
Amps @ 1.0 PF 10.4
Amps @ 0.8 PF 7.5

GENERATOR

120/208 & 132/230

Generator Manufacturer Mecc Alte Spa
Generator Model Number ET20F-200
Part Number 16346-037
Rotor 13.074 Ohms
Stator Resistance 0.16 Ohms
AVR ASR

277/480

Generator Manufacturer Mecc Alte Spa
Generator Model Number ET20F-200
Part Number 16346-038
Rotor 13.309 Ohms
Stator Resistance 1.049 Ohms
AVR ASR

ENGINE

Engine Manufacturer Kohler
Engine Model Number KD440
Fuel Type Diesel
Oil Capacity 41.6 oz. (1.3 qts)

INTRODUCTION

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.

INTENDED USES

This engine generator set has been designed primarily for portable heavy duty commercial use.

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 operate and/or store the unit outside during inclement weather without adequate protection from the elements. Failure to do so will damage the unit.

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

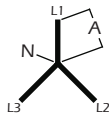
CAUTION: EQUIPMENT DAMAGE

Check phase rotation. Improper phase rotation can result in equipment damage.

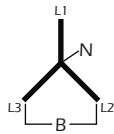
W6010KE: All models use wye (star) dedicated generator ends that cannot be reconnected. All nameplate ratings for amps and KVA are at a 0.8 PF. Some loads operate at 1.0 PF which will reduce the number of amps available but not the available KW. See page 4 of this manual for 1.0 PF amperage capabilities.

Each generator provides loads from three winding groups of equal capacity. It is essential that care is taken to properly balance the load between the winding groups.

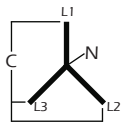
When the load is connected between any line and the neutral (example A), the load is concentrated on one winding group with an amperage rating equal to specification at 1.0 PF. You can create a balanced load by dispersing your L-N loads between each leg.



When the load is connected between any Line to Line (example B), the load is concentrated on two of the three winding groups with an amperage rating equal to the specification at 1.0 PF. You can create a balanced load by offsetting connections.



A three phase load connected to all legs (example C), the load is evenly split between all three winding groups. the load can be at 0.8 or 1.0 PF.



You may run multiple connections types at the same time as long as they do not exceed the machine's nameplate rating. Each connection type will reduce the amperage available on each winding group.

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.

LOAD TYPES

This generator is designed and rated for general commercial use. The running watts rating assumes a variable load. If your application has a fixed load that does not vary, an additional derate of 20% from the running watts is recommended to ensure the longest useful life of the engine and generator end.

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

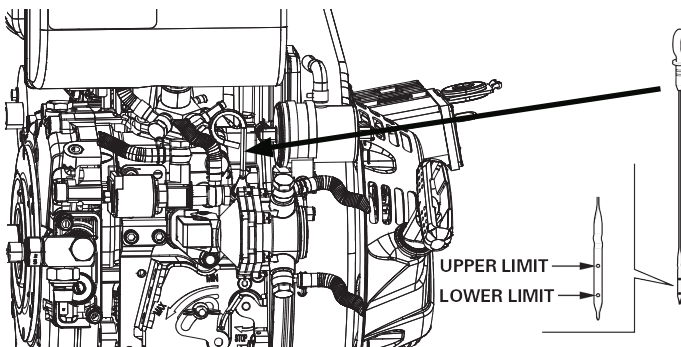
2. Before proceeding with the preparations of your new generator for operation, take a couple of minutes to ensure the unit you have received is the correct model and review the specification pages in this manual to ensure that this unit meets your job requirements.

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 1.3 quarts (41.6 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. Winco recommends our 5W-30 fully synthetic oil to give you excellent protection in cold temperatures while maintaining excellent performance in warmer weather.

F°	-40	-31	-22	-13	-4	5	14	23	32	41	50	59	68	77	86	95	104	113	122
C°	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50
SAE 10W																			
SAE 20W																			
SAE 30																			
SAE 40																			
SAE 10W-30																			
SAE 10W-40																			
SAE 10W-60																			
SAE 15W-40*																			
SAE 15W-40**																			
SAE 20W-60**																			
SAE 5W-30***																			
SAE 10W-30***																			

DIESEL FUEL

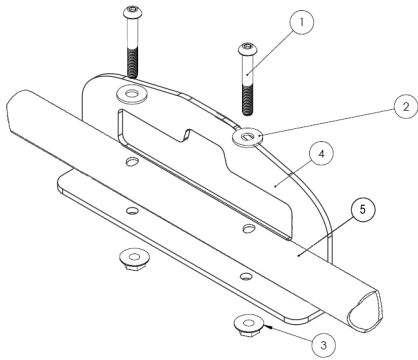
Always use a good grade of # 2 diesel fuel. For cold weather, blended #1 fuel may be used. Fuel cetane number should be 45 or higher and the fuel MUST be low sulfur or ultra low sulfur fuel. See engine operators manual for additional fuel recommendations including Bio-Diesel fuel. Never use gasoline 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 diesel 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.

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); 2 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). Secure the screw and flange, ensuring it is torqued.

OPTIONAL DOLLY KIT

An optional 2-wheel dolly kit is available for this generator. The dolly kit comes with its own instructions and parts list.

CAUTION: EQUIPMENT DAMAGE

Be sure to check the wheels properly before operating the generator.

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.

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.

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.

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.

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.

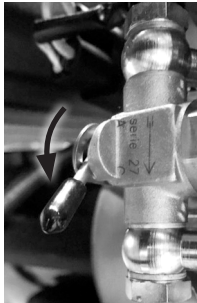
NOTICE: ENGINE START LOCKOUT

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.

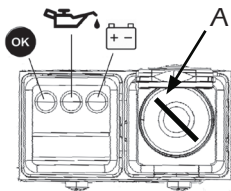
BASIC OPERATION

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.

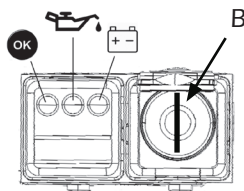
1. Check oil level, refill as needed.
2. Make sure the fuel solenoid valve lever is in the down position. This lever should never be put in the up position. The lever is located under the key switch as pictured.



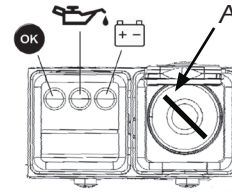
3. Turn key to 1st position (Ref A).



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.

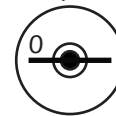
CAUTION: EQUIPMENT DAMAGE

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

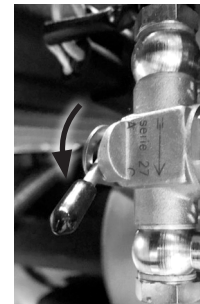
2. HOT WEATHER
Use the proper oil for the temperature expected.

STOPPING

1. Move the key to the "OFF" position.



2. Make sure the fuel solenoid valve lever is in the down position. The lever is located under the key switch as pictured. The generator will not shutdown if this lever is in the up position.



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.

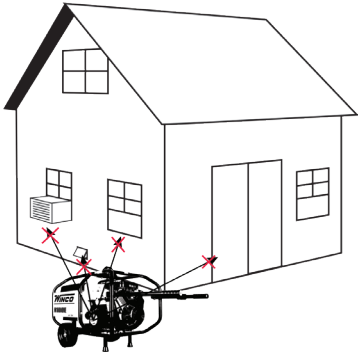
- A. While the engine is warm, drain the oil and refill with fresh oil.
- B. Clean dirt and chaff from cylinder, cylinder head fins, blower housing, screen, and muffler areas.
- C. Store in a clean and dry area.

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.

WARNING: PERSONAL DANGER:

Operating any engine driven generator without proper air flow can result in personal injury or death. DO NOT operate this unit inside a home or garage, near vents or windows, or anywhere carbon monoxide gas could accumulate.



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

Proper grounding of your generator is application dependent. Carefully evaluate your planned use of your generator to understand which grounding you require. If you are not sure what to do, contact a competent professional to assist you. The NFPA 70 250:34-35 are good technical references.

STANDARD PORTABLE GENERATOR

Your WINCO portable generator ships with a bonded neutral. You can safely use this generator without external grounding as long as all loads are powered through the receptacle panel.

VEHICLE-MOUNTED GENERATOR

Your WINCO portable generator ships with a bonded neutral. When mounted to a vehicle to safely distribute power it is necessary that the generator frame is bonded to the vehicle frame. The generator should only supply equipment that is cord and plug connected through receptacles mounted on the generator or the vehicle.

PERMANENTLY INSTALLED GENERATORS

This WINCO portable generator ships with a bonded neutral and overcurrent protection. NFPA 70 refers to this as a "separately derived system." When connecting it to a building a transfer switch specifically designed for GFCI and bonded neutral generators is required.

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.

CAUTION: EQUIPMENT DAMAGE

Check phase rotation. Improper phase rotation can result in equipment damage.

1. These engine-generator sets are designed for portable heavy duty commercial use. On 208/230V machines, receptacles are provided on the control panel to permit both L-N and L-L connections. Each of the three L-N receptacles is connected to one leg allowing for an evenly balanced loads. The full power plug is capable of three phase power.

The 480V machines are not equipped with any L-N plugs and come with a full power receptacle.

Each generator ships with a compatible full power plug. Consult a licensed electrician for wiring the TemPower plug and connecting it as temporary service.

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. Installing a transfer switch also permits the use of normal fusing.
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

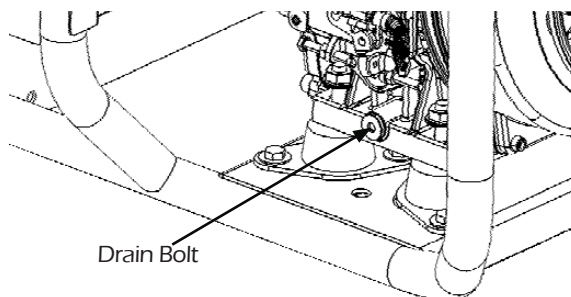
If major engine service or repair is required, contact an authorized engine service center. The manufacturer of these engines has established an excellent world-wide engine service organization. Engine service is very likely available from a nearby authorized dealer or distributor.

CHANGING THE OIL

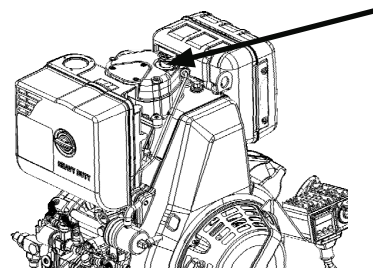
Change the oil after the first 50 hours of operation and yearly or 250 hours thereafter under normal operating conditions.

Outdoor temperatures determine the proper oil viscosity for the engines. Winco recommends our 5W-30 fully synthetic oil to give you excellent protection in cold temperatures while maintaining excellent performance in warmer weather.

- 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 41.6 oz. (1.3 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.

- Remove the cover.



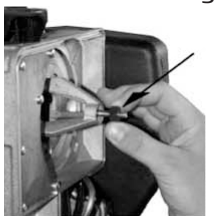
B. Remove the wing nut.



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.

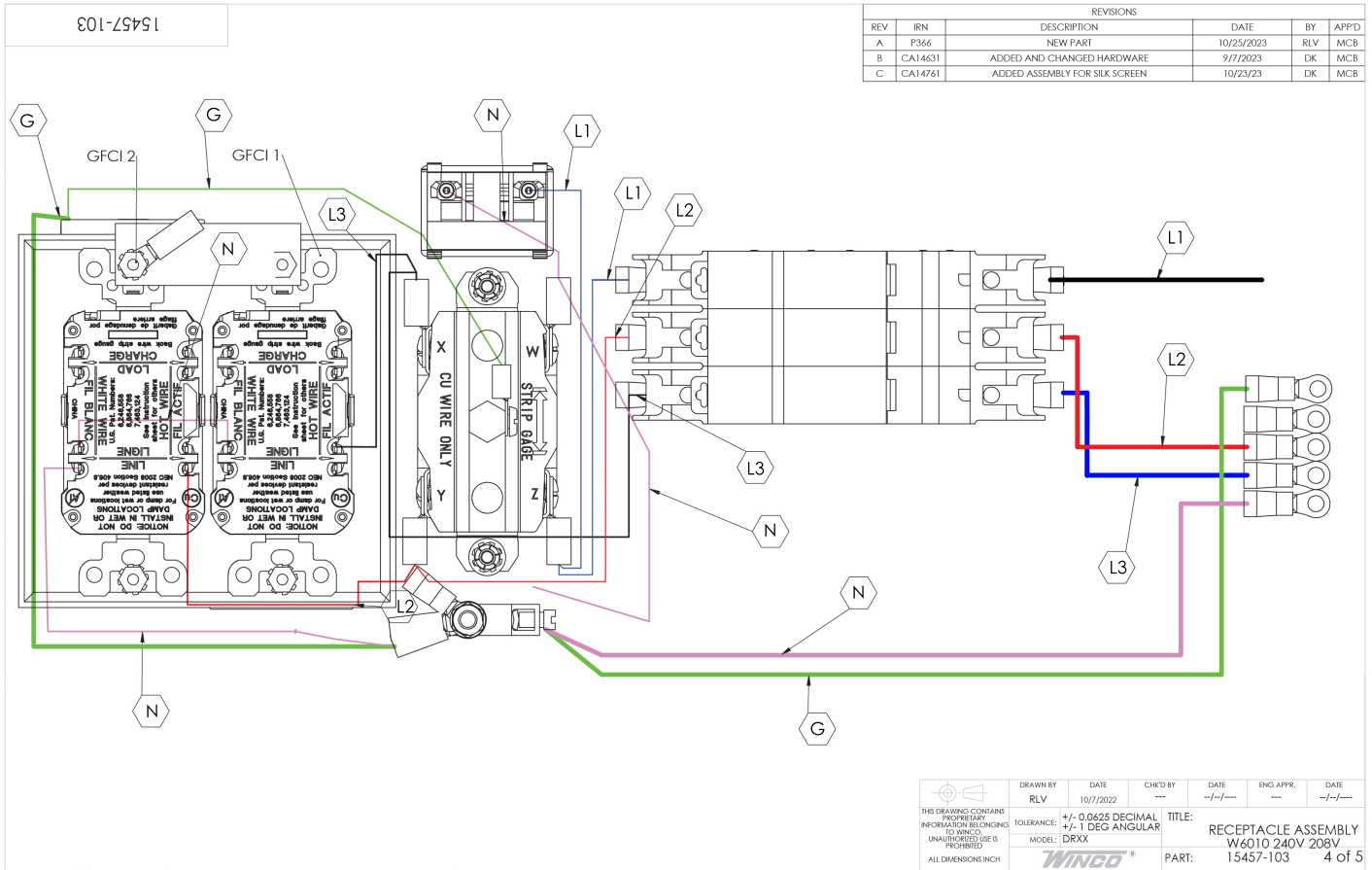
1. Keep the air inlet screen on both the engine and generator free of any dirt or debris to ensure proper cooling. At least yearly, remove the blower housing on the engine and clean the chaff and dirt out of the engine cooling fins and fly wheel. Clean more often if necessary. Failure to keep these areas 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

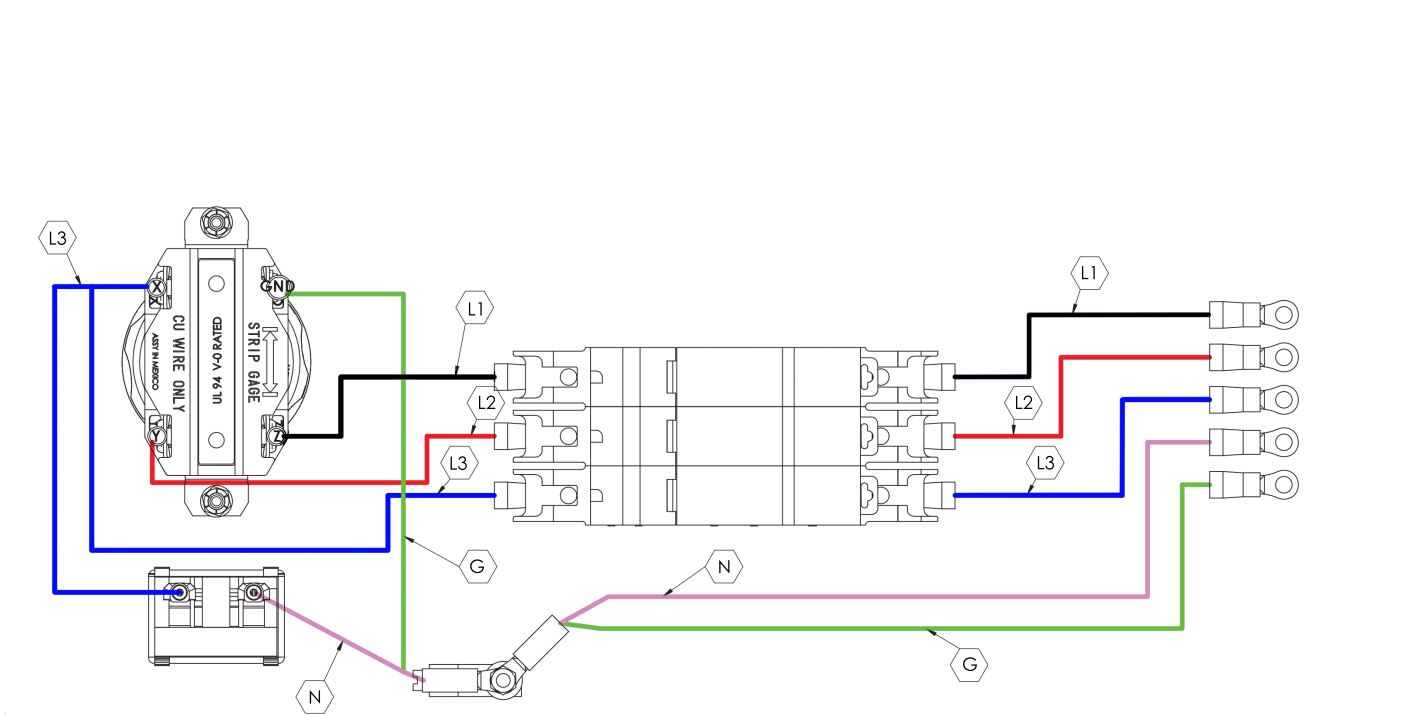
Problem	Possible Causes
Won't start	<ul style="list-style-type: none"> Low oil level Out of fuel Start switch in OFF position Fuel Valve turned off Plugged fuel filter Blown fuse in key switch Battery required to open solenoid
Voltage too low	<ul style="list-style-type: none"> Engine speed is too low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

WIRING DIAGRAM

208V & 230V



480V



CALIFORNIA EVAPORATIVE EMISSION CONTROL

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board is pleased to explain the evaporative emission control system's warranty on your model generator. In California, new equipment that uses small off-road engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. WINCO must warrant the evaporative emission control system on your generator for the period listed below provided there has been no abuse, neglect or improper maintenance of your equipment leading to the failure of the evaporative emission control system.

Your evaporative emission control system may include parts such as: carburetor, fuel tank, fuel cap, fuel lines (for liquid fuel and fuel vapors), fuel line fittings, fuel line clamps, carbon canisters, and carbon canister mounting brackets.

MANUFACTURER'S WARRANTY COVERAGE

The evaporative emission control system is warranted for two years. If any evaporative emission related parts on your equipment are defective, the parts will be repaired or replaced by WINCO.

LIMITED WARRANTY

WINCO Incorporated warrants to the original purchaser for the warranty period 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.

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, contact a Winco Authorized Service Center within the warranty period from date of purchase.

*NOTE: Units that are resold by original owner are not covered under this warranty. Any further warranty, whether expressed or implied, rests solely with the reseller.

THERE IS NO OTHER EXPRESS WARRANTY.

To the extent permitted by law, any and all warranties, including those of merchantability and fitness for a particular purpose, are limited to the warranty period from date of purchase. In no event is WINCO liable for incidental or consequential damages.

Note: Some states do not allow limitation on the duration of implied warranty and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply in every instance. This warranty gives you specific legal rights which may vary from state to state.

WINCO, INC. WARRANTY EFFECTIVE DATE

Air cooled units purchased for stock have 1 year to be sold. The warranty to the original retail customer commences on the date of sale of the product to them. All liquid cooled units have 180 days from the Winco invoice to submit a start up date. If no startup form is submitted, then warranty period starts on the Winco invoice date unit was sold.

Date of sale is defined as the day the customer takes delivery of the product. This warranty shall remain in effect to the original purchaser for the period stated on the sales literature. The warranty is not transferable and the retail customer must retain his original bill of sale as proof of purchase date.

WINCO, Inc. agrees to the following obligations during the warranty period:

1. To warrant any defect in material or workmanship of products sold under the WINCO and DYNA brand names in accordance with the warranty statements in the operator's manuals.
2. To reimburse authorized WINCO, Inc. Service Centers/Dealers for the cost of parts plus standard ground UPS shipping charges for all valid warranty repairs and to reimburse same said service centers/dealers for reasonable labor charges based on WINCO's current warranty labor reimbursement rate.
3. To furnish its authorized service centers/dealers with the necessary parts to make the repairs. WINCO Generator Warranty Periods & Restrictions

WINCO GENERATOR WARRANTY PERIODS & RESTRICTIONS

Industrial Portables

WL Models - 3 Years, See Notes 1 & 2

W Models - 3 Years, See Notes 1, 2, & 5

DP Models - 3 Years, See Notes 1 & 2

HPS Models - 2 Years, Home Use ONLY; Commercial use* is 90 Day Warranty, See Note 1

EMERGEN-C (EC) Series

2 Years, See Note 1

DE Series

1 Year/2000 hours, No Travel Time

Mobile Diesel Series

1 Year/2000 hours, No Travel Time

PTO Series

15kW & 10kW - 1 Year, Limited Farm Standby Only

25kW thru 165kW - 3 Years, Limited Farm Standby Only/Commercial use* 1 Year

Two Bearing Series

1 Year, Bench Labor and Parts only

Gaseous/Packaged Standby Series (PSS)

Air-Cooled Models (PSS8, PSS12, & PSS20) – 2 Years/2000 Hours Standby Only See Notes 3 & 4 Prime Power use 1 Year/2000 Hours See Notes 3 & 4

Liquid-Cooled Models (PSS21 - PSS150) - 2 Years/2000 Hours Standby Only See Notes 3 & 4 Prime Power use 1 Year/2000 Hours See Notes 3 & 4

Diesel Standby Series (DR)

Liquid-Cooled Models (DR12 - DR600) - 2 Years/2000 Hours Standby Only See Notes 3 & 4

Prime Power use 1 Year/2000 Hours See Notes 3 & 4

Accessories (Installed on Generator or shipped loose)

1 Year from factory invoice or 2000 Hours (whichever occurs first)

Automatic Transfer Switches (ATS)

See ATS Manufacturer's Warranty

NOTES

Note 1: First 2 years of warranty coverage includes Parts and Bench Labor Only, no travel time or labor allowance for removal or reinstallation of the product from its application.

Note 2: 3rd Year warranty coverage is parts only/no labor.

Note 3: Round trip mileage is limited to 200 miles per trip and a total of 2 trips per repair unless authorized in writing by the WINCO Service Dept.

Note 4: Mileage allow on permanently installed units only. Trailer mount units is bench labor only.

Note 5: W3000 is a 1 Year Warranty.

*Commercial use is defined as Construction, Rental, Prime Power, or use in a business of any type including agricultural and hobby. Prime Power use is defined as any application where the generator set is being used 'off-grid' where there is no utility power present. Standby use is defined as an application where utility power is present -and- the generator set is used as emergency backup during utility power outages.

WINCO reserves the right to change or improve it's products without incurring any obligations to make such changes or improvements on products purchased previously.

EXCLUSIONS:

WINCO does not warrant Engines. Engines are covered exclusively by the warranties of their respective manufacturers.

WINCO does not warrant Batteries, or Other Component Parts that are warranted by their respective manufacturers.

WINCO does not warrant modifications or alterations which were not made by WINCO, Inc.

WINCO does not warrant products which have been subjected to misuse and/or negligence or have been involved in an accident.

This warranty does not include travel time, mileage, or labor for removal or reinstallation of WINCO product from its application, unless specifically authorized.

WHAT IS COVERED BY WARRANTY

1. Generator end including rotor, stator, end brackets, and bearing.
2. Control box including transformers, circuit breakers, wiring, resistors, and switches.
3. LP/NG fuel system including fuel solenoid, demand regulator, carburetor, and hoses.
4. Cradle assembly including cradle, cross member, and shock mounts that fail. Shock mounts damaged from rough handling are not covered.
5. Reasonable travel time for the PSS & DR series generators only, that are permanently installed.
6. Ground shipping charges for warranty parts, no premium service, domestic US shipments only.

WHAT IS NOT COVERED BY WARRANTY

1. Products which have been subjected to alteration, modification, neglect or unauthorized repairs not approved in writing by Winco, Inc.
2. Products no longer owned by the original purchaser.
3. Products with shipping or freight damage. File a freight claim with the delivery carrier.
4. Products suffering normal wear, accidents, improper maintenance or improper protection in storage. Products damaged by rough handling, such as shock mounts on cradle assemblies.
5. Pressure or steam cleaning of products, cleaning of fuel system, or flushing of cooling system.
6. Replacement of filter, belts, antifreeze, or lubricants.
7. Electrical items, such as light bulbs, receptacles, spark plugs, or any items damaged by welding or jump starting.
8. Any repeat or shop come-back repairs resulting from poor service work or improper diagnosis and testing. Replacement of parts as a trial-and-error method of diagnosis will not be considered for warranty.
9. Replacement parts other than those sold by Winco, Inc.
10. Damage caused by fire, flood, lightning or any other natural disaster.
11. Damage caused by improper protection during installation, (i.e. not protecting contactor in the ATS panel and getting wire trimming or debris from drilling the box in the contactor coil or contacts.)
12. Damage caused by over loading of the generator and failure to adequately provide overload protection.
13. LP/NG fuel adjustments or conversion from one fuel to another.
14. Adjustment of any kind, all units are 100% load tested before shipping.
15. Any damage caused by the use of the equipment for purposes other than for which it was designed.
16. Engines - All engines used by Winco, Inc. are warranted by their respective manufacturer's.
17. Batteries - Must be returned to original battery manufacturer.
18. Damage caused by improper installation or failure to provide adequate ventilation.
19. Cosmetic repairs, such as repainting.
20. Freight charges for transportation to and from a Warranty Service Center.
21. Rental costs of renting replacement generators.
22. Travel time or service calls unless specifically authorized by Winco, Inc. in writing.

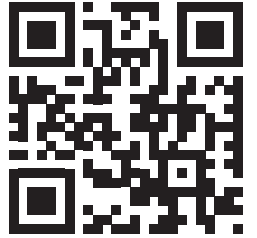
GENERAL INFORMATION

The WINCO, Inc. Service Department is open from 7:30 AM to 4:30 PM Central Standard time.

It is located at 225 South Cordova Ave., Le Center, MN, 56057-1805.

Phone Numbers: Service Department - 507-357-6831 FAX Line - 507-357-4857. Email address is service@wincogen.com

The phone number to for the General Switchboard/Sales Department is 507-357-6821.



WINCO[®]
GENERATORS



AN AMERICAN COMPANY

225 S. CORDOVA AVE • LE CENTER, MN 56057

Sales: 507-357-6821 • sales@wincogen.com

Service: 507-357-6831 • service@wincogen.com

www.wincogen.com

